SAMMAMISH TOWN CENTER SUB-AREA PLAN

Draft Environmental Impact Statement

January 31, 2007

City of Sammamish
801 228th Ave SE
Sammamish, WA 98075

City of Sammamish Washington

801 228th Avenue SE, Sammamish, WA 98075-9509
Phone: 425-295-0500 • Fax: 425-295-0600 • www.ci.sammamish.wa.us

January 31, 2007

Dear Readers:

Enclosed is the Draft Environmental Impact Statement (DEIS) for the Sammamish Town Center Subarea Plan. The City welcomes your comments on the development alternatives, impacts, and mitigations described in this document. In addition to a variety of other techniques, we are using the EIS process as a forum for input for the plan.

Four Town Center alternatives are analyzed in this Draft EIS, three action alternatives (Alternatives 1-3) and a no-action alternative (Alternative 4):

- Alternative 1 Commercial Focus – has the most residential, commercial, mixed-use and residential development;
- Alternative 2 Low Intensity – represents a mix of commercial, retail, and housing types but at a lower level of scale and intensity;
- Alternative 3 Civic Focus – has a middle-level amount of housing, mixed-use and commercial development, and also focuses on a variety of civic facilities; and
- Alternative 4 No Action – assumes that the Town Center would develop under the current Comprehensive Plan land use designations for detached single-family residential development.

The City invites your comments on this Draft EIS during the comment period from February 1 to March 2, 2007. Your comments should be mailed to the City of Sammamish, Attn: Town Center DEIS, 801 228th Ave SE, Sammamish, WA 98075. You may also email your comments to the City at: asandine@ci.sammamish.wa.us.

Using the DEIS comments, public input and other study results, the city will develop a Town Center Plan that may be a hybrid of these alternatives. Your input is welcome, encouraged and important to setting that future direction.

Thank you for your comments!

Sincerely,

Kamuron Gurol,
Director of Community Development

Fact Sheet

Project Title

City of Sammamish Town Center Sub-Area Plan

Proposed Action and Alternatives

Proposed Action

The proposed action is the adoption of a sub-area plan for the Sammamish Town Center. The Sub-Area Plan will include elements addressing the Town Center's vision, land use, zoning, environmental management, open space, transportation, capital facilities, urban design and design guidelines, and implementation.

The Sub-Area Plan is an integrated SEPA/GMA document pursuant to WAC 197-11-210. As such it will combine the processes and supporting analyses required under both GMA and SEPA. The Sub-Area Plan will be incorporated into the City of Sammamish Comprehensive Plan. Other subsequent actions may include amendments to the City's Transportation Improvement Plan, Land Use Regulations, or Capital Improvement Program.

Location

The Town Center planning area is located on the Sammamish Plateau in the center of the city of Sammamish. It is generally bounded on the north by E Main Street; on the east by 232nd Avenue SE; on the south by SE 8th Street; and on the west by 222nd Place SE.

Alternatives

Four alternative development scenarios for the Town Center are considered in this EIS, three action alternatives and a no-action alternative. Each of the three action alternatives would result in an urbanized land use pattern featuring commercial development and an increase in housing density and housing types. Two of the alternatives (Alternatives 1 and 3) feature comparable development levels, but vary on the focus of the plan (commercial vs. civic). One of the alternatives (Alternative 2) represents a lower level of development intensity. All three of the action alternatives would include approximately 30 – 40 acres of public open space, trails providing non-motorized internal and external connections, and protections for critical areas.

The No-Action Alternative assumes that the Town Center would develop according to the current Comprehensive Plan land use designations. This would result in a town center featuring existing institutional uses and low-density single-family development.

Proponent

City of Sammamish

Date of Implementation

Spring 2008, Adoption by City Council

Lead Agency

City of Sammamish
801 228th Ave SE
Sammamish, WA 98075

Responsible Official/Contact Person

Kamuron Gurol
Community Development
City of Sammamish
801 228th Ave SE
Sammamish, WA 98075
(425) 295-0500

Authors and Principle Contributors

The Draft Environmental Impact Statement for the City of Sammamish Town Center has been prepared under the direction of the City of Sammamish Community Development Department. Research, analysis, and document preparation were provided by the following firms:

Primary Author, EIS Coordination, Earth, Water, Plants and Animals, Land Use, Air and Sound, and Public Services and Utilities
Adolfson Associates Inc.
5309 Shilshole Avenue NW, Suite 200
Seattle, WA 98107

Transportation
The Transpo Group
11730 118th Avenue NE, Suite 600
Kirkland, Washington 98034

Aesthetics and graphics
Makers Architecture and Urban Design
1425 4th Avenue, Suite 901
Seattle, WA 98101

Permits and Approvals Required

- City Council adoption of the Sub-Area Plan by way of ordinance or resolution, as appropriate.
- Review by the Washington State Department of Community Trade and Economic Development (CTED).

Date of Draft EIS Issuance

January 31, 2007

Comments on the Draft EIS

Affected agencies, tribes, and members of the public are invited to comment on this Draft EIS. Pursuant to WAC-197-11-455 the comment period will begin February 1, 2007 and will end 30 days from the date of issuance at 5:00 PM on March 2, 2007. Please submit comments in writing to the City of Sammamish at Attn: Town Center DEIS, 801 228th Ave SE, Sammamish, WA 98075. You may also email your comments to the City at: asandine@ci.sammamish.wa.us.

Cost/Availability of Draft EIS

This DEIS is available for viewing at Sammamish City Hall and the Sammamish Library, 825 228th Avenue NE. The DEIS will be posted to the City's website at: www.ci.sammamish.wa.us. Copies are available for purchase at City Hall in hard copy or CD (pdf format). For more information please contact Asea Sandine at (425) 295-0557.

Previous Environmental Documents

- Final Supplemental Environmental Impact Statement for the City of Sammamish Final Comprehensive Plan (2003)

Location of Background Information

City of Sammamish, Department of Community Development. See lead agency above.

Table of Contents

Table of Contents

List of Tables

List of Figures

Chapter 1 Summary

1.1 Introduction

This chapter provides a summary of information contained in this Sub-Area Plan Draft Environmental Impact Statement (EIS). It contains a summary of the alternatives, significant impacts, mitigation measures, and significant unavoidable adverse impacts. Chapter 2 provides a more detailed description of each of the alternatives. Chapters 3 through 10 of this EIS provide detailed information concerning the affected environment, impacts, and proposed mitigation measures for each element of the environment.

1.2 Proposed Action and Site Location

1.2.1 Proposed Action

The proposed action (or proposal) is the adoption of a sub-area plan for the Sammamish Town Center. The sub-area plan will include elements addressing the Town Center's vision, land use, zoning, environmental management, open space, transportation, capital facilities, urban design and design guidelines, and implementation.

The sub-area plan would be incorporated into the City of Sammamish Comprehensive Plan. Other subsequent actions may include amendments to the City's Transportation Improvement Plan, Land Use Regulations, and Capital Improvement Program.

1.2.2 Site Location

The Town Center planning area is located on the Sammamish Plateau in the center of the City of Sammamish (Figure 1-1). The planning area is approximately 243 acres in size, bordered on the north by E Main Street; on the east by 232nd Avenue SE; on the south by SE 8th Street; and on the west by 222nd Place SE. The intersection of SE 4th Street and 228th Avenue SE is likely to be the central node of the Town Center (Figure 1-2). Approximately 60 acres of the site has been identified as wetlands, wetland buffers, or stream buffers as defined by the City's Critical Areas Ordinance (Sammamish Municipal Code [SMC] 21A.50). In addition, approximately 30 acres of the site is currently being developed as the Sammamish Commons Park. This leaves approximately 160 acres of developable land (this includes current institutional uses that are less likely to redevelop into different uses).

For the purpose of this analysis the Town Center planning area has been divided into four smaller areas hereafter referred to as the Northwest (NW), Northeast (NE), Southwest (SW), and Southeast (SE) quadrants. The four quadrants are defined by 228th Avenue SE and SE 4th Street (Figure 1-2).

1.3 Purpose and Objectives

1.3.1 Purpose of the Proposal

The purpose of the proposed Town Center Sub-Area Plan is to implement the directives contained in the City's Comprehensive Plan (adopted by the City Council in 2003 [Ordinance No. 2003-130]). The Comprehensive Plan sets forth a goal to "establish three designated community centers, including the existing centers at Inglewood Center, Pine Lake Village, and the planned City Hall/Park project, to host a diversity of high quality places to live, work, shop, and recreate" (LUG-2).

The City's Comprehensive Plan (City of Sammamish, 2003a) further provides that "following adoption of the Sammamish Commons Master Plan, the City shall initiate a sub-area planning process for properties in the vicinity of 228th Avenue that may be affected by the Sammamish Commons. This sub-area plan may include potential zoning changes and other recommendations to promote more compatible land uses and to minimize potential adverse impacts on adjoining properties" (LUP 2.2(d)).

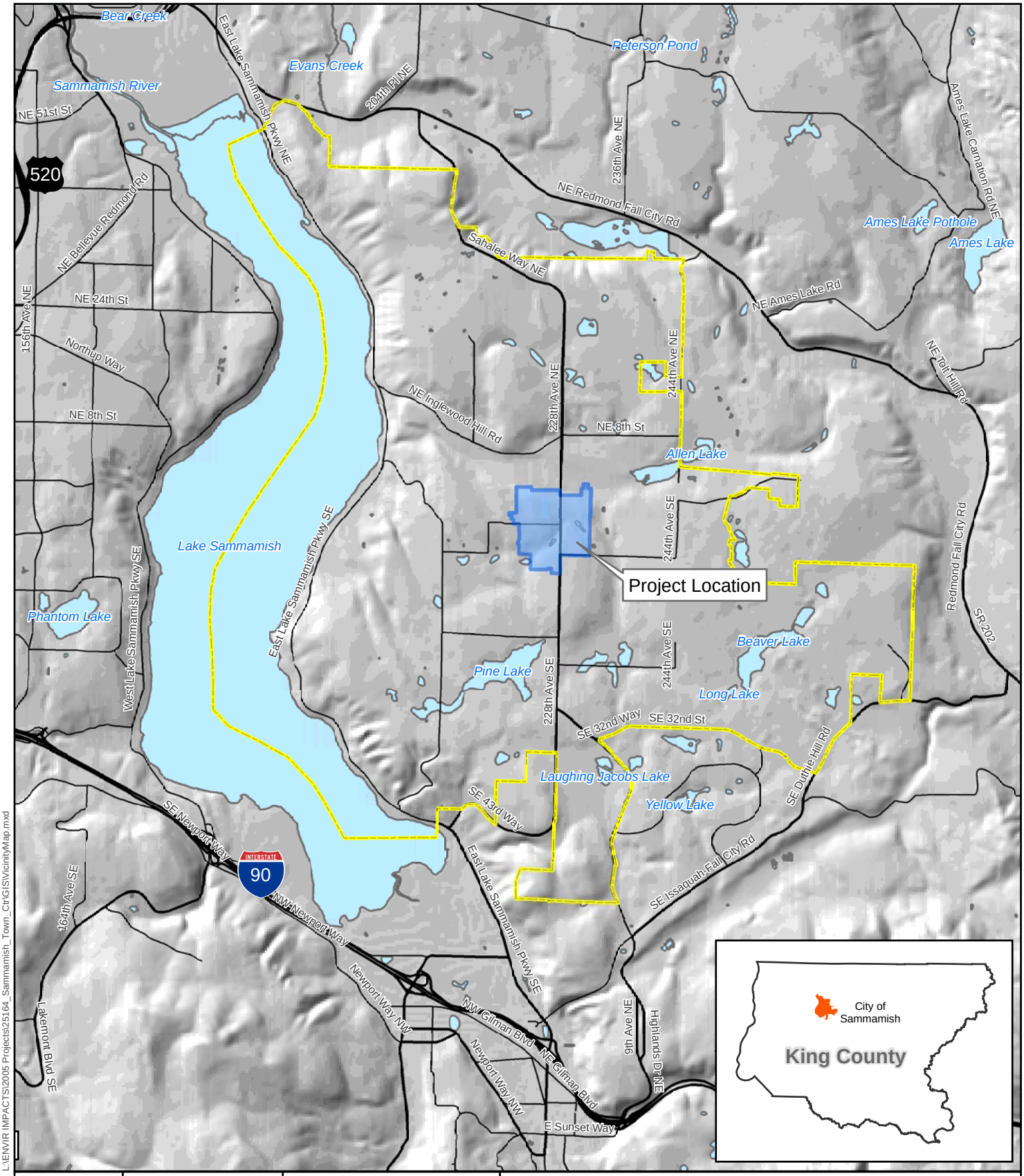
As a first step in the sub-area planning process, the Sammamish City Council adopted a vision statement for the Sammamish Town Center on March 7, 2006. The Council's vision is consistent with the overall community vision set forth in the Comprehensive Plan. The vision statement recognizes that the Town Center, as the "heart of the City," will accommodate a "unique core of urban lifestyles and experiences." Future development within the Town Center area would offer a range of commercial, residential, recreational, and cultural activities intended to efficiently serve Sammamish residents. By directing future residential, commercial, and employment growth to a defined "core," the City can further protect its natural environment, significant cultural resources, and the character of existing neighborhoods in other parts of the city.

1.3.2 Objectives of the Proposal

In accordance with the goals and policies established in the Comprehensive Plan and the City Council's vision statement, the Town Center Sub-Area Plan will emphasize four major objectives: (1) accommodate an appropriate share of urban growth; (2) preserve open spaces and habitat areas; (3) provide employment and commercial opportunities in proximity to new housing; and (4) provide adequate public facilities and services. The sub-area plan will be incorporated into the City of Sammamish Comprehensive Plan.

1.4 SEPA Process and Environmental Review

The State Environmental Policy Act (SEPA) (RCW 43.21C) requires that governments consider the environmental consequences of actions they take and, where possible, attempt to find alternative means to accomplish their goals with lower environmental impacts. This Draft EIS considers four alternative Town Center land use scenarios and provides comparisons to help decision makers and the community understand the potential environmental impacts that would likely result. This environmental assessment is one of many considerations that will be used to develop a preferred alternative and Final Town Center Sub-Area Plan. Other issues that will need to be considered include development feasibility, financial implications for City infrastructure investments, and legal issues.



L:\ENVIR IMPACTS\2005 Projects\25164_Sammamish_Town_Ctr\GIS\VicinityMap.mxd

ADOLFSON

File name: Fig1_1.pdf
Created/last edited by: DNE
Date last updated: 10/25/06

0 3,000 6,000 Feet
1:72,000

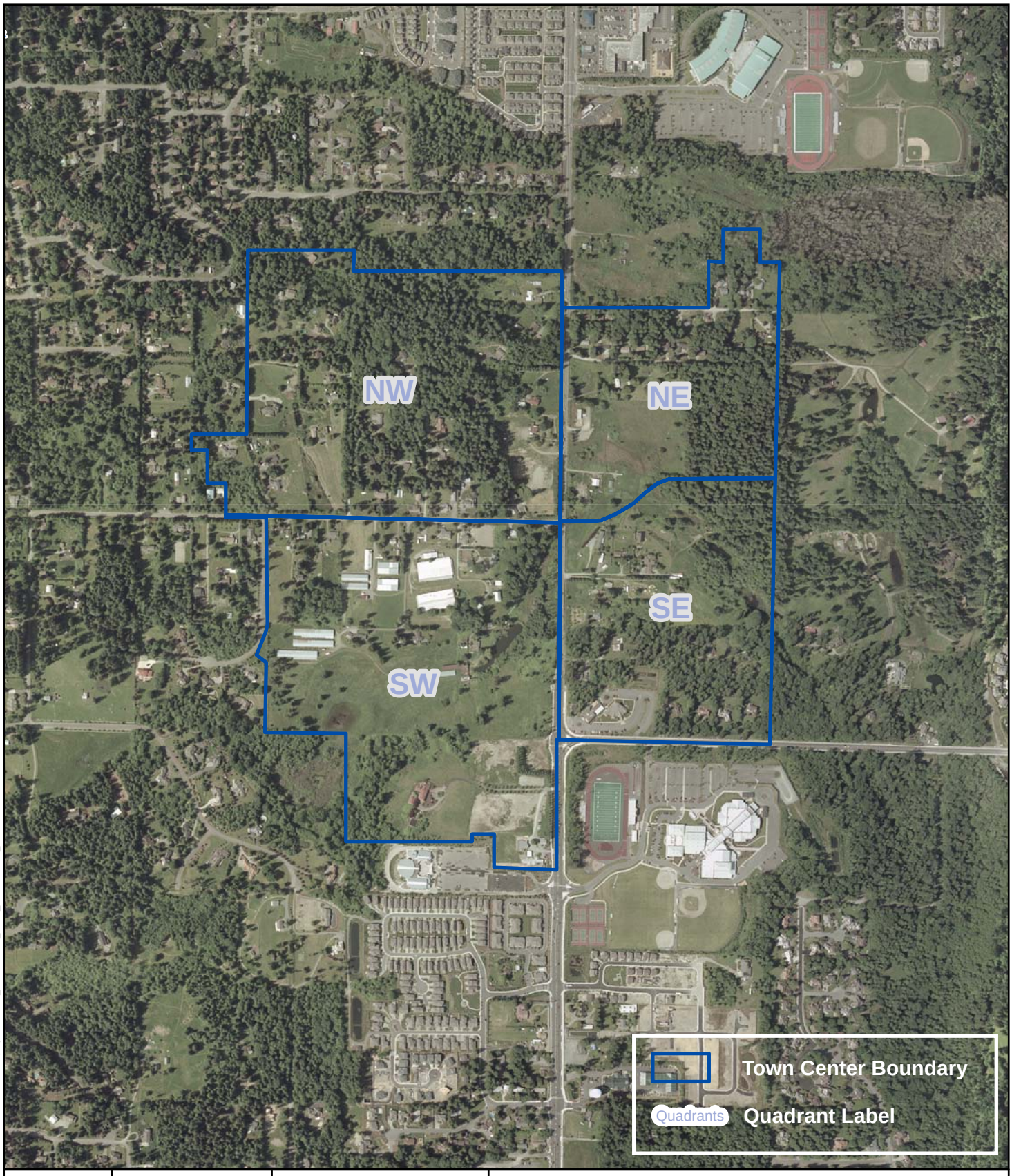
Map data are the property of the sources listed below. Inaccuracies may exist, and Adolfson Associates, Inc. implies no warranties or guarantees regarding any aspect of data depiction.
SOURCE: USGS Ortho Image, 2002; King County GIS, 2006

FIGURE 1-1

PROJECT LOCATION MAP

SAMMAMISH TOWN CENTER SUB-AREA PLAN DEIS

SAMMAMISH, WASHINGTON



L:\ENVIRIMPACTS\2005\projects\25164_Sammamish_Town_Ctr\GIS\FIG5_1.MXD

ADOLFSON

File name: FigX-X.ai
Created/last edited by: CM
Date last updated: 05/24/04

0 50 100 200 300 400 500 600 Feet

1:10,000

Map data are the property of the sources listed below. Inaccuracies may exist, and Adolfson Associates, Inc. implies no warranties or guarantees regarding any aspect of data depiction.
SOURCE:

FIGURE 1-2

SAMMAMISH TOWN CENTER VICINITY MAP

SAMMAMISH TOWN CENTER SUB-AREA PLAN DEIS

SAMMAMISH, WASHINGTON

This Draft EIS evaluates alternatives approved by the City Council in the summer of 2006. Once the Draft EIS is published, the community and City Council will have a chance to review the environmental evaluation and to consider other, non-environmental information being developed. It is probable that a preferred alternative that represents a hybrid of the alternatives considered in this document will be developed as a result of public discussion. Such a preferred alternative may require additional environmental analysis, which would be included in the Final EIS.

1.4.1 SEPA/GMA Integration

As part of the Town Center planning process, the City is integrating Growth Management Act (GMA) planning with SEPA review, as encouraged by the Washington Administrative Code (WAC 197-11-220). The purpose of the integrated process is to ensure that environmental analyses occur concurrently with and as an integral part of the planning and decision-making process. The EIS and sub-area plan processes will be integrated in accordance with the GMA and SEPA requirements as described under WAC 197-11-210 through 197-11-235. Integration of the SEPA and GMA processes will allow consideration of environmental information as well as public input, and will inform and assist decision makers in developing a preferred alternative that incorporates measures to fulfill the goals of the GMA, while identifying and mitigating probable significant adverse environmental impacts under SEPA.

The adoption of a sub-area plan is classified by SEPA as a non-project (or programmatic) action. Non-project actions are actions, such as plans, policies, and programs, which are different or broader than single site-specific projects (WAC 197-11-774). An EIS for a non-project action does not require site-specific analyses. Rather, the EIS discusses impacts and alternatives appropriate to the scope of the non-project proposal and the level of planning for the proposal (WAC 197-11-442).

1.4.2 Phased Review

The City is following a course of phased environmental review for the Town Center Sub-Area Plan. This allows the Town Center Draft EIS to focus on issues that are ready for decisions, and to defer consideration of issues that are not yet ready or require further analysis (WAC 197-11-060(5)). Under phased review, broader environmental documents, such as a sub-area plan, are followed by narrower documents, such as a site-specific or project-level analysis. The narrower documents can then incorporate by reference the general discussion already provided in this EIS, and concentrate on issues related to a specific proposal.

1.5 Description of the Alternatives

Four alternatives have been identified and are evaluated in this Draft EIS. The alternatives include three action alternatives and a no action alternative. Analysis of these alternatives will provide a better understanding of how future residential, commercial, and civic uses as well as open space could be distributed within the study area through the planning horizon of 2030.

Understanding differences between the alternatives will provide information to aid decision-making and the development of a preferred alternative. All four of the alternatives include the 30-acre Sammamish Commons and would avoid development of approximately 60 acres of streams, wetlands, and buffers. The three action alternatives will also include provisions for open spaces, public parking, low-impact development techniques, design guidelines, and a network of non-motorized trails connecting the various elements of the Town Center. The alternatives differ in the types, patterns, and intensities of planned land uses.

1.5.1 Alternative 1 – Commercial Focus

Alternative 1, the Commercial Focus Alternative, envisions the Town Center as a sub-regional destination with unique character, retail activities, family entertainment, employment, and services. Under this alternative, the Town Center would provide a walkable central retail area west of 228th Avenue SE, in the vicinity of SE 4th Street and 224th Place SE. The core area would be surrounded by a variety of housing types. This alternative is estimated to include approximately 3,000 to 4,000 new housing units; approximately 90,000 to 110,000 square feet of civic amenities; approximately 385,000 to 415,000 square feet of commercial/retail space; and approximately 65,000 to 85,000 square feet of commercial/office space in the Town Center.

1.5.2 Alternative 2 – Low Intensity

Alternative 2, the Low Intensity Alternative, envisions the Town Center as a local neighborhood with a small commercial village and limited services. Alternative 2 would create a commercial core surrounded by a limited area of mid-rise housing development. The remaining area would comprise a neighborhood of detached single-family residences and town homes. As in Alternative 1, the Town Center core would be centered immediately south of the intersection of SE 4th Street and 224th Place SE. The commercial core would be much smaller in scale, comprising approximately 150,000 to 175,000 square feet of commercial/retail development. This alternative would include 1,000 to 1,500 new housing units spread throughout the Town Center area.

1.5.3 Alternative 3 – Civic Focus

Alternative 3, the Civic Focus Alternative, would provide a civic, cultural, and recreational center surrounded by housing of various densities. This alternative would also create a central plaza north of an expanded Sammamish Commons. The plaza would be lined by public facilities that could include a library, community center, aquatic center, performing arts center, senior center, youth center, or other civic amenity. This alternative is estimated to include 2,500 to 3,000 new housing units; approximately 180,000 to 200,000 square feet of civic amenities; 185,000 to 215,000 square feet of commercial/retail space; and 115,000 to 130,000 square feet of commercial/office space.

1.5.4 Alternative 4 – No-Action

Under the No-Action Alternative, the existing Comprehensive Plan land use map would remain as adopted in the City's 2003 Comprehensive Plan. The existing land use designations in the project area include primarily low-density single-family residential and some park use for the Sammamish Commons.

Current zoning does allow institutional development under conditional use permits. There are several institutional developments in the project area now, including the Sammamish Hills Lutheran Church, the Eastside Catholic High School, the Arbor School, and the Sammamish Children's School. These existing institutional uses are likely to remain in the area, but no commercial uses would be allowed.

1.6 Summary of Potential Impacts and Mitigation Measures

Under all four of the land use alternatives, the Town Center planning area will change from its current suburban/rural character to a more developed urban/suburban character during the next 25 years. All of the alternatives (including the No-Action) accommodate an increase in population and will result in environmental impacts. The magnitude of impacts to the environment will differ depending on the specific amount, types, timing and mixes of development that would occur under each alternative. For example Alternative 1 and 3 propose more dense residential and commercial development than Alternative 2 and the No Action, which provide less housing and employment opportunities but, in many cases, with similar impacts.

The impacts to the natural environment are similar under all of the alternatives. They include loss of wildlife habitat; changes in the area's hydrology; and increased noise. All of the alternatives will also affect the built environment by impacting aesthetics and creating more demand for schools, parks and other public services. While all of the alternatives would also increase congestion on local roads, the severity of congestion would be related to the level of development. Alternative 1 would result in the most roadway congestion and the No-Action Alternative would result in the least.

Most of these impacts can be minimized by managing surface water runoff, protecting wetlands, streams and buffers; employing site planning and development guidelines that regulate the form and character of new development; avoiding or buffering conflicting land uses; and making improvements to roadways and other city infrastructure. The creation of a more dense Town Center, however, would provide the City the opportunity to more comprehensively and efficiently mitigate many of the impacts associated with increased population and development.

Table 1-1 provides a summary of the potential environmental impacts and mitigation measures for each of the four alternatives evaluated in the Draft EIS. Complete discussions of each element of the environment are found in Chapters 3 though 10.

Table 1-1. Summary of Potential Impacts and Mitigation

Alternative 1 – Commercial Focus	Alternative 2 – Low-intensity	Alternative 3 – Civic Focus	Alternative 4 – No-Action
3. Earth			
Impacts:			
All alternatives would have some development within erosion hazard areas that could have detrimental effects on soils and slope stability, and cause degradation of water quality from eroded sediment.			
Mitigation:			
Development under any of the alternatives would require a critical area review by the City during final design stages. Development proposals on sites containing erosion hazard areas must include a temporary erosion control plan to minimize erosion risks during and after construction prior to receiving approval.			
4. Water			
Impacts:			
Increased vehicle traffic and more dense concentration of population has the potential to degrade water quality in the Inglewood and Thompson Basins. Degradation of water quality has the potential to impact groundwater flow patterns and quality. The conversion of agricultural land use, and elimination of septic systems has the potential to decrease bacteria loading to both basins.			
Increases in impervious surface have the potential to result in hydromodifications within streams and wetlands in the Inglewood and Thompson Basins. Alternatives 1-3 result in similar percentages of impervious surfaces.			Increases in impervious surface are anticipated to be less than for Alternatives 1-3. However, increased impervious surface would still result in hydromodifications.
Mitigation:			
Perform baseline and ongoing surface water quantity and quality monitoring. Develop monitoring plan to track water quantity and quality to provide a better assessment of existing conditions and track performance of the installed stormwater system. Adaptively manage the stormwater system based on the results of the monitoring. Design stormwater management system to incorporate Low Impact Development (LID) techniques to mitigate potential impacts and mimic natural ecosystem processes. Implement restoration at the mouth of George Davis Creek, as recommended in the Inglewood Basin Plan. Remove impassable barriers to fish passage within Ebright Creek, as proposed in the East Lake Sammamish Basin Plan. Establish a stormwater district specifically for the Town Center planning area. The district could have the authority to collect funds to develop, install, and maintain the sub-area's stormwater system.			Implement basin-wide monitoring of water quantity and quality. Encourage the use of LID techniques to reduce impacts to stormwater. Comprehensive stormwater management techniques throughout the project area are unlikely.

Alternative 1 – Commercial Focus	Alternative 2 – Low-intensity	Alternative 3 – Civic Focus	Alternative 4 – No-Action
5. Plants & Animals			
Impacts:			
Approximately 45 to 60 acres of upland forest habitat could be removed under all action alternatives. Development would negatively impact wildlife habitat through deforestation and habitat fragmentation.			Habitat loss likely as the area develops.
Proposed major roads would cross streams/wetlands in 2 locations.	No proposed major roads would cross streams/wetlands.	Proposed major roads would cross streams/wetlands in only 1 location.	
Mitigation:			
Development under any of the alternatives will require a critical area review by the City during final design stages. Field investigation and delineation of all wetland boundaries and ordinary high water mark of streams will be necessary to determine accurate buffer areas and the allowed development and construction areas. A functional assessment of existing streams and wetlands in the Town Center area will be performed to determine areas most in need of restoration or enhancement. Assessment will allow prioritization of restoration efforts in the area. Unavoidable impacts to wetlands and streams where road crossings and trail crossings are proposed would be mitigated through restoration, enhancement, or wetland creation per the City's mitigation ratios and requirements. Avoid removal of heritage trees (trees >22 inches dbh) and significant trees where possible. Replacement trees should be planted within degraded wetland and buffers that would benefit from additional vegetation and canopy coverage. Minimize impacts to wildlife habitat in the two largest contiguous forest patches located in the northwest and northeast quadrants of the Town Center. Measures include through the preservation of upland forest as open space or park, reduction of area to be cleared for development beyond minimum requirements for significant trees, and location of buildings in areas with the least habitat value. Implement restoration at the mouth of George Davis Creek, as recommended in the Inglewood Basin Plan. Implement a Transfer of Development Rights (TDR) program to help protect critical areas and buffers.			No mitigation proposed.
6. Land Use			
Impacts:			
Existing land uses would be displaced and redeveloped with more intensive land uses. Internal and external land use conflicts are possible where higher intensity land uses are adjacent to lower intensity land uses, particularly at the edges of the Town Center. Land use conflicts are also possible where new high- or medium-intensity development occurs adjacent to existing low-intensity development.			Housing density likely to increase moderately to achieve allowable densities adopted in the Comprehensive Plan land use designations. With exception of existing institutional uses, no new land use types would be allowed in the project area. Internal and external land use conflicts unlikely because of the uniformity of residential development.

Alternative 1 – Commercial Focus	Alternative 2 – Low-intensity	Alternative 3 – Civic Focus	Alternative 4 – No-Action
Mitigation:			
Internal land use conflicts could be mitigated through site planning, building orientation or design features that separate incompatible uses. Require buffer areas or landscaping to separate conflicting uses. Phase implementation to protect existing land uses. Require that developers provide transition assistance to homeowners. External land use conflicts would be minimized by site planning that locates taller buildings in the interior of the Town Center and uses the Town Center's physical characteristics, such as topographical features or protected natural areas, as buffers between incompatible land uses.			No mitigation measures are proposed for the No-Action Alternative.
7. Transportation			
Impacts:			
Trip Generation			
Alternative 1 would generate approximately 5,680 new PM peak hour trips.	Alternative 2 would generate approximately 2,590 new PM peak hour trips.	Alternative 3 would generate approximately 3,920 new PM peak hour trips.	Alternative 4 would generate approximately 410 new PM peak hour trips.
Traffic Operations			
Alternative 1 would generate the highest levels of traffic. Three intersection in the City would operate below the City's LOS standards: ▪ Issaquah-Pine Lake Road SE/SE Klahanie Boulevard (LOS E) ▪ 212thth Avenue SE/SE 20thth Street (LOS F) ▪ 212thth Avenue SE/SE 8thth Street (LOS F) Seven roadway segments are forecast to exceed the established thresholds by more than 5%: ▪ E Lake Sammamish Parkway NE south of 187th Avenue NE; ▪ E Lake Sammamish Parkway NE about NE 30th Street; ▪ E Lake Sammamish Parkway NE	Alternative 2 would generate the lowest levels of traffic among the action alternatives. Two intersections in the City would operate below the City's LOS standards: ▪ 212th Avenue SE/SE 20th Street (LOS D) ▪ 212th Avenue SE/SE 8th Street (LOS D)212th Avenue SE/SE 20th Street; Four roadway segments are forecast to exceed the established thresholds by more than 5%: ▪ E Lake Sammamish Parkway NE south of 212th Way SE; ▪ SE 4th Street west of 228th Avenue NE;	The traffic impacts resulting from Alternative 3 would fall between Alternatives 1 and 2. Three intersections in the City would operate below the City's LOS standards: ▪ Issaquah-Pine Lake Road SE/SE Klahanie Boulevard (LOS E) ▪ 212th Avenue SE/SE 20th Street (LOS D) ▪ 212th Avenue SE/SE 8th Street (LOS D) Five roadway segments are forecast to exceed the established thresholds by more than 5%: ▪ E Lake Sammamish Parkway NE south of 187th Avenue NE, ▪ E Lake Sammamish Parkway NE	None of the study intersections located within the City of Sammamish are expected to operate below the City's LOS standard in Alternative 4. No roadway segments are forecast to exceed the established thresholds

Alternative 1 – Commercial Focus	Alternative 2 – Low-intensity	Alternative 3 – Civic Focus	Alternative 4 – No-Action
south of 212th Way SE; ▪ 212th Avenue SE south of SE 8th Street; ▪ SE 4th Street west of 228th Avenue NE; ▪ 228th Avenue SE north or NE 12th Street; ▪ 228th Avenue SE south of SE 8th Street; and ▪ 228th Avenue SE south of SE 20th Street.	▪ 228th Avenue SE north or NE 12th Street; and ▪ 228th Avenue SE south of SE 20th Street.	south of 212th Way SE, ▪ SE 4th Street west of 228th Avenue NE, ▪ ·228th Avenue SE north or NE 12th Street, ▪ 228th Avenue SE south of SE 20th Street,	
Parking			
Much of the parking for Alternative 1 would be provided through a combination of surface parking lots and parking garages. This Alternative would support the highest percentage of structured parking.	Parking for Alternative 2 would largely be provided by large surface lots.	The majority of the parking supply would be provided in surface parking lots. Alternative 3 features the most surface parking of all the alternatives.	The No-Action Alternative does not include ant public parking. Residential driveways and some on-street parking would adequately serve the residential parking demand.
Mitigation:			
The following measures could mitigate LOS failures at area intersections: ▪ Redesign 212th Avenue SE/SE 20th SE intersection to provide turn lanes. Assess necessity of traffic signal or roundabout. ▪ Redesign 212th Avenue SE/SE 8th Street intersection to provide turn lanes. Assess necessity of traffic signal or roundabout. ▪ Provide additional turn lanes for intersection at Issaquah-Pine Lake Road/SE Klahanie Boulevard and modify the signal phasing.	The following measure could mitigation LOS failures at area intersections: ▪ Redesign 212th Avenue SE/SE 20th SE intersection to provide turn lanes. Assess necessity of traffic signal or roundabout. ▪ Provide additional turn lanes at 212th Avenue SE/SE 8th Street intersection. Assess necessity of traffic signal or roundabout.	The following measure could mitigation LOS failures at area intersections: ▪ Redesign 212th Avenue SE/SE 20thSE intersection to. provide turn lanes Assess necessity of traffic signal or roundabout ▪ Provide additional turn lanes at 212th Avenue SE/SE 8th Street intersection. Assess necessity of traffic signal or roundabout. ▪ Provide additional turn lanes for intersection at Issaquah-Pine Lake Road/SE Klahanie Boulevard and modify the signal phasing.	Intersection improvements such as those discussed under the action alternatives could improve intersection operations.

Alternative 1 – Commercial Focus	Alternative 2 – Low-intensity	Alternative 3 – Civic Focus	Alternative 4 – No-Action
The following measures could mitigate LOS failures along roadway segments under each action alternative: ▪ Widen or add capacity to the failing roadway segment, ▪ Widen or add capacity to alternative routes that would alleviate the impacts to failing segments, ▪ Complete new roadway connections through the City to provide for improved connectivity and circulation that would provide alternative routes and better disperse traffic impacts, ▪ Implement higher levels of transportation demand management to reduce the vehicular demand on the roadway network, ▪ Reduce or change the mix and level of development, ▪ Adopt new level of service standards that allow for higher levels of congestion.			No roadway segments analyzed are expected to operate below LOS standards. No mitigation measures are proposed.
8. Air & Sound			
Impacts:			
Construction impacts to any one portion of the Town Center or adjacent areas would occur over a portion (or portions) of the 25-year period. Increased vehicular traffic, especially at key intersections, would create ongoing air and sound impacts. Increased residential and commercial densities would increase community noise.			Construction generated at a lower level because of lower intensity of land uses allowed. Ongoing impacts to air and noise would not occur, as community noise and air quality would remain at or near current levels.
Mitigation:			
Mitigation measures to control noise and air impacts would be considered and developed on a project-by-project basis within the Town Center planning area. All infrastructure, civic, and private development activities would be required to comply with local and state noise and air regulations.			No mitigation measures are proposed.

Alternative 1 – Commercial Focus	Alternative 2 – Low-intensity	Alternative 3 – Civic Focus	Alternative 4 – No-Action
9. Public Services & Utilities			
Impacts:			
Public Services			
Potential impacts on fire and EMS levels of service would likely follow the alternatives in the order of expected population and land use intensity, with the highest for Alternative 1 and lowest for the No-Action Alternative. Development would require the addition of 1 to 5 officers an increase that is likely attainable within the 25-year planning horizon. All of the action alternatives would result in an increase in new residences, and consequently, an increase in demand on existing park and open space facilities.			
All of the action alternatives would add students to the school districts creating a need for additional facilities. Alternative 1 would add the most students, followed by Alternatives 3 and 2 respectively.			There would be no impact to the public schools from this alternative as this growth is already accounted for in the school districts' projections.
Utilities			
This alternative would cause the greatest increase in utility demand because it has the highest concentration of development, but is not expected to exceed provider's capacity to deliver services.	This alternative would cause a lower increase in utility demand than either Alternative 1 or 2. It is not expected to exceed provider's capacity to deliver services.	This alternative would cause a lower increase in utility demand than Alternative 1, but higher than Alternative 2. It is not expected exceed provider's capacity to deliver services.	The demand for additional utility services would be the least for the No Action Alternative as there would be no commercial component, and a much smaller residential component.
Mitigation:			
If the fire and EMS LOS fall below City standard, mitigation measures may include, but are not limited to, the creation of a fourth station in the area, relocating existing stations, increasing staffing levels, making transportation improvements, and automatic response agreements with other service providers. Impacts to school districts and/or park facilities would be mitigated through impact and development fees on a project-by-project basis. Upgrades and/or expansion of both the existing electrical and natural gas systems would accommodate any of the action alternatives.			No mitigation measures are proposed.

Alternative 1 – Commercial Focus	Alternative 2 – Low-intensity	Alternative 3 – Civic Focus	Alternative 4 – No-Action
10. Aesthetics			
Impacts:			
Visual Character			
Under Alternative 1, the visual character in the Town Center would change from a suburban/rural area to a more dense and urban neighborhood featuring a commercial core. The Town Center would be characterized by a retail focus, and would feature mid-rise commercial and mixed-use buildings with structured parking, surrounded by mid- and high-rise residential buildings, preserved open spaces, and limited single-family and townhouse development interspersed throughout.	Under Alternative 2, the visual character of the Town Center would also change to a more urban character, although the change in intensity of development would be the least of the action alternatives. The Town Center would become a neighborhood of single-family homes, townhouses, with a small commercial core and protected open spaces and parks. The core of the Town Center would be the smallest of the action alternatives. A limited amount of mid-rise residential development would surround the core.	Changes in visual character under Alternative 3, would be similar to Alternative 1. The Town Center would be characterized by mid-rise residential developments with more townhouses and single-family residences interspersed with protected open spaces and parks. A core would have a civic facilities focus with less retail and mixed-use development than under Alternative 1. Parking for the core would be mostly surface lots.	The visual character in the project area under the No-Action Alternative would be expected to change to a more densely developed suburban area characterized by detached single-family developments with some limited institutional uses.
Views			
Development of new mid- and high-rise buildings could result in decreased views for the existing low-rise buildings or homes located near these sites and from public rights-of-way. All of the alternatives retain the openness of the views across Sammamish Commons.			Impacts to views are not expected from the No-Action Alternative.
Mitigation:			
Under all of the action alternatives, design guidelines would regulate the form and character of the buildings, quality and quantity of landscaping, treatment of parking lots, setbacks and open space requirements and landscape screening. Public improvements to street and park landscaping would further increase the amount of "green infrastructure" and soften the visual character of all the action alternatives.			The No-Action Alternative does not include the application of guidelines beyond existing regulations. No further mitigation measures are proposed.

1.7 Areas of Controversy and Uncertainty / Issues to Be Resolved

This Draft EIS evaluates the potential impacts to elements of both the natural environment (earth, water, plants and animals) and the built environment (land use, air quality, sound, aesthetics, transportation). Any of the action alternatives described in this document would represent significant changes to the character and environment of this area over the next 25 years. The No-Action Alternative would also likely result in significant change. While any adopted sub-area plan would be developed to be consistent with adopted plans and polices, many Sammamish residents may consider any development in the project area controversial.

1.8 Significant Unavoidable Adverse Impacts

Under all of the alternatives considered in this EIS, the existing character of the Town Center area will change over the next 25 years. Under the action alternatives, the character of the Town Center area would transform from a largely low-density residential area to an urban area featuring a range of housing densities and land use intensities. Current conditions would change under the No-Action Alternative as well. Under this alternative, residential density would be expected to increase to that allowed by the current Comprehensive Plan designations. Increases in population density, which are expected under any of the alternatives, carry with them some level of inevitable environmental impact. Each chapter in this Draft EIS identifies whether impacts are significant, adverse and unavoidable.

Chapter 2 Description of the Alternatives

2.1 Proposed Action

The proposed action (or proposal) is the adoption of a sub-area plan for the Sammamish Town Center. The sub-area plan would include elements addressing the Town Center's vision, land use, zoning, environmental management, open space, transportation, capital facilities, urban design and design guidelines, and implementation.

The sub-area plan would be incorporated into the City's Comprehensive Plan as an amendment. Subsequent actions may include amendments to the City's Transportation Improvement Plan, land use regulations, and Capital Improvement Program.

The Town Center planning area is located on the Sammamish Plateau in the center of the city of Sammamish, Washington. The Town Center area is approximately 243 acres in size, bordered on the north by E Main Street; on the east by 232nd Avenue SE; on the south by SE 8th Street; and on the west by 222nd Place SE. The intersection of SE 4th Street and 228th Avenue SE is likely to be the central node of the Town Center (see Figure 1-1 in Chapter 1).

2.2 Project Background

2.2.1 Comprehensive Plan

Planning for a City of Sammamish Town Center began with adoption of the City's Comprehensive Plan (City of Sammamish, 2003a). The Comprehensive Plan is a 20-year policy plan that established a vision for the City. The Comprehensive Plan provides goals and policies to enact that vision and comply with the goals of the Washington State Growth Management Act (GMA). The vision expressed in the City's Comprehensive Plan states in part: "The vision of Sammamish is a community of families. A blend of small-town atmosphere with suburban character, the City also enjoys a unique core of urban lifestyles and conveniences."

The Comprehensive Plan established a land use plan for Sammamish that reflects the City's vision statement for a small-town character and suburban residential style development, but with acknowledgment of community gathering areas in "centers." The Comprehensive Plan includes a goal to "establish the three designated community centers, including the existing centers at Inglewood Center and Pine Lake Village, and the planned City Hall/park project, to host a diversity of high quality places to live, work, shop and recreate" (LUG-2). Several policies were also established that further defined a process for planning a town center:

LUP-2.1 The City shall designate on the Comprehensive Plan Land Use Map three community centers to be known as the Inglewood Center, the Pine Lake Center, and the Sammamish Commons.

a. The Sammamish Commons shall consist of parcels currently owned by the City of Sammamish, or abutting parcels subsequently purchased by the City, in the

vicinity of the intersection of SE 8th and 228th Ave SE, as depicted in Figure III-2, for the site of the City Hall and a community park.

LUP-2.2 The City should plan for compact and diverse community centers that are consistent with the community vision, and respectful of surrounding neighborhoods and the capacity of natural systems.

a. The City should actively involve the community in the preparation of sub-area plans for the Inglewood and Pine Lake Centers and a Master Plan for the Sammamish Commons as designated in Figure III-2.

b. The City shall prepare and formally adopt for implementation a Master Plan to guide the development of the Sammamish Commons, as designated in Figure III-2. This Master Plan may include provisions for a City Hall, related community facilities such as a library and/or community center, and a public park. Limited commercial activities supportive of the public functions in the commons may be permitted.

c. Following adoption of the Sammamish Commons Master Plan, the City shall initiate a sub-area planning process for properties in the vicinity of 228th Avenue that may be affected by the Sammamish Commons. This sub-area plan may include potential zoning changes or other recommendations to promote more compatible land uses and to minimize potential adverse impacts on adjoining properties.

1. The Planning Commission shall recommend, for City Council review and approval, final boundaries for the sub-area.

2. The general boundaries for the sub-area plan shall include NE 4th St on the north, SE 10th St to the south, the unimproved right–of–way for 232nd Ave to the east, and 218th St extended to the west.

3. In establishing the final boundaries, whole parcels and multiple parcels in common ownership shall be included in the sub-area.

4. Sub-area planning shall focus on undeveloped and underdeveloped parcels within the final boundaries.

5. Sub-area planning shall respect the integrity of fully developed single-family residential neighborhoods, and give consideration to landscaping and/or buffer requirements between single-family residential neighborhoods, recreational uses and mixed use/commercial development.

6. The sub-area planning process shall include opportunities for public participation and comment.

2.2.2 Special Study Area Task Force

In response to the directives in the City's Comprehensive Plan for a sub-area planning process and public involvement, the Sammamish City Council appointed a Special Study Area Task Force in July 2004 (Resolution No. R2004-176). The Task Force was charged with assisting in the development of a community vision for the properties in the vicinity of the Sammamish Commons described in the Comprehensive Plan (City of Sammamish, 2003a).

From September 2004 to January 2005, the Special Study Area Task Force met seven times and hosted three community forums. In January 2005, the Task Force delivered a vision and recommendations to the City Council in a document titled *Special Study Area Vision* (City of Sammamish, 2005a). Out of that effort, a concept for the Town Center emerged. The Town Center vision would be a well-connected hub of public and private community services, a place to live, and a place for neighborhood activities. It would contain a "synergistic mix of civic, residential, and retail services." The vision included a move away from single-family development in the Town Center and increased new development, density, intensity of uses and heights, while preserving and protecting open spaces, wetlands, and streams. The Task Force's vision also recognized that transportation would be key, and it included alternative means of transportation such as non-motorized trails providing pedestrian and bicycle connections.

The Task Force's recommended next steps included conducting a master planning process, establishing design standards and guidelines, and continuing with community involvement in the planning process.

2.2.3 City Council Town Center Vision Statement

Based on the Task Force's vision, the City Council passed the *City Council Vision Statement* in March 2006 (Resolution No. R2006-229). The vision statement describes the Town Center as a "vibrant, urban, family friendly gathering place in a healthy natural setting." The vision focuses on both the urban and natural aspects of the Town Center.

The Council vision states that the Town Center is to be urban in that it will serve as a central gathering place, offer a range of commercial, recreational, cultural, and educational services and activities, feature well-designed mixed-use development, offer a variety of housing types, and provide links to the region with transit service, bicycle and pedestrian access. The Council vision seeks to preserve the Town Center's natural setting by focusing development away from natural resources and critical areas, incorporating natural resources, view corridors, and sensitive site characteristics as amenities, featuring open spaces with native vegetation, and employing a variety of environmental enhancement and low-impact development techniques. The Council vision also stresses public participation and a strategic and fiscally responsible plan that includes public as well as private investment in a way that benefits all Sammamish residents.

2.3 Objectives of the Proposal

Adoption of a Town Center Sub-Area Plan will emphasize four major objectives:

1. Accommodate an appropriate share of urban growth;
2. Preserve open spaces and habitat areas;
3. Provide employment and commercial opportunities in proximity to new housing; and
4. Provide adequate public facilities and services.

2.4 Scope of the Environmental Impact Statement

2.4.1 Scoping Activities

The City of Sammamish has determined that the Town Center proposal is a major action under the State Environmental Policy Act (SEPA) because it is likely to have probable significant adverse environmental impacts. Therefore, the proposal requires an Environmental Impact Statement (EIS) to assess these impacts.

The City of Sammamish issued a determination of significance (DS) on March 17, 2006, and initiated a formal EIS scoping process. Interested citizens, agencies, and organizations were invited to submit comments on the scope of the EIS. The scoping process was conducted from March 17, 2006 to April 12, 2006. A scoping meeting/open house was held on March 28, 2006.

Information on the existing conditions of the Town Center's built and natural environment and preliminary sketches of possible Town Center layouts were presented to the public at the scoping meeting. Open house attendees submitted comments at the open house and through the City's website. Public comments were also received through online forms accessible to the public on the City of Sammamish website, as well as emails and letters sent directly to City staff.

Following the end of the scoping period, the City issued a summary of the scoping comments received. During the scoping period, the City received a total of 60 comment forms, emails, and letters containing approximately 200 comments. Additional comments have been received by the City since the end of the scoping period and have been considered in developing the Town Center Sub-Area Plan EIS.

2.4.2 Elements of the Environment

The City determined the scope of the EIS based on the comments received and its own analysis of potential impacts and reasonable alternatives. Adoption of the Town Center Sub-Area Plan will constitute a SEPA non-project action as defined in WAC 197-11-704 and described in WAC 197-11-442. As a non-project action, the analysis in the EIS will include less detailed information on environmental impacts than would be included in a project-level proposal. SEPA non-project reviews are generally more qualitative in nature since details are still very conceptual. The EIS will focus on comparing the impacts on elements of the environment resulting from each action alternative relative to the No-Action Alternative and to each other. Subsequent SEPA review will be conducted on specific development projects as appropriate.

The Draft EIS follows the format and content as described in WAC 197-400 through 197-11-442. The EIS addresses the following elements of the environment:

- **Earth:** geologic and soil characteristics and geological hazards.
- **Water:** stormwater runoff and infiltration, flooding, groundwater characteristics and critical aquifer recharge areas, and surface and groundwater quality.
- **Streams, Wetlands, Fish & Wildlife:** streams, wetlands, fish and wildlife habitat, buffers, special-status species.
- **Land Use:** pattern of land uses, potential height, bulk, and scale of future development, relationship to relevant plans and policies, housing and population.

- **Transportation:** peak hour traffic volumes, traffic operations, parking, transit and non-motorized transportation.
- **Air & Sound:** potential air quality and sound impacts resulting from increased traffic and land use changes.
- **Public Services/Utilities:** fire protection and emergency medical services, law enforcement, public schools, parks, recreation and open space, water, sewer, energy, utilities, and solid waste disposal.
- **Aesthetics/Views:** visual character, proposed building and infrastructure massing, and views.

2.5 Description of the Alternatives

Four alternatives have been identified and are evaluated in this Draft EIS. The alternatives include three action alternatives and a No-Action Alternative. Analysis of these alternatives will provide a better understanding of how future residential, commercial, and civic uses as well as open space could be distributed within the Town Center during the 25-year planning period. An understanding of the differences between the alternatives will provide information to aid decision-making and the development of a preferred alternative.

The three action alternatives were developed through a process that included several public open houses, input from a property owners' forum, comments from the general public, the Town Center Committee, the Planning Commission, and the City Council. A design charette was held to solicit more details on the community's vision for the Town Center. The alternatives were approved for environmental analysis by the City Council on July 25, 2006. The general land use patterns approved by the Council were refined to form the EIS alternatives (shown in Figures 2-1 through 2-4).

The alternatives present several different patterns of future land use in the Town Center planning area. All of the alternatives are meant to establish long-term policy direction for a planning horizon of 2030. The action alternatives represent three distinct development strategies through which the Town Center vision could be realized. Each would differ in how the Town Center would look and function, and what purpose it would serve in the community. The No-Action Alternative is a status quo alternative. It assumes that the Town Center planning area would be developed in accordance with the adopted Comprehensive Plan land use map. Analysis of development under the No-Action Alternative serves as a baseline for comparison against the potential impacts of the action alternatives.

The four alternatives are defined by varying amounts, types, mixes, and intensities of land uses within the Town Center area. In order to conduct the analysis of reasonably expected impacts to the natural and built environments, assumption for the number of housing units and square footages/acreages of other land uses were prepared. Development scenarios that could emerge over the next 25 years were developed for each of the alternatives.

The scenarios are based on the generalized land use patterns approved by the City Council and were developed as reasonable outcomes for use in this analysis. Table 2-1 provides a summary of the range of potential land uses that could occur under each development scenario.

Table 2-1. Sammamish Town Center Land Use Scenarios

Land Use	Alt 1 Commercial Focus	Alt 2 Low Intensity	Alt 3 Civic Focus	Alt 4 No-Action
Building Areas (1000 square feet)				
Commercial/Retail	385 – 415	150 – 175	185 – 215	0
Commercial/Office	65 – 85	0	115 – 130	0
Civic/Institutional[1]	90 – 110	50 – 70	180 – 200	20 -30
Open Space (acres)				
Public Parks	31	42	38	30
Streams, Wetlands & Buffers	60	60	60	60
Private Open Space[2]	55	45	50	NA[3]
Total Open Space[4]	136	137	137	90
Housing Units				
Low Intensity				
Detached Single-Family	15 – 25	230 – 250	30 – 40	300 – 350
Townhouses	160 - 175	515 – 530	115 - 130	0
Medium Intensity				
Mid-rise Multi-family and Mixed-use (3 - 5-stories)	2,500 – 3,000	315 – 330	2,500 – 3,000	0
High Intensity				
High-rise Multi-family (12-stories)	485 – 515	0	0	0
Total Housing Units	3,000 – 4,000	1,000 – 1,500	2,500 – 3,000	300 - 350
Parking (1000 square feet)				
Surface Parking	275 – 325	200 – 250	400 – 450	0
Structured Parking	325 – 375	0	75 – 100	0
Total Public Parking	600 – 700	200 – 250	475 - 525	0

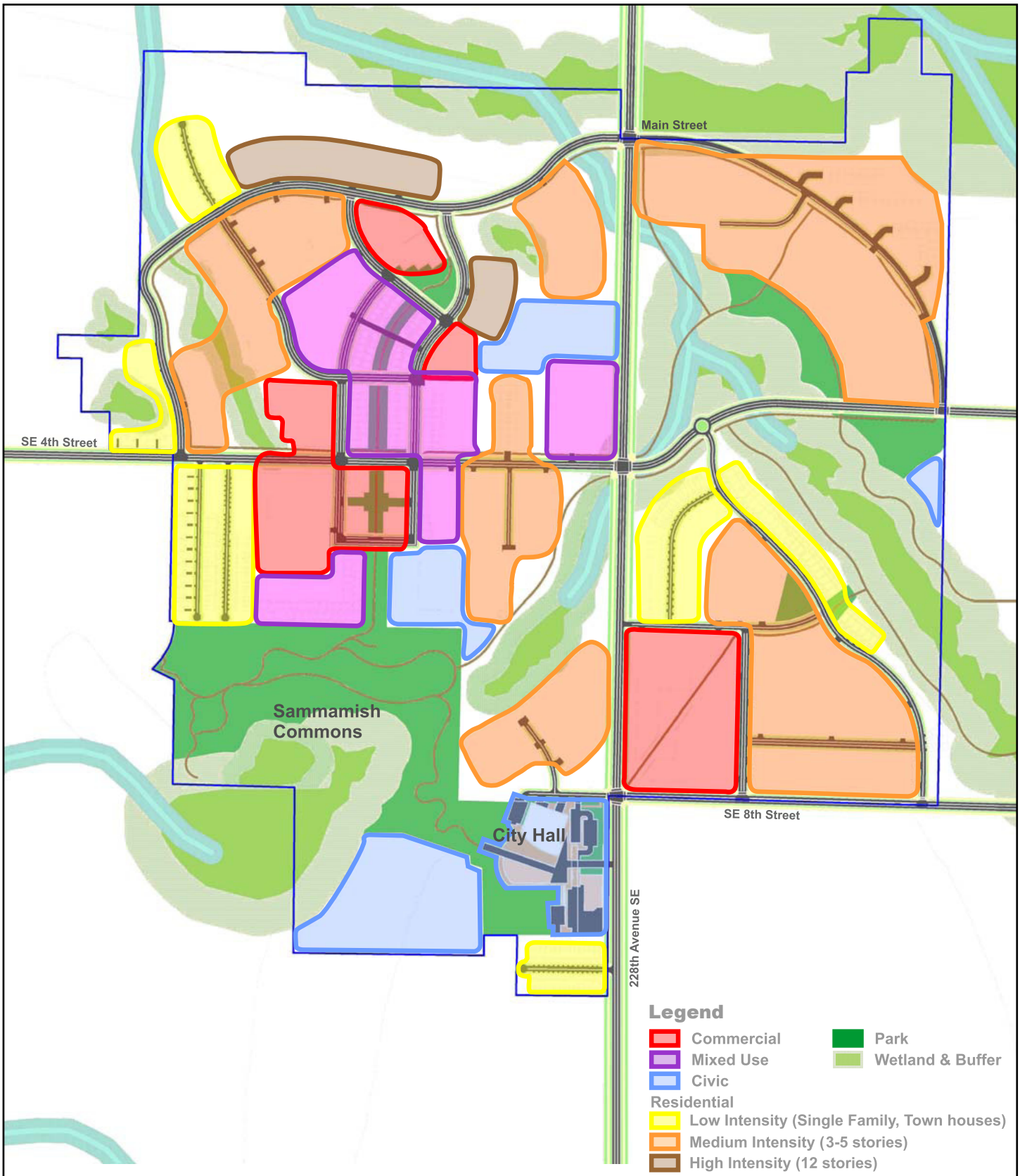
[1] Civic/institutional includes City Hall (~26,000 square feet) for all alternatives.

[2] The amount of private open space is dependant on numerous individual development decisions; these quantities are provided as working assumptions.

[3] Open space under the No-Action Alternative is assumed to include existing parks, wetlands, and buffers.

[4] Total open space does not equal the sum of open space types because some areas overlap.

These figures are not meant as forecasts of future land uses. These are assumptions developed for the purposes of comparing the potential impacts of distinctively different development scenarios to assist in public discussion and City decisions. Ultimately, the land use patterns in the Town Center area will be determined by several factors including City actions, demographic changes, and private investment choices.



ADOLFSON

File name: Fig02-1_alt1.ai
Created/last edited by: JAB
Date last updated: 01/24/07
Reference: 25164eis

N

0 200 400 FEET

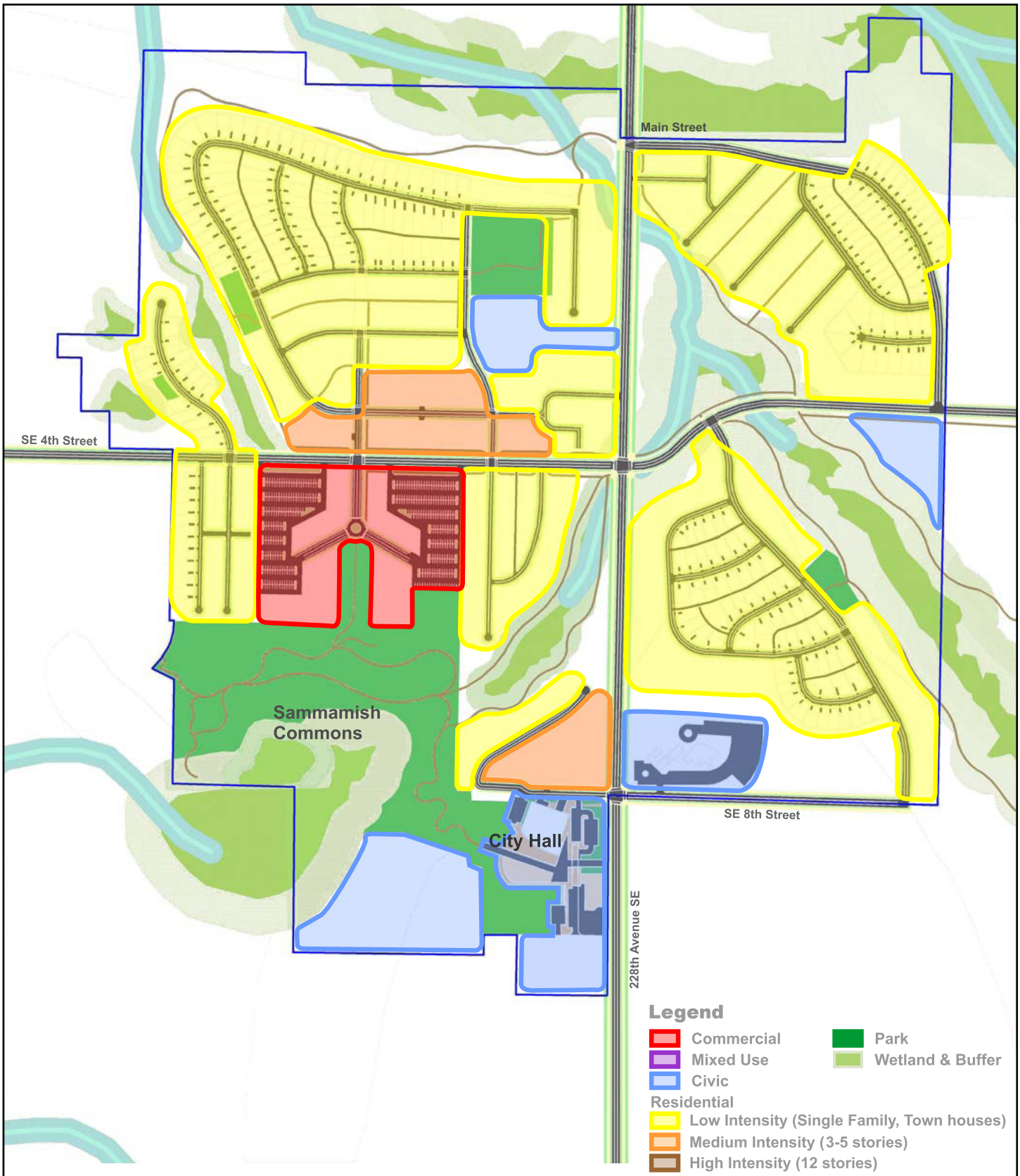
Map data are the property of the sources listed below.
Inaccuracies may exist, and Adolfson Associates, Inc. implies no warranties or guarantees regarding any aspect of data depiction.
SOURCE: MAKERS Architecture and Urban Design, 2006.

FIGURE 2-1

ALTERNATIVE 1 - COMMERCIAL FOCUS

SAMMAMISH TOWN CENTER SUB-AREA PLAN DEIS

SAMMAMISH, WASHINGTON



ADOLFSON

File name: Fig02-2_alt2.ai
Created/last edited by: JAB
Date last updated: 01/24/07
Reference: 25164eis

N

0 200 400 FEET

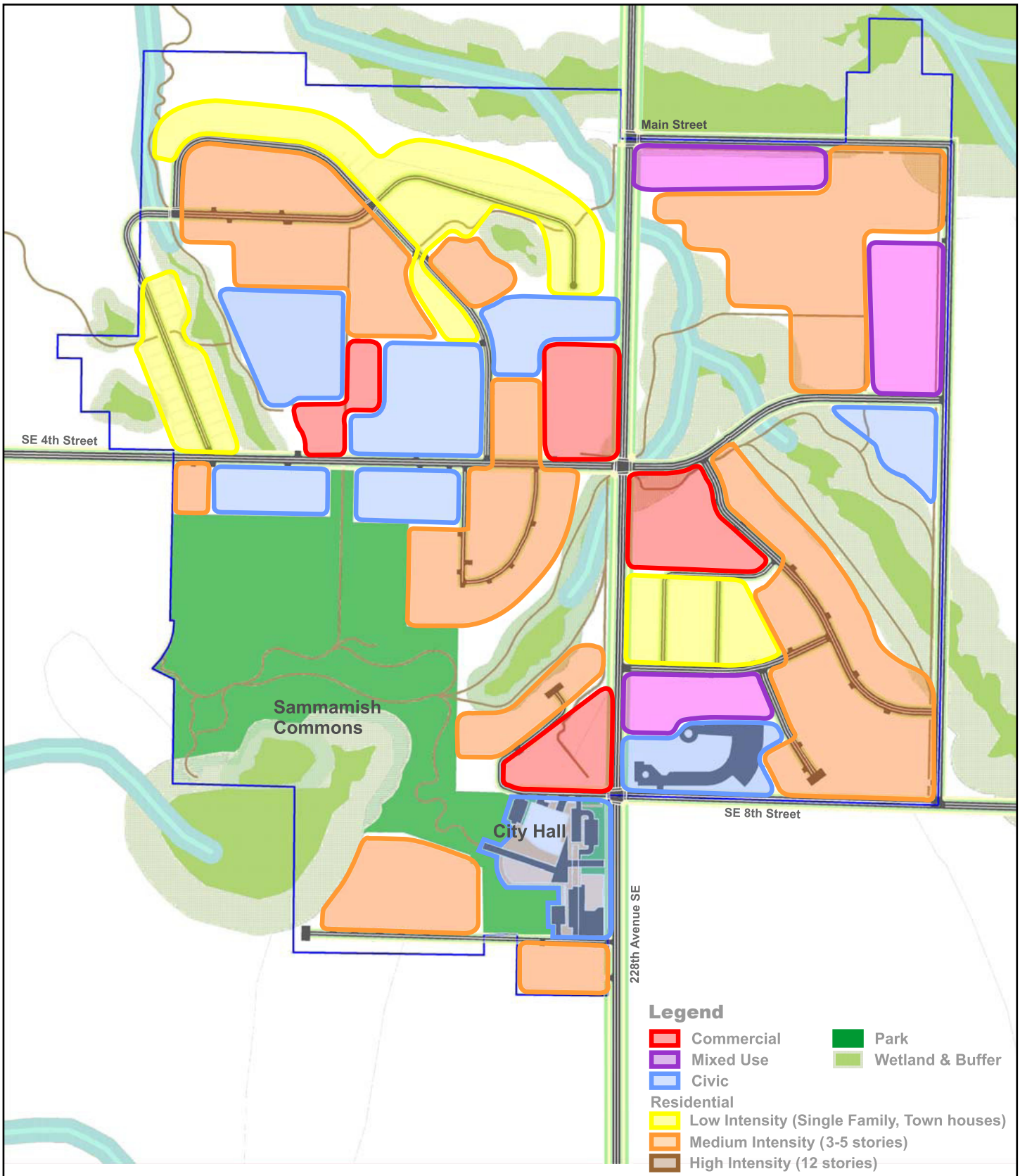
Map data are the property of the sources listed below.
Inaccuracies may exist, and Adolfson Associates, Inc. implies no warranties or guarantees regarding any aspect of data depiction.
SOURCE: MAKERS Architecture and Urban Design, 2006.

FIGURE 2-2

ALTERNATIVE 2 - LOW IMPACT

SAMMAMISH TOWN CENTER SUB-AREA PLAN DEIS

SAMMAMISH, WASHINGTON



ADOLFSON

File name: Fig02-3_alt3.ai
Created/last edited by: JAB
Date last updated: 01/24/07
Reference: 25164eis

N

0 200 400 FEET

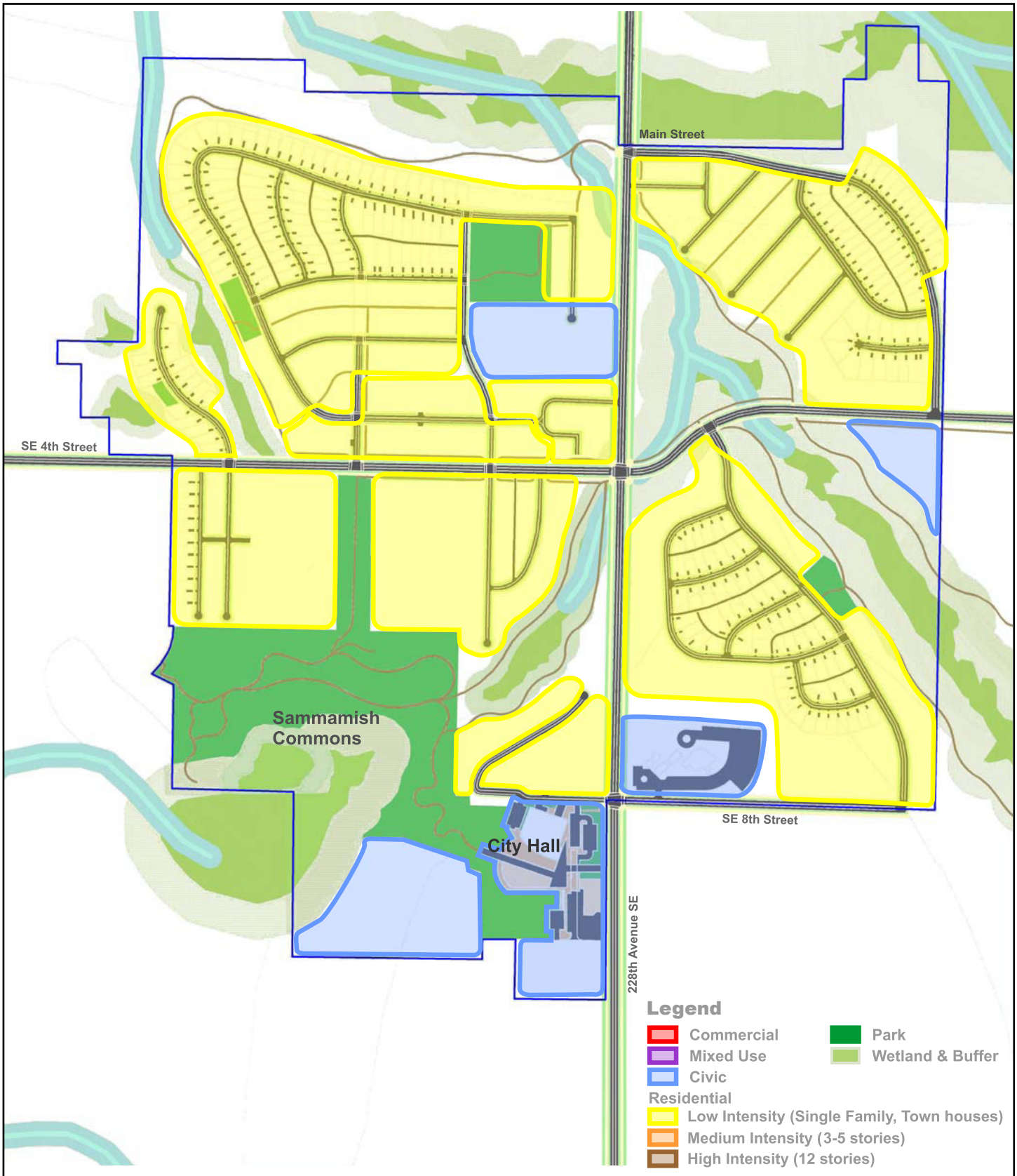
Map data are the property of the sources listed below.
Inaccuracies may exist, and Adolfson Associates, Inc. implies no warranties or guarantees regarding any aspect of data depiction.
SOURCE: MAKERS Architecture and Urban Design, 2006.

FIGURE 2-3

ALTERNATIVE 3 - CIVIC FOCUS

SAMMAMISH TOWN CENTER SUB-AREA PLAN DEIS

SAMMAMISH, WASHINGTON



ADOLFSON

File name: Fig02-4_alt4.ai
Created/last edited by: JAB
Date last updated: 01/24/07
Reference: 25164eis

N

0 200 400 FEET

Map data are the property of the sources listed below.
Inaccuracies may exist, and Adolfson Associates, Inc. implies no warranties or guarantees regarding any aspect of data depiction.
SOURCE: MAKERS Architecture and Urban Design, 2006.

FIGURE 2-4

ALTERNATIVE 4 - NO ACTION

SAMMAMISH TOWN CENTER SUB-AREA PLAN DEIS

SAMMAMISH, WASHINGTON

For ease of discussion, the DEIS divides the Town Center planning area into the Northwest (NW), Northeast (NE), Southeast (SE), and Southwest (SW) quadrants (see Figure 1-2). Additionally, the building shapes and colors shown in the land use scenario illustrations (below) represent a range of general building types and uses. These building types are keyed to the descriptions and examples shown in Figure 2-5.

2.5.1 Alternative 1 – Commercial Focus

Land Use Pattern. Alternative 1, the Commercial Focus Alternative, envisions the Town Center as a sub-regional destination with unique character, activities, family entertainment, employment, and services. Under this alternative, the Town Center would provide a walkable central retail area west of 228th Avenue SE surrounded by a variety of housing types. This alternative is estimated to add approximately 3,500 to 4,000 new housing units; approximately 65,000 to 85,000 square feet of civic amenities; approximately 385,000 to 415,000 square feet of retail space; and approximately 90,000 to 110,000 square feet of office space in the Town Center. A summary of potential land uses by quadrant is shown in Table 2-2.

Table 2-2. Alternative 1 Development Assumptions

	NW	NE	SW	SE	Total
Land Uses					
Retail (sq. ft.)	230,000	0	170,000	0	400,000
Office (sq. ft.)	0	0	0	75,000	75,000
Civic (sq. ft.)	20,000	0	80,000	0	100,000
Public Parking (sq. ft.)	300,000	0	250,000	100,000	650,000
Public Open Space (Acres)	0	2	28	1	31
Housing (dwelling units)					
Low Intensity					
Single-family	5	0	15	0	20
Townhomes	20	0	80	70	170
Medium Intensity					
Mid-rise Multi-family and Mixed-use	1,125	700	500	475	2,800
High Intensity					
High-rise Multi-family	500	0	0	0	500
Total Housing Units	**1,664**	**700**	**595**	**545**	**3,490**

The primary commercial area would be centered at the intersection of SE 4th Street and 224th Place SE. It would be linked to the northern boundary of the Sammamish Commons and extend north. This area would consist of several single-use and mixed-use retail buildings as well as some civic buildings. The commercial core would be the center of a dense mixed-use neighborhood consisting of several housing types including townhomes, mid-rise multi-family structures ranging from one to five stories, and high-rise residential towers up to 12 stories.

Land use on the east side of 228th Avenue SE would also include several types of townhomes and mid-rise residential structures. An area of office (or other commercial) development would be located on the northeast corner of 228th Avenue SE and SE 8th Street.

Transportation. Several new roads are proposed to accomplish the goals of this alternative and provide access to areas of new development. Primary access from 228th Avenue SE to the central commercial area would be along SE 4th Street. A new road would intersect with SE 4th Street at approximately 222nd Place SE and form a loop connecting 228th Avenue SE at E Main Street. East Main Street would then continue east and turn south, connecting with SE 4th Street. A second new road would head southeast from SE 4th Street and travel to SE 8th Street. The alternative would also include non-motorized trails connecting all areas of the Town Center.

Open Space. Under this alternative, the Sammamish Town Center would include the Sammamish Commons as well as three other public parks in the NE and SE quadrants, totaling approximately 31 acres. This alternative (as well as the other two action alternatives) would avoid development in streams and wetlands and their buffers. It would also establish policies that promote private open spaces. The Town Center could include a total of approximately 136 acres of open space, comprising approximately 55 percent of the land in the Town Center. All of the major nodes in the Town Center would be connected by a system of non-motorized trails that would use open space as corridors.

An illustration of the development scenario site plan under Alternative 1 is shown in Figure 2-6.

2.5.2 Alternative 2 – Low Intensity

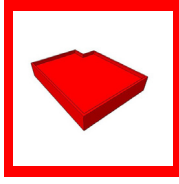
Land Use Pattern. Alternative 2, the Low Intensity Alternative, envisions the Town Center as a local neighborhood with a small commercial village and limited services. As in Alternative 1, Alternative 2 would create a commercial core centered immediately south of the intersection of SE 4th Street and 224th Place SE. However, the commercial core would be much smaller in scale, comprising approximately 150,000 to 175,000 square feet of commercial development. A summary of potential land uses by quadrant is shown in Table 2-3.

Table 2-3. Alternative 2 Development Assumptions

	NW	NE	SW	SE	Total
Land Uses					
Retail (sq. ft.)	0	0	165,000	0	165,000
Office (sq. ft.)	0	0	0	0	0
Civic (sq. ft.)	0	0	60,000	0	60,000
Public Parking (sq. ft.)	0	0	250,000	0	230,000
Public Open Space (Acres)	3	0	38	1	42
Housing (dwelling units)					
Low Intensity					
Single-family	110	55	10	65	240
Townhomes	170	110	145	100	525
Medium Intensity					
Mid-rise Multi-family and Mixed-use	220	0	100	0	320
High Intensity					
High-rise Multi-family	0	0	0	0	0
Total Housing Units	500	165	255	165	1,085

Commercial

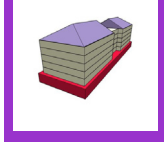
- Commercial
  - Small to medium size retail and office uses

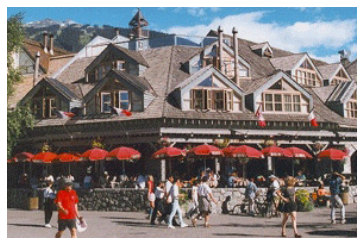


General Commercial

Mixed Use

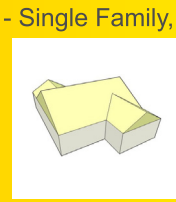
- Mixed-Use (3 - 6 stories)
  - Residential or office over pedestrian oriented retail

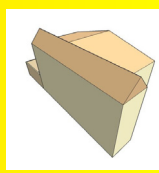




Residential

- Low Intensity Residential
  - Single Family, cottage housing and townhomes



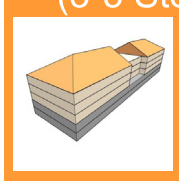


Single Family

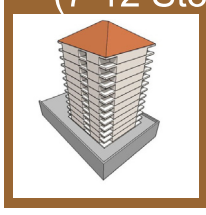
Cottage Housing

Townhomes

- Medium Intensity Residential (3-5 Stories)

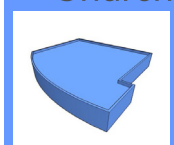


- High Intensity Residential (7-12 Stories)



Civic & Institutional

- Governmental Buildings, Schools, Churches, Hospitals, etc.



City Hall

School

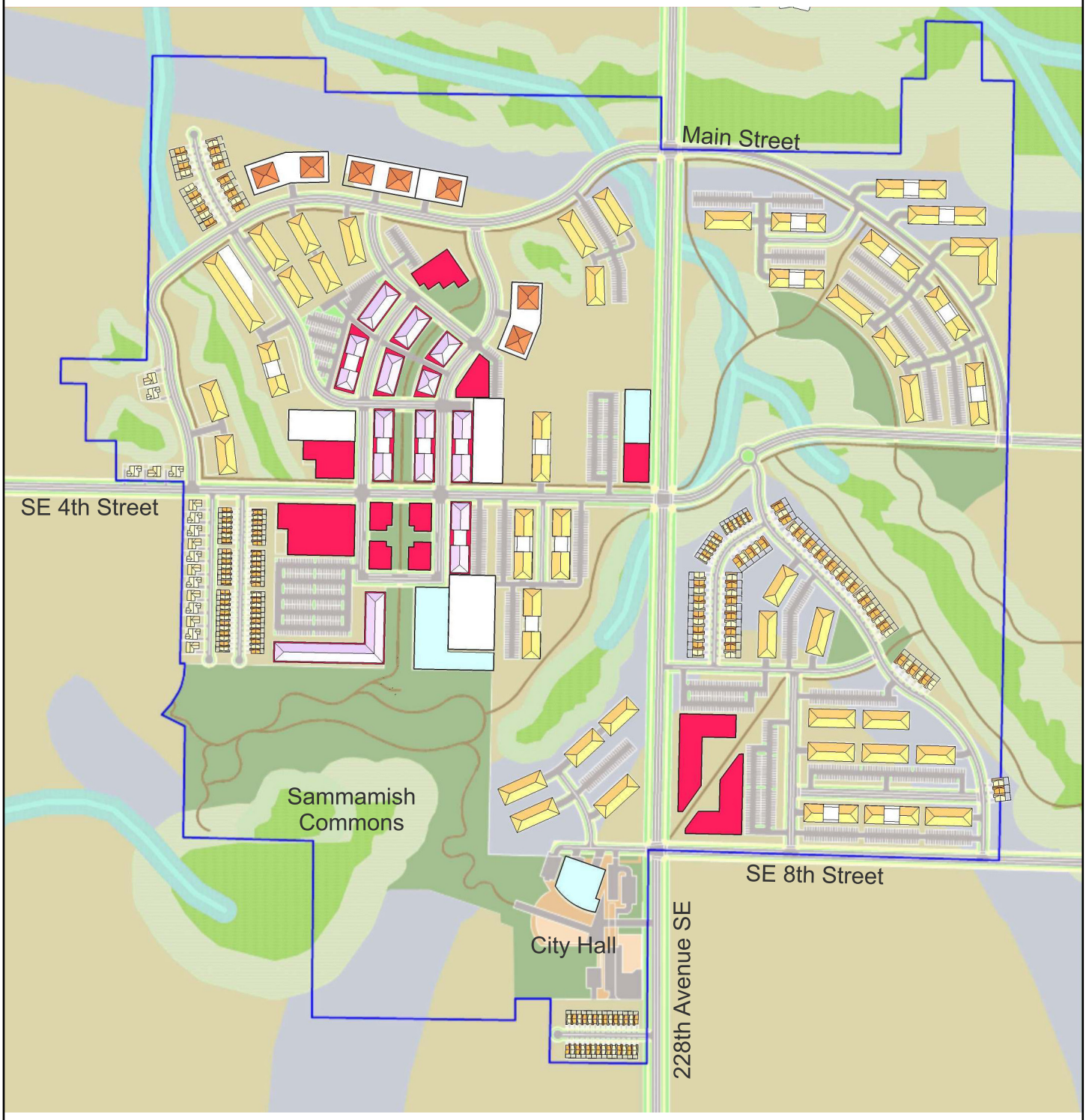
Hospital

ADOLFSON

File name: Fig02-5_buildingtype.ai
Created/last edited by: JAB
Date last updated: 01/24/07
Reference: 25164eis

SOURCE: MAKERS Architecture and Urban Design, 2006.

FIGURE 2-5
SAMMAMISH TOWN CENTER BUILDING TYPE EXAMPLES
SAMMAMISH TOWN CENTER SUB-AREA PLAN DEIS
SAMMAMISH, WASHINGTON



ADOLFSON

File name: Fig02-6_alt1siteplan.ai
Created/last edited by: JAB
Date last updated: 01/24/07
Reference: 25164eis

N

Map data are the property of the sources listed below.
Inaccuracies may exist, and Adolfson Associates, Inc. implies no warranties or guarantees regarding any aspect of data depiction.
SOURCE: MAKERS Architecture and Urban Design, 2006.

FIGURE 2-6

ALTERNATIVE 1 - COMMERCIAL FOCUS
POTENTIAL DEVELOPMENT SCENARIO SITE PLAN

SAMMAMISH TOWN CENTER SUB-AREA PLAN DEIS

SAMMAMISH, WASHINGTON

Alternative 2 would include 1,000 to 1,500 new housing units spread throughout the Town Center area. Housing would be more dispersed than under Alternative 1. New housing would be a mix of detached single-family homes, townhomes, and, near the commercial area, three-story, mid-rise, multi-family buildings.

Transportation. New roads would be needed to access new development. These would include two new loop roads north of SE 4th Street on both the east and west sides of 228th Avenue SE. Similar to Alternative 1, a new road would head south off of SE 4th Street and travel southeast to SE 8th Street on the east side of 228th Avenue SE. The alternative would also include walking trails connecting all areas of the Town Center.

Open Space. Under this alternative, the Sammamish Town Center would include approximately 42 acres of public parks including the Sammamish Commons. Similar to the other action alternatives, this alternative would avoid development in streams and wetlands and their buffers. It would also establish policies that promote private open spaces. In total, the Town Center could include approximately 137 acres of open space, which constitutes approximately 55 percent of the land in the planning area. As in the other action alternatives, the Town Center would be connected by a system of non-motorized trails that would use open space as corridors.

An illustration of the development scenario site plan for Alternative 2 is shown in Figure 2-7.

2.5.3 Alternative 3 – Civic Focus

Land Use Pattern. Under Alternative 3, the Civic Focus Alternative, the Sammamish Town Center would provide a central civic, cultural, and recreational development core surrounded by housing of various densities. This alternative would also create a central plaza near the intersection of SE 4th Street and 224th Place SE, immediately north of an expanded Sammamish Commons park. The plaza would be lined by public facilities that could include a library, community center, aquatic center, performing arts center, senior center, youth center, or other civic amenity. A summary of potential land uses by quadrant is shown in Table 2-4.

Table 2-4. Alternative 3 Development Assumptions

	NW	NE	SW	SE	Total
Land Uses					
Retail (sq. ft.)	100,000	0	25,000	70,000	195,000
Office (sq. ft.)	0	120,000	0	0	120,000
Civic (sq. ft.)	90,000	0	100,000	0	190,000
Public Parking (sq. ft.)	325,000	0	120,000	55,000	500,000
Public Open Space (Acres)	0	0	38	0	38
Housing (dwelling units)					
Low Intensity					
Single-family	35	0	0	0	35
Townhomes	63	0	0	62	125
Medium Intensity					
Mid-rise Multi-family and Mixed-use	530	840	720	760	2,850
High Intensity					
High-rise Multi-family	0	0	0	0	0
Total Housing Units	**628**	**840**	**720**	**822**	**3,010**

Commercial and retail development would be more limited than in Alternative 1, and would be located in a more diffuse pattern throughout the Town Center planning area. A smaller commercial area is envisioned around the intersection of 228th Avenue SE and SE 4th Street. Commercial development on either side of 228th Avenue SE would be connected by a pedestrian bridge over 228th Avenue SE. This alternative also includes mixed-use office (or other commercial) development along 232nd Avenue NE in the northeast corner of the Town Center area.

Housing on both sides of 228th Avenue SE would include a mix of detached single-family residences, townhomes, mid-rise, multi-family buildings from three to five stories, and some limited mixed-use developments (residential and office). This alternative is estimated to add 2,500 to 3,000 new housing units; approximately 180,000 to 200,000 square feet of civic amenities; 185,000 to 215,000 square feet of retail space; and 115,000 to 130,000 square feet of office space.

Transportation. New roads would be constructed to access new housing, commercial, and civic areas through the Town Center. A new access road is proposed for the area north of SE 4th Street on the west side of 228th Avenue SE. Development on the east side of 228th Avenue SE would be accessed by SE Main Street, SE 4th Street, SE 8th Street, 232nd Avenue NE, and a new road diverting southeast from SE 4th Street and traveling to SE 8th Street. The alternative would also include walking trails connecting all areas of the Town Center.

Open Space. Under Alternative 3, the Sammamish Commons would be expanded north and would include space for active recreational uses such as sports fields, public gardens, or a farmers market. The expanded Commons would be approximately 40 acres. Similar to the other action alternatives, this alternative would avoid development in streams and wetlands and their buffers. It would also establish policies that promote private open spaces. The Town Center could include approximately 137 acres of private open space. In total, open space could comprise approximately 55 percent of the land in the Town Center. As in the other action alternatives, the Town Center would be connected by a system of non-motorized trails that would use open space as corridors.

An illustration of the Alternative 3 development scenario site plan is shown in Figure 2-8.

2.5.4 Alternative 4 – No-Action

Under the No-Action Alternative, the existing Comprehensive Plan land use map would remain as adopted in the City's 2003 Comprehensive Plan. The existing land use designations in the Town Center include primarily low-density single-family residential and some park use for the Sammamish Commons (see Figure 2-4).

According to the Comprehensive Plan's land use map, single-family residential uses in the Town Center include a variety of densities allowing one (R-1), four (R-4), six (R-6), and eight (R-8) units per acre. This level of housing density would continue existing trends and could eventually accommodate an estimated 300 to 350 homes in the Town Center.

Current zoning does allow institutional development under conditional use permits. There are several institutional developments in the Town Center now, including the Sammamish Hills Lutheran Church, the Eastside Catholic High School, the Sammamish Children's School, and the Arbor School. Under the No-Action Alternative, there would be no retail, office, or further civic development in the Town Center area.

ADOLFSON

File name: Fig02-7_alt2siteplan.ai
Created/last edited by: JAB
Date last updated: 01/24/07
Reference: 25164eis

N

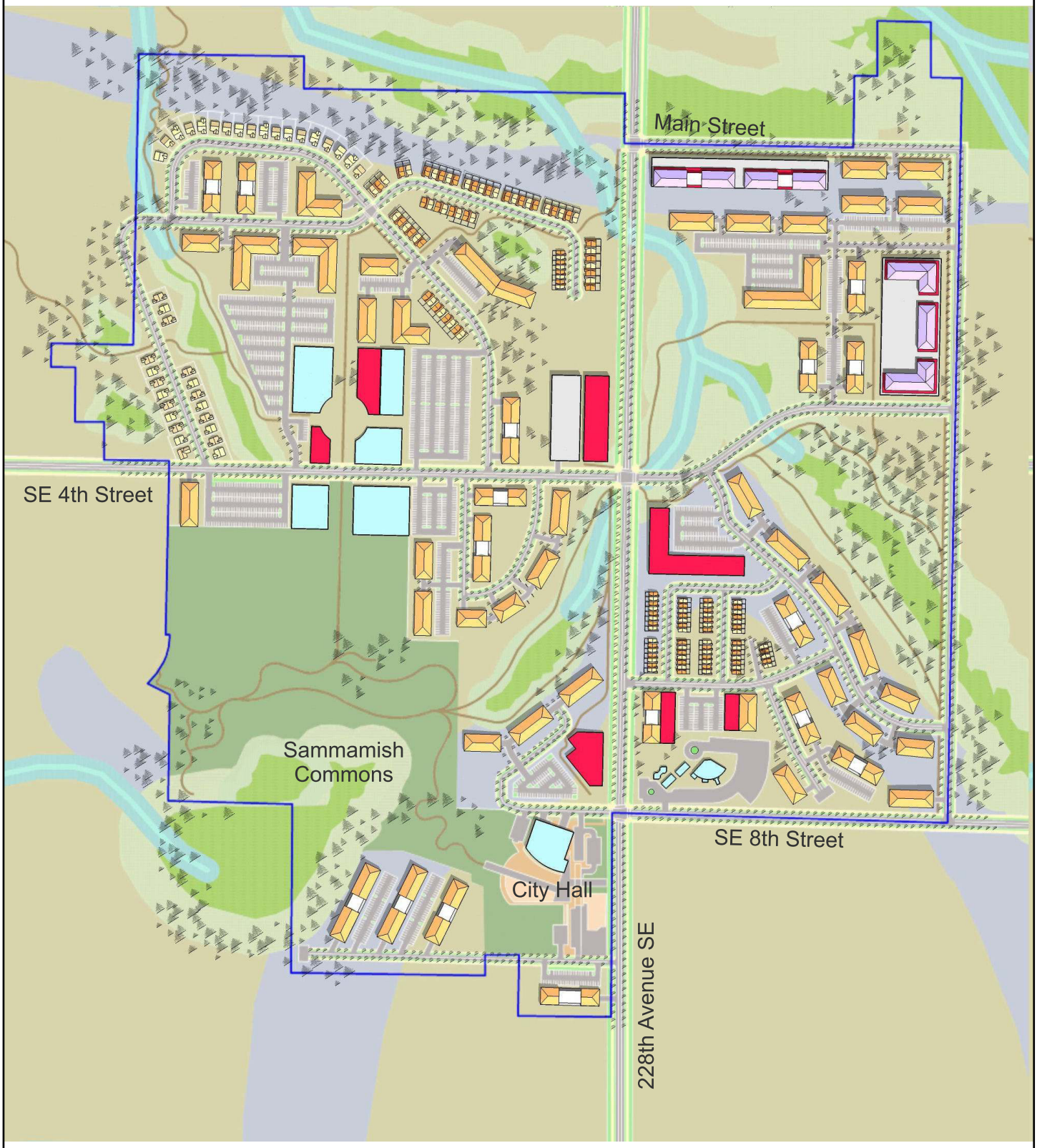
Map data are the property of the sources listed below.
Inaccuracies may exist, and Adolfson Associates, Inc. implies no warranties or guarantees regarding any aspect of data depiction.
SOURCE: MAKERS Architecture and Urban Design, 2006.

FIGURE 2-7

ALTERNATIVE 2 - LOW INTENSITY
POTENTIAL DEVELOPMENT SCENARIO SITE PLAN

SAMMAMISH TOWN CENTER SUB-AREA PLAN DEIS

SAMMAMISH, WASHINGTON



ADOLFSON

File name: Fig02-8_alt3siteplan.ai
Created/last edited by: JAB
Date last updated: 01/24/07
Reference: 25164eis

N

Map data are the property of the sources listed below.
Inaccuracies may exist, and Adolfson Associates, Inc. implies no warranties or guarantees regarding any aspect of data depiction.
SOURCE: MAKERS Architecture and Urban Design, 2006.

FIGURE 2-8

ALTERNATIVE 3 - CIVIC FOCUS
POTENTIAL DEVELOPMENT SCENARIO SITE PLAN

SAMMAMISH TOWN CENTER SUB-AREA PLAN DEIS

SAMMAMISH, WASHINGTON

A summary of potential land uses by quadrant is shown in Table 2-5.

Table 2-5. Alternative 4 Development Assumptions

	NW	NE	SW	SE	Total
Land Uses					
Retail (sq. ft.)	0	0	0	0	0
Office (sq. ft.)	0	0	0	0	0
Civic (sq. ft.)	0	0	26,000	0	26,000
Public Parking (sq. ft.)	0	0	0	0	0
Public Open Space (Acres)	0	0	0	0	0
Housing (dwelling units)					
Low Intensity					
Single-family	152	50	76	45	323
Townhomes	0	0	0	0	0
Medium Intensity					
Mid-rise Multi-family and Mixed-use	0	0	0	0	0
High Intensity					
High-rise Multi-family	0	0	0	0	0
Total Housing Units	**152**	**50**	**76**	**45**	**323**

2.6 Benefits and Disadvantages of Delaying Proposed Action

Demand for development opportunities in the project area is high. The project area has been under a building moratorium since the City incorporated in 1999. The moratorium was recently lifted in December 2006. Delay in adoption of a Town Center plan would likely accelerate the low-density single-family residential development pattern identified in the No-Action Alternative. The opportunity to create a central city core as envisioned by the City's Comprehensive Plan and City Council would be diminished. This would result in less efficient use of City resources for infrastructure and service improvements; loss of employment opportunities; and less diverse land use pattern and housing stock.

Chapter 3 Earth

This chapter of the Draft EIS examines geology and soil conditions to identify and characterize potential earth-related hazards associated with future development in the Sammamish Town Center Sub-Area. The analysis will focus on comparing the impacts on earth resources for each action alternative relative to the No-Action Alternative. With this information as a base, potential adverse impacts can be evaluated, and appropriate measures identified to mitigate or reduce impacts. Subsequent geologic analysis will be conducted on a project-specific level, as appropriate.

3.1 Affected Environment

The Town Center planning area is situated on the Sammamish Plateau within the Puget Lowland region. Elevations in this area range from about 355 to 540 feet above sea level. The Puget Lowlands lie between the Cascade Mountain Range (to the east) and the Olympic Mountain Range (to the west) (Figure 3-1). The geology of the region was formed mainly by glaciation, resulting in rolling ridges separated by long valleys.

The advance and retreat of the Vashon glacier, approximately 13,500 to 15,000 years ago, resulted in the Sammamish Plateau's geomorphology. Large amounts of glacial till make up the bulk of the sediment left behind after the glacier receded, and is the most abundant geologic component of the Sammamish Plateau. The Vashon till, also known as hardpan, is a mixture of sand, silt, clay, and gravel that can be as much as 100 feet thick. As the glacier melted, sand and gravel was deposited in beds up to 80 feet thick, known as recessional outwash areas of the plateau. Outwash deposits, found in the steep bluffs of the plateau, are made of finer sands and gravels (City of Sammamish, 2003b).

3.1.1 Soils

Soils in the Town Center planning area have been classified by the U.S. Department of Agriculture, Soil Conservation Service (SCS) in the *Soil Survey of King County Area, Washington* (SCS, 1973). Specific soil units in the Town Center planning area are shown in Figure 3-2 and described in Table 3-1.

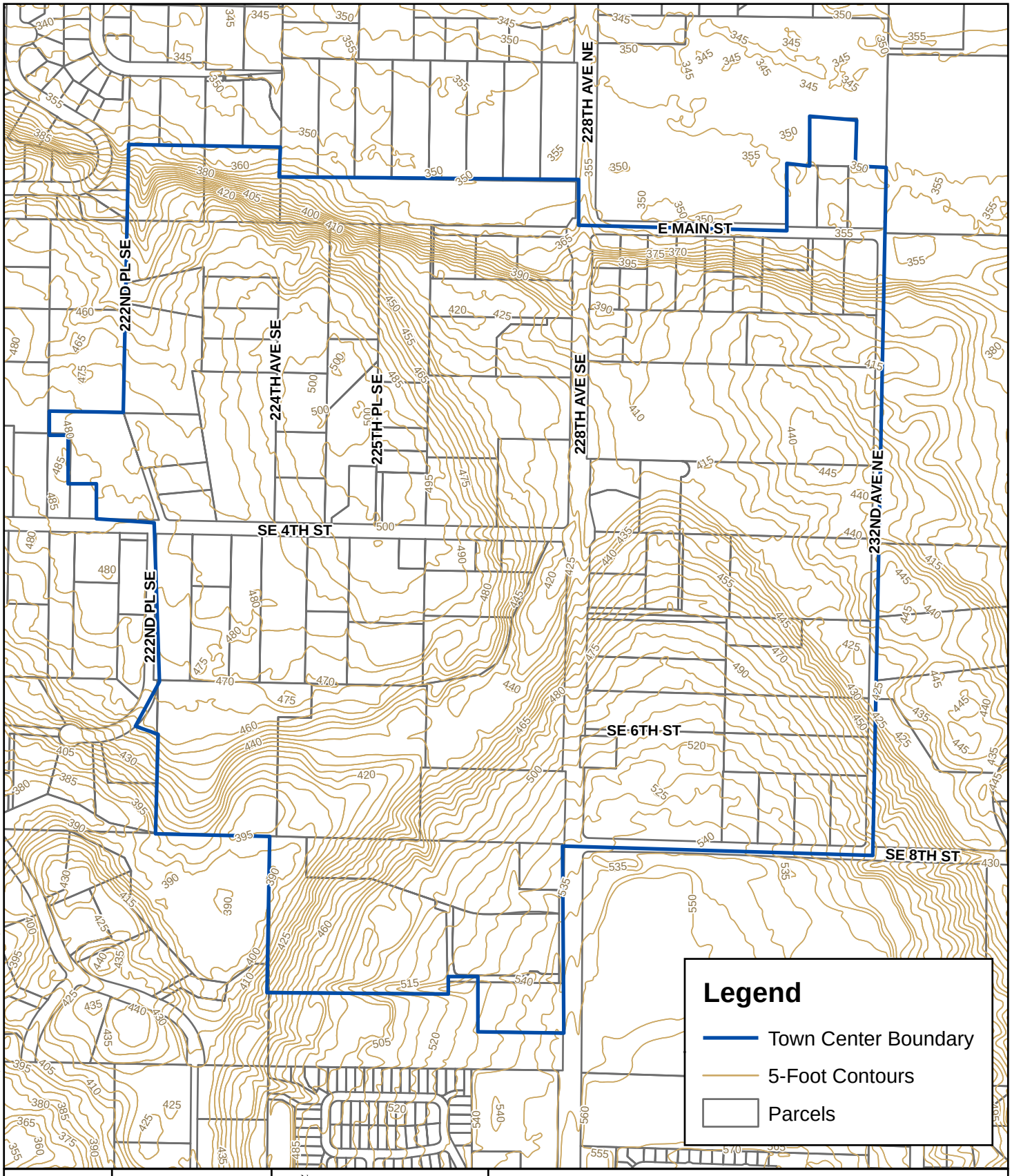
The most common soils in the Town Center planning area belong to the Alderwood series. Alderwood soils are moderately well drained, moderately deep, undulating to hilly soils that formed on glacial till on upland areas and terraces. These soils typically consist of very gravelly sandy loam to very gravelly fine sandy loam. Alderwood soils are often associated with seasonably high water tables because the underlying till acts as an aquiclude (infiltration barrier) (SCS, 1973).

Soils in this unit have a low shrink-swell potential and moderate to high corrosivity for uncoated steel and concrete. Alderwood soils can present a number of development limitations. Lateral subsurface flows on or near steep slopes can create erosion and landslide problems. Higher water tables render septic systems unusable and require special designs to achieve stable building foundations (City of Sammamish, 2003b).

Table 3-1. Town Center Soils Summary

Soil Type (Symbol) and Description	Area within Town Center in Acres (percent)	Erosion Hazard
Alderwood Gravelly Sandy Loam, 0 to 6 percent slopes (AgB): Slopes are nearly level to undulating. Runoff is slow and permeability is very slow in the substratum. This unit has a seasonally high water table, which presents moderate limitations for building foundations and severe limitations for shallow excavations.	8.5 (3.5)	Slight
Alderwood Gravelly Sandy Loam, 6 to 15 percent slopes (AgC): Soil permeability is moderately rapid in the surface layer and subsoil and very slow in the substratum. Runoff is slow to medium. Development limitations are similar to the AgB series.	171.4 (70.8)	Moderate
Alderwood Gravelly Sandy Loam, 15 to 30 percent slopes (AgD): Runoff is medium. This soil unit presents severe limitations for development. The City of Sammamish designate the areas characterized by these soils as erosion hazard.	44.2 (18.3)	Severe
Bellingham Silt Loam (Bh): Permeability is slow and there is a seasonally high water table during the rainy season. Runoff is slow. This unit has a moderate shrink-swell potential and moderate to high corrosivity for uncoated steel and concrete. The seasonal high water table presents limitations for building foundations for low buildings and septic tank filter fields. Slopes for Bh soils are less than 2 percent.	3.9 (1.6)	Slight
Everett Gravelly Sandy Loam, 5 to 15 percent slopes (EvC): Slopes for this soil are gentle to steep. The depth to groundwater can range from 0 to 17 feet. Runoff is slow to medium. Everett gravelly sandy loam soils have a low shrink-swell potential, moderate to high corrosivity for concrete and high corrosivity for uncoated steel. This soil unit presents slight to moderate limitations for building foundations where slopes are greater than 8 percent; severe limitations for shallow excavations due to excessive gravel; and hazard for piping due to the low compressibility and pervious nature when compacted. EvC soils are not suitable for septic tank filter fields or sewage lagoons due to flood hazard and rapid permeability in the soil substratum.	7.4 (3.1)	Slight to Moderate
Norma Sandy Loam (No): This soil unit is made up of poorly drained soils. Permeability is moderately rapid, the seasonal water table is at or near the surface, and runoff is slow. Norma soils have a low shrink-swell potential, moderate corrosivity for concrete and high corrosivity for uncoated steel. Norma soils present severe limitations for building foundations, shallow excavations and piping due to the high water table, flood hazard, low shear strength, low compressibility and pervious nature when compacted. Slopes for this unit are less than 2 percent and areas are level or concave.	4.1 (1.7)	No Hazard
Shalcar Muck (Sm): Very poorly drained organic soils that are stratified with mineral soils. Muck and mucky peat layers occur within a depth of 32 inches. Permeability is moderate in the organic layers and moderate to rapid in the lower part of the profile. Shalcar soils have a high shrink and low swell potential, moderate to high corrosivity for concrete and high corrosivity for uncoated steel. This soil presents severe limitations for building foundations, shallow excavations, roads, septic tank filter fields, and sewage lagoons due to its organic content and high water table.	2.5 (1.0)	No Hazard

Source: King County Soil Survey, SCS, 1973



arcexe82\Bin\Templates\Adolfson\AAIStandard8x11portrait.mxt 5/24/2004 cm

ADOLFSON

File name: Fig03-1_Topography.ai
Created/last edited by: CM/JAB
Date last updated: 10/31/06
Reference: 25164eis

N

FEET
0 250 500

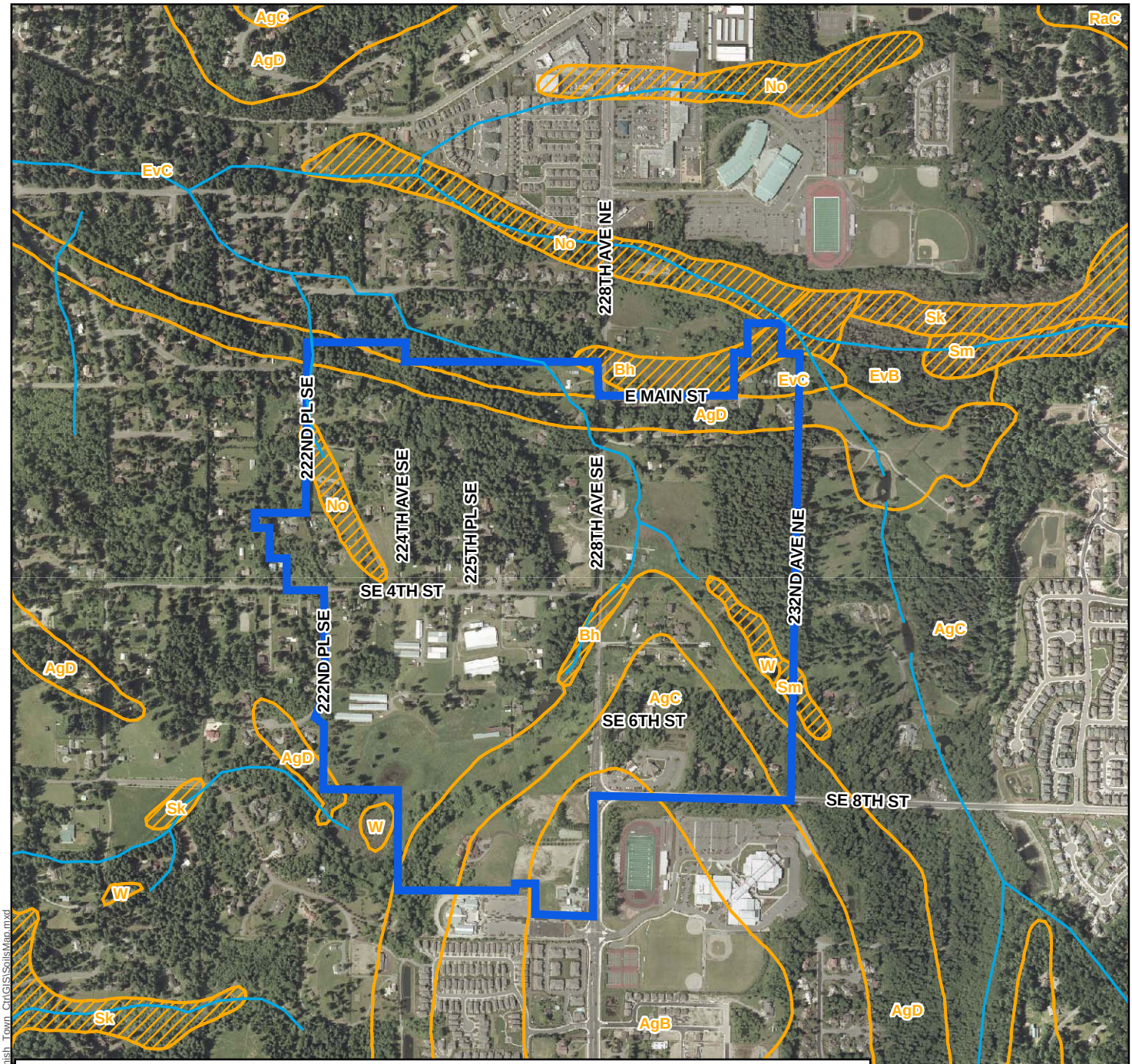
Map data are the property of the sources listed below.
Inaccuracies may exist, and Adolfson Associates, Inc. implies no warranties or guarantees regarding any aspect of data depiction.

FIGURE 3-1

TOWN CENTER AREA TOPOGRAPHY

SAMMAMISH TOWN CENTER SUB-AREA PLAN DEIS

SAMMAMISH, WASHINGTON



Legend

Town Center Boundary

Stream

Soils

Hydric

Non-Hydric

Soil Key

AgB, ALDERWOOD GRAVELLY SANDY LOAM, 0 TO 6 PERCENT SLOPES

AgC, ALDERWOOD GRAVELLY SANDY LOAM, 6 TO 15 PERCENT SLOPES

AgD, ALDERWOOD GRAVELLY SANDY LOAM, 15 TO 30 PERCENT SLOPES

AkF, ALDERWOOD AND KITSAP SOILS, VERY STEEP

Bh, BELLINGHAM SILT LOAM

EvB, EVERETT GRAVELLY SANDY LOAM, 0 TO 5 PERCENT SLOPES

EvC, EVERETT GRAVELLY SANDY LOAM, 5 TO 15 PERCENT SLOPES

No, NORMA SANDY LOAM

RaC, RAGNAR FINE SANDY LOAM, 6 TO 15 PERCENT SLOPES

Sk, SEATTLE MUCK

Sm, SHALCAR MUCK

Tu, TUKWILA MUCK

W, Water

L:\ENVIR IMPACTS\2005 Projects\25164 Sammamish Town Ctr\GIS\SoilsMap.mxd

ADOLFSON

File name: Fig03-2_soils.ai
Created/last edited by: DNE/JAB
Date last updated: 12/13/06
Reference: 25164eis

N

FEET

0 250 500 1000

Map data are the property of the sources listed below.
Inaccuracies may exist, and Adolfson Associates, Inc. implies no warranties or guarantees regarding any aspect of data depiction.

SOURCE: King County GIS, 2004, 2002 (aerial photo);
NRCS SSURGO Soils, 2003.

FIGURE 3-2

SOILS

SAMMAMISH TOWN CENTER SUB-AREA PLAN DEIS

SAMMAMISH, WASHINGTON

3.1.2 Environmentally Critical Areas

Chapter 21A.50 of the Sammamish Municipal Code (SMC), Environmentally Critical Areas, establishes controls and measures to protect defined critical areas in the city. The City's Critical Areas Ordinance (City of Sammamish, 2005c) states as one of its purposes the protection of the public, public resources, and facilities from "injury, loss of life, property damage or financial loss due to flooding, erosion, landslides, seismic events, soil subsidence or steep slopes failures" (SMC 21A.50.010(2)). To accomplish this, the code applies standards for development and permitted alterations in erosion hazard areas (SMC 21A.50.220), erosion hazards near sensitive water bodies (SMC 21A.50.225), landslide hazard areas (SMC 21A.50.260), seismic hazard areas (SMC 21A.50.270), and frequently flooded areas (SMC 21A.50.230).

As indicated in Figure 3-3, several areas within the Town Center planning area are designated as erosion hazard areas. An area northwest of the Town Center planning area is designated as a landslide hazard area. There are no seismic hazard areas or frequently flooded areas in or near the Town Center planning area.

3.1.2.1 Erosion Hazard Areas

Soil erosion is a process in which individual soil particles are detached and moved by natural agents such as wind, rain, frost action, or surface water flows. Erosion poses a potential public health and safety hazard. Eroded sediments entering bodies of water can negatively impact ecosystem functioning (see also Chapter 4 for more information on sediment impacts). In addition, erosion can directly and indirectly damage private property as well as valuable habitat and natural areas. As previously discussed, the U.S. Department of Agriculture, Soil Conservation Service (1973) has identified certain soils as being susceptible to erosion if disturbed. Such soils occur throughout the city, with the largest concentration on steeper slopes in the western part of the city (City of Sammamish, 2003b). As shown in Figure 3-3, areas characterized as erosion hazard areas are located in the northern portion and an arc in the southern half of the Town Center planning area.

3.1.2.2 Landslide Hazard Areas

Unconsolidated soil materials with slopes greater than 15 percent that are underlain with impermeable geologic materials and/or have seeps are especially subject to slippage. Areas which have experienced movement in the past or which are unstable because of rapid stream incision or stream bank erosion are also susceptible to landslides. Landslides in such areas can result in public and private costs, threats to human health and safety, and natural resource and environmental damage (City of Sammamish, 2003b).

Many slopes within Sammamish are either naturally unstable or become unstable when disturbed. Areas subject to landslides are located northwest of the Town Center planning area, as shown on Figure 3-3. There are no areas within the project area designated as landslide hazard areas.

3.2 Impacts

3.2.1 Impacts Common to the Action Alternatives

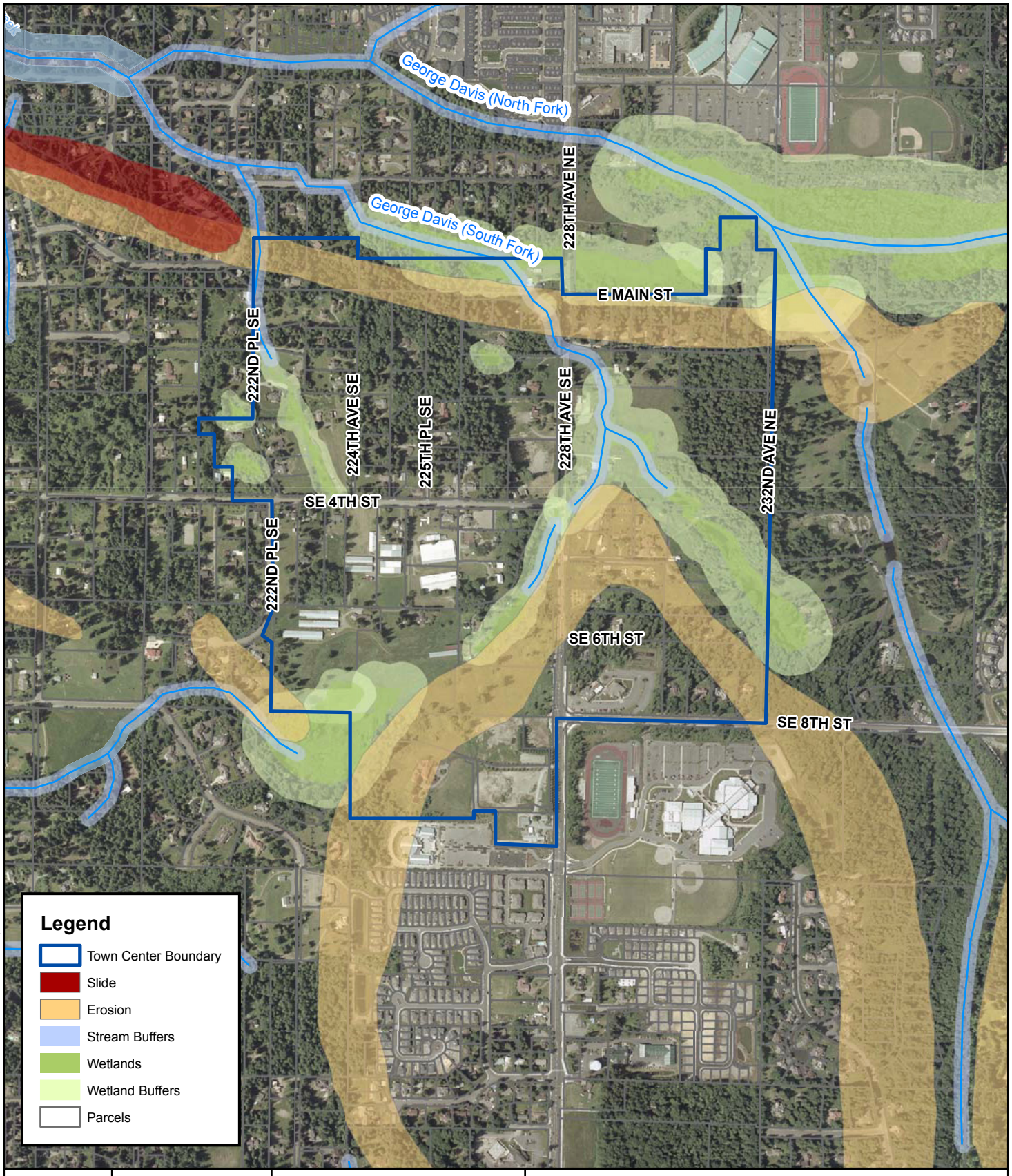
All three of the land use alternatives illustrated in Alternatives 1 through 3 would promote urbanization of the Town Center. Development under any of these scenarios could impact earth resources. The City's Draft Supplemental EIS for the Comprehensive Plan (2003b) includes an evaluation of potential impacts to earth resources from development and its conclusions are relevant to development in the Town Center planning area as well.

Development activities that have detrimental effects on soils and slope stability include the removal of protective vegetative cover, direct excavation of the soil profile, and changes in land cover and use. All of these activities would occur as the Town Center developed under any of the alternatives. As a result of these activities, soil can be lost to erosion and steep slopes may grow increasingly unstable. In addition, sediment generated by the activities may degrade water quality, reduce the capacity of wetlands and streams to store or convey water, and increase flooding (see Chapter 4 for additional discussion).

The magnitude of potential impacts resulting under each of the alternatives would depend on the scale, pace, and location of development as well as implementation of mitigation measures. Because development in the Town Center would largely be determined by private entities, the pace of development under any of the alternatives is not known. The scale of development under the Town Center Sub-Area Plan is better understood.

Alternatives 1 and 3 include similar amounts and sizes of developments, which are greater than those identified for Alternative 2. Larger structures and higher intensity uses such as retail, office, and multi-family buildings typically require more land and vegetation clearing, and would be more likely to result in impacts than individual single-family or townhouse development. However, depending on the scale and timing of individual development projects, single-family and townhouse projects could result in larger overall areas of land disturbance. For example, a single-family development involving multiple parcels could have as large an impact as a commercial development.

The location of development is an important determinant of impacts to earth resources because some areas are more susceptible than others. As discussed above, the City has identified these areas as erosion, landslide, or seismic hazards. As shown in Figure 3-3, there are several areas within the Town Center planning area designated as erosion hazard areas. Table 3-2 shows the acreage and type of development proposed within erosion hazard areas in the Town Center planning area.



arcexe82\Bin\Templates\AdolfsonVA\Standard8x11portrait.mxt 5/24/2004 cm

ADOLFSON

File name: Fig03-3_hazardareas.ai
Created/last edited by: DNE/JAB
Date last updated: 12/15/06
Reference: 25164eis

N

FEET
0 250 500 1000

Map data are the property of the sources listed below.
Inaccuracies may exist, and Adolfson Associates, Inc. implies no warranties or guarantees regarding any aspect of data depiction.
SOURCE: King County GIS, 2004, 2002 (aerial photo).

FIGURE 3-3
HAZARD AREAS
SAMMAMISH TOWN CENTER SUB-AREA PLAN DEIS
SAMMAMISH, WASHINGTON

Table 3-2. Estimates of Development in Erosion Hazard Areas in the Town Center (Acres)

Land use	Alternative 1	Alternative 2	Alternative 3
Retail	0	0	1 – 2
Mixed-use Office/Residential	0	0	1 – 2
Housing			
Single family	0	6 – 7	1 – 2
Townhouses	2 – 3	4 – 5	1 – 2
Mid-rise Multi-family	4 – 5	> 1	5 – 6
Total Acreage	**6 - 8**	**10 - 12**	**8 – 14**

The amount of land disturbance resulting from construction of townhomes and single-family development could be less than that for commercial and multi-family developments, because the building footprints of the structures themselves result in less actual lot coverage. Alternatives 2 and 3 would allow the highest levels of development in erosion hazard areas within the Town Center. Alternative 3 includes the most intensive development in erosion hazard areas because it has the most commercial and multi-family development, and thus would likely disturb more area within the hazardous zone. Specific development projects will be required to undergo a project-level evaluation to identify erosion hazard impacts.

3.2.2 No-Action Alternative

Under the No-Action Alternative, development in the planning area would occur as allowed under the current Comprehensive Plan's land use designations (see Figure 6-2 in Chapter 6). Potential impacts resulting from this development scenario were analyzed in the City's Draft Supplemental EIS for the Comprehensive Plan (2003b) under "Impacts of the Preferred Alternative." In reference to the Town Center planning area, the analysis identified the "oval-shaped erosion hazard area" (shown in Figure 3-3) and concluded that moderate to high-density land uses in this location could result in potential for sediment generation.

3.3 Mitigation Measures

3.3.1 Mitigation Measures for Hazard Areas

A critical area review by the City is required for any development proposal permit application. The City's critical areas ordinance would be implemented for any development on a site that includes erosion hazard areas. The Environmental and Conservation Element (ECE) of the Comprehensive Plan includes policies that "may be considered programmatic mitigation for avoiding, minimizing, and reducing impacts." Individual project designs will incorporate ECE policies to avoid impacts to earth resources to the greatest extent possible.

Code provisions for clearing and grading activities and erosion hazard areas regulate the timing and extent of clearing for development. Clearing, grading, filling, and foundation work in an erosion hazard area is allowed only during the drier season of the year, May 1 to September 30 (SMC 21A.50.220(1)).

Development proposals on sites containing erosion hazard areas are required to include a temporary erosion control plan prior to receiving approval (SMC 21A.50.220(2)). The plan may stipulate that silt fences or other means of preventing sediment movement must be in place and functional. A vegetation management plan is also required for all subdivisions, short-subdivisions, or binding site plans. Vegetation must be retained until building permits are approved for development on individual lots. Clearing of vegetation on lots is not allowed unless the City determines that clearing is a necessary part of the grading plan, there is no reasonable alternative to performing grading on an individual lot basis, and drainage from the graded area will meet water quality standards established in the adopted surface water manual.

Where the City determines that erosion from a development site poses a significant risk of damage to downstream receiving waters, based on the size of the project, the proximity to the receiving water, or the sensitivity of the receiving water, the applicant will be required to provide regular monitoring of surface water discharge from the site (SMC 21A.50.220(3)). The use of hazardous substances, pesticides, and fertilizers is not permitted in erosion hazard areas.

In addition to implementation of the above policies, project-level mitigation should also include the following mitigation proportionate to the amount of development under each alternative:

- Strict adherence to seasonal clearing restrictions that limit clearing and grading activities during the rainy season;
- Implementation of construction best management practices, such as the stabilization of disturbed slopes (revegetation) and the installation of silt fencing, where appropriate; and
- Immediate revegetation and stabilization of adjacent areas disturbed by construction activities.

3.4 Significant Unavoidable Adverse Impacts

None of the proposed alternatives for the Town Center Sub-Area Plan would cause significant unavoidable adverse impacts to earth resources, provided the above mitigation is implemented. The Town Center Sub-Area Plan will strive to design project components that are geologically sound and protect the community from geologic hazards.

Chapter 4 Water Resources

The Sammamish Town Center planning area is located within the East Lake Sammamish watershed, which is within Water Resource Inventory Area (WRIA) 8. The headwaters of the East Lake Sammamish watershed are located on the Sammamish Plateau, draining generally west to meet the shore of Lake Sammamish (Figure 4-1). Within the East Lake Sammamish watershed, water flows through surface channels in several small streams, in the shallow subsurface, and in deeper aquifers. Important surface and groundwater elements in this drainage basin include:

- Small streams that drain west to Lake Sammamish;
- Slope and riverine wetlands;
- Shallow aquifers in alluvium and recessional outwash;
- Aquifer recharge zones; and
- Deeper aquifers in advance outwash.

Within this chapter, surface and groundwater resources, their regional context, important features, and key processes are discussed for the vicinity of the Town Center planning area. Based on this information, potential impacts are identified for each of the four land use alternatives.

4.1 Affected Environment

4.1.1 Surface Water

4.1.1.1 Regional Surface Water Context

The Sammamish Plateau is drained by five drainage basins. Most of the City of Sammamish (73 percent) is within the East Lake Sammamish Basin, which drains east to Lake Sammamish. The northern portion of the city (20 percent) is in the Evans Creek Basin, which drains northerly into Bear Creek and then to the Sammamish River. Small portions of the city lie in the Patterson Creek Basin (6 percent), the lower Issaquah Basin (less than 1 percent), and the North Fork Issaquah Creek Basin (less than 1 percent) (City of Sammamish, 2003b) (Figure 4-1).

The Town Center planning area is located entirely within the East Lake Sammamish Basin, and drains to the Inglewood and Thompson Subbasins (Figure 4-2). Approximately 177 acres (73 percent) of the Town Center planning area drains generally north to the Inglewood Basin via tributaries to George Davis Creek. George Davis Creek and its associated wetlands are the primary surface water features within the 1,600-acre Inglewood Basin. George Davis Creek is also referred to as Eden or Eton Creek, but is referenced as George Davis Creek throughout this EIS.

The southwestern 66 acres (27 percent) of the Town Center planning area drains south and west to the Thompson Subasin. There is a mapped channel that flows from the planning area to a large wetland system (City of Sammamish Wetland 1561) that forms the headwaters of Ebright Creek (Figure 5-1, Figure 4-2). While stream channel mapping in this area is not entirely clear, several studies, including the East Lake Sammamish Basin Plan (King County, 1994), the

Inglewood Subbasin Plan (Entranco, 2005), and the WDFW Salmonscape database, indicate that flow from this wetland system is focused south to Ebright Creek.

4.1.1.2 Inglewood Subbasin

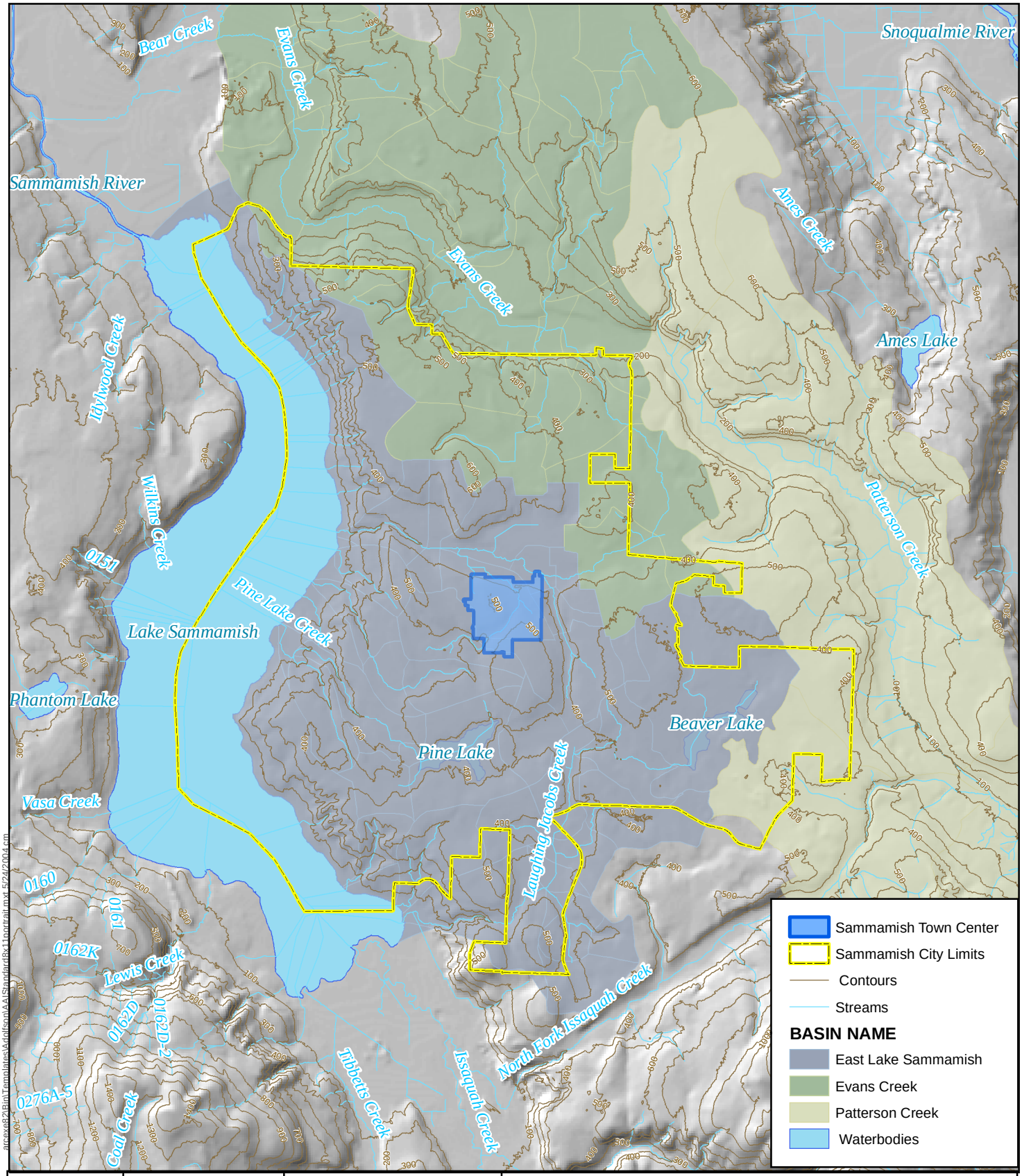
Approximately three-quarters of the Town Center planning area (approximately 177 acres) drains north to Tributaries 0144A and 0144C of George Davis Creek. These tributaries flow north to meet mainstem George Davis Creek (Tributary 0144) approximately 1,250 feet downstream and northwest of the Town Center planning area (Figure 4-3). The mainstem of George Davis Creek then flows another mile downstream (west) to the eastern shore of Lake Sammamish. The headwaters for George Davis Creek and its main tributaries are wetlands located in the upper basin generally east of 228th Avenue NE.

Two main branches (Tributaries 0144A and 144B) of George Davis Creek flow together near the intersection of NE 4th Street and 219th Avenue NE. After crossing NE 6th Street, the creek descends into a forested ravine. Base flow emerges within the ravine, roughly one-half mile upstream from the mouth, where the ground surface drops sufficiently to intersect groundwater. The connection between George Davis Creek and Lake Sammamish is highly altered. The creek flows through a series of culverts under East Lake Sammamish Parkway, a private access road, and a waterfront home. An overflow bypass pipe conveys excessive stormwater volumes to the north and discharges flows into Lake Sammamish at a boat launch (Entranco, 2005).

Stream flow patterns within George Davis Creek are influenced by the deposits of recessional outwash material (Qva) throughout the main stream valley. These relatively coarse, highly permeable soils provide a large volume of water storage, which moderates flooding throughout this reach as the stream conveys shallow subsurface flow to the ravine reach. The valley and channel slope is gentle through this upper reach, which results in greater channel stability than in neighboring drainages (Entranco, 2005).

Several wetland areas exist within the basin, often as broad headwater wetlands that coalesce into stream channels, or as broad riverine, slope, and depressional wetlands on valley alluvium. Several of these wetlands have been inventoried by the City of Sammamish and/or King County. See Chapter 5 for more detailed information regarding wetlands.

Population within the Inglewood sub-basin has grown rapidly, transitioning from a primarily farming community to a developed residential community (Herrera, 2004). Most of the basin is developed with residential and commercial uses. The distribution of land cover is patchy, with clusters of denser development surrounded by more open areas. The Inglewood Basin has approximately 244 acres of impervious surface area, which is approximately 15 percent of the basin area (Entranco, 2005). The Town Center planning area includes areas of the Inglewood Subbasin where previous analysis has indicated that impervious surfaces cover 6.7 to 9.2 percent of the area (Entranco, 2005).



File name: Fig4-1
Created/last edited by: PD
Date last updated: 10/28/06

0 4,000 Feet

Map data are the property of the sources listed below.
Inaccuracies may exist, and Adolfson Associates, Inc. implies no warranties or guarantees regarding any aspect of data depiction.
SOURCE: King County, 2006/Sammamish. 2005

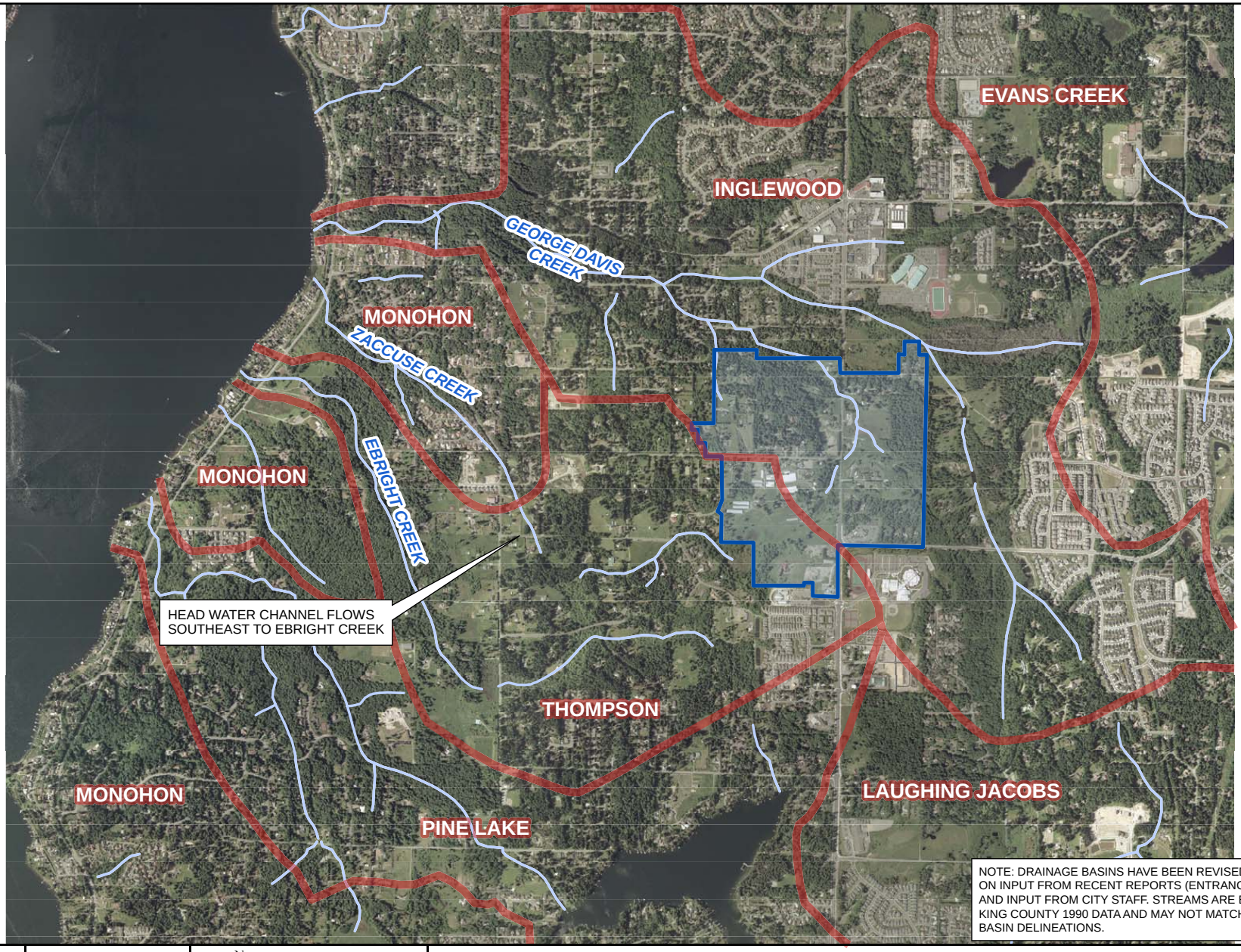
ADOLFSON

FIGURE 4-1

DRAINAGE BASINS

SAMMAMISH TOWN CENTER EIS

SAMMAMISH / KING COUNTY, WASHINGTON



ADOLFSON

File name: Fig04-2_subbasins.ai
Created/last edited by: JAB
Date last updated: 12/13/06
Reference #: 25164eis

N

FEET
0 500 1000 2000

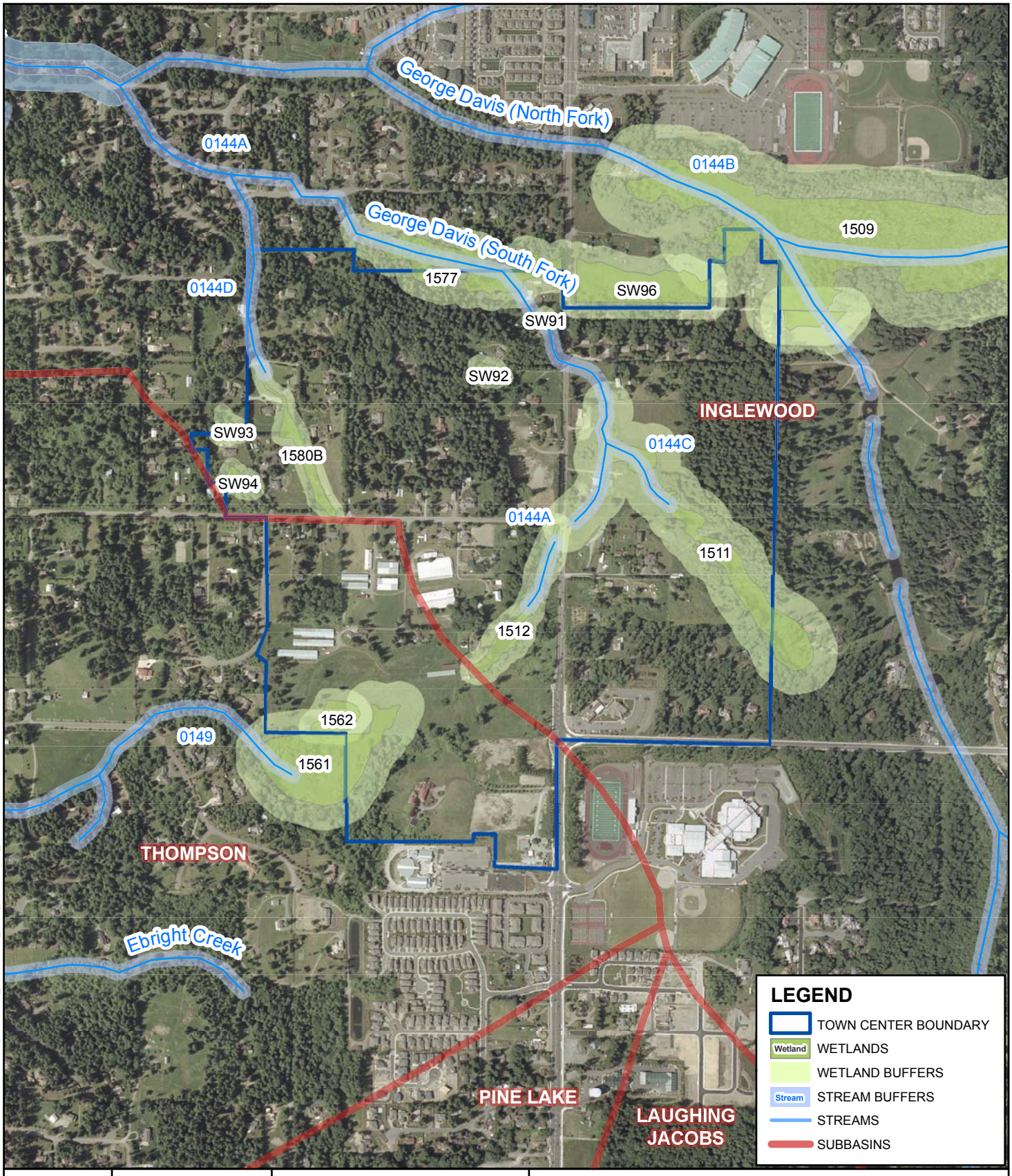
SOURCE: King County GIS, 2004.

FIGURE 4-2

SUBBASINS AND CREEK NAMES

SAMMAMISH TOWN CENTER SUB-AREA PLAN DEIS

SAMMAMISH, WASHINGTON



L:\ENVIRIMPACTS\2005\projects\25164_Sammamish_Town_Ctr\GIS\FIG5_1.MXD

ADOLFSON

File name:
Fig04-3_wetlandandstreams.ai
Created/last edited by: CM/JAB
Date last updated: 12/15/06

FEET
0 250 500 1000

Map data are the property of the sources listed below.
Inaccuracies may exist, and Adolfson Associates, Inc. implies no warranties or guarantees regarding any aspect of data depiction.

FIGURE 4-3

WETLANDS AND STREAMS

SAMMAMISH TOWN CENTER SUB-AREA PLAN EIS

SAMMAMISH, WASHINGTON

4.1.1.3 Thompson Subbasin

The southwestern portion of the Town Center planning area (approximately 66 acres) drains to the Thompson Subbasin. Similar to the Inglewood Subbasin, the Thompson Subbasin is rapidly transitioning from forest and small-scale agricultural uses to a developed residential community. Ebright Creek (Tributary 0149) is the primary surface water feature in the Thompson Basin, flowing west toward Lake Sammamish. Some recessional glacial outwash (Qvr) soils exist in the upper portions of the Ebright Creek drainage, but they are not as extensive as the deposits in the Inglewood Subbasin.

The lower reaches of Ebright Creek have been identified as providing key salmonid habitat ecosystem functions (Kerwin, 2001; King County WLRD April 2005). Species observed by volunteer monitoring include Kokanee, sockeye, and chum salmon. Ebright Creek has proven to be an important community resource with substantial restoration potential (King County, 1994; Kerwin, 2001).

Major channel erosion and sedimentation have been identified in the ravine and upper reaches of Ebright Creek (King County, 1994; City of Sammamish, 2001). The Thompson Basin does not have the same storage/buffering capacity in outwash soils as the Inglewood Basin. Therefore, changes to the channel system resulting from development and changes in land use are more evident in this basin. These issues have also prompted restoration efforts to be focused within Ebright Creek, including a 300-foot section of graded stream channel that was restored in 1998.

Several wetland areas exist within the basin, either as headwater wetlands or as broad riverine, slope, and depressional wetlands on valley alluvium. Several of these wetlands have been inventoried by the City of Sammamish and/or King County. Wetland 1517 is a large wetland system that forms a headwater of Ebright Creek (Figure 4-3).

4.1.2 Rainfall and Runoff Processes

The relationship between rainfall and runoff to produce stormwater is a key element of the hydrologic cycle to consider when analyzing potential impacts of land development. Rainfall-runoff processes are typically governed by climate, geology, topography, soil, and vegetation type. Land development can directly impact topography, soils, and vegetation on a site.

Rainfall-runoff processes vary across the Town Center planning area due to differences in underlying geology, soils, and topography. As discussed in the Chapter 3, much of the Town Center planning area is underlain by glacial till (Qvt) soils. While soils that have formed in till (e.g., Alderwood gravelly sandy loam) can be well drained to excessively well drained in the upper part, the underlying till materials have low permeability. The infiltration capacity of Qvt areas is limited, meaning that a higher percentage of rainfall will be converted to runoff on these types of soils than in more permeable outwash soils.

The northern portion of the Town Center planning area (approximately north of E Main Street) includes the alluvial valley of George Davis Creek. These alluvial soils are typically underlain by permeable recessional glacial outwash (Qvr) materials. These areas have a high infiltration capacity, and act to moderate surface flows in channels by providing shallow subsurface storage of water. Past modeling studies of rainfall-runoff patterns in this area indicate that these Qvr materials provide the equivalent of 7,000 acre-feet of detention storage (Figure 4-4) (Entranco, 2005).

In general, the combination of (1) relatively small basin size, (2) forested, well-drained soils in the Qvt materials, and (3) large storage capacity of permeable Qvr materials acts to avoid and prevent major flooding issues in this area.

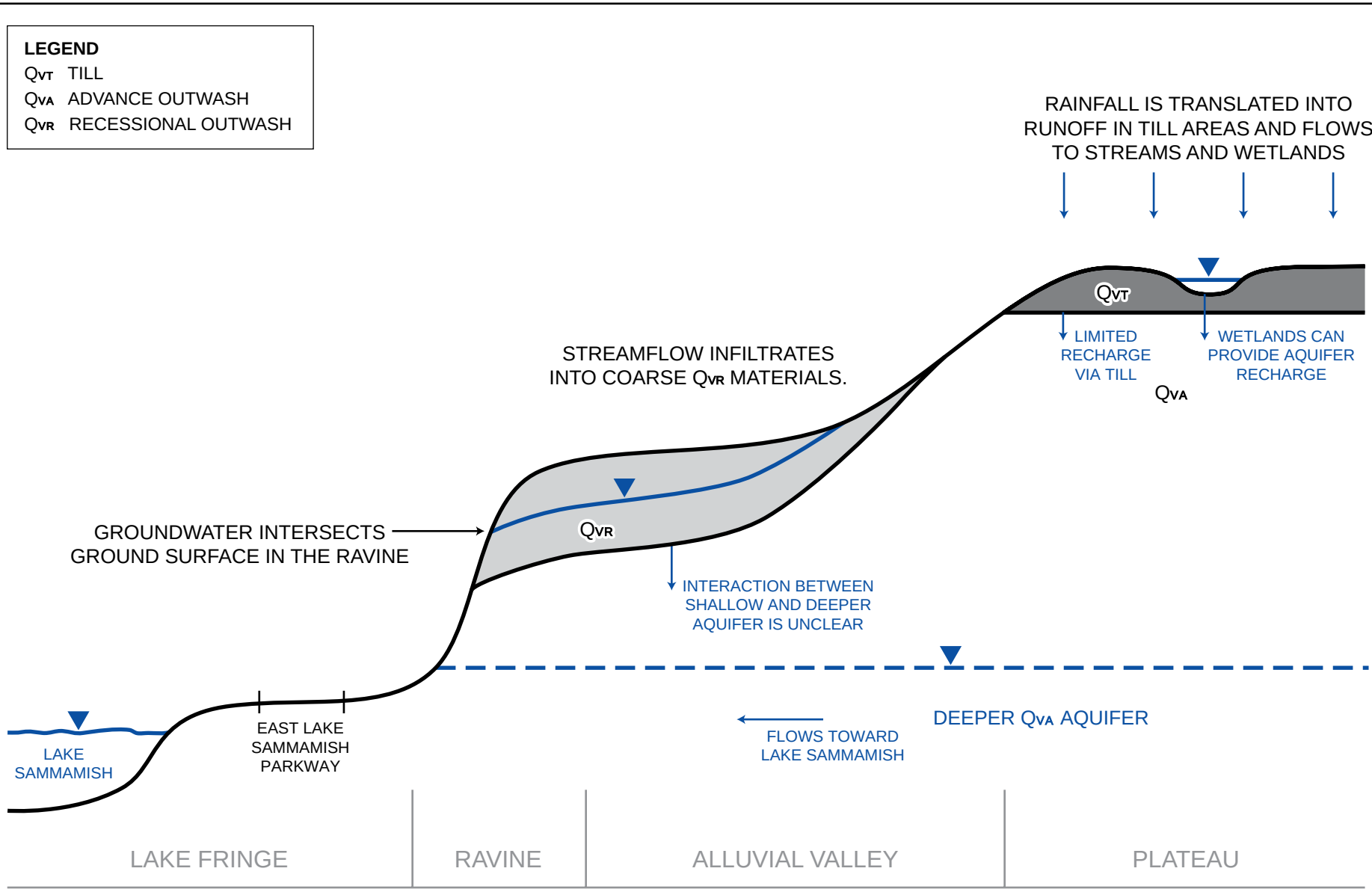
The King County database of drainage complaints was inspected to investigate past patterns of flooding in this vicinity. In general, drainage complaints on or just downstream of the Town Center planning area consisted of localized issues relating to blocked or modified drainageways. Several of the complaints focused on sediment-laden runoff from active construction sites. There were several reports in 1989 –1990 of flooding of structures in the parcels that include George Davis Tributary 0144A, just downstream of the Town Center planning area (Figure 4-3). This trend of flooding due to improperly maintained culverts is confirmed in the East Lake Sammamish Basin Plan (King County, 1994). It appears that most of these issues have been resolved with the implementation of structural repairs/upgrades to the stormwater system (Entranco, 2005). However, these past flooding episodes indicate that changes to surface flow patterns in the basin have occurred, and that the system may be sensitive to further alterations.

Flooding within the Thompson Subbasin appears to be limited to some roadway flooding surrounding Wetland 1517 (King County, 1994). This location is approximately 2,500 feet southwest of the Town Center planning area. The primary issue for Ebright Creek appears to be in-channel erosion in the upper and middle reaches, which results in sedimentation in the lower reaches (King County, 1994). Sedimentation within the lower reaches negatively impacts in-channel habitats for many species, including salmonids.

4.1.3 Stormwater Management

Stormwater runoff is typically regulated at federal, state, and local levels. These regulations typically address how new development will manage stormwater and provide for improving water quality. The City of Sammamish Stormwater Management Plan (City of Sammamish, 2001) addresses the City's goals for environmental and water quality maintenance and improvement. The City of Sammamish Municipal Code and policies promote the comprehensive management of stormwater and surface waters through flood, erosion, and sedimentation controls, and the prevention of water quality degradation. The City code refers to the King County Surface Water Design Manual (KCSWDM) (1998) and applicable regulations of the Washington State Hydraulic Code as the basis for developing both long-term stormwater systems and temporary erosion and sedimentation control (TESC) facilities.

The City of Sammamish is currently planning to update its surface water design regulations to utilize the most current version of the KCSWDM (2005a). In addition, the City is investigating ways to develop an incentive-based program to encourage the use of Low Impact Development (LID) techniques (City of Sammamish, 2006b). The overall intent is to increase the application of LID techniques, especially in areas that are suitable for infiltration. In general, incentives are based on allowing the proposed project to be modeled as less than entirely impervious when certain flow control techniques are applied. The City hopes to adopt these new regulations in 2007.



ADOLFSON

File name: Fig04-4_waterschematic.ai
Created/last edited by: JAB
Date last updated: 10/31/06
Reference #: 25164

SOURCE: Adolfson Assoc., 2006.

FIGURE 4-4

CONCEPTUAL SCHEMATIC OF SURFACE AND SUBSURFACE WATER

SAMMAMISH TOWN CENTER SUB-AREA PLAN DEIS

SAMMAMISH, WASHINGTON

4.1.4 Surface Water Quality

The quality of the water in the Inglewood and Thompson Subbasins is the end result of interactions among precipitation, land uses, soils, and vegetation. Past studies have found that, while overall water quality in both basins is generally good, there are some potential water quality issues in both basins (Herrera, 2004; Entranco, 2005). These issues focus on nutrients, bacteria, suspended sediment, temperature, and metals (City of Sammamish, 2001).

As required by the Federal Clean Water Act, the Washington State Department of Ecology (Ecology) currently maintains a database (current as of 2004) of surface waters where water quality is impaired when compared to state water quality standards (Chapter 173-201A) (known as "the 303(d) list") (Ecology, 2004). Water bodies are protected according to their uses, with the primary categories for aquatic life, recreation, and water supply. All feeder streams to lakes are classified as Class AA[1], and all of the City's streams fall into this class. The 303(d) list has five categories, with Category 5 being the most impaired. Water bodies with a Category 5 listing trigger the Total Maximum Daily Load (TMDL) and cleanup plan process.

King County has monitored water quality in both major streams in the vicinity of the Town Center planning area (George Davis Creek and Ebright Creek), and the results are publicly available on the King County website (KCDNR, 2006). King County monitors conventional parameters (e.g., pH, conductivity, temperature), nutrients, bacteria, and metals. King County has developed a high, moderate, and low rating system to provide a consistent way to qualitatively compare water quality among stream systems.

The lower reach (generally at and below the ravine) of George Davis Creek is on the 2004 303(d) list as Category 5 for fecal coliform. This listing, supported by samples collected by King County in 2002, showed that fecal coliform levels in the creek exceeded state water quality standards[2]. Water quality in George Davis Creek is rated "moderate concern" based on low dissolved oxygen, high fecal coliform bacteria, and suspended solids levels in the summer months (KCDNR, 2006).

The lower reach of Ebright Creek is also on the 2004 303(d) list as Category 5 for fecal coliform, based on samples collected by King County. In general, water quality in Ebright Creek is rated "moderate concern." High levels of nutrients, suspended solids, and fecal coliform bacteria compromise water quality in Ebright Creek (KCDNR, 2006).

Elevated water temperatures are also a concern for George Davis Creek and Ebright Creek. Urbanization tends to result in increased water temperatures as energy is transferred from impervious surfaces and as water is retained in ponds. King County monitoring data show that water temperatures in both creeks can exceed 12°C (53.6°F). From the King County data, it did not appear that temperatures often exceed the Ecology standard of 16°C.

[1] Rivers and streams are rated in one of four classes: Class AA – Extraordinary, Class A – Excellent, Class B – Good, and Class C – Fair. Different water quality standards apply to the different classes as set forth by the Washington Administrative Code (WAC) 173-201-045. Each of these classes has a different set of water quality standards.

[2] George Davis Creek is listed as Eden (or Eton) Creek on the 303(d) list

The generation and transport of phosphorous to Lake Sammamish is another key water quality concern for George Davis Creek and Ebright Creek. Lake Sammamish is on the 303(d) list for total phosphorous, and reducing phosphorous loading has been a focus of basin and cleanup plans for this area. The Inglewood Basin Plan makes reference to higher than typical phosphorous loading to the lake by George Davis Creek (Entranco, 2005).

4.1.5 Groundwater

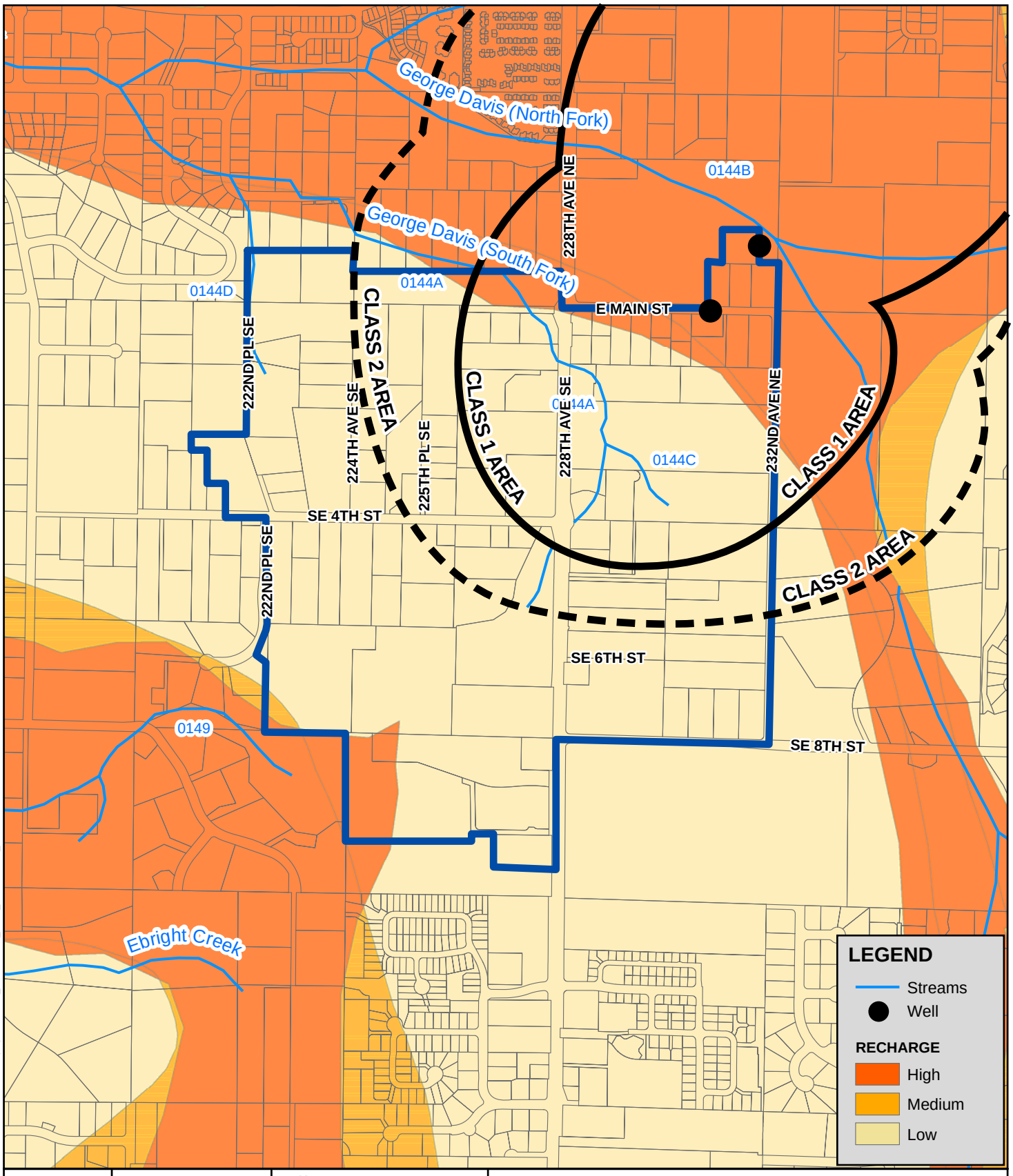
4.1.5.1 Regional Groundwater Characteristics

Groundwater is rainwater that has filtered into the ground and stays below the surface in permeable geologic deposits called aquifers. The amount of groundwater available and the amount of water available to recharge groundwater are affected by precipitation, geology, land use, population growth, and water reuse (Fetter, 1994; City of Sammamish, 2003b). Within the City of Sammamish, groundwater is the primary source of domestic water.

There are two main aquifers beneath the City of Sammamish, based on King County studies of well information available within the Issaquah Creek Valley Groundwater Management Area. A deeper aquifer exists within sands deposited during the advance of the Vashon glaciation. These sands (Qva materials) are often capped with a layer of till (Qvt) that protects the underlying aquifer from surface land uses. However, the extent and thickness of the Qvt layer can vary substantially, and may be completely eroded in drainage basins. Based on King County data, the water table within the Qva aquifer is between 250 and 300 feet above mean sea level (approximately 150 to 200 feet below the ground surface). The movement of groundwater near the Town Center planning area ranges from westerly to northerly. A shallow aquifer exists within Vashon recessional outwash (Qvr) and younger alluvial materials (Qal) in the valley bottom. The Qvr/Qal aquifer exists within the alluvial valley of George Davis Creek. In this portion of the George Davis Creek valley, the groundwater elevation is near the surface, and flow direction is to the north (King County, 2005b). This area is mapped as having high susceptibility to groundwater contamination (Figure 4-5).

4.1.6 Water Use and Supply

Groundwater supplies in the study area are managed by the Sammamish Plateau Water and Sewer District (District). The District is divided into two zones: the Plateau Zone and the Cascade View Zone. The study area is located within the Plateau Zone. Two aquifers, the Plateau Aquifer and the Issaquah Valley Aquifer, supply groundwater to the Plateau Zone. Five wells draw from the Plateau Aquifer and three wells draw from the Issaquah Valley Aquifer. There are two wells located in the northeastern (NE) quadrant of the Town Center planning area (Figure 4-5).



L:\ENVIRIMPACTS\2005\projects\25164_Sammamish_Town_Ctr\GIS\FIG5_1.MXD

ADOLFSON

File name:
Fig04-5_Aquifer_recharge.ai
Created/last edited by: AC/JAB
Date last updated: 12/13/06
Reference: 25164eis

N

100 300 500 FEET
0 200 400 600
1:10,000

Map data are the property of the sources listed below.
Inaccuracies may exist, and Adolfson Associates, Inc. implies no warranties or guarantees regarding any aspect of data depiction.
SOURCE: King County GIS, 2002.

FIGURE 4-5
AQUIFER SUSCEPTIBILITY TO CONTAMINATION AND WELLHEAD PROTECTION ZONES
SAMMAMISH TOWN CENTER SUB-AREA PLAN DEIS
SAMMAMISH, WASHINGTON

Wellhead protection areas (WHPAs) have been established to protect surface and subsurface areas surrounding wells and well fields that supply public water (Figure 4-5). Protection areas reduce the possibility that contaminants are able to reach the aquifers and wells and affect water quality. A WHPA is defined as the surface and subsurface area surrounding a well through which potential contaminants are likely to pass and reach the wells. In Washington, WHPAs are defined based on the time of travel (TOT) for groundwater to move from its point of infiltration to its point of discharge at the well (Sammamish Plateau Water and Sewer District, 2005). Two supply wells exist near the northeastern portion of the Town Center planning area (Figure 4-5).

4.1.7 Aquifer Recharge

The recharge of both the shallow (Qal) and deep (Qva) aquifers is a key ecosystem function on the Sammamish Plateau. As land use intensifies, the probability increases that pollutants can enter these aquifers. King County has developed maps of areas that have high, medium, and low susceptibility to groundwater contamination (King County, 2005b). For the Town Center vicinity, there are areas categorized as high susceptibility (shown in Figure 4-5). These areas generally correspond to the presence of more permeable deposits along the stream channels, and in the headwater wetlands for Ebright Creek.

The Sammamish Critical Areas Code (SMC 21A.50.280) establishes development standards for critical aquifer recharge areas (CARAs) for the City of Sammamish. Critical aquifer recharge areas are defined as areas in the city with a critical recharging effect on aquifers used for potable water (SMC 21A.15.253). The City of Sammamish divides CARAs into three classes:

- Class 1 CARAs are mapped areas located with the 1- or 5-year capture zone of a Wellhead Protection Area3.
- Class 2 CARAs are mapped areas located within the 10-year capture zone of a Wellhead Protection Area.
- Class 3 CARAs are mapped areas outside Wellhead Protection Areas that are identified as high aquifer susceptibility areas based on characteristics of surficial geology and soil types.

Development standards provide for the protection of groundwater quality by establishing guidelines for stormwater runoff, surface water infiltration, groundwater contamination, and permitted land uses. The Town Center planning area contains designated Class 1 and 2 CARAs as well as limited areas of Class 3. These areas are shown in Figure 4-5.

4.1.8 Groundwater Quality

The District monitors water from its water supply wells for total coliform bacteria, inorganic and physical contaminants, trihalomethanes, volatile and synthetic organic chemicals, and

[3] Wellhead protection zones are areas around wells where contamination would result in polluting the water supply well within a specific time period. Time periods used by the Washington State Department of Health Drinking Water Program are six months, one year, five years, and ten years (Morgan, 2005). Time-of-Travel Zone refers to the delineated area within which groundwater moves towards, and eventually reaches, a water supply well within a given period of time.

radionuclides. Sampling frequencies for these contaminants vary considerably. In accordance with state regulations, the water in each of the wells throughout the distribution system is tested once every three years.

The District submits drinking water samples monthly to test for coliform[4] bacteria, as required by state regulations. On January 17, 2004, during routine water testing, coliform bacteria was found to be present in some of the samples taken in the Plateau Zone of the District. The bacteria level found was not large enough to constitute a violation of the maximum contaminant level for total coliform bacteria. The District conducted follow-up tests and took additional samples to verify improvement of the water quality. All follow-up test samples were found to be free of the bacteria (Sammamish Plateau Water and Sewer District, 2005).

Coliforms were found in more samples than allowed and this was a warning of potential problems. The samples that showed the presence of coliform were further tested to see if other bacteria of greater concern, such as fecal coliform or *E. coli*, were present and none of these bacteria were found (Sammamish Plateau Water and Sewer District, 2005). The District chlorinated the water system in order to eliminate any remaining bacteria, and continues to permanently chlorinate the majority of the District's water system to enhance protection.

4.2 Impacts

The potential impacts to water resources resulting from the proposed Sammamish Town Center land use alternatives are discussed below.

4.2.1 Impacts Common to All Alternatives

There are several types and patterns of impacts to water resources that are common to all development alternatives. These impacts typically focus on temporary construction impacts, and impacts resulting in a change in or expansion of current land uses.

Over the next 25 years, as the Town Center planning area develops, there is the potential for construction activities to impact water resources. This potential is significant for the planning area due to the relatively large area to be disturbed (around 100 acres for most alternatives), and the presence of erodable soils that have formed on glacial till or on relatively steep slopes.

If site disturbance results in off-site migration of sediment, it is likely that the sediment will follow existing topography and surface water flow patterns. Therefore, off-site migration of sediment has significant potential to negatively impact aquatic resources, including the wetlands and streams of the George Davis and Ebright Creek ecosystems.

Excess coarse and fine sediment input into aquatic ecosystems can result in serious ecological consequences. Excess coarse sediment can be deposited in stream channels, which can reduce channel capacity, leading to increased flooding. Excess coarse sediment can also be deposited in

[4] Coliforms are bacteria that are naturally present in the environment and are used as an indicator that other, potentially harmful bacteria may be present.

wetlands, reducing the overall area of wetlands and negatively impacting wetland functions. The impacts of potential sediment deposition in streams and wetlands could affect the function of aquifer recharge areas located in the Qvr materials downstream of the Town Center planning area. Fine sediment deposition over these permeable materials could decrease the ability of water to infiltrate into these shallow aquifers.

Excess fine sediment loading to aquatic systems can result in elevated turbidity during storm events. Elevated turbidity can reduce fish usage and predatory success, and can result in gill abrasion in juvenile fish. Fine sediment is often a vector for nutrients, metals, and bacteria. Therefore, increasing the fine sediment load could result in increased phosphorous and fecal coliform transport to downstream reaches, aggravating existing water quality issues. Though downstream transport would be likely, the potential impacts to Lake Sammamish would be buffered as much of the stream flow infiltrates into the Qvr materials upstream of the ravine.

4.2.1.1 Surface Water

All of the alternatives have the potential to change the way surface water moves through and out of the Town Center planning area. The site is currently in low- to moderate-density residential and low-intensity agricultural land use. All of the alternatives would result in increased impervious surface, altered rainfall-runoff relations, and levels of vehicle traffic.

Both the East Lake Sammamish and Inglewood Basin Plans identify changes in surface water flow quantity and quality as a result of the development that has occurred to date in the vicinity of the Town Center planning area (King County, 1994; Entranco, 2005). These impacts generally consist of a modified rainfall to runoff relationship, which may have changed the frequency and duration of flow events within George Davis and Ebright Creeks. Current levels of impervious surfaces in the Inglewood Basin (15 percent) are likely sufficient to change channel morphology (Booth et al., 2002). As discussed above, the Qvr and Qva materials along the course of George Davis Creek act to buffer increases in peak flows due to the large subsurface water storage capacity. Therefore, past changes in land use have had more impact on Ebright Creek than they have on George Davis Creek, as evidenced by channel erosion and sedimentation in the lower reaches of Ebright Creek. Further, it is likely that Ebright Creek will be more sensitive to future land use changes than George Davis Creek.

The quantity of impervious surface is a key factor in changing the rainfall to runoff relationship. To estimate the percent impervious surface for each alternative, the land use scenarios for each alternative were reviewed to estimate the area of each land use. Percentages of impervious surface were applied to each land use according to broad generalizations and numbers tabulated in NRCS 210-VI-TR-55 (1986). Using these percentages, impervious areas were determined for each alternative, as summarized in Table 4-1. These percentages of impervious area are a general estimate, and do not represent specific site conditions.

The areas of retail, office, civic, and mixed-use in the Town Center alternatives were determined by calculating the area of the footprints shown on the conceptual site plans (Figures 2-1 through 2-4). These areas represented potential building footprints, and therefore the impervious area was estimated to be 95 percent impervious, which is higher than the estimate included in the TR-55 report. The TR-55 numbers assume that the area will include lawns and other plantings around the buildings.

Table 4-1. Estimates of Impervious Surface for Each Development Alternative

Land Use	Estimate of Impervious Area (%)	Alternative 1 Commercial Focus Area (acres)	Alternative 2 Low-Intensity Area (acres)	Alternative 3 Civic Focus Area (acres)	Alternative 4 No-Action Area (acres)
Residential (1 unit/0.25 acre)	38	0	20	0	150
Residential (1 unit/0.083 acre)	65	27	30	27	0
Retail	95	4	4	4	0
Office	95	2	0	0	0
Civic	95	2	1	4	0
Mixed-Use	95	5	0	5	0
Public Park[1]	10	25	35	31	24
Parking	95	16	6	18	0
Roads	95	42	46	48	8
Critical Areas (wetlands and buffers)	0	60	60	60	60
Private Open Space	10	57	44	49	0
Total Site Impervious Percentage	**--**	**39.0**	**36.0**	**40.8**	**27.2**

[1] In all of the action alternatives approximately 6 acres of the Sammamish Commons overlaps a wetland and buffer. These 6 acres have been placed in the Critical Areas category for estimating impervious surface.

The 2003 Draft Supplemental EIS for the Comprehensive Plan used different estimates of impervious surfaces. These differences are not likely to be major when comparing the action alternatives, since the areas of each land use are generally similar between alternatives and percentages are applied evenly to all alternatives. However, the No-Action Alternative is dominated by residential land use designated R4 over approximately 150 acres of developable land. In this instance, the estimates of impervious surface will vary significantly depending on the percentage impervious assigned to R4. The TR-55 report assumes that R4 (one residence on a quarter acre) will be 38 percent impervious. The 2003 Draft Supplemental EIS assumes that R4 will be 55 percent impervious, consistent with the allowance in the current Sammamish Municipal Code. Using the 2003 Draft Supplemental EIS estimate, the No-Action Alternative would result in over 80 acres of impervious surface, covering approximately 38 percent of the Town-Center planning area, a level similar to the action alternatives.

Even the lowest estimates of impervious surfaces expected to result from the proposed development exceed 25 percent. This amount is more than 10 percent greater than current levels. This level of impervious surface is greater than current estimates of future buildout in the Inglewood Basin Plan (Entranco, 2005). These levels of impervious surface are in a range known to result in substantial changes in system hydrology. Therefore, retention/detention (e.g., ponds, vaults, etc.) will be necessary to meet the requirements of the King County Surface Water Design Manual (KCSWDM).

Development in the Town Center planning area with its associated stormwater also has the potential to modify natural water pathways, and could result in interbasin transfer of water. In each of the action alternatives a major public or commercial feature is planned along the

drainage divide between the Inglewood and Thompson Basins. Changing basin boundaries can result in changes in the volume and timing of water delivered to surface channels, potentially resulting in erosion and sedimentation. These impacts are assumed to be negligible in this case because stormwater systems can be designed to match drainage areas.

The development of the Town Center planning area also has the potential to negatively affect water quality in both George Davis and Ebright Creeks. In general, the greater vehicular traffic resulting from higher density development, roads, and parking areas has the potential to build up pollutants on impervious surfaces. These pollutants are then transported downstream to aquatic resources. The addition of impervious surfaces and stormwater ponds also has the potential to increase water temperatures.

The proposed changes in land use also have the potential to improve water quality in both creeks for some water quality parameters. The proposed land use eliminates agriculture in and near these headwater streams and wetlands. Direct access of livestock to streams and wetlands is a likely source of fecal coliform bacteria to each system (King County, 1994). Therefore, eliminating this land use could reduce bacteria loading to the creek and ultimately Lake Sammamish. Similarly, all proposed development alternatives will result in connection to a regional wastewater treatment system. The abandonment of existing septic systems also has the potential to reduce bacteria loading to both streams.

4.2.1.2 Groundwater

Under all of the alternatives, development in the Town Center planning area has the potential to change groundwater flow patterns in both the Qvt and Qvr/Qal geologic deposits. Changes in land use could impact groundwater quality.

Within the portions of the Town Center planning area underlain by Qvt materials, limited impacts to groundwater flow patterns are anticipated. The increase in impervious surface would reduce the amount of shallow subsurface flow within the soil, and the low permeability of the till material limits recharge to deeper aquifers. Water that had traveled in the shallow subsurface would be replaced by flow discharging from the stormwater system. The storage provided in the till soils is typically greater and more distributed than storage in the stormwater system. Therefore, while the stormwater system would be designed to match peak flows discharging from the site, the system would likely result in longer duration, lower magnitude flows to downstream receiving waters**.** This change in timing is not anticipated to have significant impacts on downstream receiving waters. The change in pathway could result in negative water quality impacts including elevated temperatures and increased pollutant loading.

Development in the Town Center planning area has the potential to impact the groundwater recharge area that exists within the Qvr materials north of the planning area. As discussed above, higher intensity land use in the Town Center planning area has the potential to mobilize and transport greater amounts of sediment. This sediment could be deposited in the coarse sediments in the alluvial valley of George Davis Creek, thereby limiting infiltration. This same process could occur in the wetlands in both the Inglewood and Thompson Basins, impacting aquifer recharge functions of those wetlands.

Of primary concern is the quality of the water being recharged into the deeper aquifers in the Qva deposits that feed some of the District's supply wells. As discussed above, the District utilizes groundwater for most of the domestic water supply throughout the vicinity of the Town Center. While there does not appear to be sufficient information to directly link streamflow in George Davis Creek to these deeper aquifers (Herrera, 2004), there is a potential for surface waters to be conveyed downstream to permeable deposits. If development negatively affects the quality of surface water, the permeable deposits could provide a vector to contaminate deeper aquifers (Figure 4-4).

4.2.2 Alternative 1 – Commercial Focus

4.2.2.1 Surface Water

The potential for impacts to surface water under Alternative 1 are similar to the discussion for all alternatives above. Alternative 1 has a greater focus on retail land uses. This land use is typically higher density and results, on average, in greater areas of impervious surface and greater traffic turnover than residential land uses. Accordingly, Alternative 1 would result in approximately 2 percent more impervious surface than Alternative 2.

However, residential land uses under Alternative 1 would be concentrated in higher densities than the other alternatives (500 to 1,000 more residential units). This pattern allows for more housing units per acre with more land left for open space. As a result, Alternative 1 would have approximately 2 percent less impervious surface than Alternative 3.

4.2.2.2 Groundwater

See Impacts Common to all Alternatives above.

4.2.3 Alternative 2 – Low Intensity

4.2.3.1 Surface Water

The potential for impacts to surface water as a result of Alternative 2 is similar to the other alternatives discussed above. Alternative 2 has a greater focus on residential land use and is intended to feature a lower intensity land use pattern. Alternative 2 would result in the lowest level of impervious surface of the three development alternatives at 36 percent. However, the difference is relatively small considering the relatively large difference in residential density and commercial and civic land uses featured in the other alternatives. The percentages of impervious surface for the action alternatives are generally similar, making it difficult to identify significant differences between them based on this measure.

4.2.3.2 Groundwater

See Impacts Common to all Alternatives above.

4.2.4 Alternative 3 – Civic Focus

4.2.4.1 Surface Water

The potential for impacts to surface water as a result of Alternative 3 are similar to the discussion for all alternatives, above. Alternative 3 has a greater focus on civic facilities. The addition of these public facilities to the higher density residential, retail, and office land uses results in the highest percentage of impervious surface. Impervious surfaces for Alternative 3 are estimated to be 40.8 percent. As stated above, the percentages of impervious surface for the action alternatives are generally similar, making it difficult to identify significant differences between them.

4.2.4.2 Groundwater

See Impacts Common to all Alternatives above.

4.2.5 Alternative 4 – No-Action

The No-Action Alternative would result in substantially lower densities of people, roads, and impervious surfaces within the Town Center planning area. As such, the overall impacts to water resources are anticipated to be lower than the three action alternatives. However, assuming that the people who would have moved into a higher density Town Center move into the general Sammamish Plateau area, these potential impacts could be spread over a larger geographic area.

4.2.5.1 Surface Water

The impacts to surface water in the Inglewood and Thompson Basins as a result of selecting Alternative 4 have generally been considered in the existing basin plans (King County 1994, Entranco 2005) and Comprehensive Plan Supplemental Draft EIS (2003b).

For George Davis Creek, an HSPF model was used to investigate the potential for flooding, assuming that the basin was built out to the current Comprehensive Plan designation. This analysis determined that the potential change to flood peaks and durations was "relatively small." As discussed above, the glacial outwash and alluvial deposits along the valley provide storage that prevents large-scale flooding in the middle portion of the basin (Entranco, 2005). However, it appears from King County records that flooding of structures has occurred along Tributary 0144A. In addition, much of the stream channel length in the Town Center planning area is located within Qvt materials that do not benefit from the buffering capability of the outwash deposits. Therefore, the installation of appropriate retention/detention facilities is still recommended.

Water quality impacts within George Davis Creek are a greater concern, because of the potential for bacteria and phosphorous loading to Lake Sammamish. The Basin Plan recommends that the phosphorous and sediment treatment options from the KCSWDM be implemented for new development and retrofits. Therefore, requiring the implementation of phosphorous and sediment controls should provide sufficient mitigation of these potential impacts.

For Ebright Creek, the lack permeable deposits results in a channel system that is more sensitive to changes in flow durations. These changes are evident as bed and bank erosion in the upper and middle reaches of Ebright Creek. The 1994 Basin Plan projects that future land use conditions could increase peak flows by 100 to 150 percent (King County, 1994). Therefore, robust retention/detention standards will be necessary to mitigate the potential impact of future development on sediment transport within Ebright Creek.

Future land uses are also expected to negatively impact water quality within Ebright Creek. The East Lake Sammamish Basin Plan predicts that increases in turbidity, nutrients, metals, and organic pollutants are likely (King County, 1994). Therefore, additional water quality treatment measures will be necessary.

Since the development under the No-Action Alternative could be distributed through many private entities, stormwater management would not be subject to a master drainage plan. Each development will be required to meet standards of the KCSWDM, but incremental development would not be conducive to a comprehensive stormwater management approach throughout the Town Center planning area.

4.2.5.2 Groundwater

The No-Action Alternative has the potential to impact groundwater quality. Residential land use will increase in density over current conditions, resulting in more roads and vehicle traffic. The potential for pollutant buildup on roadways to be washed off into receiving waters will increase. Since many of the streams and wetlands have connectivity with at least the shallow aquifer, there is potential for groundwater pollution.

The No-Action Alternative would likely result in limited changes to groundwater flow patterns and magnitudes when compared to the action alternatives. Single-family development will likely be more distributed, and will cover less overall area than the other alternatives. Therefore, the interruption of aquifer recharge will likely be limited.

4.3 Mitigation

4.3.1 Action Alternatives

There are several potential mitigation opportunities for the action alternatives in the Sammamish Town Center planning area:

- Implement stormwater retention/detention and treatment facilities as required in the KCSWDM
- Implement Low Impact Development (LID) techniques to minimize potential stormwater quantity and quality impacts. The use of LID techniques such as green roofs and infiltration trenches can act as “credits” to reduce the necessary stormwater infrastructure.
- Develop and implement a Stormwater District specifically for the Town Center planning area. The district would have the authority to collect funds to develop, install, and maintain the planning area’s stormwater system.

- Implement water quantity and quality monitoring in George Davis and Ebright Creeks, focusing on the upper watershed.
- Prepare a basin plan for the Thompson Subbasin identifying and quantifying problem areas and recommending capital improvement projects.
- Remove impassable barriers to fish passage within Ebright Creek, as proposed in the East Lake Sammamish Basin Plan (King County, 1994).
- Restore the mouth of George Davis Creek, as proposed in the Inglewood Basin Plan (Entranco, 2005).

4.3.2 No-Action Alternative

The mitigation measures for the action alternatives could also be implemented for the No-Action Alternative. However, since development under the No-Action Alternative will be accomplished on a parcel-by-parcel basis, it may be more difficult to implement the basin-wide mitigation measures.

4.4 Significant Unavoidable Adverse Impacts

The majority of the potential impacts identified above can be mitigated by the implementation of an appropriate stormwater plan, in concert with monitoring and adaptive measures to detect and prevent degradation of surface and groundwaters. However, stormwater retention/detention and treatment are still emerging technologies. The Sammamish Town Center planning area is located in an area with streams and wetlands that drain to Lake Sammamish, and with regionally important aquifers and aquifer recharge areas. Adverse impacts that may occur despite mitigation are:

1. Stream channel sedimentation and erosion, and accelerated transport of sediment and nutrients to Lake Sammamish, as a result of reduction of forest cover and increase in impervious surfaces.

2. Degradation of surface water quality as a result of greater population and impervious surfaces.

3. Degradation of ground water quality either via recharge of impacted surface water, or directly from spills of pollutants within aquifer recharge areas.

Chapter 5 Streams, Fish, Wetlands, and Wildlife

This chapter describes the streams, fish, wetlands, and wildlife habitat in the Sammamish Town Center planning area and the impacts that are likely to result from the land use alternatives. A discussion of the City's Environmentally Critical Areas Ordinance describes the protection and regulation of these critical areas. Special-status species, including endangered and threatened fish and wildlife, that may occur within the Town Center planning area are also discussed. The analyses in this chapter are based on existing data and limited field investigation.

5.1 Affected Environment

5.1.1 Environmentally Critical Areas

The City of Sammamish adopted an update of its Critical Areas Ordinance on December 20, 2005 (effective January 3, 2006). Streams, wetlands, and fish and wildlife habitats are regulated under the City of Sammamish Municipal Code (SMC) 21A.50 Environmentally Critical Areas.

5.1.1.1 Streams

Streams are defined as those areas in the city where surface waters produce a defined channel or bed, not including irrigation ditches, canals, storm or stormwater run-off conveyance devices or other entirely artificial watercourses, unless they are used by salmonids or are used to convey streams naturally occurring prior to construction of such watercourses (SMC 21A.15.1240).

Streams are classified according to fish presence and hydrologic characteristics. The perennial reaches of both George Davis Creek and Ebright Creek (located outside and east of the Town Center planning area) are named specifically as streams of special significance, Type F streams (SMC 21A.15.1240). Streams of special significance are those perennial reaches designated by the City based on historic fish presence and/or the probability of restoration. The seasonal or intermittent portions of these streams that do not have potential to be used by salmonids would be considered Type Ns (SMC 21A.15.1240).

The City requires buffers on streams from the ordinary high water mark (SMC 21A.50.330). Buffers associated with stream types are shown in Table 5-1. These buffer widths are designed to reduce or mitigate the impact of adjacent development on streams.

Table 5-1. City of Sammamish Stream Buffers

Stream Type	Buffer Width (feet)
Type S (inventoried as a "shoreline of the state")	150
Type F (salmonid presence; salmonid potential use; special significance) Streams of special significance: George Davis Creek Ebright Creek Pine Lake Creek Laughing Jacobs Creek below Laughing Jacobs Lake	150
Type Np (perennial flow; no potential salmonid use)	75
Type Ns (seasonal or ephemeral; no potential salmonid use)	50

5.1.1.2 Wetlands

The City requires that wetlands are rated or assigned a category according to the Washington State Wetland Rating System for Western Washington (Hruby 2004). The rating system was designed to differentiate between wetlands based on their sensitivity to disturbance, their significance, their rarity, our ability to replace them, and the functions they provide. In addition to rating a particular wetland, the rating system also provides a qualitative assessment of several wetland functions, including water quality, flood flow alteration, and wildlife habitat. Wetlands are given points based on a series of questions regarding water quality, hydrologic, and habitat functions and then scored into four categories, Category I (highest score) through Category IV (lowest score).

The City requires buffers to protect and preserve wetland functions and values (SMC 21A.50.290). Buffers associated with categories of wetlands are shown in Table 5-2. These buffer widths are designed to reduce or mitigate the impact of adjacent development on wetland functions.

Table 5-2. City of Sammamish Wetland Buffers

Wetland Category		Buffer Width (feet)
Category I		
	Natural Heritage or bog wetlands	215
	Habitat score 29-36	200
	Habitat score 20-28	150
	Not meeting above criteria	125
Category II		
	Habitat score 29-36	150
	Habitat score 20-28	100
	Not meeting above criteria	75
Category III		
	Habitat score 20-28	75
	Not meeting above criteria	50
Category IV		50

In some circumstances, based on specific criteria, the updated Environmentally Critical Areas regulations allow for smaller buffer widths through buffer averaging and/or reduction. Buffer widths may also be increased to ensure protection of the function and value of specific high-value wetlands and habitat for threatened or endangered species (SMC 21A.50.290). The City also defines specific land uses and activities allowed in regulated wetland buffers in the city. Allowed uses include approved utility corridors, surface water management facilities, public and private trails, and viewing platforms (SMC 21A.50.300). Trails in sensitive areas are also subject to development standards under SMC 21A.30.210. The Environmentally Critical Areas code contains a limited exemption for hydrologically isolated wetlands smaller than 1,000 square feet as long as the City determines that the filling or dredging of the wetland will not result in cumulative impacts, and the impacted wetlands are mitigated under an approved mitigation plan (SMC 21A.50.320).

5.1.1.3 Fish and Wildlife Habitat

To protect fish and wildlife habitats, the Environmentally Critical Areas code includes standards and requirements for development proposals that would alter Fish and Wildlife Habitat Conservation Areas (HCAs) or their buffers (SMC 21A50.325). HCAs are those areas "that are essential for the preservation of critical habitat and species"(SMC 21A.15.468). The definition of HCAs includes: (1) areas where state or federally listed species have a primary association; (2) streams, lakes, or naturally occurring ponds; (3) state conservation areas; and (4) wildlife habitat corridors (as designated by the King County wildlife habitat network).

The Environmentally Critical Areas code establishes variable-width buffer areas for development activities near HCAs. The ordinance allows certain low impact development activities in HCAs, such as pervious trails, viewing platforms, and grass-lined swales for stormwater (SMC 21A.50.325(3)(c)).

Habitat corridors are linked to the designated wildlife habitat network and are set aside for preserving the connection between habitats. Corridors are established if the undeveloped land forms one contiguous tract that enters and exits the property where the wildlife habitat network crosses the property. The corridor width should not be less than 150 feet and should maintain a width of 300 feet whenever possible (SMC 21A.50.327(2)).

A portion of the King County designated wildlife habitat network extends east to west through the southern portion of the Town Center planning area. It enters the Town Center planning area at the southwest corner after extending across the Skyline High School property, and then joins with the south fork of George Davis Creek. The designated network continues along the same route as the creek, encompassing its riparian corridor, exiting the planning area and turning south to join with the Ebright Creek riparian corridor. Undeveloped forest occurs in several places along the designated corridor, creating opportunities to establish contiguous wildlife corridors as described above.

Another portion of the designated wildlife habitat network is present just east of the Town Center planning area, following the north fork of George Davis Creek and extending north to south. The two corridors intersect outside the Town Center planning area, east of Skyline High School and south of SE 8th Street.

The Draft Supplemental EIS (2003b) of the City's Comprehensive Plan includes results from a field reconnaissance of these wildlife corridors and an assessment of their effectiveness. Wildlife corridors were mapped within the Draft Supplemental EIS project area, which overlaps the majority, but not all of, the Town Center planning area. Figure 5-1 shows the mapped corridors for the Draft Supplemental EIS project area. Areas of highly erodible soils and landslide hazard areas, most of which contain forested habitat, have also been mapped as wildlife habitat. These areas have been identified as wildlife habitat since they are generally either undeveloped or underdeveloped, and because of site constraints they are likely to remain that way (City of Sammamish, 2003a).

5.1.2 Significant Trees

The City has specific requirements for tree retention, protection, replacement, and enforcement (SMC 21A.35). The tree regulations are not defined as an environmentally sensitive areas and are not regulated by the Environmentally Critical Areas code. Instead, significant tree regulations are within the City's development code under Landscaping and Irrigation, Chapter 21A.35 Development Standards. Per SMC 21A.35.1333, significant trees are defined as:

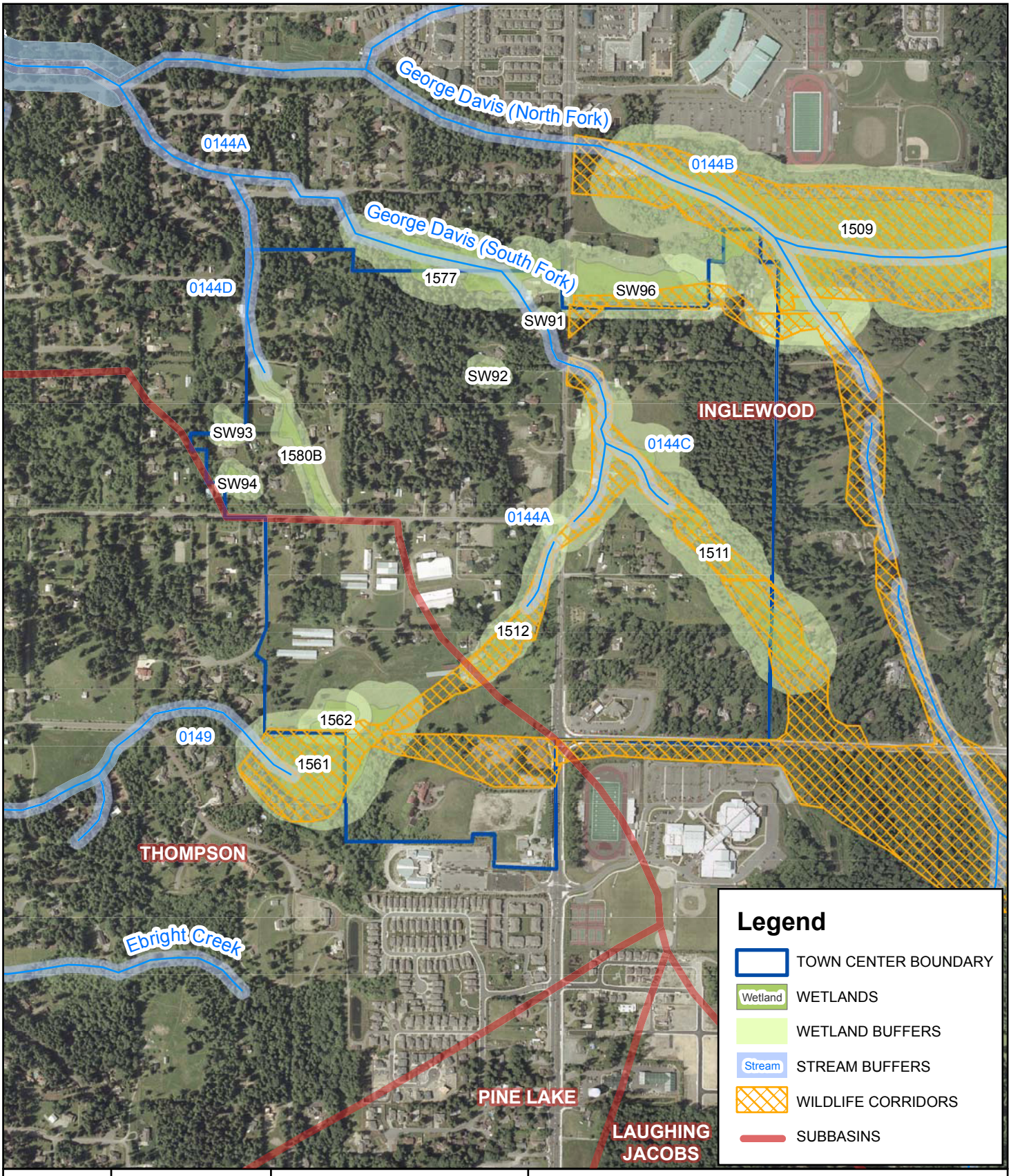
- a coniferous tree with a diameter of eight (8) inches or more diameter breast height (dbh); or
- a deciduous tree with a diameter of twelve (12) inches or more dbh.

The City also identifies heritage trees for protection, which are defined as trees that are equal to or greater than twenty-two (22) inches dbh (SMC 21A.15.1332).

All new subdivisions and short plats within the Town Center planning area must retain a certain percentage of significant trees to meet City requirements. For areas that are unconstrained by environmentally sensitive areas, such as wetlands and streams, and their associated buffers, a minimum of 25 percent of significant trees must be retained (SMC 21A.35.210(2)). A minimum of 30 percent retention is required for commercial and institutional developments. If wetlands and streams are present, the significant trees within those sensitive areas and associated buffers may be counted for up to 50 percent of the tree requirement (SMC 21A.35.210(4)).

SMC 21A.35.210(5) allows up to 50 percent of the trees identified for retention to be removed, provided that replacement trees will be installed per the replacement ratios outlined in SMC 21A.35.240. Trees must be replaced at the following ratios:

> (i) Removed trees with a dbh greater than nine (9) inches up to twelve (12) inches shall be replaced by four (4) trees;
>
> (ii) Removed trees with a dbh greater than twelve (12) inches up to sixteen (16) inches shall be replaced by six (6) trees; and
>
> (iii) Removed trees with a dbh of sixteen (16) inches or more shall be replaced by eight (8) trees (this includes all heritage trees).



L:\ENVIRIMPACTS\2005\projects\25164_Sammamish_Town_Ctr\GIS\FIG5_1.MXD

ADOLFSON

File name:
Fig05-1_WetlandsWildlife.ai
Created/last edited by: CM/JAB
Date last updated: 12/15/06

FEET
0 250 500 1000

Map data are the property of the sources listed below.
Inaccuracies may exist, and Adolfson Associates, Inc. implies no warranties or guarantees regarding any aspect of data depiction.
SOURCE:

FIGURE 5-1

WETLANDS, STREAMS, AND WILDLIFE CORRIDORS

SAMMAMISH TOWN CENTER SUB-AREA PLAN DEIS

SAMMAMISH, WASHINGTON

5.1.3 Streams and Fish

The Town Center planning area is located in the Inglewood Subbasin in the Cedar-Sammamish Water Resource Inventory Area (WRIA 08). The subbasin covers 1,640 acres (2.6 square miles) and the majority of streams in the subbasin drain to Lake Sammamish.

Approximately 1.45 miles (7,635 linear feet) of streams and tributaries are located in the Town Center planning area (Figure 5-1). One named and one unnamed tributary to George Davis Creek (WRIA 08-0144), are located within the Town Center planning area. Ebright Creek (WRIA 08-0149) and Zaccuse Creek are located southwest of the Town Center planning area within the Thompson Subbasin. These streams generally flow in an east to west direction toward Lake Sammamish.

5.1.3.1 George Davis Creek

George Davis Creek flows through riparian corridors, farm fields, ponds, and wetlands. Portions of the stream are piped within developed areas. The stream has two forks that support intermittent or seasonal flow and come together north of the Town Center planning area at the intersection of NE 4th Street and 222nd Avenue NE.

The north fork originates from wetlands and springs north and south of Eastlake High School, at the northeast corner of the Town Center planning area. The south fork begins from wetlands near the southwest corner, between SE 13th and SE 8th Streets. Based on published data, these seasonal reaches of the stream flow approximately 3 miles through a relatively flat area. After the confluence, the main channel of George Davis Creek flows west and drops 300 feet in less than a mile, flowing through a steep ravine and into Lake Sammamish. The stream becomes perennial (having year-round flow) midway down the ravine, approximately 0.5 mile from where the stream flows into Lake Sammamish.

George Davis Creek supports salmonids downstream (west) of the confluence of the two forks at approximately 220th Place NE (see Figure 5-1). Fish species have reportedly included coho salmon (rearing), cutthroat trout (spawning and rearing), and rainbow trout (spawning and rearing) (Williams et al., 1975; King County, 1990; City of Sammamish, 2003b). A resident population of cutthroat trout has been recorded in George Davis Creek, and recent undocumented electrofishing confirmed the presence of cutthroat in the stream (City of Sammamish, 2003b; Curry, 2006).

An extensive barrier of culverts and stormwater overflow pipes is present near the outfall of the creek at Lake Sammamish. Fish habitat upstream of this barrier (the ravine section) is considered very high quality. Another fish passage barrier is located downstream of the intersection of NE 6th Street and 216th Avenue NE (City of Sammamish, 2003b). Removing these barriers is a high priority according to the subbasin plan (Entranco 2005), although the feasibility of barrier removal is unknown at this time (Curry, 2006).

Historically, livestock near the headwater areas of George Davis Creek reportedly increased phosphorous loads and fecal coliform levels, substantially degrading water quality in the stream. However, some reaches of George Davis Creek have an intact riparian corridor. These higher

quality riparian zones contain considerable amounts of large woody debris throughout the channel that help to control sediment transport within George Davis Creek.

5.1.3.2 Ebright Creek

Ebright Creek is approximately 1,200 feet southwest of the Town Center planning area and flows west toward Lake Sammamish. The creek is approximately 2.65 miles long and is fed by two tributaries originating within large scrub-shrub and forested wetlands just south of the Town Center planning area.

Ebright Creek supports salmonids, including coho salmon (spawning and rearing), Kokanee (spawning), cutthroat trout (spawning and rearing), and rainbow trout (spawning and rearing) (Williams et al., 1975; King County, 1990). The population of Kokanee within Ebright Creek is genetically distinct from other populations within the Lake Washington-Sammamish watershed (R2 Resource Consultants, 2000). In the most recent scientific literature, there are inconsistencies regarding fish passable barriers within Ebright Creek (R2 Resource Consultants, 2000). Available literature suggests that no total barriers exist throughout the stream, although high-gradient reaches within a small ravine between the plateau and Lake Sammamish likely inhibit fish movement. Although the creek is of minimal size for Chinook salmon, a few have been reported as occurring in the creek. The creek is unclassified east of 212th Avenue SE where the wetlands begin. There is an impassible fish barrier located north of SE 8th Street and west of 212th Avenue SE (Greater Lake Washington Technical Committee, 2001).

As indicated in Chapter 4, water quality in Ebright Creek is rated “moderate concern” (KCDNR, 2006). Problems in the Ebright Creek subbasin include bed and bank erosion in the upper and middle reaches, resulting in sedimentation of lower reach salmonid spawning and rearing habitat.

5.1.4 Wetlands

The Town Center planning area contains multiple large wetlands associated with George Davis Creek and several other small- to medium-sized wetlands that are isolated depressions (Figure 5-1). To determine the presence and extent of wetlands, the City used existing GIS data to preliminarily map wetlands in the Town Center planning area. A limited field investigation of publicly accessible properties was then conducted to verify and adjust the locations of the mapped wetlands and to identify additional unmapped wetlands.

The City’s GIS data for wetlands are adapted directly from the King County Sensitive Areas Map Folio (King County, 1990). The 1990 folio of wetlands in King County was developed using soil survey data, aerial photographs, and limited field verification. The GIS data also contain wetland information developed for the Comprehensive Plan Draft Supplemental EIS (2003b). This information was developed on a broad scale evaluating vegetation and wildlife. The Draft Supplemental EIS used the City’s wetland GIS data supplemented with field reconnaissance information to map wildlife habitat and wetlands in the Comprehensive Plan’s “special study area”, which overlaps the majority of the Town Center planning area.

For the Town Center EIS, wetlands previously mapped in the King County Sensitive Areas Map Folio within the Town Center planning area were field reviewed, mapped with a GPS unit in their approximate location, and then classified according to the City’s current wetland rating

system. Four additional wetlands were identified as part of this effort in the planning area (SW91, SW92, SW93, and SW94). Table 5-3 provides a summary of characteristics of wetlands in the planning area. It is important to note that the wetland mapping was developed using existing information with limited field investigation. Some wetlands that are not identified on Figure 5-1 may exist on private properties within the Town Center planning area.

Table 5-3. City of Sammamish Mapped Wetlands[1]

Wetland Name[1]	Size within the Planning Area (acres)	Characteristics	Location in Town Center Planning Area	City of Sammamish Rating	City of Sammamish Buffer (feet)
1509	0.8	forested, scrub-shrub, emergent wetland bog complex; headwater tributary to George Davis Creek; high value wildlife habitat	Northeast corner, majority extends east outside Sub-area	Category I	215
1511	4.4	forested, scrub-shrub, emergent, aquatic bed wetland at headwater intermittent tributary to George Davis Creek; several man-made ponds	Eastern portion	Category I	150
1512	1.6	forested, scrub-shrub, emergent, open water wetland associated with headwater intermittent tributary to George Davis Creek; supports waterfowl	Central portion	Category III	75
1561	1.7	forested, scrub-shrub, emergent, aquatic bed wetland associated with headwater intermittent tributary to Ebright Creek	Southwest quadrant, majority extends south outside Town Center Sub-area	Category I	150
1562	1.0	emergent, aquatic bed wetland near Wetland 61	Southwest quadrant	Category II	75
1577	1.6	forested, scrub-shrub, emergent wetland complex; includes two headwater intermittent tributaries to George Davis Creek	Northwest quadrant; majority extends outside Sub-area	Category II	100
1580B	1.1	emergent wetland, associated with intermittent tributary to George Davis Creek	Northwest quadrant	Category IV	50
SW91	0.03	emergent wetland complex associated with intermittent tributary to George Davis Creek	Northwest quadrant	Category IV	50
SW92	0.3	forested, scrub-shrub, emergent wetland complex	Northwest quadrant	Category III	50

Wetland Name[1]	Size within the Planning Area (acres)	Characteristics	Location in Town Center Planning Area	City of Sammamish Rating	City of Sammamish Buffer (feet)
SW93	0.06	forested, scrub-shrub, emergent wetland complex associated with intermittent stream	Northwest quadrant	Category III	50
SW94	0.4	forested, scrub-shrub, emergent wetland complex	Northwest quadrant	Category III	50
SW96	0.01	forested, scrub-shrub, emergent wetland complex associated with intermittent stream	Northeast quadrant; majority occurs outside Sub-area	Category II	100

[1] Wetland Identification: City of Sammamish GIS database 2006; Wetland Identification number and size per City of Sammamish data, or DSEIS mapped wetland.

Some of the wetlands located in the northern portion of the Town Center planning area and associated with George Davis Creek (Wetlands 1511, 1509 and 1577) have a high level of diversity and function. The forested and scrub-shrub portions of these wetlands have high wildlife habitat value because of multiple canopy layers, high snag densities with perch sites, and diverse plant communities. Wetland 1509 also contains an area of bog, a unique and rare wetland community. Scrub-shrub areas are dominated by Douglas spirea, willow, salmonberry, and Pacific ninebark, and emergent areas are dominated by soft rush and creeping buttercup. These large wetland complexes are particularly important for recharging groundwater, protecting downstream areas from flooding, maintaining water quality in George Davis Creek, protecting downstream fish habitat, and reducing erosion and flooding during storms (City of Sammamish, 2003b).

Wetlands 1511 and 1512 are linear wetlands located along intermittent tributaries of the south fork of George Davis Creek. They join together in the northeast quadrant of the Town Center planning area. Wetland 1511 contains forest, scrub-shrub, and emergent wetland communities with several open water ponds. The northern portion of the wetland is a grazed wet pasture dominated by a mixture of nonnative grasses. The southern portion is a forested wetland dominated by red alder, western red cedar, and black cottonwood (City of Sammamish, 2003b).

Wetland 1512 occurs west of 228th Avenue SE in the southwest quadrant. The wetland contains a ponded area upstream of a constructed dam and has forested, scrub-shrub, and emergent wetland communities. Dominant forest species are red alder and Scouler's willow, and dominant shrub species are Douglas spirea and twinberry. Soft rush, skunk cabbage, and small-fruited bulrush dominate emergent areas.

There are five small- and medium-sized wetlands located at the headwaters or midstream of tributaries to George Davis Creek and Ebright Creek that provide several important functions within the Town Center planning area. The majority of these wetlands (Wetlands 1580B, 1561, 1562, 1512, and SW91) contain depressions that regulate stormwater flows and provide detention after flood events. These wetlands also provide groundwater recharge and water quality improvement through the removal of sediment and toxicants during detention.

Wetland 1561 is a large, diverse wetland that supports seasonal ponding and provides wildlife habitat. This wetland is also well connected to undeveloped upland forests and is associated with Ebright Creek. Wetland 1562 is adjacent to Wetland 1561 and associated with a human-made impoundment that has created ponded open-water habitat with wetland fringe. The emergent community is dominated by common cattail, soft rush, sedge, velvetgrass, and creeping buttercup (B-Twelve Associates, 2004).

Three small, isolated wetlands occur in areas of low topography within the Town Center planning area (SW92, SW93, and SW94) (Figure 5-1). Additional undocumented or unmapped small wetlands and other riparian areas associated with George Davis Creek tributaries may be present in the Town Center planning area. These small wetlands serve as areas for the recharge of groundwater and the control and treatment of stormwater. They also provide high-quality habitat for a variety of common and special-status wildlife species.

5.1.5 Wildlife and Wildlife Habitats

Wildlife species and their association with specific habitat types in the Sammamish Town Center planning area were characterized using the methods described in *Wildlife-Habitat Relationships in Oregon and Washington* (Johnson and O'Neil, 2001). Using the habitat types described by Johnson and O'Neil, wildlife habitats identified within the Town Center planning area include:

- westside lowlands conifer-hardwood forest (also called upland forest);
- urban and mixed environs;
- herbaceous and westside riparian wetlands; and
- agriculture, pasture, and mixed environs.

Westside lowland conifer-hardwood forest, or **upland forest**, occurs in medium to large patches in the northern portion and southwest corner of the Town Center planning area. Small, scattered patches fragmented by roads and other development are also present throughout the planning area. The largest, contiguous corridor of forest occurs in the northeast quadrant north of the area currently being developed for Eastside Catholic High School. The canopy of upland forest consists of coniferous and deciduous trees, including Douglas fir, western hemlock, red alder, western red cedar, and big-leaf maple. Dominant shrubs include osoberry, vine maple, and salal. Common herbaceous (ground cover) species include sword fern, nettle, and bracken fern.

Upland forest provides several features that are beneficial for wildlife habitat, such as a diversity of plant species, two to three canopy layers, surface waters (George Davis Creek and small ponds), large and small snags, downed wood, and leaf litter. These forest areas persist as large riparian greenbelts in an otherwise developed landscape, providing refuge and corridors for wildlife movement.

Common wildlife species that may be observed within the Town Center planning area and are closely associated with upland forest include black-tailed deer, coyote, raccoon, big brown bat, Douglas squirrel, mountain beaver, barred owl, varied thrush, winter wren, chestnut-backed chickadee, golden-crowned kinglet, and northern red-legged frog.

Urban and mixed environs habitat occurs as scattered patches in commercial and residential developed areas. Vegetation consists of ornamental landscaping and patches of native vegetation, including trees and shrubs. Wildlife in these patches is typically tolerant of human activities or a high level of disturbance and will reproduce in urbanized environments.

Common species that may be observed in urban and mixed environs habitats within the Town Center planning area and are closely associated with this habitat type include Norway rat, house mouse, Virginia opossum, American crow, Steller's jay, European starling, house sparrow, and house finch.

A variety of different types of **herbaceous and westside riparian wetlands** are present throughout the Town Center planning area. Wetlands dominated by aquatic plants and herbaceous species are present in several depressions throughout the planning area. Forested wetlands are associated with the two forks of George Davis Creek. These wetlands provide habitat for a larger number of wildlife species and those that are less tolerant of human activities. The aquatic and herbaceous wetlands also provide habitat for several amphibian species.

Common species that may be observed within the Town Center planning area and are closely associated with this habitat type include deer mouse, raccoon, Townsend's vole, common yellowthroat, great blue heron, violet-green swallow, red-winged blackbird, Virginia rail, marsh wren, black-capped chickadee, ruby-crowned kinglet, bullfrog, long-toed salamander, and Pacific chorus frog.

Agriculture, pasture, and mixed environs habitats include scattered, small patches of agricultural land remaining throughout the Town Center planning area, such as grazed pastures and small farms. These areas are occupied by wildlife species that are adapted to use a variety of habitats for foraging and breeding. Pastures often have high levels of human and stock activity and may undergo a regular pattern of disturbance, such as haying or tilling. Hedges and fencerows, windbreaks and shelterbelts of dense vegetation often surround pastures and provide permanent cover, structural diversity, and potential corridors for wildlife movement.

Common species that may be found within the Town Center planning area pastures and are closely associated with this habitat type include western big-eared bat, black rat, eastern gray squirrel, raccoon, ring-necked pheasant, rock dove, red-tailed hawk, and song sparrow.

5.1.6 Special-Status Species and Priority Habitats

"Special-status species" include species designated by federal or state government agencies (USFWS, NOAA Fisheries, and WDFW) as endangered, threatened, proposed, candidate or sensitive. It also includes wildlife species considered to be "species of local importance" by King County. "Listed species" only include those fish and wildlife species designated as endangered or threatened at the federal level by NOAA Fisheries, USFWS or at the state level by WDFW. The City of Sammamish protects listed species under the Fish and Wildlife Habitat Conservation Areas code described earlier.

Special-status species occurring in the Town Center planning area vicinity may include:

- Bald eagle (state and federal threatened);

- Great blue heron (state monitor);
- Green heron (state monitor);
- Merlin (state candidate);
- Pileated woodpecker (state candidate); and
- Vaux's swift (state candidate).

The Washington Department of Fish and Wildlife (WDFW) maintains a database of nesting locations and priority habitats for listed wildlife species as the Priority Habitats and Species (PHS) database. Priority species include those that are listed by state and federal agencies. A search of the database (WDFW, 2005) found that three areas of wetland priority habitat occur within the Town Center planning area. These wetlands are associated with George Davis Creek and are included within the wetland areas as mapped on Figure 5-1 (Wetlands 1577, SW96, 1509, 1511, 1561, and 1562).

The PHS database search found that no priority wildlife species are documented within the Town Center planning area. The closest bald eagle nest is located more than a mile west of the Town Center planning area near the shoreline of Lake Sammamish. A great blue heron rookery, noted as active in 2004, is also located near the lake shoreline more than 2 miles southwest of the planning area. An osprey nest is mapped approximately 3.5 miles south of the planning area.

NOAA Fisheries, USFWS, and WDFW PHS data were consulted to provide information about the use of the streams in the Town Center planning area by listed fish species. No anadromous fish are reported present in the stream reaches in the Town Center planning area due to intermittent flows, steep gradients, and the fish barrier near the mouth of George Davis Creek.

5.2 Impacts

Impacts to streams, fish, wetlands, and wildlife were analyzed qualitatively in terms of potential effects resulting from implementation of the Town Center alternatives. Differences between the alternatives involve the amount and location of new roads through streams and wetlands, forest and vegetation removal, intensity of land use, and area remaining as open space or parks.

5.2.1 Impacts Common to All Action Alternatives

As part of the Town Center planning process, a vision statement was developed by the City Council. The Council's vision statement (Resolution R2006-229) draws particular emphasis on the natural character of the Town Center planning area. It states that the natural setting of the Town Center will be preserved and enhanced by focusing new development away from natural resources and critical areas. The vision statement declares that the design of the Town Center will avoid streams and wetlands and include the creation of interconnected public and private open spaces by trails or parks. Infrastructure, such as roads and trails, is proposed in different locations and in varying amounts under each alternative as described in the following sections. All of the action alternatives (1 through 3) have been designed to preserve and protect wetlands,

streams, and their buffers. However, roads and trails will cross or extend within wetlands, streams, or buffers.

Proposed trails will be designed to meet the development standards under SMC 21A.30.210, which include the use of existing corridors and the use of pervious materials to promote infiltration and groundwater recharge. In addition, trails in proximity to wetlands and streams or buffers will be located in the outer 25 percent of the buffer and be generally aligned parallel to the stream or perimeter of the wetland. Where trails cross wetlands or streams, design of these trails will follow the impact avoidance and mitigation sequence as required under SMC 21A.50.

As shown on Figures 2-5 through 2-7, no commercial, retail, civic, or residential land uses are proposed within wetlands or streams. Approximately 60 acres or 25 percent of the land within the Town Center area is currently wetlands, streams, or buffer and would be protected under all the action alternatives. Because all of the action alternatives would adhere to the adopted vision statement and plan development away from sensitive natural features, there is little difference in impacts to streams, fish, wetlands, and wildlife between the three action alternatives.

In terms of wildlife impacts, areas of upland forest that currently provide habitat are likely to be removed to accommodate development under all of the alternatives. Over time, undeveloped forests and unprotected natural areas could be cleared or significantly reduced and replaced with impervious surfaces, buildings, and ornamental landscaping.

The two largest and contiguous forest patches located in the northwest and northeast quadrants of the study area, along with an area in the southeast quadrant, would be developed under all three of the action alternatives. These forest patches contain approximately 45 to 60 acres of upland forest habitat. In the northwest quadrant, a mix of retail, civic, and residential uses is proposed for an area that currently supports upland forest associated with multi-acre single-family parcels. In the northeast quadrant, a forested area north of NE 4th Street would be developed for multi-family residential uses and new roads (see Figures 2-5 through 2-7). Unlike other patches of upland forest, this patch is relatively undeveloped and does not contain any residential structures.

Removal of upland forest would be subject to the City's significant tree protection requirements under SMC 21A.35. Under all of the action alternatives, an inventory of the significant trees present within the area to be developed would be conducted, and the trees to be removed and retained would be identified. Tree retention would be a minimum of 25 percent (for subdivisions, and 30 percent for commercial and institutional development) in areas without wetlands or streams and their associated buffers present. Development would be designed to include the retained trees as open areas, dividing screens between different land uses, etc. If the area to be developed is constrained by wetlands and streams and buffers, such as the northeast quadrant in the Town Center planning area, significant trees within the sensitive areas would be inventoried and counted for up to 50 percent of the minimum retention requirement.

The City allows an additional 50 percent of the trees identified for retention to be removed as long as trees are replaced elsewhere per the required replacement ratios. Replacement trees could be planted in wetlands and buffers in need of additional vegetation and canopy coverage, or as landscaping or open areas. These new or enhanced habitats will offset some of the impacts to wildlife in the area and increase wetland and buffer function and values.

In general, the wildlife corridors mapped in the City of Sammamish Comprehensive Plan Draft Supplemental EIS (2003b), and as shown in Figure 5-1, will not be impacted under any of the action alternatives (1 through 3). The protection of streams and wetlands as required by the Town Center vision statement would result in the preservation of the majority of these corridors. The wildlife corridor that includes the south fork of George Davis Creek and the Ebright Creek riparian corridor would be the central feature representing the natural character of the Town Center. Retail, civic, and residential land uses have been planned around this corridor and the Sammamish Commons is located to the south. Trails and other pedestrian pathways within the stream buffer and undeveloped forest would provide internal connections throughout the Town Center. As stated under SMC 21A.50.327(2), the wildlife corridor will typically be less than 150 feet wide and will maintain a width of 300 feet whenever possible.

Impacts to listed and other special-status species will be generally similar under all of the action alternatives. The protection of streams and wetlands will preserve important habitats for listed wildlife species, including bald eagle, great blue heron, green heron, merlin, pileated woodpecker, and Vaux's swift. In terms of other wildlife species, land development under all the action alternatives will result in a reduction of upland forest and agricultural habitats, and an increase in urban and mixed environs habitats. Wildlife species associated with urban and mixed environs will likely increase under all the alternatives, and species associated with other habitats will decrease.

All of the action alternatives would result in a similar amount of area preserved as open space. Open space includes all of the area set aside as public parks, private open space, and areas protected as wetlands, streams, and buffers. In terms of wildlife habitat, public parks vary in their use by wildlife. If the park is exclusively used for active recreation, such as sports fields, the park has a high level of human activity that would disturb wildlife and the vegetation typically provides little habitat value. If the park supports passive recreational opportunities, such as trails and viewing platforms, vegetation is likely less maintained and more diverse, providing habitat for birds and small mammals. Private open space typically occurs in small, scattered patches of landscaped ornamental vegetation adjacent to residences or other developed areas. Private open space is generally of moderate wildlife value because it is typically surrounded by developed areas and not connected to other habitats. Wetlands, streams, and buffers provide high wildlife habitat value because they contain diverse vegetation communities with multiple habitat features. These critical areas are also typically identified by signage and often protected from human disturbance by fences.

5.2.2 Alternative 1 – Commercial Focus

Under Alternative 1, the development in the Town Center study area would be focused on retail land uses and moderate- to high-density residential development. Development intensity under this alternative would be higher than under the No-Action Alternative or Alternative 2. It would be similar to that expected under Alternative 3.

Alternative 1 proposes construction of three new major arterial roads in the Town Center. Construction of these roads would result in impacts to streams, wetlands, and buffers in two separate locations, the most of all alternatives. Both stream crossings are associated with a new road in the northwest quadrant of the Town Center that would intersect with SE 4th Street at

approximately 222nd Place SE and form a loop connecting to 228th Avenue SE at E Main Street (Figure 2-1). Road construction would include mitigation measures such as installation of fish-passable culverts and restoration of disturbed areas.

Alternative 1 would include an estimated 42 acres of new road right-of-way, which is the least amount compared to the other two action alternatives. However, all three proposed new rights-of-way are similar in all of the action alternatives: Alternative 2 would develop approximately 46 acres and Alternative 3 would develop 48 acres.

Alternative 1 would result in the least amount of public open space (approximately 30 acres), but the highest amount of potential private open space (approximately 55 acres). Areas designated as private open space would be either landscaped vegetation or preserved native habitat. Private open space would be larger (particularly relative to the housing density) because the higher density development proposed under this alternative would support a more compact land use pattern, allowing more open space.

Total open space in the Town Center, including public and private open space, as well as wetlands and buffers, is estimated to be 136 acres (adjusting for overlapping categories). The estimated total open space under both Alternatives 2 and 3 is 137 acres. There is no meaningful difference between the alternatives in terms of total open space.

5.2.3 Alternative 2 – Low Intensity

Alternative 2 would result in the least overall impacts to streams, fish, wetlands, and wildlife habitat of the action alternatives. Under Alternative 2, the Town Center would be a small commercial center with limited services, and housing would generally be more dispersed.

In comparison to the other action alternatives, Alternative 2 proposes three major roads with no additional stream or wetland crossings (Figure 2-2). No impacts to streams, wetlands, and buffers would occur, the least of the alternatives. Alternative 2 would include an estimated 46 acres of new road rights-of-way, slightly more than Alternative 1 and slightly less than Alternative 3.

Alternative 2 would result in a similar amount of public open space (approximately 40 acres) as Alternative 3. The proposed low-density development results in a more broad and dispersed land use pattern, which results in the lowest amount of private open space (approximately 45 acres). However, Alternative 2 includes a much larger amount of low-density single-family residential land use (approximately 27 acres). If estimates of pervious surfaces in single-family developments are used as a proxy for private open space, then a portion of this (approximately 62 percent; see assumptions shown in Table 4-1, Chapter 4, Water) could be added to the total open space estimate.

Given this assumption, the total estimated open space in Alternative 2 (including public open space, wetlands, and buffers and private open space) is estimated at 154 acres (adjusted for overlapping areas), which is more than Alternatives 1 and 3. As stated above, open space areas could function as wildlife habitat at varying levels. The private open space would be of moderate habitat value.

5.2.4 Alternative 3 – Civic Focus

Alternative 3 would result in a moderate level of overall impact to streams, fish, wetlands, and wildlife habitat. Impacts associated with Alternative 3 are anticipated to be similar to Alternative 1, but more significant than Alternative 2.

Alternative 3 proposes two major roads with only one stream crossing (Figure 2-3). Impacts to streams, wetlands, and buffers would occur in only one location, which is more than Alternative 2 and less than Alternative 1. As with Alternative 1, road construction would include mitigation measures such as installation of fish-passable culverts and restoration of disturbed areas. Alternative 3 would include an estimated 48 acres of new road right-of-way, the most of all the alternatives.

Alternative 3 would result in approximately 40 acres of public open space, similar to Alternative 2. It would also result in approximately 50 acres of private open space, less than Alternative 1 and more than Alternative 2. These areas and the protected wetlands and buffers would total an estimated 137 acres (adjusted for overlapping areas), approximately 55 percent of the Town Center. As stated above, total open space under Alternative 2 does not differ from the other alternatives. All of the open space areas could function as wildlife habitat at varying levels, as described above.

5.2.5 Alternative 4 – No-Action

Under the No-Action Alternative, the area would be developed at the allowable densities adopted in the Comprehensive Plan. As described in Chapter 6, the majority of developable land (approximately 150 acres) in the Town Center planning area is designated for single-family development (R1 – R4). Assuming that pervious surfaces give an approximation of private open space, the No-Action Alternative could have as much as 100 acres (based on impervious assumption shown in Table 4-1, Chapter 4, Water). When added to existing public open space (30-acre Sammamish Commons) and wetlands and buffer areas (60 acres), total open space under the No-Action Alternative would be estimated at 170 acres (adjusted for overlapping areas), which is more than the three action alternatives. As stated above, private open space is of moderate wildlife value because of its separation from other areas and proximity to development.

Under Alternative 4, the estimated 45 to 60 acres of upland forest currently present in the Town Center planning area could also eventually be lost to development under the current land use plan. Similar to the action alternatives, wildlife using upland forest in the area would be displaced, and wildlife tolerant of human activity would increase. Significant trees in the upland forest would be analyzed under the City's tree protection regulations, and removal would be limited to allowed amounts. Impacts to streams, fish, wetlands, and wildlife habitat would be analyzed on a project-by-project basis and permitted under the City's critical areas review process. A comprehensive stream and wetland protection plan as included by the City Council's Town Center vision statement would not occur under the No-Action Alternative.

5.3 Mitigation Measures

There are several mitigation measures to address potential impacts to streams, fish, wetlands, and wildlife as a result of Town Center development.

- Perform field investigation and delineation of all wetland boundaries and ordinary high water mark of streams. This information can be used to determine accurate buffer areas to determine locations of allowed development and construction areas.
- Perform a functional assessment of existing streams and wetlands in the Town Center area and determine areas most in need of restoration or enhancement. Use assessment to prioritize restoration efforts in the area.
- Avoid and minimize impacts to wetlands and streams where road crossings and trail crossings are proposed. Unavoidable impacts would be mitigated through restoration, enhancement, or wetland creation per the City's mitigation ratios and requirements.
- Avoid removal of heritage trees (trees greater than 22 inches dbh) and significant trees where possible. Replacement trees should be planted within degraded wetland and buffers that would benefit from additional vegetation and canopy coverage.
- Minimize impacts to wildlife habitat in the two largest contiguous forest patches located in the northwest and northeast quadrants of the Town Center through the preservation of upland forest as open space or park; the reduction of area to be cleared for development beyond minimum requirements for significant trees; and the location of buildings in areas with the least habitat value.
- The City could develop and implement a Transfer of Development Rights (TDR) program as part of a Final Sub-Area Plan. Such a program would provide a mechanism for spreading the benefits and costs of Town Center development and critical areas protection more equitably across Town Center landowners.

  Typical TDR programs allow landowners to sever development rights from properties in government-designated low-density areas, and sell them to purchasers who want to increase the density of development in areas that local governments have selected as higher density areas.

  For example, a Town Center landowner whose property contained a large portion of protected critical areas could sell development rights to a landowner who owned a property that allowed more intensive development. The result would be that the critical area remains undeveloped and the owner has the opportunity to benefit from development in other areas of the Town Center.

5.4 Significant Unavoidable Adverse Impacts

All of the action alternatives (1 through 3) have been designed to preserve and protect wetlands, streams, and their buffers. Under Alternative 4, development of these areas will be regulated by the City's Critical Area Ordinance and the majority of these areas will be protected from development. However, development of the area and loss of upland forest habitat will occur

under all the alternatives. Loss of upland forest will be minimized by the City's tree protection regulations, but some tree removal will occur. Due to the increase in population, commercial, and civic opportunities, the area will transform from a rural or suburban environment to an urban environment. Over time, undeveloped forests and unprotected natural areas would be cleared or significantly reduced and replaced with impervious surfaces, buildings, and ornamental landscaping. Wildlife associated with rural areas, such as deer and coyote, and some species of birds, amphibians, and reptiles, will be displaced.