



Fall 2010

LEED neighborhood and design assessment: the Bellingham downtown alleyway revitalization

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Western Washington University

Huxley College of the Environment



LEED Neighborhood and Development Assessment: The Alleyways

Dr. Troy Abel - Fall 2010

ESTU 436 – Environmental Impact Assessment

LEED Neighborhood and Design Assessment:

The Bellingham Downtown Alleyway Revitalization

Prepared for Environmental Studies 436
under the supervision of instructor Troy Abel, Ph.D

Western Washington University

Huxley College of the Environment

Fall 2010

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This report represents a class project that was carried out by students of Western Washington University, Huxley College of the Environment. It has not been undertaken at the request of any persons representing local governments or private individuals, nor does it necessarily represent the opinion or position of individuals from government or the private sector.

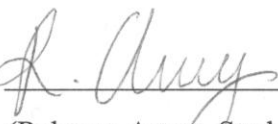
Environmental Impact Assessment
Huxley College of the Environment


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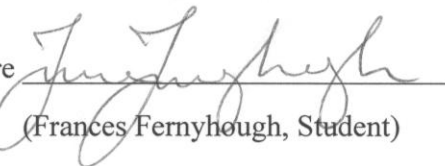
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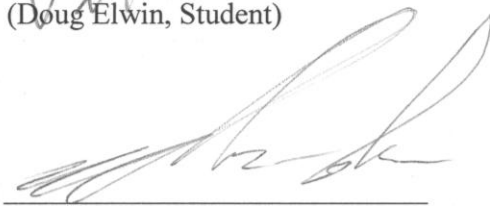
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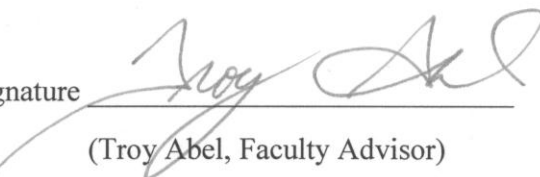
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Date 12-3-2010

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Fact Sheet

Title

LEED Neighborhood Development: Downtown Alleyways

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Introduction

Bellingham is a vibrant city nestled amid the Northwestern Cascades in close proximity to Canada, surrounded by vast agricultural flood plains, rolling foothills and striking snowcapped peaks. A crown jewel of the Pacific Northwest, Bellingham attracts people from across the country for a spectacular quality of life, higher education and a unique sense of community available only there. Needless to say, the population in Bellingham is projected to grow in the coming decades. By 2022, Bellingham is expected to grow over 50%, by almost 30,000 people, adding to the current population of 76,100 (COB, 2009), creating a significant impact on the municipality and metropolitan areas. (Population Growth Forecasts) Faced with a greater demand for land and services, municipalities of the future must seek innovative ways of meeting this growth without falling into the present urban paradigm of greater city sprawl. Space is becoming limited, farmland is being pressed by development and warnings of global climate change call for a radical shift in infrastructure. City planners, community leaders, developers, politicians and citizens are facing the difficult reality of finding ways to develop urban areas in revolutionary new ways. Boiled down into its most basic tenants, this new horizon is best described as sustainable urbanism, “walk-able and transit served urbanism integrated with high performance buildings and high performance infrastructure”. (Farr, 2008) Drawing from building movements like new urbanism, smart growth and green building, sustainable urbanism is a synthesis of the classic environmentally friendly growth with other pressing social concerns like economic disparity, vehicle dependent communities, un-equitable neighborhood patterns and pedestrian safety. Urban renewal projects are an opportunity to gain experience reaching the needs of a community both environmentally and socially.

Downtown Bellingham is going to be the site of a major urban development in the near future that will add a great deal of community appeal for Bellingham residents and commercial real estate. This project is a major retrofit of the Cornwall corridor, the heart of Bellingham’s central business district. Large retail outlet is going to be placed on either ends of the project boundaries and the alleyways that run parallel to the main streets will be renovated. The goal of this project is to increase capacity and attractiveness of the central business district, using the principles of smart growth, new urbanism and sustainable building technology as they are synthesized in the current 2009 LEED Neighborhood Design rating system. Designed by the U.S. Green Building Council as an industry standard system to measure and rate Green building projects, LEED rating systems have evolved to provide a voluntary and objective measure of a project’s sustainability. Instead of designing and building the urban environment with a variety of Euclidean land uses that require extensive automobile connection to function properly, LEED standards help build mixed use communities that are designed and built to function self-sufficiently. Sustainable urbanism takes a more holistic approach to design, leading to the construction of healthy communities that encourage non-motorized transportation, mass transit and close proximity of everyday amenities. Bellis Fair Mall in Bellingham is an example of a Euclidean use, automobile-dependent development, which resulted in the loss of economic

activity downtown. Renovating the Downtown through LEED standards will effectively shift much of this retail activity from Bellis Fair Mall to a new urban village downtown, reducing automobile dependence and enhancing the livability of the downtown corridor.

Our job as a sustainable growth consulting firm is to evaluate Bellingham's potential for urban renewal based on the LEED-ND 2009 Rating System. This analysis begins with evaluating the current Cornwall revitalization proposal previously presented, through the LEED checklist. This project will focus on the alleyways that run parallel to Cornwall, the surrounding infill and building renovation. By doing this, we will be able to establish the potential for LEED certification of the existing plan and identify areas that can be improved upon to achieve a higher rating. Our alternative action will take the initial proposal a step further by evaluating potential solutions that can be utilized to meet more of the LEED requirements.

As an academic consultation team, our mission is to bridge the gap between builders, government planners and the concerned public by evaluating the LEED-ND as a sustainable growth tool. We are confident that prejudice concerning environmentally sustainable growth can be met with practical methods for reducing environmental harm, efficiency thresholds and habitat restoration, providing the public with intelligently designed community space that will benefit us all.

Letter to Citizen

Huxley College of the Environment
Western Washington University
516 High Street, Bellingham WA 98225

December 1, 2010

Dear Concerned Citizen,

This document was compiled by the Fall 2010 Environmental Impact Assessment ESTU 436 class as an academic endeavor to evaluate the current plans for downtown revitalization through the United States Green Building Council (USGBC) LEED for Neighborhood Design criteria.

Development plans for the commercial district in downtown Bellingham are a candidate for LEED-ND certification due to the compact nature of the current downtown infrastructure. Through a public process, it has been determined that a re-development plan of the waterfront and Cornwall corridor is desired by the public to return community vitality and economic development to the commercial district while preserving the historic characteristics of downtown Bellingham.

Contents of this document include credits that are achievable by the current Alleyways revitalization proposal in addition to alternative actions that could increase the achievable points possible through the framework of LEED-ND 2009, with a commitment by the community and city.

We believe that the long term goals for a re-vitalization of downtown Bellingham can be adequately met since the ideals articulated through current proposals and community input coincide with the mission put forth by the LEED coalition. Through a partnership between the USGBC, the Congress for the New Urbanism (CNU), and the Natural Resource Defense Council (NRDC), the rating systems titled Leadership in Energy and Environment Design (LEED) have been developed as a third party verification system for various different development projects based on specific criteria. This system is designed to create strategies for development that are based on the principles of smart growth, new urbanism, energy efficiency, green infrastructure and environmental stewardship.

Beyond being environmentally conscious, these principles serve to benefit the community and individuals by creating a healthy, vibrant and prosperous urban environment. LEED-ND provides a voluntary leadership standard that, if adopted by local government as a standard for the development community through a public-private partnership, could change the character of downtown Bellingham to greatly enhance the quality of life for all citizens.

We look forward to working with you,

Abel Environmental Consulting

Purpose of LEED-ND

The U.S. Green Building Council (USGBC), the Congress for the New Urbanism (CNU), and the Natural Resources Defense Council (NRDC)—organizations that represent leading design professionals, progressive builders and developers, and the environmental community—have come together to develop a rating system for neighborhood planning and development based on the combined principles of smart growth, New Urbanism, and green infrastructure and building. The goal of this partnership is to establish a national leadership standard for assessing and rewarding environmentally superior green neighborhood development practices within the framework of the LEED® Green Building Rating System™.

The five areas of emphasis in the LEED-ND rating system consist of:

Smart Location and Linkage (SLL)

Neighborhood Pattern and Design (NPD)

Green Infrastructure and Buildings (GIB)

Innovation and Design Process (IDP)

Regional Priority Credit (RPC)

LEED-ND serves as a voluntarily adopted system for a new approach to urban planning in areas of site location, design and construction. A main focus of the system is to reward the use of infill locations that have already been developed, including contaminated brown field sites. By doing this, urban areas are revitalized, urban sprawl is reduced, pedestrian activity is encouraged reducing automobile dependence, pollution is mitigated through stormwater and landscape improvements, energy efficiency goals are achieved, and historic characteristics are preserved. As a result, urban communities perform better from an environmental standpoint while still providing a sense of place that is so vital to the character of a city.

Executive Summary

The alleyway project incorporates six alleyways that run parallel to Cornwall, beginning on the north side at East and West Champion Street and ending the south side by East and West Chestnut Street. The west side of the project begins on Commercial Street and the east side of the project end at Railroad Avenue. In addition, this project involves the connection lot next to the Cornwall Bridge that provides a location for an extension of the interurban trail that runs down Boulevard Park.

Specifically, the alleyways provide the potential for increased storefront space and retail space available for businesses that can be easily accessed by pedestrians by opening up these key connections with new pavement, lighting and aesthetic features. Increasing connectivity through revitalizing alleys will result in the potential for greater pedestrian flow through the entire downtown commercial district while reducing the need for an automobile as the primary source of transportation through this area.

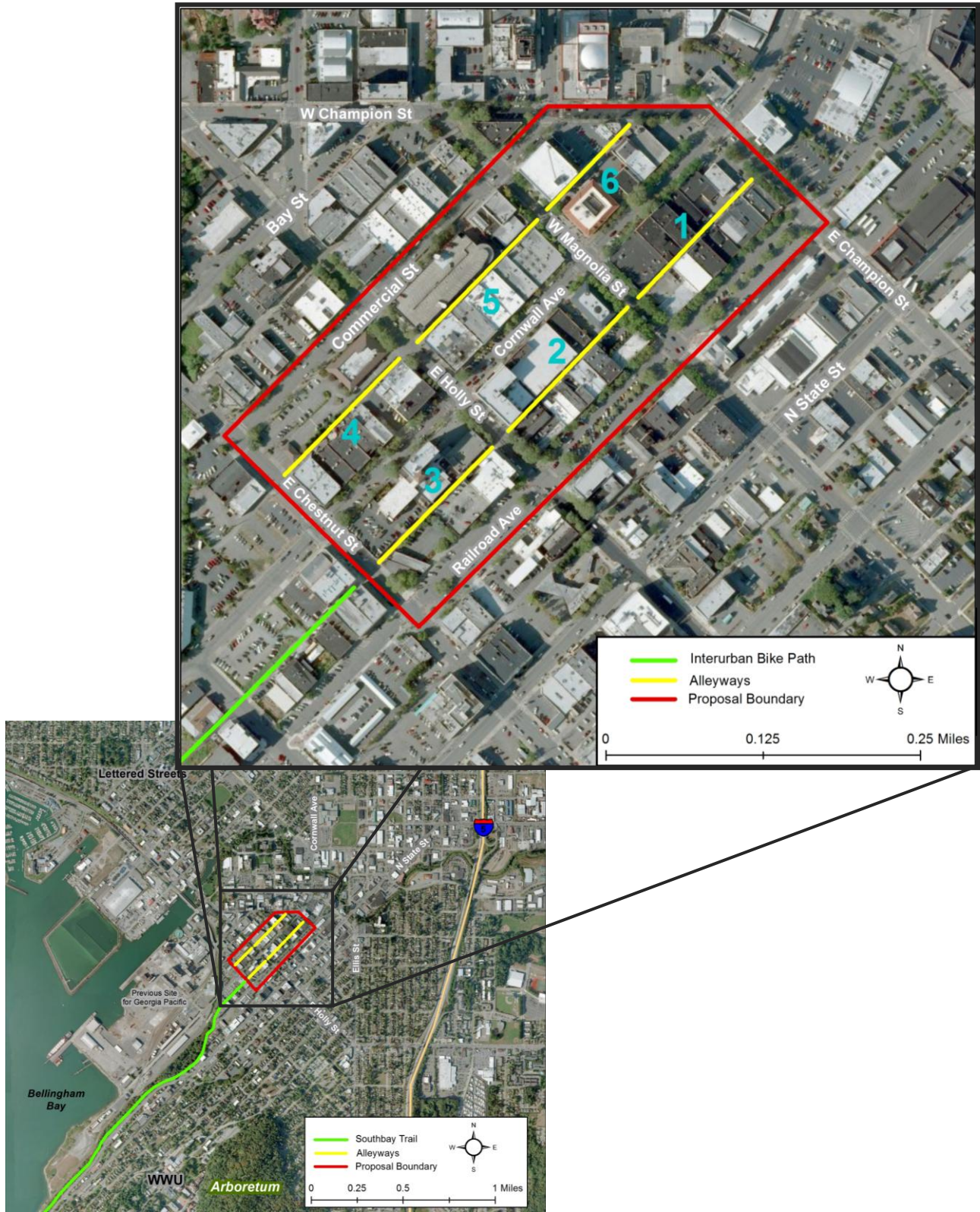
Our team has utilized the existing Downtown/Cornwall revitalization proposal by evaluating it through LEED-ND standards. Through this process, we have determined a number of possible methods for improving the score of the alleyway section. Based on the alternative actions that we suggest, we have developed a LEED certification score that will help to guide city planning officials towards the potential of this project as an urban green development.

Downtown Bellingham and especially the alleyways are a smart location for the application of LEED-ND on renovation and urban infill since it has been previously developed, is surrounded by a high density of public transportation services, and offers a high population density from both residents and employees. Through LEED-ND, many of the environmental concerns related to urban development are addressed, such as public transportation access, water use efficiency, runoff mitigation, energy generation and efficiency. Becoming LEED certified at any level requires proactive solutions to these concerns. By developing an integrated design plan with sustainability goals at the core of the project, the Alleyways can become a vital part of the entire downtown renovation project, including the dockside development, effectively creating a healthy, vibrant community for generations to come.

With the proposed design, the Alleyway section of the Downtown/Cornwall revitalization project, can achieve a Gold rating.

Site Maps

Figure 1. Downtown Bellingham Alleyway Revitalization Site



Decision Matrix

	Proposed Action	Alternative Action
	Percent of Points Earned	
Smart Location & Linkage: 27 total possible points	74%	89%
Built Environment	83%	89%
Natural Environment	33%	83%
Social/Economic Impacts	100%	100%
Neighborhood Pattern & Design: 44 total possible points	68%	93%
Built Environment	68%	91%
Natural Environment	100%	100%
Social/Economic Impacts	65%	95%
Green Infrastructure & Buildings: 29 total possible points	59%	83%
Built Environment	61%	78%
Natural Environment	50%	100%
Social/Economic Impacts	-	-
Innovation & Design Process: 6 total possible points	67%	67%
Built Environment	100%	100%
Natural Environment	-	-
Social/Economic Impacts	100%	100%
Regional Priority Credits: 4 total possible points	75%	100%
Built Environment	-	-
Natural Environment	0%	100%
Social/Economic Impacts	100%	100%
Total Percentage	67%	88%

Certification Levels	Proposed Action
Certified: 40-49 points (36-45 %)	· 74 credits awarded (meets Gold LEED certification) with no changes to the proposed development action.
Silver: 50-59 points (46-54 %)	
Gold: 60-79 points (55-72 %)	
Platinum: 80-110 points (>73%)	
	Alternative Action
	· Potential to meet 97 credits (Platinum LEED certification). Through more sustainable development practices.



Smart Location and Linkage (SLL)- 27 Possible Points

Proposed Action: (20/27)

Alternative Action: (24-25/27)

“The core of every center must be linked to all other cores by roads and transit” (Neleson, 1994, pg.114)

“By emphasizing and enabling such elements as increased physical activity, healthier environments, and more interactive communities, Smart Growth has enormous potential to enhance the health of populations.” (Gellar, 2003).

SLL Prerequisite 1: Smart Location

Required Prerequisite: Met

Purpose:

To encourage smart growth in the community, in order to provide revitalization for a community, the development should be within said community, being within walking distance or at least along a bus route.

Requirements:

To fulfill this credit the site must be within an infill site, next to an infill site with connectivity, or in a location with adequate transit service.

Proposed Action:

The development is to be built into only infill sites and into existing buildings. This is ideal for connectivity. Being close to residential areas, and western, the project area will be easily accessible by both students and Bellingham citizens.

Alternative Action:

No alternative action is needed to complete this prerequisite. The location placement for this type of revitalization is in the ideal location.

SLL Prerequisite 2: Imperiled and Ecological Communities

Required Prerequisite: Met

Purpose:

To protect the imperiled and ecological communities.

Requirements:

In order to fulfill this prerequisite, the proposed area must not be in an area where no such species or communities have been found or have a high likelihood of occurring, comply with a approved habitat conservation plan, or work with a qualified biologist to create and implement a conservation plan

Proposed Action:

There are no imperiled or ecological communities in the proposed development area. We are building in an area that is already developed, and thus is not in an area which would native plants to grow.

Alternative Action:

While alternative action is needed to complete this prerequisite, our group has suggested that the proposal include native plant conservation areas, offsite, in order to better promote and protect these very sensitive areas.

SLL Prerequisite 3: Wetland and Water Body Conservation

Required Prerequisite: Met

Purpose:

To maintain high water quality, the natural water cycle and habitat for biodiversity preservation.

Requirements:

In order to fulfill this prerequisite, the proposal should either not take place on or within 50ft of any wetland, or 100ft of any water bodies.

Proposed Action:

The proposed development is neither on nor within 50 feet of a wetland or 100 feet of a water body. Though the proposed area is in an infill site and so is not on either of these areas, the site is within a mile radius of Bellingham Bay. This means taking measure to reduce runoff and implement erosion control is still necessary (see GIB prerequisite 4).

Alternative Action:

No alternative action is needed.

SLL Prerequisite 4: Agriculture Land Conservation

Required Prerequisite: Met

Purpose:

To protect agricultural resources by preserving farm and forest lands.

Requirements:

In order to fulfill this prerequisite, the proposed area must not disturb prime soils, unique soils, or soils of state significance as identified in a state of Natural Resources Conservation Service soil survey, it must be in a location compliant with SLL prerequisite 1, option 1 or 3, it must be in a location that is a designated receiving area for developed rights under a publicly administered farmland protection program that provides for the transfer of developed rights from lands designated for conservation to lands designated for development, or if it does disturb these soils, mitigate the loss through the purchase of easements.

Proposed Action:

The area in which the proposal is located on an infill site, and is in the middle of downtown Bellingham, thus not located on any potential agricultural land or soil.

Alternative Action:

No alternative action is necessary.

SLL Prerequisite 5: Floodplain Avoidance

Required Prerequisite: Met

Purpose:

To protect not only the structure but the lives of those who work and live in the development. It will also encourage open space and conserve habitats, and maintain and create better water quality by protecting the natural water cycle.

Requirements:

To fulfill this prerequisite, the proposal location must be located on a site that does not contain any land within a 100-year-high-or moderate-risk floodplain, on an infill site or in a non-conveyance area of river or coastal floodplain without storm surge potential, or if the site is in any part within the floodplain, only develop on portions outside of the floodplain or that have been previously developed or that are in a non-conveyance area of river or coastal floodplain without storm surge potential.

Proposed Action:

The proposed development is located on an infill site and is not within any known floodplain.

Alternative Action:

No alternative action is needed.

SLL Credit 1: Preferred Location

Evaluation: Proposed action: (8/10 points), Alternative action: (8-9/10 points)

Purpose:

To encourage development within existing cities, suburbs, and towns to reduce adverse environmental and public health effects associated with sprawl. As well as to reduce development pressure beyond the limits of existing development and to conserve natural and financial resources required for construction and maintenance of infrastructure.

Requirements:

To evaluate this credit and to earn the most points possible the project can fulfill any combination of the three following options:

Option 1: Location Type

- Locate the project in one of the following locations:
 - A previously developed site that is not an adjacent site or infill site (1 point).
 - An adjacent site that is also a previously developed site (2 points).
 - An infill site that is not a previously developed site (3 points).
 - An infill site that is also a previously developed site (5 points).

AND/OR

Option 2: Connectivity

Locate the project in an area that as existing connectivity within ½ mile of the project boundary as listed in Table 1.

SLL Table 1. Points for connectivity within ½ mile of project (USGBC, 2009)

Intersections per square mile	Points
≥ 200 and < 250	1
≥ 250 and < 300	2
≥ 300 and < 350	3
≥ 350 and < 400	4
≥ 400	5

AND/OR

Option 3: Designate High-Priority Locations

- Achieve the following (3 points possible):
 - Earn at least 2 points under NPD Credit 4, Mixed-Income Diverse Communities, Option2, Affordable Housing.
 - In addition, locate the project in one of following high-priority redevelopment areas: EPA National Priorities List, Federal Empowerment Zone, Federal Enterprise Community, Federal Renewal Community, Department of Justice Weed and Seed Strategy Community, Department of the Treasury Community Development Financial Institutions Fund Qualified Low-Income Community (a subset of the New Markets Tax Credit Program), or the U.S. Department of Housing and Urban Development’s Qualified Census Tract (QCT) or Difficult Development Area (DDA).

Proposed Action:

The proposed project is located on an infill site that is also a previously developed site, earning 5 out of 5 points from the first option. The current connectivity within ½ mile of the project and its boundary has a total of 115 intersections per square mile earning zero out of 5 possible points. Intersections per square mile is the number of intersections within ½ miles of the project boundaries divided by the area (square miles) of the project’s extended ½-mile boundary.

$$214 \text{ intersections} / 1.861 \text{ mi}^2 = 114.99 \text{ intersections per square mile}$$

The connectivity around this project has a large impact from the former Georgia-Pacific (GP) site located in the Central Waterfront District along Bellingham Bay, southeast of the project (WA State Department of Ecology, November 2010). This site has limited publically accessible roads, and is a large section of the ½ mile area beyond the project boundary.

SLL Figure 1. Connectivity within ¼ and ½ mile distance from project area (Appendix A)



The 3 extra points out of the 10 possible points are earned in the third option. We meet the requirement of meeting at least 2 points under NPD Credit 4, Option 2 (See NPD Credit 4, Proposed Action), as well as can locate the project in a high-priority redevelopment area. The U.S. Department of Housing and Urban Development (2010) defines the census tract of the project location as a Qualified Census Tract (QCT). Pursuant to the International Revenue Code §42(d)(5)(C)(ii)(I) of 1986, a QCT is defined as, “Any census tract which is designated by the Secretary of Housing and Urban Development and, for the most recent year for which census data are available on household income in such tract, either in which 50% or more of the households have an income which is less than 60% of the area median gross income (AMGI) for such year or which has a poverty rate of at least 25%.”

Alternative Action:

The connectivity of the project site is where an alternative action could earn more points. The Central Waterfront District currently includes minimal intersections, but if it were to be developed at least 1 additional point could possibly be earned (see Appendix B). Although more intersections could increase connectivity to the area at least 158 additional intersections would need to be developed to increase the ratio of intersections per square mile up to 200; the minimum amount of intersections per square mile to earn 1 point.

$$214 + 158.2 = 372.2 / 1.861\text{mi}^2 = 200 \text{ intersection per square mile}$$

SLL Credit 2: Brownfield Redevelopment

Evaluation: Proposed action: (0/2 points), Alternative action: (2/2 points)

Purpose:

“Brownfield sites are abandoned or underused properties where there may be environmental contamination. Redevelopment efforts are often hindered by the liability for the cleanup or the uncertainty of cleanup costs. Brownfield sites that aren’t cleaned up represent lost opportunities for economic development and for other community improvements.” (WA State Department of Ecology, 2010)

The purposed the requirements for this credit encourage the reuse of land by developing sites that are complicated by environmental contamination, thereby reducing pressure on undeveloped land.

Requirements:

To earn the 2 possible points under this credit the project must meet the following requirement options:

Option 1: Brownfield Sites (1 point)

- The project must be located on a site where either part or all of the site is documented as contaminated, or on a site defined as a brownfield by a local, state, or federal government agency; and remediate the site contamination in ways that the controlling public authority

approves the protective measures and/or cleanup as effective, safe, and appropriate for the future use of the site.

OR

Option 2: High Priority Redevelopment Areas (2 points)

- Gain the points from option 1, AND
- The project must be located in one of the following redevelopment areas: EPA National Priorities List, Federal Empowerment Zone, Federal Enterprise Community, Federal Renewal Community, Department of Justice Weed and Seed Strategy Community, Department of the Treasury Community Development Financial Institutions Fund Qualified Low-Income Community, or the U.S. Department of Housing and Urban Development's Qualified Census Tract or Difficult Development Area.

Proposed Action:

“With certain legal exclusions and additions, the term “brownfield site” means real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant.” (EPA, 2009)

The proposed Alleyway project is not located on a contaminated site, as well as a brownfield site according to the Washington State Department of Ecology's Toxic Cleanup Program. Due to not meeting the requirements of option 1, option 2 cannot be met, earning the proposed project zero points. Although option 1 is not met, the second requirement of option 2 is met by locating the project in one of the listed redevelopment areas. As determined in SLL Credit 1, Preferred Location, Proposed Action, the project site qualifies under the U.S. Department of Housing and Urban Development's Qualified Census Tract.

Alternative Action:

If the Cornwall revitalization project were extended onto the GP of the Central Waterfront District the project site could be considered contaminated. The alternative action, where the existing GP site would be included in the Cornwall project area would add an additional 2 points because it would meet the requirements of option one and the site already meets the existing requirement of option 2. Although the project site is not completely located on a contaminated site, the purpose of the credit is to encourage development of environmental contaminated areas rather than encourage development on undeveloped land. This project site is a previously developed area, thus no undeveloped or natural environments are disturbed on the currently proposed development area.

SLL Credit 3: Locations with Reduced Automobile Dependence

Evaluation: Proposed action: (7/7 points), Alternative action: (7/7 points)

Purpose:

To encourage development in locations shown to have multimodal transportation choices or otherwise reduced motor vehicle use, thereby reducing greenhouse gas emissions, air pollution, and other adverse environmental and public health effects associated with motor vehicle use.

Requirements:

In order to qualify for this credit, the project must accomplish these requirements:

- The project must be located on a site with existing transit service such that at least 50% of dwelling units and nonresidential building entrances (inclusive of existing buildings) are within a ¼-mile walk distance of bus or streetcar stops, or within a ½-mile walk distance of bus rapid transit stops, light or heavy rail stations, or ferry terminals, and the transit service at those stops in aggregate meets the minimums listed in Table 1. Both weekday and weekend trip minimums must be met to earn points at a particular threshold.
- Weekend daily trips must include service on both Saturday and Sunday. Commuter rail must serve more than one metropolitan statistical area (MSA) and/or the area surrounding the core of an MSA.

SLL Table 2. Minimum daily transit service for projects with multiple transit types (bus, streetcar, rail, or ferry). (USGBC, 2009)

Weekday Minimum Daily Trips	Weekend Minimum Daily Trips	Points
60	40	1
76	50	2
100	65	3
132	85	4
180	130	5
246	150	6
320	200	7

Proposed Action:

The proposed project receives 7 out of the possible 7 points because it is located on a site with existing transit services provided by the Whatcom Transportation Authority (WTA). At least 50% of dwelling units and nonresidential building entrances (inclusive of existing buildings) are within a ¼-mile walk distance of bus stops or within ½-mile walk distance of bus rapid transit stops. The WTA transit service at those stops in aggregate provides frequent weekend and weekday trips. There are 24 Downtown routes stopping at the Bellingham Station, providing 419 daily weekday trips, and 243 daily weekend trips (WTA, 2010).

SLL Table 3. Bus routes leaving Bellingham Station, 205 E Magnolia St, corner of Railroad and Champion or Magnolia Streets (WTA, 2010)

Route	Weekday	Weekend
3 Maplewood	12	9
4 Hospital	12	9
14 Fairhaven/Downtown	30	24
15 Cordata/WCC/Downtown	28	22
25X Lynden/Bellingham	1	0
43/44 Yew St.	13	9
49 Bakerview/Downtown	9	4
50 Gooseberry Pt./Downtown	8	6
70X Blaine/Bellingham	5	0
71X Everson/Nooksack/Sumas	2	0
72X Kendall/Bellingham	10	4
80X Bellingham/Mt. Vernon	16	4
105 Fairhaven/Downtown	17	15
107 WWU	22	9
108 Samish Way	12	9
190 Lincoln Creek/Downtown	25	9
196 WWU-Lincoln/Downtown	4	5
197 Lincoln-WWU/Downtown	3	4
232 Downtown/Cordata	50	23
331 Cordata/WCC/Downtown	50	23
401 Fairhaven/Downtown	50	23
512 Sudden Valley/Downtown	13	10
525 Barkley/Downtown	15	13
540 Silver Beach/Downtown	12	9
Total	419	243

** The project meets the maximum of 7 points due to the Bellingham Station located within ¼ mile of the required dwelling entrances, although the location of this project is compliant with reducing automobile dependence to an even larger extent. This analysis only includes major public bus trips per day, but does not include the trips made at other smaller bus stops located within the preferred project location.

Alternative Action:

No alternative action is needed.

SLL Credit 4: Bicycle Network and Storage

Evaluation: Proposed action: (0/1 point), Alternative action: (1/1 point)

Purpose:

“A protected bicycle path is a symbol that a citizen on a \$30 bicycle is equally important to one in a \$30,000 car,” declared the former mayor of Bogota, Enrique Peñalosa Jr. (2007).

To promote bicycling and transportation efficiency, including reduced vehicle miles traveled (VMT). To support public health by encouraging utilitarian and recreational physical activity.

Requirements:

BICYCLE NETWORK

Design and/or locate the project to meet at least one of the three requirements below:

- a. An existing bicycle network of at least 5 continuous miles in length is within 1/4-mile bicycling distance of the project boundary.
- b. An existing bicycle network within 1/4-mile bicycling distance of the project boundary connects to at least ten diverse uses within 3 miles' bicycling distance from the project boundary.

AND

BICYCLE STORAGE

Provide bicycle parking and storage capacity to new buildings as follows:

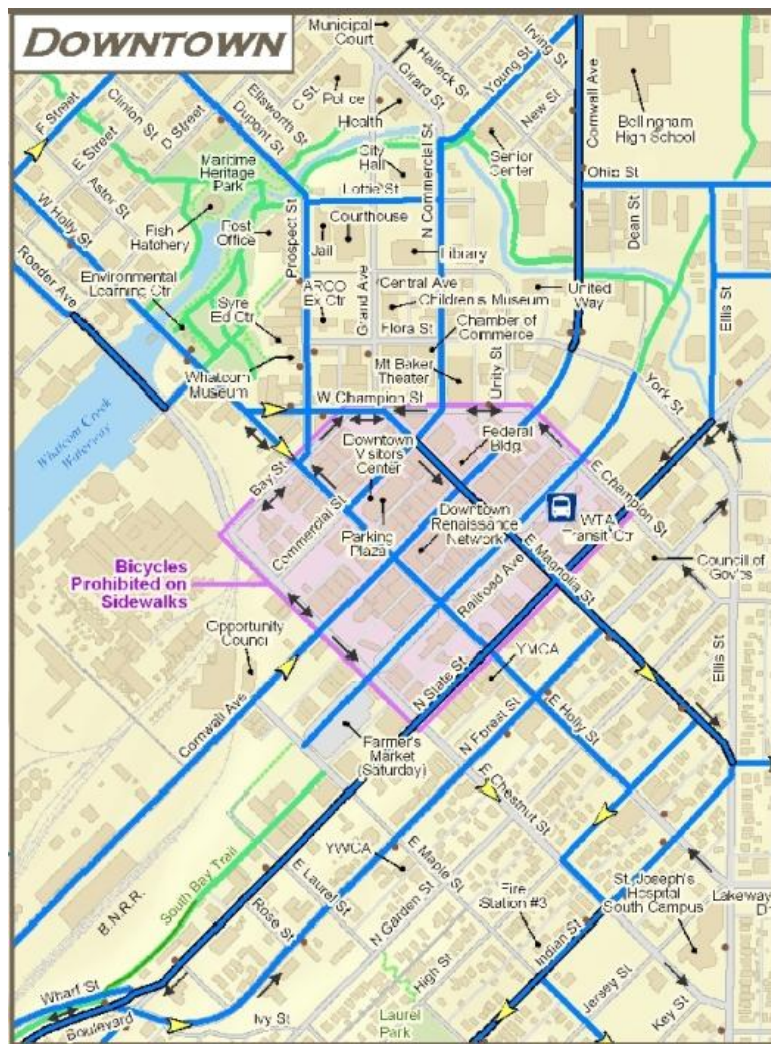
- a. **Multifamily residential.** Provide at least one secure, enclosed bicycle storage space per occupant for 30% of the planned occupancy but no fewer than one per unit. Provide secure visitor bicycle racks on-site, with at least one bicycle space per ten dwelling units but no fewer than four spaces per project site.
 - b. **Retail.** Provide at least one secure, enclosed bicycle storage space per new retail worker for 10% of retail worker planned occupancy. Provide visitor or customer bicycle racks on-site, with at least one bicycle space per 5,000 square feet of retail space, but no fewer than one bicycle space per business or four bicycle spaces per project site, whichever is greater. Provide at least one on-site shower with changing facility for any development with 100 or more new workers and at least one additional on-site shower with changing facility for every 150 new workers thereafter.
 - c. **Nonresidential other than retail.** Provide at least one secure, enclosed bicycle storage space per new occupant for 10% of planned occupancy. Provide visitor bicycle racks on-site with at least one bicycle space per 10,000 square feet of new commercial nonretail space but not fewer than four bicycle spaces per building. Provide at least one on-site shower with changing facility for any development with 100 or more new workers and at least one additional on-site shower with changing facility for every 150 new workers thereafter.
- Secure, enclosed bicycle storage areas must be locked and easily accessible to residents and/or workers. Provide informational signage on using the storage facilities.

- Visitors' and customers' bicycle racks must be clearly visible from a main entry, located within 100 feet of the door, served with night lighting, and protected from damage from nearby vehicles. If the building has multiple main entries, bicycle racks must be proportionally dispersed within 100 feet of each.
- Shower and changing facility requirements may be met by providing the equivalent of free access to on-site health club shower facilities, if the health club can be accessed without going outside. Provide informational signage on using the shower facilities.

Proposed Action:

Pursuant to the current proposal, the requirements for bicycle storage are not fully met and thus there are zero points earned for this credit. The project meets the requirements for the bicycle network sections in that it has an existing bicycle network, the Southbay trail connecting to the Whatcom Creek trail, of at least 5 miles in length within ¼-mile bicycling distance of the project boundary, which connects to multiple diverse use locations (see Figure 2 below).

SLL Figure 3. Downtown Bellingham Bike Network Map (Appendix C)



Alternative Action:

Full points can be achieved by supplying enclosed bicycle storage with changing facilities meeting the requirements above.

SLL Credit 5: Housing and Jobs Proximity

Evaluation: Proposed action: (3/3 points), Alternative action: (3/3 points)

Purpose:

To encourage balanced communities with a diversity of uses and employment opportunities.

Requirements:

This credit's evaluation is broken up into three options: Project with Affordable Residential Component (3 points), Project with Residential Component (2 points), or Infill Project with Nonresidential Component (1 point). Under the first option the project must meet all of the following requirements.

- Include a residential component equaling at least 30% of the project's total building square footage (exclusive of parking structures)
- Locate and/or design the project such that the geographic center (or boundary if the project exceeds 500 acres) is within ½ mile walk distance of existing full-time-equivalent jobs whose number is equal to or greater than the number of dwelling units in the project
- Satisfy the requirements necessary to earn at least one point under NPD Credit 4, Mixed-Income Diverse Communities, Option 2, Affordable Housing

Proposed Action:

Under careful analysis of the project's residential and non-residential building area, calculations were produced of the proposed and current square footage. The proposed action was found to meet the requirements for the first option earning a total of 3 points. According to the City of Bellingham Employment Lands Report (2008) the Downtown Employment Area averages 514ft² per employee. This provides roughly 7,383 jobs within ½-mile of the projects geographic center (COB, 2008, pp. 27). The proposed project also satisfies the requirements necessary to earn at least one point under the NPD Credit 4, Mixed-Income Diverse Communities, Option 2, Affordable Housing (See NPD Credit 4, Proposed Action).

The last point out of the three possible points is earned by including a residential component equaling at least 30% of the projects total building square footage (exclusive of parking structures). We find this requirement to be met at 27.2% of the project's total building square footage. Although the percentage is not greater than 30% the total building square footage had to be recalculated from the original proposal, and thus due to unclear building dimensions the minimal possible residential and total building square footage had to be used. New calculations find the total residential area to be 353,751.62ft² and the total building area (exclusive of parking structures) equal to 1,301,117ft².

Alternative Action:

Further action to improve the clarity of this credit could be included in an alternative action write up which includes accurate calculations such as total building square footage. Alternative actions following multiple LEED-ND credits include the implementation of higher buildings which could thus be used to resolve any disputes over the project's square footage.

SLL Credit 6: Steep Slope Protection

Evaluation: Proposed action: (1/1 point), Alternative action: (1/1 point)

Purpose:

To minimize erosion to protect habitat and reduce stress on natural water systems by preserving steep slopes in a natural, vegetated state.

Requirements:

Locate on a site that has no existing slopes greater than 15%, or avoid disturbing portions of the site that have existing slopes greater than 15%.

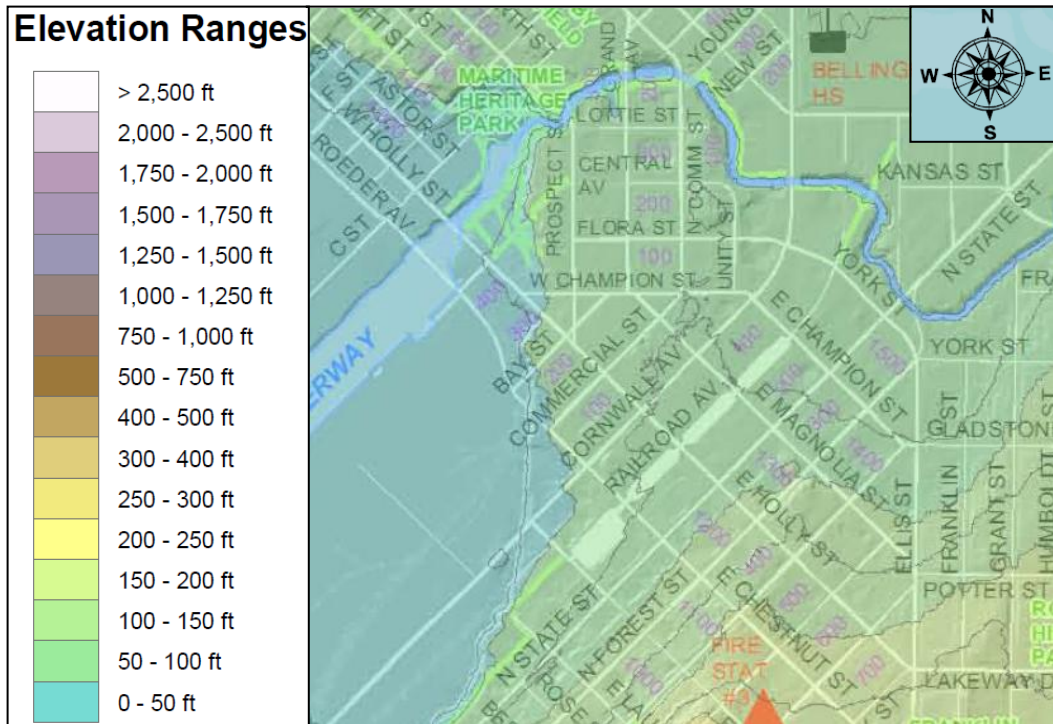
For ALL projects:

All options apply to existing natural or constructed slopes. Portions of project sites with slopes up to 20 feet in elevation, measured from toe to top, that are more than 30 feet in any direction from another slope greater than 15% are exempt from the requirements, although more restrictive local regulations may apply.

Proposed Action:

Based on the city's contour maps there are no existing slopes greater than 15% in the project area (See SLL Figure 3 below).

SLL Figure 3. Topographic map of the Bellingham downtown area. (Appendix D)



*Each counter interval is equal to 25 feet.

Alternative Action:

No alternative action is needed, because there are no steep slopes within the project area.

SLL Credit 7: Site Design for Habitat or Wetland and Water Body Conservation

Evaluation: Proposed action: (1/1 point), Alternative action: (1/1 point)

Purpose:

To conserve native plants, wildlife habitat, wetlands, and water bodies.

Requirements:

For sites without significant habitat or wetlands and water bodies:

- The project must be located on a site that does not have significant habitat. Significant habitat is defined as:
 - Habitat for species that are listed or are candidates for listing under state or federal endangered species acts, habitat for species of special concern in the state, and/or habitat for those species and/or ecological communities classified as G1, G2, G3, and/or S1 and S2 species by NatureServe.
 - Locally or regionally significant habitat of any size, or patches of predominantly native vegetation at least 150 acres.

- Habitat flagged for conservation under a regional or state conservation or green infrastructure plan.
- Project must also be located on land that is not within 100 feet of significant habitat.
- Proposal must fulfill the requirements of Options 1 or 2 (a) under SLL Prerequisite 3, Wetland and Water Body Conservation.

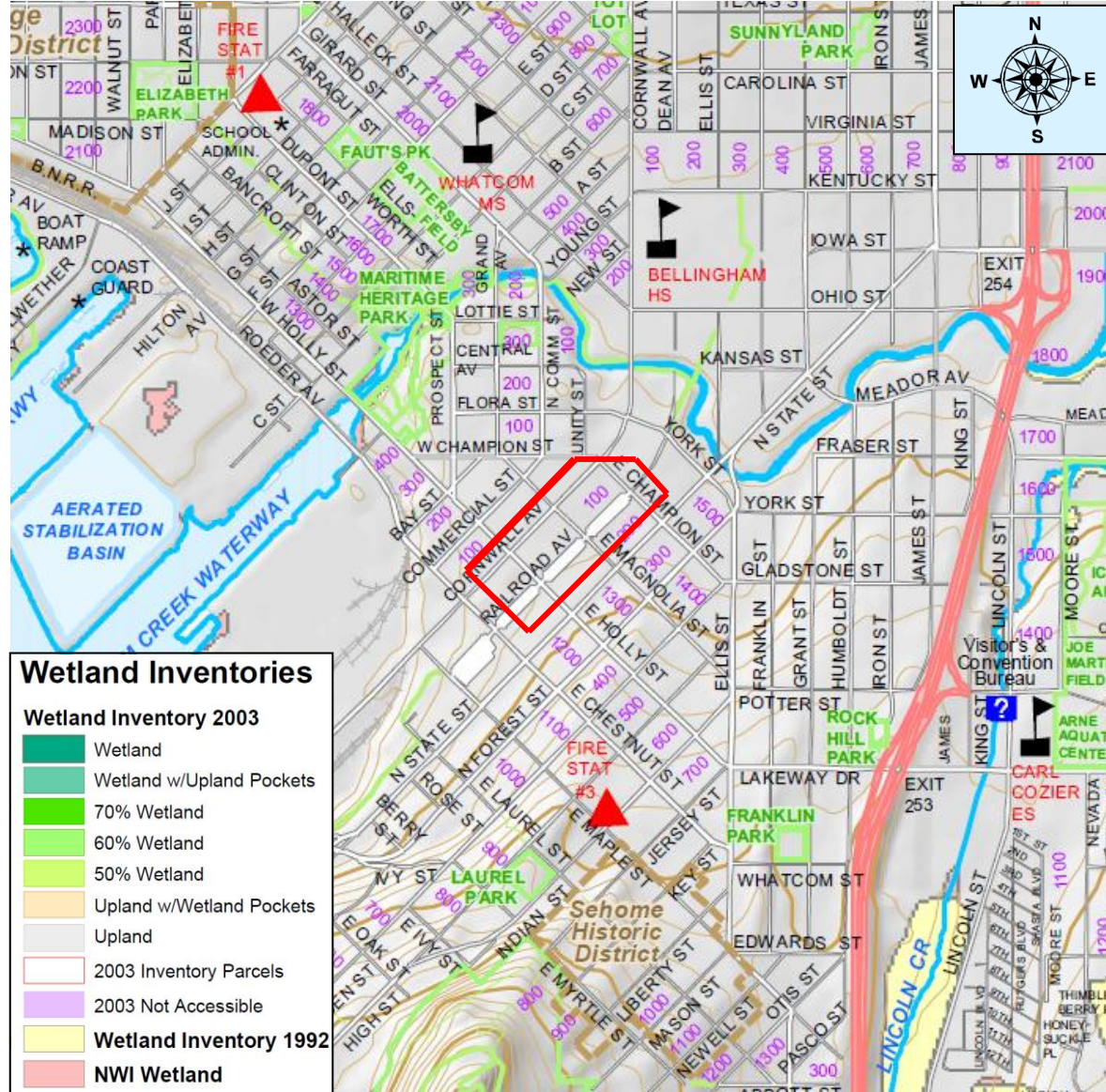
For all projects the following features are not considered wetlands, water bodies, or buffer land that must be protected; previously developed land and man-made water bodies and wetlands.

Proposed Action:

Under the requirements of option 1 the project is located on a site without significant habitat as defined above or land within 100 feet of such habitat. The requirements are met for option 1 of SLL Prerequisite 3, Wetland and Water Body Conservation locating the project on a site that includes no wetlands, no water bodies, no land within 50 feet of wetlands, and no land within 100 feet of water bodies (See SLL Figure 4 below).

The proposed project is in an area that is zoned commercially and is on a previously developed site. If the site did have significant habitat, prior to any project development working alongside the Washington state's Natural Heritage Program and the state's fish and wildlife agency to outline identified significant habitat on the site.

SLL Figure 4. Wetlands inventory of downtown Bellingham area (Appendix E)



Alternative Action:

No alternative action is needed at this time.

SLL Credit 8: Restoration of Habitat or Wetlands and Water Bodies

Evaluation: Proposed action: (0/1 point), Alternative action: (0/1 point)

Purpose:

To restore *native plants*, wildlife habitat, *wetlands*, and *water bodies* that have been harmed by previous human activities.

Requirements:

To fulfill the requirements for this credit,

- An area equal to or greater than 10% of the project site's development footprint must use only native plants in order to restore predevelopment native ecological communities, water bodies, or wetlands.
- Work with a qualified biologist to ensure predevelopment conditions are properly met.
- Protect the restored areas from development.
- Identify and commit to ongoing management activities, in order to maintain restored areas for a minimum of three years after the project is built which may be met by earning SLL Credit 9, Long-Term Conservation Management of Wetlands and Water Bodies.

The requirements are not met if the project has negative effects on habitat for species identified in Option 2(a) of SLL Credit 7, Site Design for Habitat or Wetland and Water Body Conservation.

Proposed Action:

Currently, the requirements for this credit cannot be fully met without tearing down 10% of the buildings. This downtown dense, urban area is proposed to be developed to increase economic activity, thus decreasing the dwelling units and economic use would alter the entire project and is not feasible at this stage of analysis.

Alternative Action:

The use of native plants over 10% of the development footprint may not be currently proposed, but the use of native plants throughout the development such as trees, shrubs, rooftop gardens, etc., can increase the use of native plants to the downtown Bellingham area. The area where the bike path connection of the Southbay trail and the Whatcom Creek trail is made could have an alternative use as a native habitat instead of the underused parking lot it resides as now. The City of Bellingham has a diverse number of nurseries that provide native plants as well as a detailed list of native plant species of which the project developers could use to restore native plant species in the area and refrain from the use of foreign invasive species (COB Parks and Recreation, COB Public Works Department, 2010). The city of Bellingham strives to include restoration of native habitats throughout the area as the City develops. Our downtown Alleyway Restoration area is within 2/3-mile from 2 critical water body areas, such as the mouth of Whatcom Creek and Bellingham Bay (see Appendix F for map of local restoration). Whatcom Creek houses riparian and fish passage restoration projects, of which the way the city develops and implements native habitats and LEED certified buildings, can affect these important entities to the Bellingham area and its residents.

SLL Credit 9: Long-Term Conservation Management of Habitat or Wetlands and Water Bodies

Evaluation: Proposed action: (0/1), Alternative action: (1/1)

Purpose:

To conserve native plants, wildlife habitat, wetlands, and water bodies.

Requirements:

The main requirement is to produce and carry out the implementation of a management plan of at least ten-years for new or existing on-site native habitats, water bodies, and/or wetlands and their buffers, as well as the creation of a secure funding source for management.

- Involve a qualified biologist or a professional from a natural resources agency or natural resources consulting firm in writing the management plan and conducting or evaluating the ongoing management.
- The plan must include biological objectives consistent with habitat and/or water resource conservation, and it must identify
 - 1) procedures, including personnel to carry them out, for maintaining the conservation areas;
 - 2) estimated implementation costs and funding sources; and
 - 3) threats that the project poses for habitat and/or water resources within conservation areas (e.g., introduction of exotic species, intrusion of residents in habitat areas) and measures to substantially reduce those threats.
- The project does not meet the requirements if it has negative effects on habitat for species identified in Option 2(a) of SLL Credit 7, Site Design for Habitat or Wetland and Water Body Conservation.

Proposed Action:

Currently the proposed action does not meet the requirements for this credit, because the proposal does not include the creation or implementation of a long term management plan for new or existing on-site native habitats, water bodies, and/or wetlands and their buffers.

Alternative Action:

It is possible to implement a management plan for the Southbay Trail connection; however the current condition of the connection cannot be identified as a native habitat, water body, wetland or buffer zone, and thus could be restored back to a native habitat area. The implementation plan would need to involve a restoration process as specified in SLL Credit 8. To conserve the native plants, wildlife habitat, wetlands, and water bodies as the purpose states, the comprehensive project can include an implementation on developers to financially and politically support the long term restoration and conservation of not only the possible Southbay Trail bike path connection lot but also the neighboring significant environmental areas of which could be impacted by large developments to the area. Conditions would include the use of LEED certified buildings to keep the impacts on the neighboring Bellingham Bay, and Whatcom Creek to a minimum. Also there could be long term efforts to support the protection and restoration of the salmon runs on Whatcom Creek.

Neighborhood Pattern and Design (NPD)- 44 Possible Points

Proposed Action: (30/44)

Alternative Action: (38-41/44)

“The key to active street life is creating a twenty-four hour city, with neighborhoods so diverse in their use that they are inhabited around the clock. Eating, shopping, working, socializing – no one activity can flourish in the absence of any other, since they are all mutually reinforced”
(Duany et. al. 2000. p.156)

NPD Prerequisite 1: Walkable Streets

Required Prerequisite: Met

Purpose:

To promote walking, good health and a lower Vehicle Miles Traveled (VMT).

Requirements:

The requirements to fulfill this prerequisite is

- a. 90% of the new building frontage faces a public space
- b. At least 15% of existing and new street frontage within and bordering the project has a minimum building-height-to-street-width ratio of 1:3
- c. Continuous sidewalks or equivalent all-weather provisions for walking are provided along both sides of 90% of streets or frontage within the project
- d. No more than 20% of the street frontages within the project are faced directly by garage and service bay openings.

Proposed Action:

Because the project calls for the revitalization of the alleyways into public gathering spaces, for pedestrian and bicycle use only, the buildings will all front either a street with a sidewalk, or paseo. The height-to-width ratio will be met with ease, as all the new buildings will have two or more stories, since they will be for multiple usages (both for business and residential purposes) and because at least half of the buildings will front the alleyways. There are sidewalks on all both sides of each street, and the alleyway’s revitalization will provide an area for pedestrians and bicyclists to ride and walk. There will also, not be more than 20% of the street frontages within the project facing garage or service bay openings.

Alternative Action:

No alternative action is needed.

NPD Prerequisite 2: Compact Development

Required Prerequisite: Met

Purpose:

This is to promote the conservation of land and transportation efficiency. If there are dwelling units or if the area is within a reasonable walking distance, then there will be a reduction in the amount of VMT. This will also create less congestion and traffic on the roads, and promote good health due to exercise.

Requirements:

In order to fulfill the prerequisite the proposal must include at least a density of 7 dwelling units and at least a density of at least .50 FAR.

Proposed Action:

The project proposal calls for the construction of buildings with the density 1.51 FAR of buildable land available for nonresidential uses, and for the density of 22 dwelling units per acre of buildable land available for residential uses.

Alternative Action:

No alternative action is needed.

NPD Prerequisite 3: Connected and Open Community

Required Prerequisite: Met

Purpose:

To provide an area that is well connected and easily accessible to the public from multiple locations. This will create transportation efficiency and promote the multitude of modes of transportation.

Requirements:

In order to fulfill the prerequisite the proposal must include at least 140 intersections per square mile and the proposal must include at least one through-street and/or nonmotorized right-of-way, or locate the project such that the existing streets within ¼ mile of the project boundary is has least 90 intersections per square mile.

Proposed Action:

There are 123.74 intersections per square mile within a quarter mile of the project boundary. (See Appendix C).

Alternative Action:

No alternative action is needed.

NPD Credit 1: Walkable Streets

Evaluation: Proposed action: (11/12 points), Alternative action: (12/12 points)

“For policy-makers, designers and managers of public spaces, the recommendation of this study [Walkable Main streets] is to consider simultaneously the physical, land-use and social aspects of the built environment to support walking.” (Mehta, 2008, p. 243)

Purpose:

To promote transportation efficiency, including reduced vehicle miles traveled (VMT). To promote walking by providing safe, appealing, and comfortable street environments that support public health by reducing pedestrian injuries and encouraging daily physical activity.

Requirements:

- a. At least 80% of the total linear feet of street-facing building facades in the project are no more than 25 feet from the property line.
- b. At least 50% of the total linear feet of street-facing building facades in the project are no more than 18 feet from the property line.
- c. At least 50% of the total linear feet of mixed-use and nonresidential street facing building facades in the project within 1 foot of a sidewalk or equivalent provision of walking.
- d. Functional entries to the building occur at an average of 75 feet or less along nonresidential or mixed-use buildings or blocks.
- e. Functional entries to the building occur at an average of 30 feet or less along nonresidential or mixed-use buildings or blocks.
- f. All ground-level retail, service, and trade uses that face a public space have clear glass on at least 60% of their façades between 3 and 8 feet above grade.
- g. If a façade extends along a sidewalk, no more than 40% of its length or 50 feet, whichever is less, is blank (without doors or windows).
- h. Any ground-level retail, service, or trade windows must be kept visible (unshuttered) at night; this must be stipulated in covenants, conditions, and restrictions or other binding documents.
- i. On-street parking is provided on a minimum of 70% of both sides of all new and *existing* streets, including the project side of bordering streets. The percentage of on-street parking is calculated by dividing the length of street designated for parking by the total length of the curb along each street, including curb cuts, driveways, and intersection radii. Space within the parking lane that is occupied by corner bulb-outs (within 24 feet of an intersection), transit stops, and motorcycle or bicycle parking may be counted as designated for parking in this calculation. Woonerfs are not considered streets for this subsection.
- j. Continuous sidewalks or equivalent provisions for walking are available along both sides of all streets within the project, including the project side of streets bordering the project. New sidewalks, whether adjacent to streets or not, must be at least 10 feet wide on retail or mixed-use blocks and at least 5 feet wide on all other blocks. Equivalent provisions for walking include woonerfs and all-weather-surface footpaths at least 5 feet wide. Note that these requirements specify wider sidewalks than required by NPD Prerequisite 1, Walkable Streets.

- k. If the project has ground-floor dwelling units, the principal floor of at least 50% of those units must have an elevated finished floor no less than 24 inches above the sidewalk grade. Below-grade basement spaces and/or accessory dwelling units are exempt from this requirement.
- l. In nonresidential or mixed-use projects, 50% or more of the total number of office buildings include ground floor retail along 60% of the length of the street-level façade; 100% of mixed-use buildings include ground floor retail, live-work spaces, and/or ground-floor dwelling units along at least 60% of the street-level façade; and all businesses and/or other community services on the ground floor are accessible directly from sidewalks along a public space, such as a street, square, paseo, or plaza, but not a parking lot.
- m. At least 40% of all street frontages within the project have a minimum building-height-to-street-width ratio of 1:3 (i.e., a minimum of 1 foot of building height for every 3 feet of street width).
- n. 75% of new residential-only streets within the project are designed for a target speed of no more than 20 mph.
- o. 70% of new nonresidential and/or mixed-use streets within the project are designed for a target speed of no more than 25 mph. A multiway boulevard, with travel lanes separated from access lanes by medians, may apply this requirement to its outer access lanes only (through-lanes are exempt), provided pedestrian crosswalks are installed across the boulevard at intervals no greater than 800 feet.
- p. At-grade crossings with driveways account for no more than 10% of the length of sidewalks within the project.

Proposed Action:

- a. All the building facades facing the street, of which are mostly mixed use buildings, are all within 25" of the property line. Many of which have a zero lot line and are adjacent to sidewalks so will meet this requirement.
- b. This requirement is met as most building facades are within 18' of the property boundary.
- c. Most buildings have sidewalks on the street and alley ways as to provide ease of access for pedestrians. This requirement is met.
- d. The estimated distance between functional entries averages below 75 feet.
- e. This requirement is not met as functional entries to mixed-use buildings average well above 30 feet.
- f. All ground level retail incorporates 60% glass windows into their façades. As well the windows grade is above 3 feet and below 8, averaging to 7 feet.
- g. Currently there is no situation where a building's façade is blank for 50 feet in the downtown area. With the current conditions of the proposal there should not be a building with these large blank facades. This requirement is met.
- h. There are no details containing restrictions on visible windows within a binding document. Therefore this requirement is not met.
- i. The proposed parking situation places on-street parking along every street within the project. This creates a score well above 70%.
- j. The proposed sidewalks are to be 15 feet wide and cover all streets within the project boundary. This meets the requirements.
- k. There are no ground floor dwelling units. This point is omitted.

- l. All building if mixed use have retail on the ground floor that have direct access to the side walk or alleyway plaza. This requirement is met.
- m. There lowest street-width ratio is 1:35 with most buildings being well over this ratio, especially with the new proposal additions. There for this requirement is met.
- n. There are no residential only streets within the project.
- o. The current speed limit is 25mph and that is expected to remain as it already is proven to improve safety.
- p. There are few driveways within the project. Generally the driveways are for drive thru banks and parking. These driveways are to be removed or remain as such driveways account for less than 10% of the projects sidewalks.

Alternative Action:

Only one of these requirements needs to be met to gain full points, however both can be implemented easily.

- a. This requirement can be met by placing entrances into buildings less than 30 feet apart. This would average to about 4 entrances per building. This is possible as there are a large variety of building sizes so many may have one entrances while others will have multiple.
- h. By requiring that any ground level window of a retail, service or trade use must be kept visible at night. This can be achieved by stipulating this requirement in covenants, conditions, and restrictions (CC&R) or in another binding document.

NPD Credit 2: Compact Development

Evaluation: Proposed action: (3/6 points), Alternative action: (3-6/6 points)

Purpose:

To encourage development in existing areas to conserve land and protect farmland and wildlife habitat. To promote livability, walkability, and transportation efficiency, including reduced VMT. To improve public health encouraging daily physical activity associated with alternative modes of transportation and compact development.

Requirements:

This credit is assessed on the square footage of residential and nonresidential components achieving desired densities per acre of buildable land, as seen in the table below.

NPD Table 1. Points for density per acre of buildable land (USGBC, 2010, p.53)

Residential density (DU/acre)	Nonresidential density (FAR)	Points
> 10 and ≤ 13	> 0.75 and ≤ 1.0	1
> 13 and ≤ 18	> 1.0 and ≤ 1.25	2
> 18 and ≤ 25	> 1.25 and ≤ 1.75	3
> 25 and ≤ 38	> 1.75 and ≤ 2.25	4
> 38 and ≤ 63	> 2.25 and ≤ 3.0	5
> 63	> 3.0	6

DU = dwelling unit; FAR = floor-area ratio.

$$\text{Residential Density} = \frac{\text{Number of Dwelling Units}}{\text{Buildable land in Acres}}$$

$$\text{Floor Area Ratio} = \frac{\text{Non residential Building Floor Area}}{\text{Buildable Land Area}}$$

Proposed Action:

Based on the current situation and the estimated proposed number of units to be added to the Cornwall area the current calculations are derived so that this credit can be assessed accurately.

$$\frac{471 \text{ Units}}{22 \text{ Acres}} = 22 \text{ Dwelling Units/Acre}$$

$$\frac{1403500 \text{ Ft}^2}{927100 \text{ Ft}^2} = 1.51 \text{ FAR}$$

With the current proposal the non-residential floor-area ratio is scoring that of 1.51. The residential density per acre is that of about 22 Dwelling units per acre, as shown above. This causes a score of 3 points for the credit as per NPD Table 1.

Alternative Action:

The alternative action that could be implemented would provide the final points with this credit. There is an opportunity with this proposal to provide a greater abundance of residential units in the downtown core as well as a larger commercial square footage. This can be achieved by raising the height and in turn the number floors within each proposed infill building. This will result with most, if not all buildings are mixed use with commercial or retail on the ground floor, or even second floor as well, with residential units above. Additionally this would also provide a flux of population to the downtown Bellingham core to encourage economic growth.

This would work in conjunction with the City of Bellingham comprehensive plan, considering there is an estimated ‘residential capacity of up to 2,000 new housing units in this area by 2022’ (COB & Behee 2009, p.5).

NPD Credit 3: Mixed-Use Neighborhood centers

Evaluation: Proposed action: (4/4 points), Alternative action: (4/4 points)

Purpose:

To cluster diverse land uses in accessible neighborhood and regional centers to encourage daily walking, biking, and transit use, reduced VMT and automobile dependence, and support car-free living.

Requirements:

This is assessed on the 50% of the residential units being ¼ mile away from multiple diverse uses; credits are allocated according to the table below. The list diverse use types are defined in Appendix G.

NPD Table 2. Points for diverse uses within 1/4-mile walk distance, by time of occupancy (USGBC 2010, p. 55)

Diverse uses	Percentage occupancy of total square footage	Points
4-6	20%	1
7-10	30%	2
11-18	40%	3
≥ 19	50%	4

Proposed Action:

The Cornwall Revitalization project provides qualifies for 4 points as 19 diverse uses are within ¼ mile walking distance of over 50% residential units. There also multiple additional usages not included within this analysis as the credit was already fulfilled.

NPD Table 3. Distance of Diverse Uses from the Alleyways project Area

Type of Diverse Use	Distance from Project Border
Food Co-Op	0.15 Miles
Bellingham Farmers Market	0.06 Miles
Shell	0.2 Miles
Rite Aid	Within Project Boundary
Bank of America	Within Project Boundary
Tony & Guy Hairdressing Academy	On Project Border
Boundary Bay Brewery & Bistro	0.07 Miles
Bobs Burgers	0.03 Miles
Leopold Retirement Center	Within Project Boundary
American Museum of Radio & Electricity	0.1 Miles
Preschool of the Arts	0.18 Miles
Mt. Baker Theater	0.04 Miles
Movie Theater	Proposed within Project Boundary
Whatcom County Courthouse	0.2 Miles
Whatcom Sheriffs Office	0.23 Miles
US Post Office	Within Project
Public Library	0.18 Miles
Maritime Heritage Park	0.2 Miles
Whatcom County YMCA	0.1 Miles

Alternative Action:

There is no need for an alternative action as the central business district of Bellingham already holds many diverse uses. This could however be accentuated by the inclusion of a policy that encourages an even placement establishments, so several establishment of one type are not located alongside each other. However this is not necessary to gain extra points.

NPD Credit 4: Mixed-Income Diverse Communities

Evaluation: Proposed action: (6/7 points), Alternative action: (7/7 points)

Purpose:

To promote socially equitable and engaging communities by enabling residents from a wide range of economic levels, household sizes, and age groups to live in a community. This credit is assessed under two points, diversity of housing and affordable housing.

Requirements:

Diversity of housing is calculated with the use of the Simpson Diversity Index, which assesses the probability that any randomly chosen dwellings are of a different type as defined below. The Simpson diversity index is calculated by the following equation and needs to score above 0.5.

$$Score = 1 - \sum \left(\frac{n}{N} \right)^2$$

Where n = the total number of dwellings in a single category, and N = the total number of dwellings in all categories. (USGBC, 2010, p.57)

NPD Table 4. Housing categories (USGBC 2010, p.58)

Type	Square feet
Detached residential, large	> 1,250
Detached residential, small	≤ 1,250
Duplex or townhouse, large	> 1,250
Duplex or townhouse, small	≤ 1,250
Dwelling unit in multiunit building with no elevator, large	> 1,250
Dwelling unit in multiunit building with no elevator, medium	> 750 to ≤ 1,250
Dwelling unit in multiunit building with no elevator, small	≤ 750
Dwelling unit in multiunit building with elevator, 4 stories or fewer, large	> 1,250
Dwelling unit in multiunit building with elevator, 4 stories or fewer, medium	> 750 to ≤ 1,250
Dwelling unit in multiunit building with elevator, 4 stories or fewer, small	≤ 750
Dwelling unit in multiunit building with elevator, 5 to 8 stories, large	> 1,250
Dwelling unit in multiunit building with elevator, 5 to 8 stories, medium	> 750 to ≤ 1,250
Dwelling unit in multiunit building with elevator, 5 to 8 stories, small	≤ 750
Dwelling unit in multiunit building with elevator, 9 stories or more, large	> 1,250
Dwelling unit in multiunit building with elevator, 9 stories or more, medium	> 750 to ≤ 1,250
Dwelling unit in multiunit building with elevator, 9 stories or more, small	≤ 750
Live-work space, large	> 1,250
Live-work space, small	≤ 1,250
Accessory dwelling unit, large	> 1,250
Accessory dwelling unit, small	≤ 1,250

Additionally affordable housing assesses new and/or for-sale dwellings prices for households earning below Area Median Income (AMI). Points are allocated as per the table below.

NPD Table 5. Points for affordable housing (USGBC 2010, p.59)

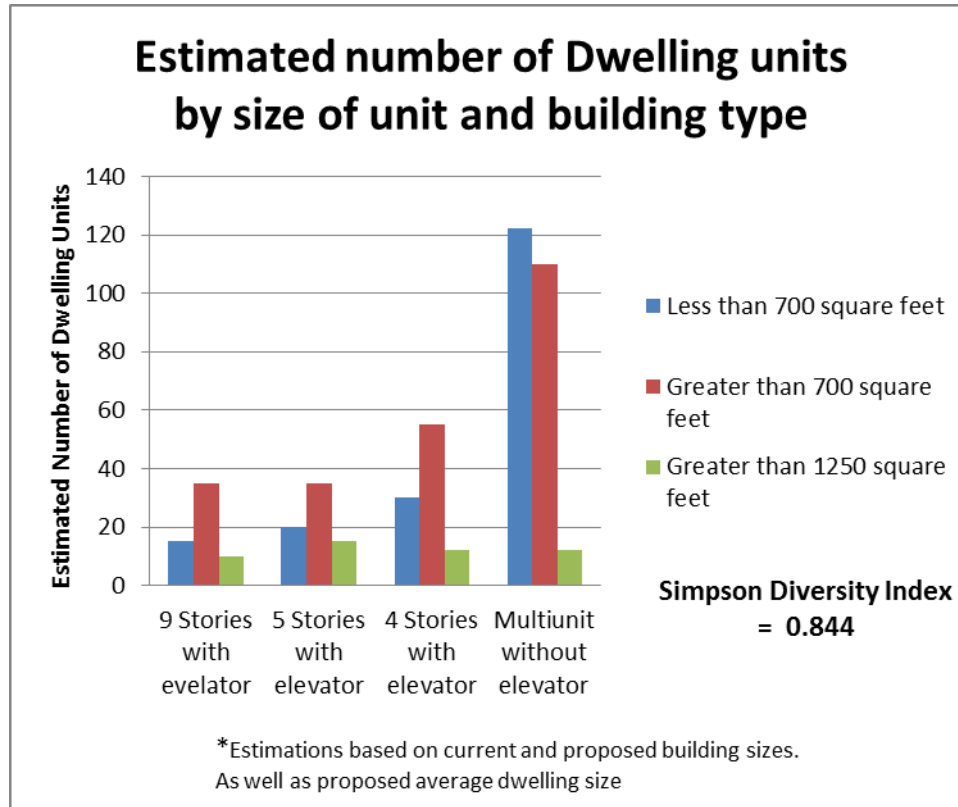
Rental dwelling units				For-sale dwelling units			
Priced up to 60% AMI		Priced up to 80% AMI		Priced up to 100% AMI		Priced up to 120% AMI	
Percentage of total rental units	Points	Percentage of total rental units	Points	Percentage of total for-sale units	Points	Percentage of total for-sale units	Points
5	1	10	1	5	1	8	1
10	2	15	2	10	2	12	2
15	3	25	3	15	3	--	--

AMI = area median income.

Proposed Action:

Extrapolating from the current residential dwelling unit buildings and sizes it is expected that this project is to get 6 points for this credit. There are eight different housing categories, with a variety of small to large sized dwellings within buildings up to 9 stories with and without elevators as seen in NPD Table 6. The Simpson diversity index scored 0.84. This provides full points for this section of the credit.

NPD Figure 1. Simpson Diversity Index calculated by the number of dwelling units by size of building and unit.



The second section based on affordable housing also receives full points. The extrapolation of current housing prices, even in the worst circumstances, provides 3 points. The current situation of housing prices would have to double before a point can be lost. The current percentage of rental dwelling units priced below 80% of Area Median Income (AMI) is above 70% (USCB 2010) (WS OFM 2010), when extrapolated this figure does go down slightly. This is assisted by the fact that there are multiple affordable housing projects adjacent to the project boundary.

Alternative Action:

The final point within this credit can only be achieved by at least 10% of for sale dwelling units to be priced at 100% of AMI. This cannot be guaranteed until the proposal goes ahead as there are no current plans on having specific prices on for sale dwellings. This is supported by the fact

that most dwelling units are only for rent within the downtown area. There is however a high probability that this point would be achieved, especially if current sale conditions continue.

NPD Credit 5: Reduced Parking Footprint

Evaluation: Proposed action: (0/1 points), Alternative action: (1/1 points)

Purpose:

To design parking that increases the pedestrian orientation of projects and minimize the adverse environmental effects of parking facilities. To reduce public health risks by encouraging daily physical activity associated with walking and bicycling.

Requirements:

To be awarded this credit no more than 20% of the development footprint area can be allocated to off-street parking lots. There also needs to be carpool or vehicle share program equivalent to 10% of the total nonresidential and mixed-use buildings on site. Finally there needs to be bicycle storage for new buildings as specified in SLL credit 4: Bicycle Network and Storage.

Proposed Action:

This credit is not awarded because of facility issues that can easily be added into the proposal. The parking facilities are all on-street parking better Chestnut and Champion Streets. As such the off-street parking does not exceed 20% of the development footprint. This requirement is met, however the bicycle related requirement is not.

There are to be a minimum of one bicycle rack per block. This is to be at least about 50 spaces for retail and residential use. However for this size of a project there needs to be changing facilities with showers. This has not been specified within the Downtown proposal.

The current proposal for carpool parking is not within 200ft or equal to 10% of total automobile parking.

Alternative Action:

This credit can be achieved by providing multiple bicycle racks, about 3 per block each with at least 20 bicycle spaces. This number would be reduced slightly with the inclusion of a bike-share program to about a total of about 12 public bicycle racks and 6 within the bike-share program. This needs to be assisted by the inclusion of public showering and changing facilities to encourage people to ride to work.

An additional action is to provide multiple reserved parking spaces to a carpool program, each spaced evenly throughout the project. This would encourage groups of people to use retail facilities between both anchor stores as their car is located between them.

NPD Credit 6: Street Network

Evaluation: Proposed action: (0/1 points), Alternative action: (0/1 points)

Purpose:

To promote projects that have high levels of internal connectivity and are well connected to the community at large. To encourage development within existing communities, thereby conserving land and promoting multimodal transportation. To improve public health by encouraging daily physical activity and reducing the negative effects of motor vehicle emissions.

Requirements:

To obtain points under this section there need to be more than 300 intersections per square mile. Also all the distances between intersections need to be less than 400 feet apart

Proposed Action:

The current proposed action does not gain any points for street network as the longest current street interval is over 400 feet, largest being 500 feet, therefore disqualifying this credit.

However this effect on internal connectivity is compensated by the fact that these blocks are long and thin; with many intersections about 280 feet apart.

However the additional criteria for this credit are intersections per square mile. Both points need to be fulfilled to receive points. Nonetheless there are 123 intersections within ¼ mile radius (see **Appendix E**). This is well under 300 intersections per square mile in the project area therefore there is no possibility with the current available criteria to gain any points under this credit.

Alternative Action:

There are little to no possible alternative actions as the blocks would have to be resized which would cause too many costs to be environmentally feasible.

NPD Credit 7: Transit Facilities

Evaluation: Proposed action: (1/1 points), Alternative action: (1/1 points)

“The location of a project in an urban area may reduce vehicle miles traveled if the residents use public transportation or walk to work.”(Garde 2009, p.435)

Purpose:

To encourage transit use and reduce driving by providing safe, convenient, and comfortable transit waiting areas and safe and secure bicycle storage facilities for transit users.

Proposed Action:

Cornwall’s revitalization project holds an extensive new transit service proposal that is aimed to enhance the current transit system by providing a trolleybus system. Each stop will display schedules, as well as multiple stops are to be constructed with a shelter. Currently there is a transit system; however with the expected increase in ridership the trolleybus shall be needed. In conjunction with this new transit system there is to be multiple bicycle racks provided not only at bus stops but throughout the project area, such as in alleys and near parking facilities.

Alternative Action:

This requirement is expected to be fulfilled through the proposed action, therefore there is no need for an alternative action.

NPD Credit 8: Transportation Demand Management

Evaluation: Proposed action: (0/2 points), Alternative action: (2/2 points)

“Mass transit incentive programs can provide significant savings by reducing and deferring the need to increase parking capacity, allowing for land use development that might be eliminated by parking, and by reducing vehicle operating costs.”(Dorsey, 2004, p.237)

Purpose:

To reduce energy consumption, pollution from motor vehicles, and adverse public health effect by encouraging multimodal travel.

Requirements:

By achieving two of the options below one point is received.

OPTION 1. TDM Program

- Create and implement a comprehensive TDM program for the project that reduced weekday peak-period motor vehicle trips by at least 20% compared with a baseline case, and fund the program for a minimum of three years following build-out of the project. The TDM program must be prepared by a qualified transportation professional. Any trip reduction effects of Options 2-5 may not be included in calculating the 20% threshold.

OPTION 2. Transit Passes

- Provide transit passes valid for at least one year, subsidized to be half of regular price or cheaper, to each occupant locating within the project during the first three years of project occupancy (or longer). Publicize the availability of subsidized transit passes.

OPTION 3. Developer-Sponsored Transit

- Provide year-round, developer-sponsored private transit service from at least one central point in the project to other major transit facilities, and/or other destinations such as a retail or employment center, with service no less frequent than 45 daily weekday trips and 30 daily weekend trips. The service must begin by the time the project total square footage is 20% occupied and must be guaranteed for at least three years beyond project build-out. 20% occupancy is defined as residents living in 20% of the dwelling units and/or employees working in 20% of the total nonresidential square footage. Provide transit stop shelters and bicycle racks adequate to meet projected demand but no less than one shelter and one bicycle rack at each transit stop. Shelters must be covered, be at least partially enclosed to buffer wind and rain, and have seating and illumination. Bicycle racks must have a two-point support system for locking the frame and wheels and must be securely affixed to the ground or a building.

OPTION 4. Vehicle sharing

- Locate the project such that 50% of the dwelling units and nonresidential building entrances are within a ¼ mile walk distance of at least one vehicle in a vehicle-sharing program. For each vehicle, dedicate one parking space accessible to vehicle-sharing members. Through signage and other means, publicize the availability and benefits of the vehicle-sharing program. IF the project has more than 100 dwelling units and/or employees and has a minimum transit service of 60 daily weekday trips and 40 daily weekend trips, at least one additional vehicle and parking space for every 100 dwelling units and/or employees must be available. If the project has more than 100 dwelling units and/or employees but does not have transit service at the frequencies specified above, at least one additional vehicle and parking space for every 200 dwelling units and/or employees must be available. Where new vehicle locations are created, a vehicle sharing program must begin by the time the project total square footage is 20% occupied; commit to providing vehicles to the locations for at least two years.

OPTION 5. Unbundling of Parking

- For 90% of multiunit residential units and/or nonresidential square footage, the associated parking spaces are sold or rented separately from the dwelling units and/or nonresidential square footage.

Proposed Action:

Currently there are not any proposals to provide transit options that will reduce energy consumption and pollution, or comprehensive transportation demand management.

Alternative Action:

In addition to a Transportation management plan, as specified in Option 1 above, there would be a vehicle share program, developer sponsored transit that includes transit passes for residents within the project area. This needs to meet the requirements as specified above.

NPD Credit 9: Access to Civic and Public Space

Evaluation: Proposed action: (0/1 points), Alternative action: (0/1 points)

“The least of the least that a democratic society should have is public pedestrian space of great quality. Sidewalks, pedestrian streets, plazas, sports facilities, parks, even public transport, public libraries could be considered as public space as well.” (Eckerson & Peñalosa 2007)

Purpose:

To improve physical and mental health and social capital by providing a variety of open spaces close to work and home to facilitate social networking, civic engagement, physical activity, and time spent outdoors.

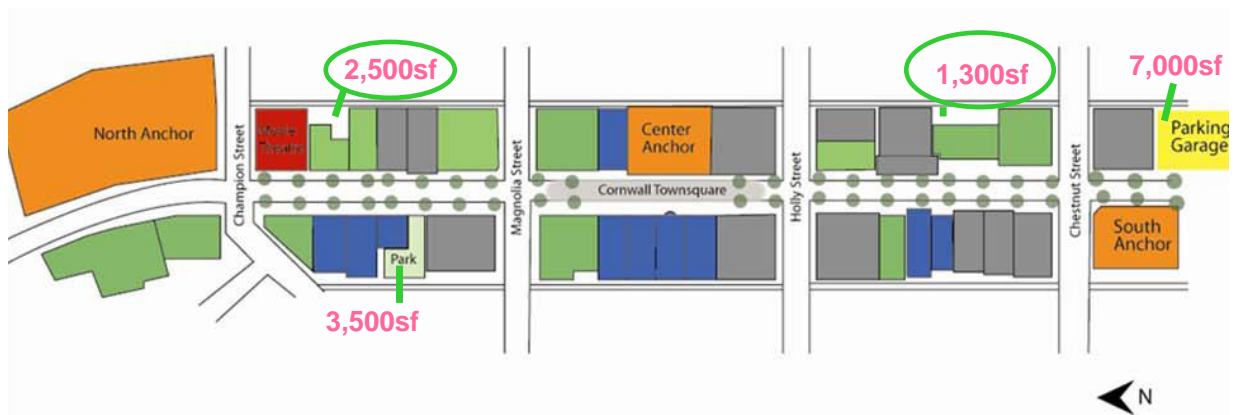
Requirements:

Locate and design the project so that there is a civic or passive use space, such as a square park, plaza or paseo, within the project. This space needs to be at least 1/6 acre and lie within 1/4-mile of 90% of planned and existing building entrances.

Proposed Action:

There are four proposed parks within the project however they cannot be included because they are considered too small. They are all less than 1/6 acre, one only by 200 square feet, as seen in the image below. The proposed plazas and squares also are not over 1/6 therefore could not be included, their median is also not above 1/2 acre. Therefore the point could not be awarded.

NPD Figure 2. Size and location of Public spaces along Cornwall Avenue (Feasibility analysis)



Furthermore there are multiple parks slightly over a 1/4 of a mile from the project boundary so could not be included. Specifically the bicycle trail connection and the Maritime Heritage Park (see Appendix H). This means the requirements for this credit were not met.

Alternative Action:

The only alternative action available is to increase the size of one park within the proposed area however the consequence of this is the demolition of a building. The other possible option was to use a current open lot, however this infill space is better used for mixed use buildings as that will provide the highest LEED-ND points. This is not a viable action therefore there are no additional points available for an alternative action.

NPD Credit 10: Access to recreation Facilities

Evaluation: Proposed action: (1/1 points), Alternative action: (1/1 points)

Purpose:

To improve physical and mental health and social capital by providing a variety of recreational facilities close to work and home to facilitate physical activity and social networking.

Requirements:

Locate or design the project so that publicly accessible outdoor or indoor recreation facility lies within ½ mile walk of the project, each facility consisting of physical improvement options.

Proposed Action:

The Cornwall revitalization project is located within ½ mile of a Battersby park. This park contains sports fields, baseball, which covers 3.8 acres and located on F St and Girard St intersection.

This location is also in conjunction to multiple parks, such as those that do not hold specific recreational facilities, which all provide an opportunity to improve the mental and physical health of the local residents.

Alternative Action:

As there is to be a new public park located within the project area (See NPD Figure 2). There is an opportunity to provide additional recreational facilities to not only support the local residents but also the commuters using to retail stores. A possible addition would be ‘tot lots’, this may not provide additional points, it will however be beneficial for the community.

NPD Credit 11: Visitability and Universal Design

Evaluation: Proposed action: (0/1 points), Alternative action: (1/1 points)

Purpose:

To enable the widest spectrum of people, regardless of age or ability, to more easily participate in community life by increasing the proportion of areas usable by people of diverse abilities. This is assessed on the number and type of universal design features that provide universal function, access and usability.

Requirements:

To gain this credit at least 20% of dwelling units need to be furnished with universal design features specified by LEED-ND.

Proposed Action:

There are no current actions with the proposal to facilitate universal function, access and usability.

Alternative Action:

At least 20% of all dwelling units (over 95 units) need to be outfitted with the following universal design requirements to meet this credit and gain its points. These features include easy-to-grip door handles, cabinets, window locking mechanisms, faucet handles, hands-free switches and motion-detector lighting.

NPD Credit 12: Community Outreach and Involvement

Evaluation: Proposed action: (0/2 points), Alternative action: (2/2 points)

“The journey towards sustainability requires broadly based support. Empowering people mobilises local knowledge and resources and enlists the support and active participation of all who need to be involved in all stages, from long-term planning to implementation of sustainable solutions.” (UNEP, 2002, p. 10)

Purpose:

To encourage responsiveness to community needs by involving the people who live or work in the community in project design and planning and in decisions about how it should be improved or how it should change over time.

Requirements:

Provide meetings with property owners, residents, business owners and workers; and planning and community development officials to provide input into the design, construction and post construction phases. Additionally conduct design charrette or interactive workshops with the public.

Proposed Action:

The current action does not have an established community involvement to the extent expected within a LEED-ND checklist.

Alternative Action:

To gain full points the alternative action needs to hold two different types of meetings. Firstly monthly meetings are to be held by the city of Bellingham or the designers of the project. These meetings are intended to increase public involvement in the Cornwall project by providing discussion and additional actions. Some suggested focal points are aesthetics, character and public spaces.

Secondly any developer who takes on this project will implement a charrette, interactive workshop, to discuss the community development. The workshop will be two days, open to the public, and include participation by nearby property owners, local community, designers and planners. These parts of the community outreach program should be held during the planning and design phase and through part of the construction.

NPD Credit 13: Local Food Production

Evaluation: Proposed action: (1/1 points), Alternative action: (1/1 points)

Purpose:

To promote community-based food production, improve nutrition through increased access to fresh produce, support preservation of small farms producing a wide variety of crops, reduce the negative environmental effects of large-scale industrialized agriculture, and support local

economic development that increases the economic value and production of farmlands and community gardens.

Requirements:

Establish deed restrictions that do not prohibit growing produce in project area. To earn points in credit either dedicated permanent growing space based on dwelling units; or purchase shares in community-supported agriculture; or place farmers' market within ½ mile walk of center of the project.

“The location and design of food markets is vitally important for urban farming. In the absence of government leadership, the placement of food retailing outlets in cities is often haphazard and inefficient.” (Halweil & Nierenberg, 2007, p.60)

Proposed Action:

There are currently no restrictions or covenants, conditions, and restrictions that prohibit growing produce in the project area. There is currently a farmers' market within ½ a mile of the projects center. The Bellingham Farmers Market has operated at least once a week from April through October for over 15 years (Bellingham Farmers, 2009). As such should be in operation throughout and after the project's completion.

Alternative Action:

While full points are already gained for this credit there is an opportunity to extend this by providing permanent growing space or facilities within the project. This could be obtained by roof top gardens as proposed on the North Anchor.

NPD Credit 14: Tree-Lined and Shaded Streets

Evaluation: Proposed action: (2/2 points), Alternative action: (2/2 points)

“Some of the physical characteristics identified as contributing to walking behavior in public spaces such as Main Streets include generous sidewalk width, trees, shade and shelter, an obstacle-free path, and traffic-calming strategies.” (Mehta, 2008, p.221)

Purpose:

To encourage walking, bicycling, and transit use and discourage excessive motoring speeds. To reduce urban heat island effects, improve air quality, increase evapotranspiration, and reduce cooling loads in buildings.

Requirements:

Design and build the project so that there are trees provided on both sides of the street, at least 60% of street lengths and averaging less than 40 feet between each tree. Additionally trees and other structures are to provide shade over at least 40% of the sidewalks. The trees need to provide shade within ten years of the landscape installation.

Proposed Action:

There are currently trees providing shade to the side walk, in conjunction with awning therefore will not require a registered architect. The trees and awnings provide about 70% shade coverage for the sidewalk, averaging about 35ft between each tree.

Alternative Action:

There is no need for alternate action.

NPD Credit 15: Neighborhood Schools

Evaluation: Proposed action: (1/1 points), Alternative action: (1/1 points)

Purpose:

To promote community interaction and engagement by integrating schools into neighborhood. To support students' health by encouraging walking and bicycling to school.

Requirements:

Place the project such that at least 30% of the building square footage and 50% of the dwelling units are within a ½ mile of a new or existing elementary school or middle school, or within 1 mile of a high school. This is to be accompanied by sidewalks, bicycle lanes, or traffic control and calming measures.

Proposed Action:

Bellingham High School is located about ½ mile continuing up Cornwall Ave from the center of the project area. This existing school is located close to the project area with a useable sidewalk too Bellingham High School. This will increase students' health as it encourages them to walk or bicycle to and from school.

Alternative Action:

There is no need for an alternative action.

Green Infrastructure and Building (GIB)- 29 Possible Points

Proposed Action: (17/29)

Alternative Action: (22-24/29)

“The Green building is a movement dedicated to the transformation of practice in the design, construction, and operation of built environments. The objective is to reduce the negative impacts of built environments while creating healthy, comfortable, and economically prosperous places for people to live, work, and play. The popular term “green building” encompasses the collection of processes, institutions, and individuals that serve to assess current practice, identify opportunities for improvement, develop and deploy tools, and provide independent review and recognition of results. The green building community has diversified from its origins in the architecture and engineering professions to encompass the full range of professionals involved in lifecycle of built environments.” (USGBC, Green Building & Human Experience)

This section focuses primarily on the built environment but tailors its requirements towards an integrated approach that goes beyond developers, making the planning community, the public and government vital participants in the green building process. It deals with green building techniques that increase a buildings energy, water and sewer efficiency while specifying methods for reducing construction waste, runoff pollution and greenhouse gas emissions.

GIB Prerequisite 1: Certified Green Building

Required Prerequisite: Met

Purpose:

Encouragement of green building practices through the design of a newly built building.

Requirements:

To further encourage environmentally friendly practices, it is required that at least one whole building within the project boundaries must be LEED certified.

Proposed Action:

The proposal requires that all new buildings, infill sites and renovations including retail spit construction will achieve LEED certification. Although not explicitly stated in the building plans for alleyway infill, the North and South Anchor are both designed as LEED certified structures. Based on the current proposal, this document includes infill building designs that are explicitly LEED certified.

Alternative Action:

Current proposal action fulfills this prerequisite, no alternative action is needed.

GIB Prerequisite 2: Minimum Building Energy Efficiency

Required Prerequisite: Met

Purpose:

To encourage the energy-efficient design of buildings which will inherently use less energy and reduce the negative environmental impacts associated with energy use and production.

Requirements:

In order to fulfill this prerequisite, the project must document, for new buildings, a. all building energy efficiency by producing a LEED compliant energy model following the methodology outlined in the LEED rating system, b. comply with the prescribed measures of the ASHRAE Advanced Energy Design Guide, and for buildings less than 100,000 square feet, and c. comply with the prescriptive measures identified in the Advanced Buildings Core Performance Guide developed by the New Buildings Institute, as appropriate to each building's scope. Also, for new single family residential buildings and new multiunit residential buildings three stories or fewer, at least 90% of these will meet ENERGY STAR or equivalent criteria.

Proposed Action:

The project will document, for new buildings, all building energy efficiency by producing a LEED compliant energy model following the methodology outlined in the LEED rating system, comply with the prescriptive measures of the ASHRAE Advanced Energy Design Guide, and for buildings less than 100,000 square feet, comply with the prescriptive measures identified in the Advanced Buildings Core Performance Guide developed by the New Buildings Institute, as appropriate to each building's scope. For new single family residential buildings and new multiunit residential buildings three stories or fewer, at least 90% of these will meet ENERGY STAR or equivalent criteria.

Alternative Action:

No alternative action is needed.

GIB Prerequisite 3: Minimum Building Water Efficiency

Required Prerequisite: Met

Purpose:

To encourage the design of water-efficient buildings to be more environmentally friendly.

Requirements:

To fulfill the prerequisite, the proposal must have all new nonresidential buildings, mixed-use buildings, and multifamily residential buildings four stories or more to have an average of at least 20% less indoor water usage than in baseline buildings and for new single-family residential buildings and new multiunit residential buildings three stories or fewer, 90% of the buildings will use a combination of fixtures that would earn 3 points under LEED for Homes 2008 Credit 3, Indoor Water Use.

Proposed Action:

The new nonresidential buildings, mixed-use buildings, and multifamily residential buildings four stories or more will have an average of at least 20% less indoor water usage than in baseline buildings. For new single-family residential buildings and new multiunit residential buildings three stories or fewer, 90% of the buildings will use a combination of fixtures that would earn 3 points under LEED for Homes 2008 Credit 3, Indoor Water Use.

Alternative Action:

No alternative action is needed.

GIB Prerequisite 4: Construction Activity Pollution Prevention

Required Prerequisite: Met

Purpose:

To reduce pollution from erosion and airborne dust during the construction process of new buildings.

Requirements:

To fulfill this prerequisite, the project must create and implement an erosion and sediment control plan for all new construction activities associated with the project. The plan must list the BMPs employed and describe how they accomplish the following objectives: a) Prevent loss of soil during construction by stormwater runoff and/or wind erosion, including but not limited to stockpiling of topsoil for reuse, b) Prevent sedimentation of any affected stormwater conveyance systems or receiving streams, and c) Prevent polluting the air with dust and articulate matter. Also, the erosion and sedimentation control plan must describe how the project team will do the following: a) Preserve vegetation and mark clearing limits, b) Establish and delineate construction access, c) Control flow rates, d) Install sediment controls, e) Stabilize soils, f) Protect slopes, g) Protect drain inlets, h) Stabilize channels and outlets, i) Control pollutants, j) Control dewatering, k) Maintain the BMPs, and finally l) Manage the erosion and sedimentation control plan.

Proposed Action:

The project will include an erosion and pollution control plan for all new construction, including the renovation and creation of any and all buildings involved. This will include, but will not be limited to, the use of seed spray, mulching, leaving some established plants in place, and planting new native species in landscaped areas, especially in those with a slope. There will be cloth filters put just beneath the street and parking lot stormwater drains to catch any soil eroded during the construction process, and the implementation of a protective barrier (usually a multitude of tarps or cloths over construction sites in order to lessen the spread of dust particles.

Alternative Action:

No alternative action is needed.

GIB Credit 1: LEED Certified Green Buildings

Evaluation: Proposed action: (0/5 Points), Alternative action: (1/5 Points)

Purpose:

Encourage the design, construction, and retrofit of buildings that utilize green building practices.

Requirements:

Design, construct and retrofit up to 40% of the total project square footage to be certified under one of the LEED building programs: LEED for New Construction, LEED for Existing Buildings, LEED for Homes, LEED for Schools, LEED for Retail: New Construction, or LEED for Core & Shell.

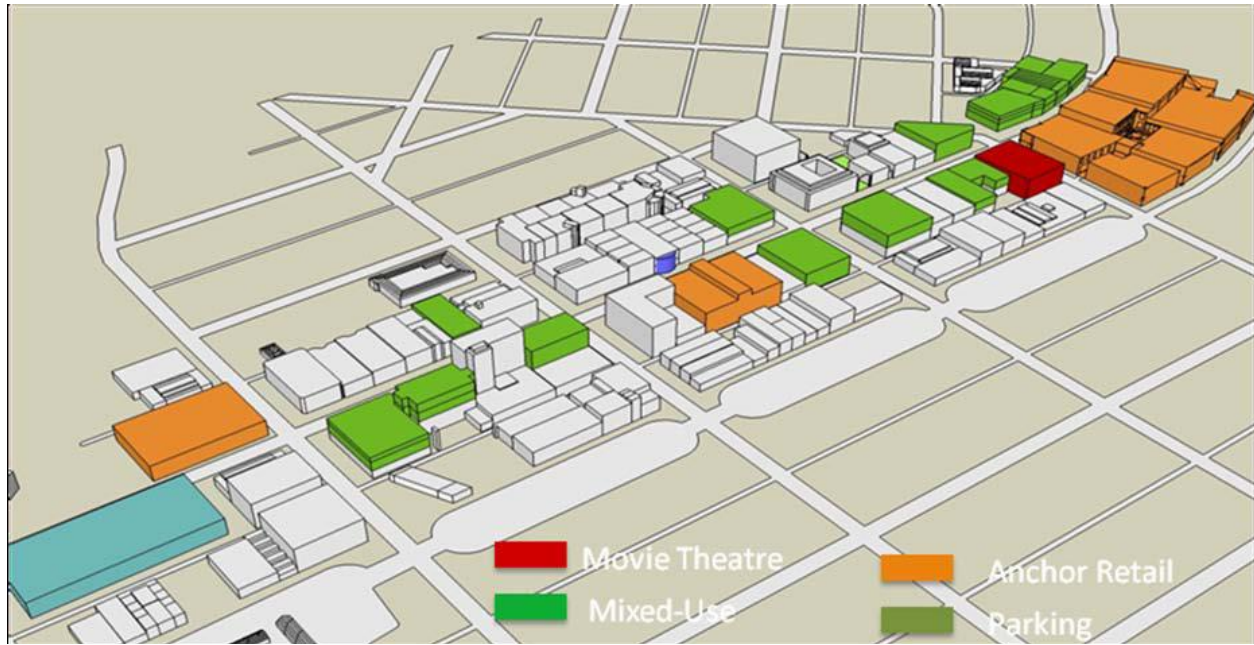
GIB Table 1: Points for LEED Compliant Square Footage (USGBC, 2009)

Percentage of square footage certified	Points
≥ 10% and < 20%	1
≥ 20% and < 30%	2
≥ 30% and < 40%	3
≥ 40% and < 50%	4
≥ 50%	5

Proposed Action:

Currently, the total existing project square footage is 8,029,363 ft². The current proposal designates 161,191 ft² of added mixed use construction to the entire project as infill. This is about 2% of the total square footage of the project. If all of the new construction was LEED certified, it would not meet the minimum requirement for this credit. This calculation is not taking into account the North Anchor, South Anchor, movie theatre or parking structure. Combining these buildings with the mixed use infill will increase the amount of added square footage of new construction to 617,261 ft² only about 7% of the total square footage of the project. Provided that all of the new construction including the Anchors is LEED certified, as the proposal suggest, this still will not be enough total added square footage of LEED certified building to meet the minimum requirement for this credit.

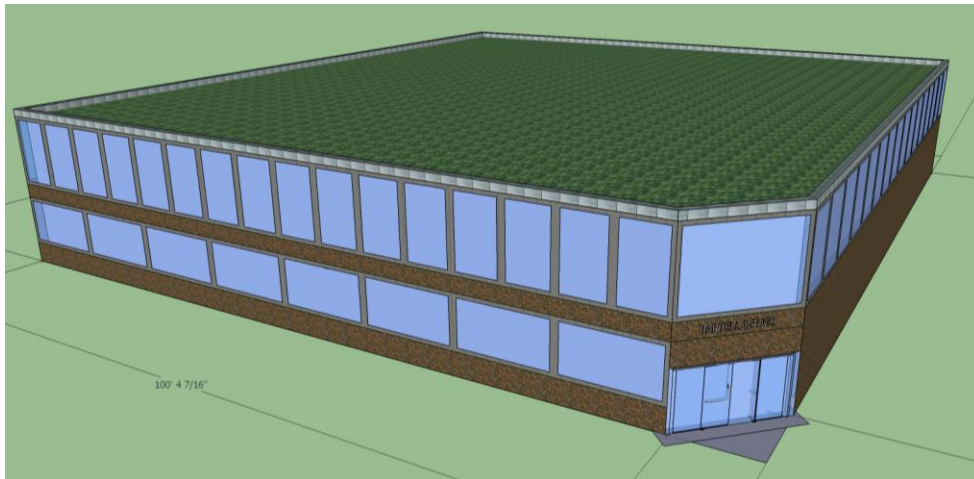
GIB Figure 1. Proposed Building Additions (mixed use infill in green)



Mixed Use Infill and Renovations

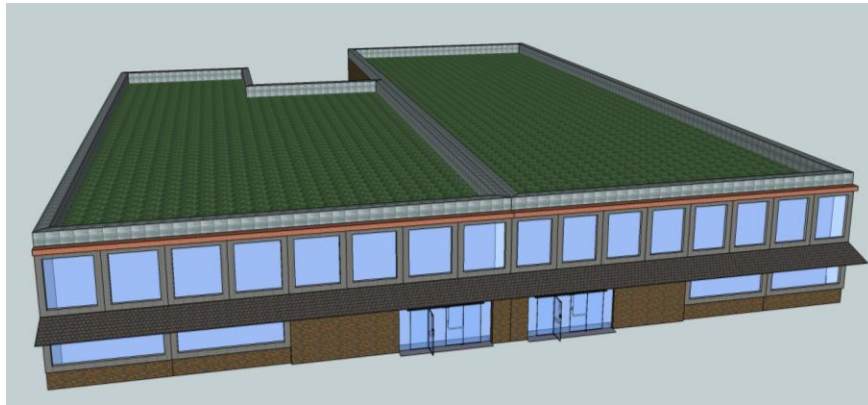
Alley #1:

GIB Figure 2. Bartell Drugstore Floor Addition



Square Footage: 27,180 ft²
Number of Floors: 2
Office Capacity: 17 800 ft² offices
Retail Footage: 13,590 ft²
FAR: 2

GIB Figure 3. Midblock Floor Addition

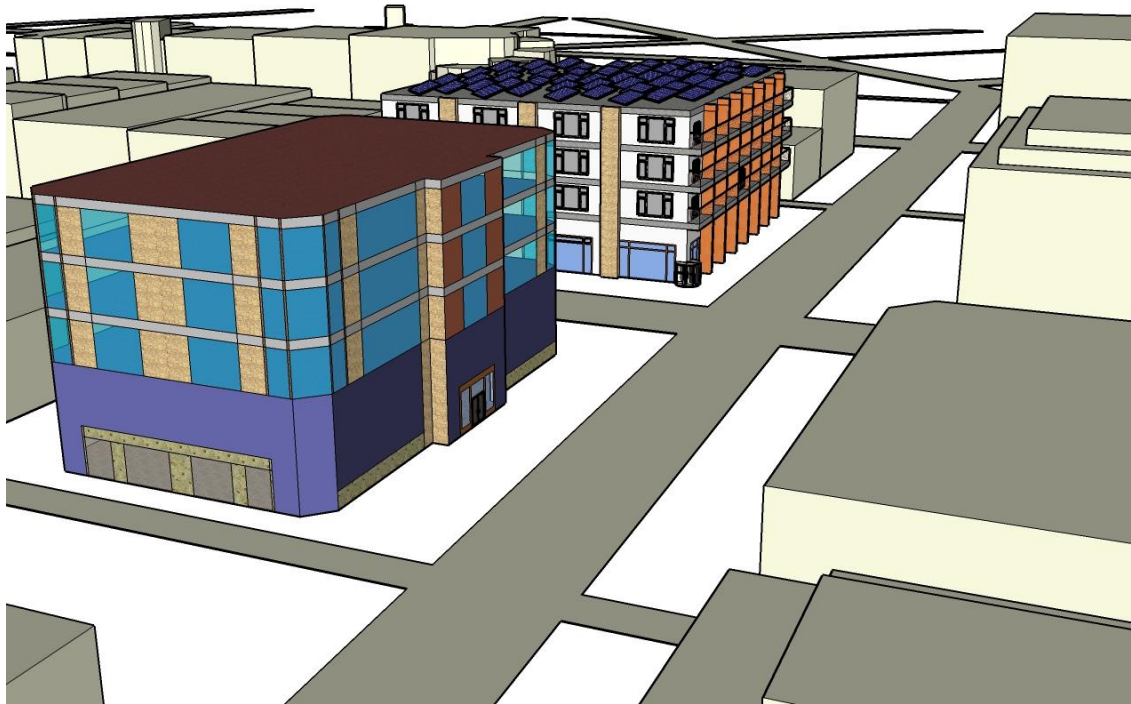


Square Footage: 41, 922 ft²

Number of floors: 2

Alley #2

GIB Figure 5: Chase Bank with Mixed-Use



GIB Figure 6: Chase Bank with Mixed-Use



Square footage: 38,400 ft²

Floors: 2

Alley # 3

Renovation of the Bank of America Building on the corner of Cornwall and Magnolia. Addition of three floors.

Square Footage: 26,840 ft²

Number of Floors: 4

Residential capacity: 20 1000 ft² units

FAR: 2.2

Floor addition of the building on the corner of Cornwall and E. Chestnut.

Square Footage: 24,800 ft²

Number of Floors: 2

Residential Capacity: 12 1000 ft² units

FAR: 1.2

Alley #4

One small building built on the parking lot on the middle of the lot.

Square footage: 27,500 ft²

Number of floors: 4

FAR: 3.9

Alley #5

GIB Figure 4. Peoples Bank Renovation



Square Footage: 51,409 ft²
Number of Floors: 4
FAR: 2.6

Alley #6

GIB Figure 5. Triangular Lot Model



Square Footage: 21,580 ft²
Number of Floors: 4

Alternative Action:

In order to meet the requirements of this credit, more new buildings would have to be proposed for infill sites within the project boundary. There are four parking lots that are potential sites for infill construction, not indicated on the main project proposal. Three are bank parking lots and

one is a parking lot owned by the Bellingham Tower containing a beauty shop. The total lot square footage of these areas combined is 94,205 ft². This calculation only refers to the lot size. With an FAR of three, for potential three story buildings, this would mean an addition of 282,615 ft² of floor space in new building construction. This increase in added infill square footage plus the existing added square footage including the Anchors for the entire project would increase the total added square footage to 899,876 ft². Provided that all of the new buildings containing this square footage are LEED certified, this would increase the percentage of LEED certified area to 11% of the total project, enough to qualify for one credit under this category. These numbers are all rough estimates of potential, meaning that the actual possible buildable area could be more or less than what is reported.

GIB Credit 2: Energy Efficiency in Buildings

Evaluation: Proposed Action: (2/2), Alternative action: (2/2)

Purpose:

Encourage the development of energy efficiency in the design and construction of buildings to limit the environmental impacts of energy production and consumption on air, water and land pollution.

Requirements:

Design at least 90% of all buildings in the project according to the appropriate energy efficiency categories of ASHRAE/IESNA 90.1-2007. New buildings must show an 18% (1point) or 26% (2points) increase in efficiency above the baseline established by the standard. Building renovations must show a 14% (1point) or 22% (2point) increase in efficiency above the standard.

Proposed Action:

Currently we have seven new buildings that we are proposing as infill to various lots along the alleyways. All of these buildings are to be designed and built according to LEED standards. Energy efficiency is a category that LEED certification is especially committed to excelling in. In order to do this, a detailed energy portfolio must be developed for each building plan, using the building performance rating method in Appendix G of ANSI/ASHRAE/IESNA Standard 90.1–2007. For the buildings that are less than 100,000 ft², the Advanced Buildings™ Core Performance™ Guide Section 1 and 2, developed by the New Buildings Institute will provide the planning framework for energy efficiency solutions.

At this stage of the proposal there is no hard data or energy models to outline the exact energy efficiency solutions that these buildings will employ, however the ASHRAE Advanced Energy Design Guide for Small Retail Buildings 2006 provides useful criteria for understanding what some of these solutions might be. The recommendations in this guide have been designed to lead to 30% energy use reductions from the baseline standard outlined in the 90.1-2007. The proposal

outlines a holistic design utilizing an integrated design approach and construction process with the goal of meeting and enforcing energy standards at each stage of the project.

- Draft an Owner's Project Requirement (OPR) document, a brief description of the project energy goals. This document provides a basis for the integrated planning stage of the building.
- Climate Zone analysis that determines the lighting and heating needs with respect to the project's location. Orientation, certain design element, lighting systems, heating systems, passive solar and active solar systems all must be tailored to the specific climate zone of the project.
- Plans that outline interior lighting decisions with specifications for lighting power densities (LPD) as laid out in 90.1-2007 and a plan that distinguishes between general lighting and accent lighting.
- HVAC system that is designed with specific energy efficiency goals.
- A Design Phase that begins early in the project design phase, allowing the team to incorporate energy goals into the details of the building plan. Refer to table 2-1 for a guide for the "integrated" design process.
- A construction phase that outlines specifically the actions a construction team needs to take to ensure that the energy efficiency design meets the energy goals. During the construction phase, an independent team conducts site visits to verify that the outline is being adhered to. Refer to table 2-2.
- After construction, the same independent team evaluated the site to verify that the energy efficiency systems are operating as intended and that the energy goals have indeed been met. Refer to table 2-3 for appropriate timing of this process.

(Advanced Energy Design Guide for Small Retail Buildings, www.ashrae.org)

"A second engine driving green building practice is the concept of integrated design: working in interdisciplinary teams to optimize overall building performance without adding construction cost. Integrated design teams have succeeded by reallocating existing budget monies to achieve a higher-performance building, largely by stressing the performance of systems over components. The classic illustration of design integration is increasing the energy performance of a building's envelope, which in turn enables the installation of a smaller and more efficient mechanical system," (Farr, 2007).

Calculations:

Whatcom County is in Climate Zone 3, according to the EIA Commercial Building Energy Consumption Survey climate zone analysis. Climate zone 3 as defined in this context has less than 2,000 cooling degree days and 4,000-5,499 heating degree days over a 30 year period. Both heating and cooling degree days are the difference between the average temperature of a given day and a baseline of 65 degrees. An average below the baseline is a heating degree day and an average above the baseline is a cooling degree day.

Average commercial building energy intensity is 90.5 thousand Btu (per square foot). Office buildings have an average energy intensity of 97.2 thousand Btu per square foot. Office buildings of different sizes have different energy intensities.

GIB Table 2: Office Building Energy Intensities

Office buildings	Table 2	
Small	1,001 - 5,000 square ft.	87.2 thousand Btu / square ft.
Medium	5,000 – 50,000 square ft.	82.6 thousand Btu / square ft.
Large	>50,000 square ft.	109 thousand Btu / square ft.

Retail and service buildings have an average energy intensity of 76.4 thousand Btu per square foot. Food service buildings have an average energy intensity of 245.5 thousand Btu per square foot (see Appendix I). Based on the average commercial building energy intensity and the square footage of new mixed use construction infill for the total project site, the project would require about 1.46×10^{10} Btu. A 26% reduction of this value would mean reducing the consumption by 3.8×10^9 Btu, meaning the total consumption of all the buildings would instead be 1.08×10^{10} Btu. This is a rough calculation of energy consumption based on the national standards and is cited to provide a rough baseline for potential energy efficiency goals.

Alternative Action:

This requirement is possible to meet through the outline above. No alternative action is necessary provided that the building and design of new infill and renovations is conducted based on the initial energy modeling and integrated design approach.

GIB Credit 3: Building Water Efficiency

Evaluation: Proposed action: (0/1), Alternative action: (1/1)

Purpose:

Reduce effects on natural water resources and reduce burdens on community water supply and wastewater systems by reducing the water consumption in major renovations.

Requirements:

Indoor water usage in new buildings and renovations must be 40% less than that of baseline buildings, established by the Energy Policy Act of 1992, Energy Policy Act of 2005 and the fixture performance standards outlined in the Uniform Plumbing Code of 2006.

Proposed Action:

There is little specification for water efficiency in the proposal, especially technology that will be able to meet the tightening restrictions of this credit. The LEED 2009 water efficiency standards have become more stringent, as well as the baseline water usage requirements. The prerequisite calls for a 20% reduction over baseline water usage values based on the best case water efficiency technology. Achievement of this credit involves a reduction of 40%. Due to the limits of current ultra-low flow water devices, the current evaluation would need plans that incorporate gray water systems or waterless fixture technology to meet this requirement.

An **estimated occupancy baseline usage** needs to be calculated which include only the following fixtures and fittings: water closets (toilets), urinals, lavatory faucets, showers, kitchen sink faucets, and pre-rinse spray valves. The **water efficiency threshold** is calculated as a weighted average of water usage for the buildings constructed as part of the project based on their conditioned square footage.

Alternative Action:

All new construction and renovations will need to be designed and build with LEED compliant fixtures that demonstrate the flow requirements established in this credit. This means using fixtures that represent the leading edge in low-flow technology. However, this credit requires a 40% increase in efficiency, suggesting that a majority of the plumbing devices will have to be replaced with zero water appliances and a non-potable water recycling system will need to be incorporated in the design plans of each building. Both of these actions are feasible.

Zero water appliances include composting toilets and waterless urinals. Composting toilets are becoming highly sophisticated, far from the backyard problem that they are often associated with. There are a number of manufacturers (Envirolet, Ecovita, Clivus Multrum, Sun-Mar, ect.) who make various models from tiny to high capacity, three stage models with electronic mixing. Waste coming from these devices is sterile and ready for use or easily disposable through a municipality. Waterless urinals are a basic urinal that is designed so that no flush is needed to remain sanitary. These urinals will save on energy costs associated with flushing apparatus, water costs, plumbing costs and insulation costs. Manufacturers include DesertCube, Ecotech Water LLC, Kohler, Zero Flush and more (Stumpf, 2006).

Employing a non-potable water recycling system has many positive benefits through LEED-ND. Not only will it help meet the requirements for this credit, but it will help with Credit 8, Stormwater Management by collecting runoff directed from buildings into cisterns installed during renovation or construction. This water is then treated, stored and incorporated into a selective plumbing system that routes the runoff into various non-potable uses that can offset the use of potable water from the city system.

GIB Credit 4: Water-Efficient Landscape

Evaluation: Proposed action: (0/1), Alternative action: (1/1)

Purpose:

To limit or eliminate the use of potable water and other natural surface or subsurface water resources on project sites for landscape irrigation.

Requirements:

Reduce the water consumption for outdoor irrigation 50% from midsummer baseline using a combination of the following strategies.

- a. Plant species, plant density, and microclimate factor.
- b. Irrigation efficiency.
- c. Use of captured rainwater.
- d. Use of recycled wastewater.
- e. Use of water treated and conveyed by a public agency specifically for non-potable uses.
- f. Use of other non-potable water sources, such as storm-water, air-conditioning condensate, and foundation drain water.

Proposed Action:

There are currently no proposed recycled water systems for landscape irrigation.

Alternative Action:

Since the alleyways are a constrained space, there is little room for landscaping options, especially since retail buildings are proposed for the infill lots. Space is limited and sunlight is limited, especially since increasing building height and installing photovoltaic solar panels provides important efficiency solutions as specified by LEED. However, plants do provide shade that can help mitigate the urban heat island effect, provide evapotranspiration of precipitation that would otherwise runoff into surface water and soften the urban landscape for the casual pedestrian or resident. We will be looking for any opportunity to landscape within our project boundary. Additionally, there is the connection lot on E. Maple and Cornwall that will allow for the connection of the interurban trail to the downtown corridor. We propose that this lot be landscaped in such a way as to restore it to a native lowland forest habitat as much as possible.

Project Phase 1: Through the overall design of the project and infill additions, determine the capacity for plants in the urban landscape. Design for the connection lot will include specific location of plants by species, trail location and boundaries. Based off of this initial design, a midsummer water demand baseline can be calculated based off of the average rainfall for the area, specific plant demand based on species used and groundwater availability. Incorporated in the design will be solutions for reducing that demand by the specified amount. Some of these options include:

- Use of native species whose water requirements and midsummer tolerances match the local climate, requiring less application of additional water beyond the seasonal precipitation.
- Use of a rainwater catchment system that collects the rainwater from the roofs of the alleyway buildings and directs it to large storage tanks which have a large enough capacity to hold water through the wet season.
- A drip irrigation system that is connected to the rainwater catchment system which will allow for the direct application of rainwater to plants to increase the efficiency of delivery while reducing the load on municipal water.

GIB Credit 5: Existing Building Reuse

Evaluation: Proposed action: (1/1), Alternative action: (1/1)

Purpose:

To extend the life cycle of existing building stock to conserve resources, reduce waste, and reduce adverse environmental effects of new buildings related to materials manufacturing and transport.

Requirements:

Use 50% of the existing building structure in a renovation, including the structural floor, roof decking, exterior skin and framing or 20% of the total existing building stock including the structure and exterior.

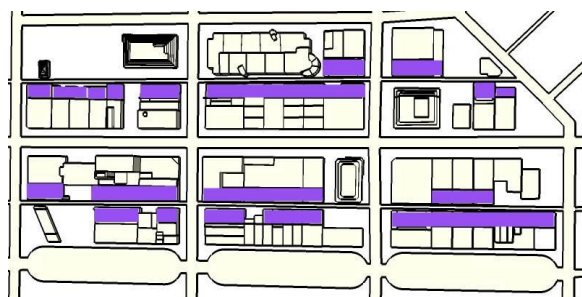
Proposed Action:

The current proposal suggests a plan to renovate many of the shops that face Railroad, Cornwall and Champion and in doing so, create additional shop frontage along the alleyways so that they can become shopping corridors. Many of the existing shops are constructed in a style which is consistent with the historic center of downtown Bellingham, meaning that any renovation efforts will require the re-use of existing structures to maintain the structural integrity and style of Bellingham's downtown.

Alternative Action:

Other LEED-ND GIB technology credits call for the use of contemporary energy efficient design and green building techniques. Renovating old buildings now, gives the developer an excellent opportunity to create buildings that exemplify the environmental values of coming generations while preserving the historic atmosphere of a particular place. Adherence to these principles requires reducing the amount of construction waste that a project creates by the re-use of existing infrastructure and materials.

GIB Figure 6: Proposed Alleyway Retail Split (Cornwall Revitalization, 2010)



Phase 1: (See Appendix J) The initial design and construction phase will focus on renovation projects primarily in order to develop realistic goals. Therefore, construction will begin by clearing the alleyways of power lines and garbage dumpsters, then renovating key locations along the alleyway corners, making possible retail frontage on both the main street and the alleyway. Corner lots are more accessible than mid-alley lots so there initial renovation should draw people in to the alleys as a pedestrian corridor, setting the stage for the renovation and split retail conversion of middle lots. It is through these initial renovation projects that this credit will be addressed.

Phase 2: (See Appendix J) After corner lots are renovated and alleyways are resurfaced with a storm-water system and new pavement, the renovation of mid-alley lots can commence. During this phase, meeting the requirements of this credit will become especially important due to the numerous complicated renovations that will take place.

GIB Credit 6: Historic Resource Preservation and Adaptive Reuse

Evaluation: Proposed action: (1/1), Alternative action: (1/1)

Purpose:

To encourage the preservation and adaptive use of historic buildings and cultural landscapes that represent significant embodied energy and cultural value, in a manner that preserves historic materials and character-defining features by not demolishing any historic buildings, or portions thereof, or alter any cultural landscapes as part of the project.

Requirements:

At least on historic building or preservation site must be present within the project boundary.

Proposed Action:

There are six historic buildings on the project site. The Leopold Hotel on 1224 Cornwall Ave, the Bellingham National Bank, the BPOE Elks Building on 1414 Cornwall Avenue, the Federal

Building at 104 West Magnolia and the Montague and McHugh building at 114 West Magnolia. The location of these historic buildings fulfills the requirements for this credit.

The requirements for this credit also specifies that if these buildings are to be renovated at all, approval must be granted by the local historic preservation review board and the historical integrity of the building must not be compromised.

Alternative Action:

Few of the historical buildings are set for renovation within the project boundary except for the Montague and McHugh building on 114 W. Magnolia. The renovation of this building will not occur unless approval is granted in a programmatic agreement with the State Historic Preservation Office.

GIB Credit 7: Minimize Site Disturbance in Design and Construction

Evaluation: Proposed action: (1/1), Alternative action: (1/1)

Purpose:

To preserve existing noninvasive trees, native plants, and pervious surfaces by locating 100% of the development footprint on areas that have been previously impacted by construction.

Requirements:

Locate 100% of the development on lands that have been previously developed (see Definitions) or 100% of the project impact zone on lands that have been previously developed.

Proposed Action:

The project takes place in the downtown sector which has been 100% developed.

Alternative Action:

The connection lot on E. Maple and Cornwall is the only undeveloped lot, based on the LEED-ND 2009 definition of previously developed. We have proposed a reconditioning of this site with the goal of restoring it to a natural habitat. Therefore, we are not proposing infrastructure development that will impact native vegetation, seal pervious surfaces or damage non-invasive trees.

Phase 1: For proof of compliance under this credit a survey will be conducted to determine:

- The condition of existing trees in the project boundary by a certified arborist.
- Location of heritage trees with historic significance.
- Trees larger than 6 inches DBH.
- Location of any invasive vegetation.

GIB Credit 8: Storm-water Management

Evaluation: Proposed action: (2/4), Alternative action: (2-4/4)

Purpose:

To reduce pollution and hydrologic instability from storm-water, reduce flooding, promote aquifer recharge, and improve water quality by emulating natural hydrologic conditions.

Implement a comprehensive storm-water management plan for the *project* that retains on-site, through infiltration, evapotranspiration, and/or reuse the rainfall volumes listed in Table 3.

GIB Table 3. Points for retaining storm water on-site (USGBC, 2009)

Percentile rainfall event (total volume to be retained)	Points
80%	1
85%	2
90%	3
95%	4

Proposed Action:

Currently, the storm-water system coming from the roves downtown is not connected to the municipal sewer for sewage capacity reasons, meaning that runoff goes down the alleyways to three storm-water collection locations within the project boundary.

- 1) A 30 inch pipe receiving water from the Chestnut Street portion of the project that discharges into the Whatcom Waterway at Laurel Street. This is an untreated flow prior to discharge into the Bay.
- 2) A 36 inch pipe collecting water from the Holly, Magnolia area of the project that discharges into the Whatcom Creek estuary at Marine Heritage Park after it goes through a treatment process located in Army Street ROW on the southerly side of Holly.
- 3) A system that drains the Champion Street area which discharges water at various points along Whatcom creek, none of which are treated (W. M. Reilly, personal email communication).

The proposal calls for the alleyways to me resurfaced with a Low Impact Development (LID) pervious surface that will allow rainwater to infiltrate the pavement. New development on the project currently proposes green roofs and roof gardens. Both measures will help to deliver surface runoff to the ground water system or directly to the atmosphere through evapotranspiration by the plants used in green roof additions.

Calculations:

According to the National Oceanographic and Aeronautic Association (NOAA) the largest rainfall event in the Bellingham Area was 5.02 inches in one day. (NOAA Climatic Data Center) Given that the total project area is 971,903 ft² or about 22 acres, the total amount of runoff from an event of this magnitude would be 3,029,559 gallons of water in one day.

GIB Table 4. Water Volumes

Percentile Storm Event	Square Feet	Rainfall, inches	Gallons Captured	Points Earned
100%	971,903 ft ²	5.02	3,029,559	4
95%	971,903 ft ²	4.77	2,879,863	4
90%	971,903 ft ²	4.52	2,727,791	3
85%	971,903 ft ²	4.27	2,575,719	2
80%	971,903 ft ²	4.02	2,426,023	1

Alternative Action:

Our goal for developing a BMP (see Definitions) will be based on the Washington State Department of Ecology’s Storm-water Management Manual for Western Washington, Volume V, Runoff Treatment (2005). We are trying to retain storm-water on site, through infiltration, evapotranspiration and reuse. The Department of Ecology is committed to help municipalities retrofit and build low impact storm-water systems through numerous incentives. Low impact development refers to a method of building infrastructure that imitates the natural hydrology or movement of water at the site. For the Pacific Northwest, originally a temperate forest ecosystem, the majority of precipitation is dispersed along the forest floor or returned to the atmosphere through evapotranspiration. Only about 1% of the falling precipitation will actually become surface runoff. Conventional high impact development prevents infiltration from occurring by sealing soils with impermeable surfaces like concrete, asphalt and buildings. Doing this increases the percentage of a precipitation event that goes to surface runoff, which alters the frequency and magnitude of flood cycles in streams. Here in Bellingham, altering the existing flood disturbance regime of streams has a negative impact on salmon. Our project is located in the Whatcom Creek watershed which is a salmon bearing stream. Being an urban stream, it is especially susceptible to alteration from urban runoff due to impermeable surfaces, making it necessary to employ low impact development practices in all new construction in the downtown corridor in hopes of moving towards the restoration of a disturbance regime that is within historic boundaries (PSP, Low Impact Development, 2010).

“Over the past two centuries, however, rapid climate change and major anthropogenic modifications to salmon ecosystems have dramatically altered disturbance regimes that salmon experience. To the extent that these disturbance regimes assume characteristics outside the range of the historical template the species evolved under, resilience of salmon populations might be compromised,” (Waples, 2009).

It may be difficult to justify the cost of storm-water improvements in the project boundary when the impermeable surface contained here is only a small fraction of the impermeable surface in the rest of the Whatcom Creek watershed. The realized effect on flood regimes and pollution in Whatcom Creek might not be significant. Furthermore, the salmon populations in this watershed are already severely depressed. However, developing a working storm-water system in this

project will provide vital data that can translate to other low impact development storm-water projects across the city, making this project the necessary piece to a bigger puzzle.

Phase 1: A survey will be conducted to determine the project's development footprint, a baseline from which the rainfall retention value will be calculated with. It will include the potential pollution sources, either point or non-point, landscaping and percentage of non-pervious surfaces. Using the guidance of the Storm-water Management Manual, solutions that will help meet the requirements of water retention will be incorporated into the design phase of the project. During the initial construction phase, an underground storm-water system will be built that will ensure the stability of surrounding soils. This means routing the underground water to areas that are stable enough for the water to flow into the ground water system. All of the underground engineering will be based on the BMP's outline in the necessary documents. The goal during this phase is to increase the area of pervious surface in the alleyways by repaving them with permeable brick. There are a number of permeable brick products utilizing recycled materials that will be feasible, including EZ-Bricks and ARTO products.

Another solution for reducing storm-water volumes is to employ green roof technology on a portion of site.

“Green roofs can also mitigate storm-water runoff from building surfaces by collecting and retaining precipitation, thereby reducing the volume of flow into storm-water infrastructure and urban waterways. Green roofs are ideal for urban storm-water management because they make use of the existing roof space and prevent runoff before it leaves the lot. They can reduce annual total building runoff by as much as 60% to 79% and estimates based on a 10% green roof coverage suggest that they can reduce overall regional runoff by about 3%.” (Oberndorfer, 2007)

GIB Credit 9: Heat Island Reduction

Evaluation: Proposed action: (1/1), Alternative action (1/1)

Purpose:

Reduce heat islands to minimize effects on the microclimate and human and wildlife habitat.

Requirements:

Incorporate into 50% of the project's non roof hardscape any combination of the following strategies:

- a. Provide shade from open structures, such as those supporting solar photovoltaic panels, canopied walkways, and vine pergolas, all with a solar reflectance index (SRI) of at least 29.
- b. Use paving materials with an SRI of at least 29.
- c. Install an open-grid pavement system that is at least 50% pervious.
- d. Provide shade from tree canopy (within ten years of landscape installation).

Proposed Action:

The current proposal calls for a paving and pathway system in the alleyways made from a Low Impact Development (LID) pervious surface.

Alternative Action:

Many of the proposed solutions influence more than one of the LEED-ND credit requirements. For this credit, the installation of a pervious surface as a pavement will also reduce the heat island effect if the color chosen has a SRI above 29. Many of the paving products available do provide this option and advertise as LEED certified products.

Green roof technology will provide strength to the entire GIB section and especially this credit.

“In urban environments, vegetation has largely been replaced by dark and impervious surfaces. These conditions contribute to an urban heat island, wherein urban regions are significantly warmer than surrounding suburban and rural areas, especially at night. This effect can be reduced by increasing albedo (the reflection of incoming radiation away from the surface) or by increasing vegetation cover with sufficient soil moisture for evapotranspiration. A regional simulation model using 50% green roof coverage distributed evenly throughout Toronto showed temperature reductions as great as 2 degrees centigrade in some areas,” (Oberndorfer, 2007).

Renovated and new buildings on the project site will also be designed with SRI compliant or green roof technology. Green roofs also have a storm-water mitigation component to them and are to be installed during both construction phases.

GIB Credit 10: Solar Orientation

Evaluation: Potential points: (0/1), Alternative action: (0/1)

Purpose:

To encourage energy efficiency by creating optimum conditions for the use of passive and active solar strategies.

Requirements:

Design and orient 75% or more of the project’s total building square footage (excluding existing buildings) such that one axis of each qualifying building is at least 1.5 times longer than the other, and the longer axis is within 15 degrees of geographical east-west.

Proposed Action:

The alleyways currently run northeast to southwest. Some of the proposed infill, especially the triangle shaped lots along Alley #6, at the North End of the development that face west. Champion Street has potential to have Buildings oriented along an East-West axis. Both lots have a combined total of 17,380 square feet, making up about 26% of the total square footage added through infill development. Any renovations must comply with the Existing Building

Reuse credit, meaning that the current orientation of the buildings along both blocks must be maintained in order to conserve existing infrastructure.

Alternative Action:

Due to the orientation of the project and the constrained nature of the urban infill, there is little room to orient buildings along an East/West axis. There is a possibility of doing this on the movie theatre in Alley #1 and the triangle lots on Alley #6, were a tiered construction could be used to orient the longest building faces southward. However, these buildings are not a high enough proportion of the project to meet this requirement. It might be possible to meet this requirement with the Anchor buildings, especially the North Anchor.

GIB Credit 11: On-Site Renewable Energy Sources

Evaluation: Proposed action: (1/3), Alternative action: (3/3)

Purpose:

Promote on-site renewable energy to reduce energy consumption.

Requirements:

Incorporate on-site nonpolluting renewable energy generation, such as solar, wind, geothermal, small-scale or micro hydroelectric, and/or biomass, with production capacity of at least 5% of the project's annual electrical and thermal energy cost (exclusive of existing buildings).

Proposed Action:

The project does not address on-site renewable energy for the alleyways.

Alternative Action:

Create multiple renewable energy measures to collectively create enough energy to fulfill the LEED credit. Viable measures could include biomass, wind, photovoltaic cells, and solar water heating. The project needs to include at least 5% of the annual thermal and electrical costs as being produced by on-site renewable energy. Receiving one point for this credit seems to be the most feasible solution due to the amount of construction and space needed for larger scale renewable energy sources.

Another option to meet this requirement, provided that all possible onsite renewable energy sources are utilized, would be to purchase Renewable Energy Certificates (REC) that verify offsetting the energy consumption on the project with offsite renewable energy generation. A REC measures the delivery of 1Mwh or 1000kwh of renewable electricity to the intercontinental grid. When an electron is added to the grid, it is physically indistinguishable from an electron produced by a non-renewable source. A REC represents the right to claim the environmental benefits of that electricity source and account for electricity generation through renewable sources (REC, U.S. Environmental Protection Agency).

GIB Credit 12: District Heating and Cooling

Evaluation: Proposed action: (2/2), Alternative action: (2/2)

Purpose:

Reduce environmental pollution by employing a district heating system.

Requirements:

Incorporate a district heating and/or cooling system for space conditioning and/or water heating of new buildings (at least two buildings total) such that at least 80% of the *project's* annual heating and/or cooling consumption is provided by the district plant. *Single-family residential* buildings and *existing* buildings of any type may be excluded from the calculation.

Proposed Action:

The entire downtown project site could utilize the services of the nearby CoGen steam plant for district heating. This would be a relatively easy task to accomplish with the cooperation of the entire project site. 80% of the project's annual heating and/or cooling energy must come from the district plant. Each system component that is addressed by ANSI/ASHRAE/IESNA Standard 90.1-2007 must have an overall efficiency performance at least 10% better than that specified by the standard's prescriptive requirements. Additionally, annual district pumping energy consumption that exceeds 2.5% of the annual thermal energy output of the heating and cooling plant (with 1 kWh of electricity equal to 3,413 Btus) must be offset by increases in the component's efficiency beyond the specified 10% improvement.

Alternative Action:

No alternative action is needed.

GIB Credit 13: Infrastructure Energy Efficiency

Evaluation: Proposed action: (1/1) Alternative action: (1/1)

Purpose:

Reduce pollution of the environment from energy consumption.

Requirements:

Design, purchase, or work with the municipality to install all new infrastructure, including but not limited to traffic lights, *street* lights, and water and wastewater pumps, to achieve a 15% annual energy reduction below an estimated baseline energy use for this infrastructure. The baseline is calculated with the assumed use of lowest first-cost infrastructure items.

Proposed Action:

The project does not address the reduction of infrastructure energy consumption.

Alternative Action:

The use of LED traffic lights, energy-efficient street lights, wastewater treatment systems, and any other low-energy measures. Utilizing these efficient devices will be a very manageable task in the development of the project site serving a good purpose of lowering energy consumption and reducing utilities costs. The energy usage costs would have to be lowered by 15% annually in order to fulfill this credit.

GIB Credit 14: Wastewater Management

Evaluation: Proposed action: (2/2) Alternative action: (2/2)

Purpose:

Reduce pollution created from wastewater and promote reuse of wastewater.

Requirements:

Design and construct the *project* to retain on-site at least 25% of the average annual wastewater generated by the project (exclusive of *existing* buildings), and reuse that wastewater to replace *potable water*. An additional point may be awarded for retaining and reusing 50%. Provide on-site treatment to a quality required by state and local regulations for the proposed reuse. The percentage of wastewater diverted and reused is calculated by determining the total wastewater flow using the design case after the GIB Prerequisite 3 calculations, and determining how much of that volume is reused on-site.

Proposed Action:

Create a project design to reuse wastewater generated from the site of at least 50% of the total created. The use of on-site wastewater treatment will be the best way to achieve this credit as in treating wastewater generated in a building within the same building. Wastewater could also be directed to the Post Point Wastewater Treatment Plant located in the Fairhaven neighborhood.

Alternative Action:

No alternative action is needed.

GIB Credit 15: Recycled Content in Infrastructure

Evaluation: Proposed action: (1/1) Alternative action: (1/1)

Purpose:

Use recycled materials to reduce the need of manufacturing new materials from natural resources.

Requirements:

Use materials for new infrastructure such that the sum of *postconsumer* recycled content, in-place reclaimed materials, and one-half of the *preconsumer* recycled content constitutes at least 50% of the total mass of infrastructure materials. Count materials in all of the following infrastructure items as applicable to the *project*:

- a. Roadways, parking lots, sidewalks, unit paving, and curbs.

- b. Water retention tanks and vaults.
 - c. Base and subbase materials for the above.
 - d. Stormwater, sanitary sewer, steam energy distribution, and water piping.
- Recycled content is defined in accordance with ISO/IEC 14021, Environmental labels and declaration, Self-declared environmental claims (Type II environmental labeling).

Proposed Action:

Utilization of low-impact development in pavement surfacing. Surfacing the pavement in the alleyways with as much recycled material as possible will achieve the credit requirement. Having at least 50% of the materials used in the infrastructure be recycled material. This could be attained through creating sidewalks, parking lots, roadways, and all subbase materials with recycled products.

Alternative Action:

No alternative action is needed.

GIB Credit 16: Solid Waste Management Infrastructure

Evaluation: Proposed action: (1/1) Alternative action: (1/1)

Purpose:

Reduce the amount of waste created from construction and demolition debris from landfill and incinerator disposal.

Requirements:

Meet at least four of the following five requirements and publicize their availability and benefits:

- a. Include as part of the *project* at least one recycling or reuse station, available to all project occupants, dedicated to the separation, collection, and storage of materials for recycling; or locate the project in a local government jurisdiction that provides recycling services. The recyclable materials must include, at a minimum, materials paper, corrugated cardboard, glass, plastics and metals.
- b. Include as part of the project at least one drop-off point, available to all project occupants, for potentially hazardous office or household wastes; or locate the project in a local government jurisdiction that provides collection services. Examples of potentially hazardous wastes include paints, solvents, oil, and batteries. If a plan for post-collection disposal or use does not exist, establish one.
- c. Include as part of the project at least one compost station or location, available to all project occupants, dedicated to the collection and composting of food and yard wastes; or locate the project in a local government jurisdiction that provides composting services. If a plan for post-collection use does not exist, establish one.
- d. On every mixed-use or nonresidential *block* or at least every 800 feet, whichever is shorter, include recycling containers adjacent to other receptacles or recycling containers integrated into the design of the receptacle.

e. Recycle and/or salvage at least 50% of nonhazardous construction and demolition debris. Develop and implement a construction waste management plan that, at a minimum, identifies the materials to be diverted from disposal and specifies whether the materials will be stored on-site or commingled. Excavated soil and land-clearing debris do not contribute to this credit. Calculations can be done by weight or volume but must be consistent throughout.

Proposed Action:

Create a waste management plan that implores the recycling and salvage of at least 50% of the construction debris. There are several recycling stations located in the downtown area. Hazardous waste drop-off points and compost stations are located within a few miles of the project site.

Alternative Action:

No alternative action is needed.

GIB Credit 17: Light Pollution Reduction

Evaluation: Proposed action: (1/1) Alternative action: (1/1)

Purpose:

To provide enough lighting for improving pedestrian safety and comfort. Improve nighttime visibility through reducing glare from the built environment.

Requirements:

“Shared areas” of a project are spaces and facilities dedicated to common use (publicly or privately owned).

In residential areas, at least 50% of the external luminaires must have fixture-integrated lighting controls that use motion sensors to reduce light levels by at least 50% when no activity has been detected for 15 minutes.

AND

In all shared areas, install automatic controls that turn off exterior lighting when sufficient daylight is available and when the lighting is not required during nighttime hours; these lights must meet the total exterior lighting power allowance requirements in Table 3.

AND

Document which lighting zone or zones (Table 1) describe the project, and for all shared areas, follow the requirements in Table 2. If two or more different zones border the project, use the most stringent uplight requirements, and use light trespass requirements for the adjacent zone. Roadway lighting that is part of the project must meet the requirements for the appropriate zone. For illuminance generated from a single luminaire placed at the intersection of a private vehicular driveway and public roadway accessing the site, project teams may use the centerline of the public roadway as the site boundary for a length of two times the driveway width centered at the centerline of the driveway when complying with the trespass requirements.

Compliance with the light trespass requirements may alternatively be met by using only luminaires that comply with Table 4 ratings for backlight and glare.

AND

Stipulate *covenants, conditions, and restrictions* (CC&R) or other binding documents to require continued adherence to the requirements.

Proposed Action:

The current plan is to maintain 80% lighting coverage on building facades within alleyways. This is intended to provide maximum comfort and visibility for patrons within alleyways. The best way to comply with the LEED credit would be to install motion sensors onto at least 50% of fixtures where light is dimmed by 50% when there has been no pedestrian activity for 15 minutes. Another task that the credit calls for is that on angling street lights in such a way to avoid unnecessary glare shining into residences and obstructing nighttime views. These are very feasible measures to utilize in the project design, as the extensive one-time costs of the products can be alleviated by long-term lowered energy use.

Alternative Action:

No alternative action is needed.

Innovation and Design Process (IDP)- 6 Possible Points

Proposed Action: (3/6)

Alternative Action: (3/6)

“In this age of entrenched economic and political forces opposing sustainability, no single planning effort is going to set cities on a path towards a healthy long-term future. Rather, the need is for long-term strategy emphasizing consensus processes, public education, political organizing, policy tools such as indicators and performance standards, development of vision documents and “best practices” examples, and the creation of institutions that can more effectively address physical planning and equity issues. Together, such efforts can develop the knowledge, political will, and institutional capacity to bring about change.” (Wheeler, pg. 507)

IDP Credit 1: Innovation and Exemplary Performance

IDP Proposed Credit 1.1: Non-Motorized Transportation Infrastructure

Evaluation: 1 Point

Purpose:

To increase and maintain non-motorized transportation travel. To improve bike lane, sidewalk, and trail connectivity and quality. Enhancing the non-motorized travel experience as to induce sustainable modal choices.

Compliance Requirements:

Option 1

Increase trail connectivity within and surrounding the project boundaries. Connect at least 2 existing trails together within a mile radius of the project. The new trail connection must meet local government guidelines and be at least a ¼ mile in length. A document must be created in association with the local government to agree upon which trails are most important to extend around project boundaries and if any specific amenities should be included within the trail extensions such as benches.

Option 2

Enlarge sidewalk space to at least 12 feet wide in 80% of the project area. Enlarge bike lanes to at least 3 feet wide with clear lane designation in 80% of the project area. A document must be created to identify areas where sidewalks should be built if no sidewalks exist in accordance with the local government.

IDP Proposed Credit 1.2: Pedestrian Safety

Evaluation: 1 Point

Purpose:

To provide pedestrians with a sense of safety while walking through the urban pedestrian realm. Create a walkable environment to maintain more foot traffic which in turn creates more customers for nearby businesses and added safety with more pedestrians providing eyes on the street.

Compliance Requirements:

Mitigate wherever potentially hazardous conditions exist for pedestrians. A consensus must be achieved with the local government to identify and agree upon areas where mitigation should be done. A document must be made in coordination with the local government identifying where pedestrian hazards are located and how they will be fixed.

1. Add lighted crosswalks to hazardous areas.
2. Add lighting 80% of store fronts.
3. Create mixed-use buildings with residential above commercial space in identified dead-zones.

IDP Proposed Credit 1.3: Aesthetics and Artisanhip

Evaluation: 1 Point

Purpose:

To account and provide for social capital in the urban environment by providing an artistic experience. *“We need art , in the arrangements of cities as well as in the other realms of life, to help explain life to us, to show us meanings, to illuminate the relationship between the life that each of us embodies and the life outside us. We need art most, perhaps, to reassure us of our own humanity.”* (Jacobs, 1992, pg. 372)

Compliance Requirements:

Provide public art in the amount of 1.5% of the total construction costs up to 1 million dollars dedicated to public art. Residents within a project area must not be more than a ½ mile radius away from a piece of public artwork. The requirement for implementing public art initiates when construction or renovation costs total over \$100,000. The quality and content of the public art must be approved by the local government to assure suitable art is placed.

IPD Credit 2: LEED® Accredited Professional

Evaluation: 1 Point

Proposed Action:

This credit can be attained through the training of a City of Bellingham staff member of the Planning & Community Development Department. Most likely the staff member would be the Planning Director or a Planner III as the LEED Professional would be in a managerial position overseeing the progress of the revitalization of downtown Bellingham.

Regional Priority Credit (RPC)-4 Possible Points

Proposed Action: (3/4)

Alternative Action: (4/4)

Purpose:

LEED-ND provides for additional points when credits are fulfilled to a certain amount. The credits that apply to regional credits vary depending on geographical location which change in importance according to the zip code of the given project site location.

Requirements:

RPC are gained from previous LEED-ND credits that USBGC and regional councils have designated as specifically important to their local area. Under each ZIP code there is an opportunity to gain 4 credits of a total 6 credits available.

Relevant Credits:

RP Credit 1: (1 Point)

SLL Credit 5: Housing and Jobs Proximity

Evaluation: Proposed action: (3/3)

RP Credit 2: (1 Point)

NPD Credit 3: Mixed-Use Neighborhood Centers

Evaluation: Proposed action: (4/4)

RP Credit 3: (1 Point)

NPD Credit 4: Mixed-Income Diverse Communities

Evaluation: Proposed action: (6/6)

RP Credit 4: (1 Point)

GIB Credit 8: Stormwater Management

Evaluation: Proposed action: (2/4), Alternative action: (2-4/4)

Final Analysis

Based on our analysis of the current proposal for the Cornwall Revitalization, we concluded that the project would achieve a LEED-ND rating of Gold. This rating was assigned to the proposal as is. When information was not present in the proposal, we gathered that information when possible and included it in our analysis. Overall, our assessment was positive for the current condition of the proposal, due to the effort taken to find sustainable methods for growth in downtown. However, the current proposal lacks many of the benchmarks that specify the exact requirements that need to be met to achieve the sustainability goals put forth by the previous class. Evaluating the proposal through LEED helped establish those requirements through the credit system. Each credit has a set level of requirements that must be met in a specific way. Through our LEED-ND based assessment of the proposal, we were able to help frame a plan for the development designed to meet those requirements.

When the current proposal was not able to specify that it met the LEED requirements or was clearly not going to meet the requirements, we offered an alternative action. Under the alternative action, our analysis carried the proposal to a new level by defining the measures that need to be taken for this project to meet those high sustainability goals and meet the maximum LEED-ND rating. We concluded that the project would achieve a LEED-ND rating of Platinum under the alternative action. Based on the analysis of the current proposal and the alternative actions we proposed, we find that the Cornwall Revitalization Project in downtown Bellingham has plenty of potential to be a leader for sustainable urban growth in the future. In part, this is due to its central location in downtown Bellingham. Being a dense urban center, the downtown area offers a wide range of mixed use buildings, amenities and transportation infrastructure. It is also an area that has been almost completely developed, meaning that growth in this area will not stress un-developed land, habitat or waterways.

This project is an example of urban restoration, an attempt to mitigate environmental harm associated with urban development while bringing increased use, community development, economic growth and population density to an economically depressed area. However, the Cornwall project represents a small part of the future of urban growth in Bellingham. We found through our analysis many connections to the current waterfront project proposal, as well as the surrounding urban development. This project represents a small piece of a larger movement, the attempt of a modern city to build strength and vitality into its center. To build in accordance with the modern threats of climate change, habitat destruction and urban pollution so that we don't have to assume that development damages the environment, but represents a positive step for our health and communities.



LEED 2009 for Neighborhood Development Project Scorecard

Project Name: LEED-ND Assessment: The Alleyways of the Cornwall Proposal

Yes	?	No				27 Points Possible
20	22	24	Smart Location and Linkage			

Yes	?	No				27 Points Possible
Y			Prereq 1	Smart Location	Required	
Y			Prereq 2	Imperiled Species and Ecological Communities	Required	
Y			Prereq 3	Wetland and Water Body Conservation	Required	
Y			Prereq 4	Agricultural Land Conservation	Required	
Y			Prereq 5	Floodplain Avoidance	Required	
8	8	8	Credit 1	Preferred Locations		10
	1	2	Credit 2	Brownfield Redevelopment		2
7	7	7	Credit 3	Locations with Reduced Automobile Dependence		7
	1	1	Credit 4	Bicycle Network and Storage		1
3	3	3	Credit 5	Housing and Jobs Proximity		3
1	1	1	Credit 6	Steep Slope Protection		1
1	1	1	Credit 7	Site Design for Habitat or Wetland and Water Body Conservation		1
			Credit 8	Restoration of Habitat or Wetlands and Water Bodies		1
		1	Credit 9	Long-Term Conservation Management of Habitat or Wetlands and Water Bodi		1

Yes	?	No				44 Points Possible
30	38	41	Neighborhood Pattern and Design			

Yes	?	No				44 Points Possible
Y			Prereq 1	Walkable Streets	Required	
Y			Prereq 2	Compact Development	Required	
Y			Prereq 3	Connected and Open Community	Required	
11	12	12	Credit 1	Walkable Streets		12
3	3	6	Credit 2	Compact Development		6
4	4	4	Credit 3	Mixed-Use Neighborhood Centers		4
6	7	7	Credit 4	Mixed-Income Diverse Communities		7
	1	1	Credit 5	Reduced Parking Footprint		1
			Credit 6	Street Network		2
1	1	1	Credit 7	Transit Facilities		1
	2	2	Credit 8	Transportation Demand Management		2
			Credit 9	Access to Civic and Public Spaces		1
1	1	1	Credit 10	Access to Recreation Facilities		1
	1	1	Credit 11	Visitability and Universal Design		1
	2	2	Credit 12	Community Outreach and Involvement		2
1	1	1	Credit 13	Local Food Production		1
2	2	2	Credit 14	Tree-Lined and Shaded Streets		2
1	1	1	Credit 15	Neighborhood Schools		1

Yes ? No

17 22 24 Green Infrastructure and Buildings 29 Points Possible

Y							
Y				Prereq 1	Certified Green Building		Required
Y				Prereq 2	Minimum Building Energy Efficiency		Required
Y				Prereq 3	Minimum Building Water Efficiency		Required
Y				Prereq 4	Construction Activity Pollution Prevention		Required
	1	1		Credit 1	Certified Green Buildings		5
2	2	2		Credit 2	Building Energy Efficiency		2
	1	1		Credit 3	Building Water Efficiency		1
	1	1		Credit 4	Water-Efficient Landscaping		1
1	1	1		Credit 5	Existing Building Use		1
1	1	1		Credit 6	Historic Resource Preservation and Adaptive Reuse		1
1	1	1		Credit 7	Minimized Site Disturbance in Design and Construction		1
2	2	4		Credit 8	Stormwater Management		4
1	1	1		Credit 9	Heat Island Reduction		1
				Credit 10	Solar Orientation		1
1	3	3		Credit 11	On-Site Renewable Energy Sources		3
2	2	2		Credit 12	District Heating and Cooling		2
1	1	1		Credit 13	Infrastructure Energy Efficiency		1
2	2	2		Credit 14	Wastewater Management		2
1	1	1		Credit 15	Recycled Content in Infrastructure		1
1	1	1		Credit 16	Solid Waste Management Infrastructure		1
1	1	1		Credit 17	Light Pollution Reduction		1

Yes ? No

4 4 4 Innovation and Design Process 6 Points

1	1	1		Credit 1.1	Innovation and Exemplary Performance: Non-Motorized Transportation Infrastruc		1
1	1	1		Credit 1.2	Innovation and Exemplary Performance: Pedestrian Safety		1
1	1	1		Credit 1.3	Innovation and Exemplary Performance: Aesthetics and Artisanhip		1
				Credit 1.4	Innovation and Exemplary Performance:		1
				Credit 1.5	Innovation and Exemplary Performance:		1
1	1	1		Credit 2	LEED® Accredited Professional		1

Yes ? No

3 4 Regional Priority Credit 4 Points

1		1		Credit 1.1	Regional Priority Credit: Bellingham, WA 98225: SLL Credit 5		1
1		1		Credit 1.2	Regional Priority Credit: Bellingham, WA 98225: NPD Credit 3		1
1		1		Credit 1.3	Regional Priority Credit: Bellingham, WA 98225: NPD Credit 4		1
		1		Credit 1.4	Regional Priority Credit: Bellingham, WA 98225: GIB Credit 8		1

Yes ? No

74 86 97 Project Totals (Certification estimates) 110 Points

Certified: 40-49 points, **Silver:** 50-59 points, **Gold:** 60-79 points, **Platinum:** 80+ points

Conclusion

Evaluating the Cornwall Revitalization Project through LEED-ND proved to be a valuable process for many reasons. First of all, it established specific requirements that must be met to achieve a satisfactory level of sustainability for urban growth in Bellingham during the coming decades. By doing this, these requirements can be incorporated into a developer's project design, becoming benchmarks of Smart Growth. Before a shovel has broken the soil or a nail has been driven, the sustainability goals for the project that we have as a community become realized. By defining the environmental potential of a project on paper during the design and planning phase, we are better able to incorporate sustainable design into our development methods while also creating a more holistic process of community design.

Furthermore, the complexity of urban development became apparent through the LEED analysis. The Cornwall project is just one piece of a whole urban movement toward sustainability. When connected with the Waterfront Redevelopment project, it becomes an important connection adding strength to a development that seeks to utilize a vacant brownfield along a prime waterfront location. It will increase the connectivity of this project to downtown, provide access for the waterfront development and add space for mixed use buildings bringing residential growth to the area. Adding inertia to the retail growth in the downtown corridor also affects the outer lying regions of Bellingham, specifically the Bellis-Fair Mall area. It gives the city an opportunity to explore different options for building a mixed use urban village on or near the Bellis Fair site, reducing the transportation pressure on Bellingham through less vehicle dependency.

By looking through the lens of LEED-ND, we were also able to evaluate LEED as a tool for sustainable growth. LEED remains an incentive approach, one that doesn't hinge on regulatory action. "In contrast, LEED-ND is a market-driven and voluntary approach that is intended to go beyond satisfying the regulatory requirements to advancing the sustainability of neighborhood developments," (Garde, 2009). How much incentive the market will provide and how much return for initial investment a LEED certified project will provide is still a question that remains unanswered. For now, we have found that LEED-ND provides primarily social capital for a developer in the form of advertising exciting new "green developments".

Clearly, LEED-ND goes beyond the State Environmental Policy Act as an information source for actions that can potentially harm the Environment. Nor is it strictly a regulatory process. Our best assessment of LEED-ND is that it is a specific way to measure the realization of sustainable growth, New Urbanism and Smart Growth principles. Regardless of whether LEED is voluntary or not, it provides a benchmark upon which to measure the growth of the sustainable growth movement. In itself, this is a valuable tool due to the varying definitions of "sustainable growth", "green building" and "urban renewal". This ambiguity illustrates how cutting edge this concept of sustainability is. Everyone from academics, city planners, politicians, developers and most

importantly the citizen are constantly helping to re-define this concept into a practical form that will leave an indelible mark on our towns and cities. With this in mind, LEED-ND allows us to measure sustainable growth in broad terms.

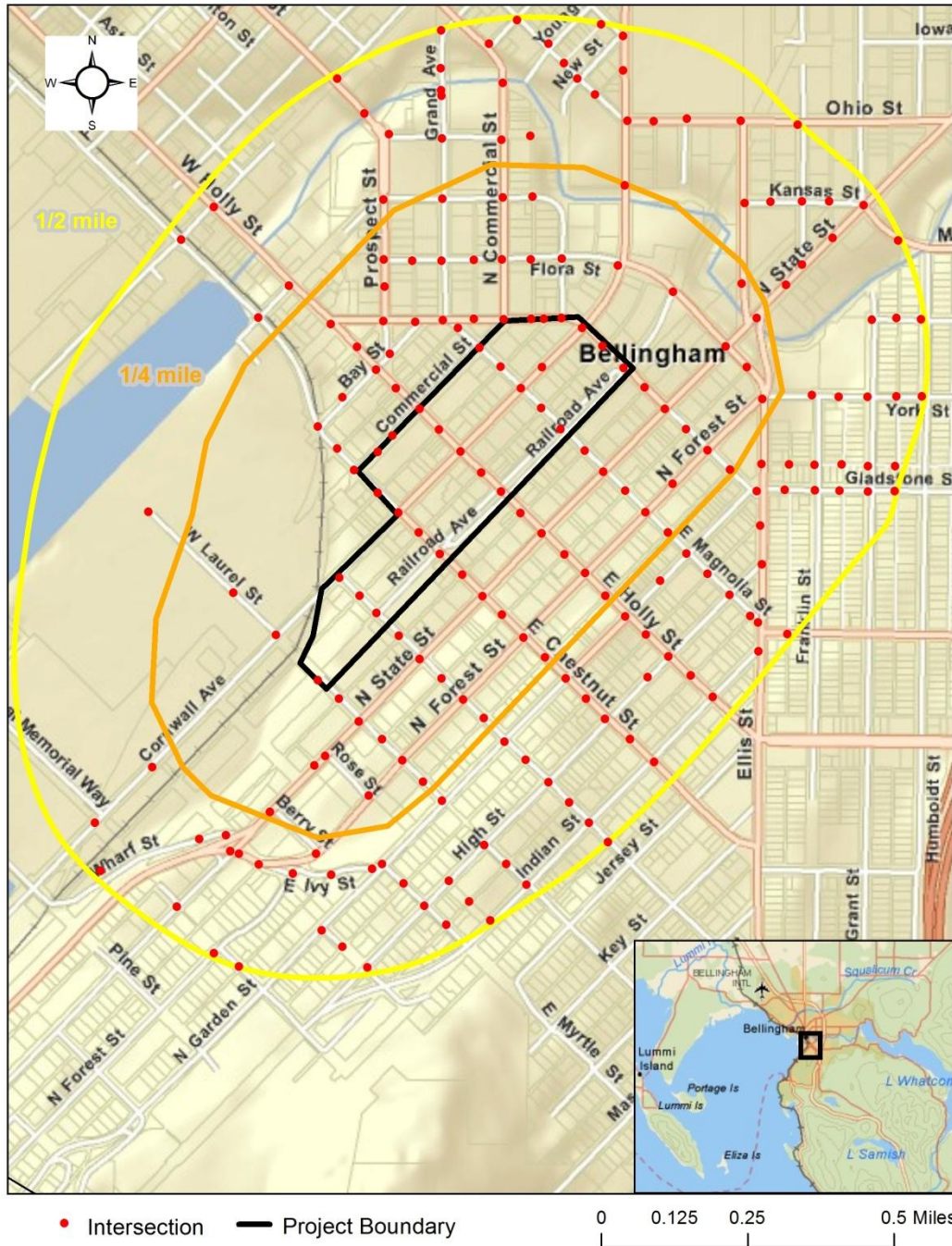
“The path to a sustainable lifestyle builds on the principles of smart growth, new urbanism and green buildings. If successful, it will not only vastly reduce environmental harm but also offer stunning enhancements to the current quality of life. The setting for this lifestyle is sustainable urbanism, the creation and support of communities that are so well designed for a high quality of life that people will eagerly opt to meet their daily needs on foot and transit. Compared to the American lifestyle as we know it, the quality of a life lives in sustainable urbanism is healthier, happier, more independent and not least of all longer,” (Farr, 2008).

In light of the current urban condition resulting from a materialistic, fossil fuel dependent worldwide culture, sustainable urbanism principles offer relief from dire quality of life issues that go far beyond narrow environmental concerns. As environmental movement buzzwords like “green” and “sustainable” become commercialized, lose their intended meaning in the rush of modern life, apathy among the people most in need of relief can grow. A nihilistic culture is the enemy of change, divide people along superficial lines. Unless the sustainable growth movement is willing to move past pressing concerns of climate change and address problems like improving access essential services for oppressed urban communities, the nihilism towards the movement will only grow.

LEED-ND certainly offers practical solutions designed to increase the quality of life in urban communities, build healthier communities improve access to vital services for everyone. This is one of the major selling points for LEED programs and will probably determine their success or failure. It also provides a framework for the integrated design approach, a new and more inclusive method of designing and building communities. It provides a third party evaluation tool for sustainable principles and practices. It also provides a critical marketing tool. Yet LEED principles, new urbanism and smart growth are only stepping stones towards a new paradigm for urban life. It is no longer enough to optimize function of the various components of an automobile dependent, resource squandering pattern of development. The entire pattern needs to be re-written. Projects like the Cornwall Revitalization project in Bellingham, using LEED-ND, provide important opportunities to learn what next steps need to be taken towards resilient, prosperous, equitable and healthy human civilizations that can ultimately withstand the test of time.

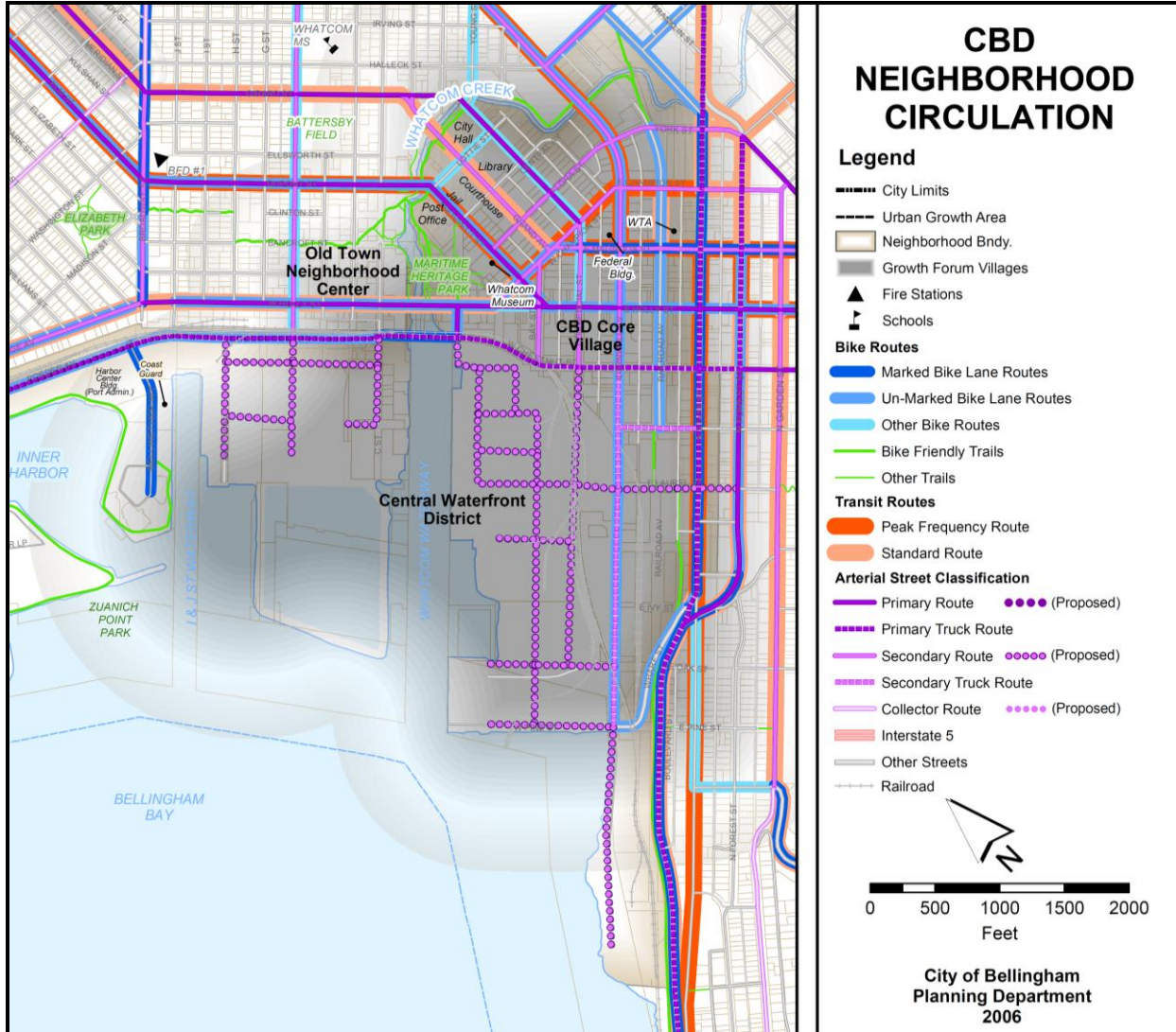
Appendix A-Intersections around project

Intersections within 1/4 and 1/2 mile
Buffers around Project Boundary



Cartographer: Rebecca Avery with assistance from Frankie Fernyhough, 11-4-2010, 1984 Web Mercator

Appendix B - New Potential Intersections Map

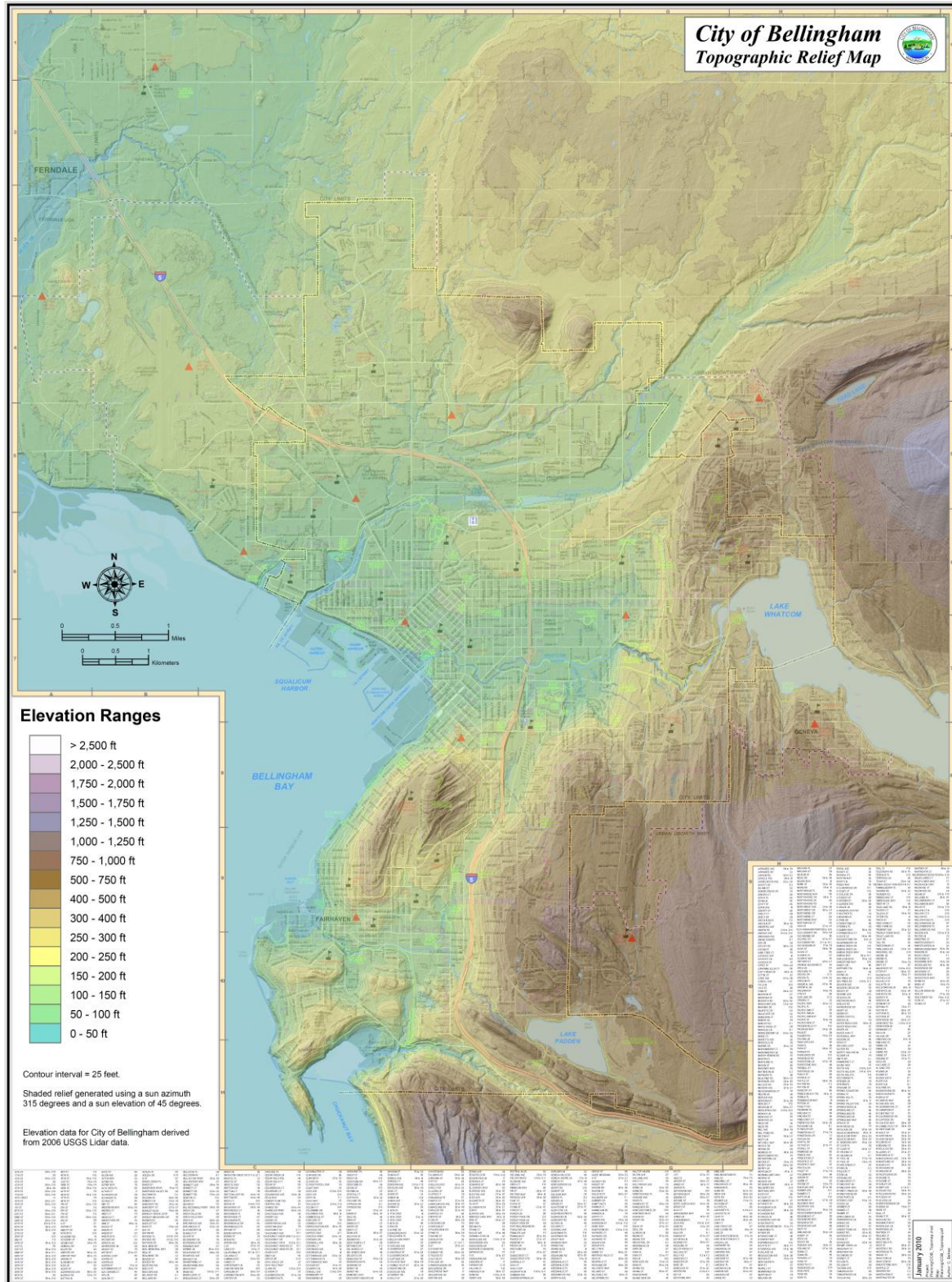


Cropped from larger map, legend is accurate. (COB, 2006)

Appendix C- Bike Network Map

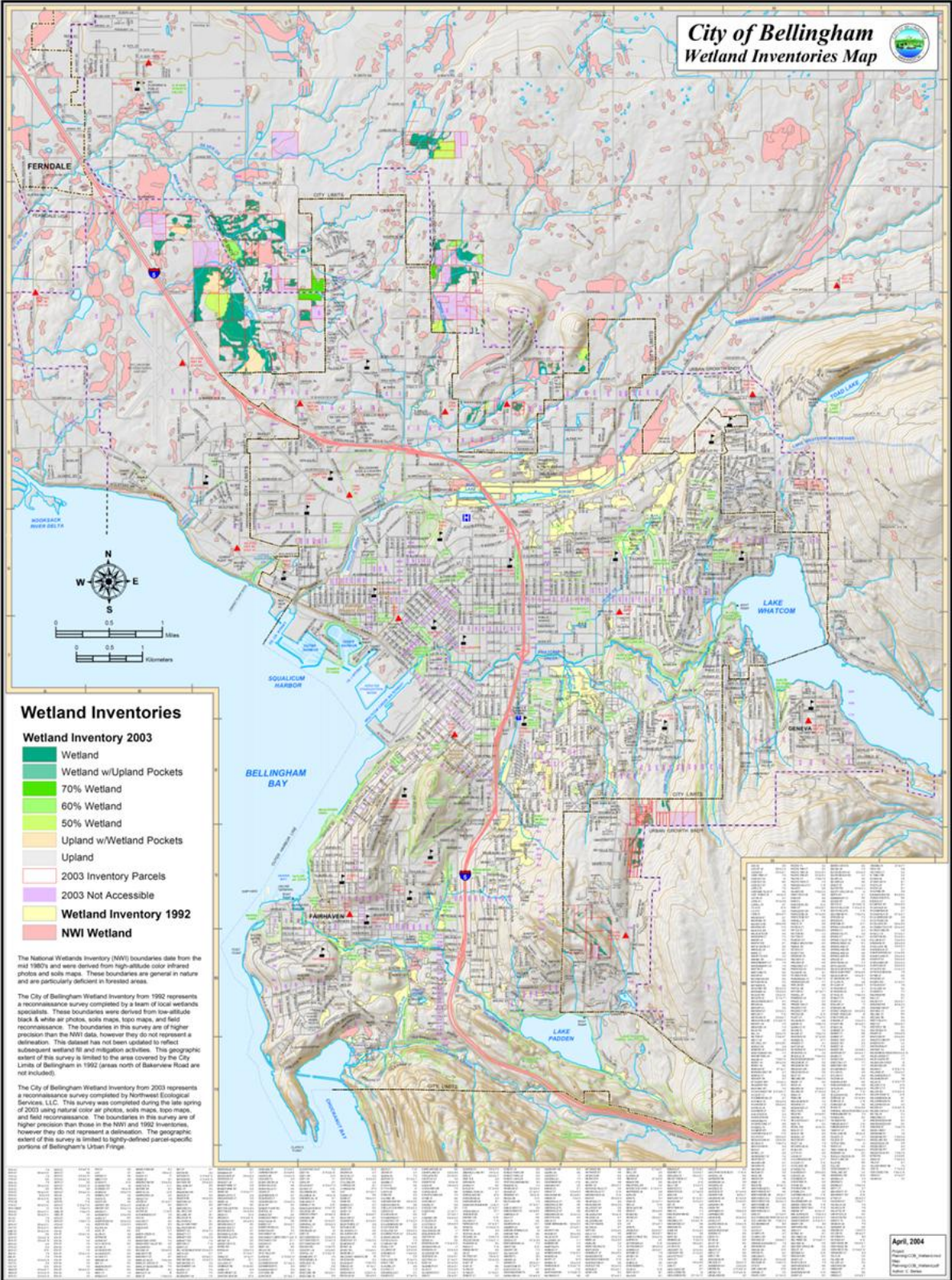


Appendix D - Topographic Map



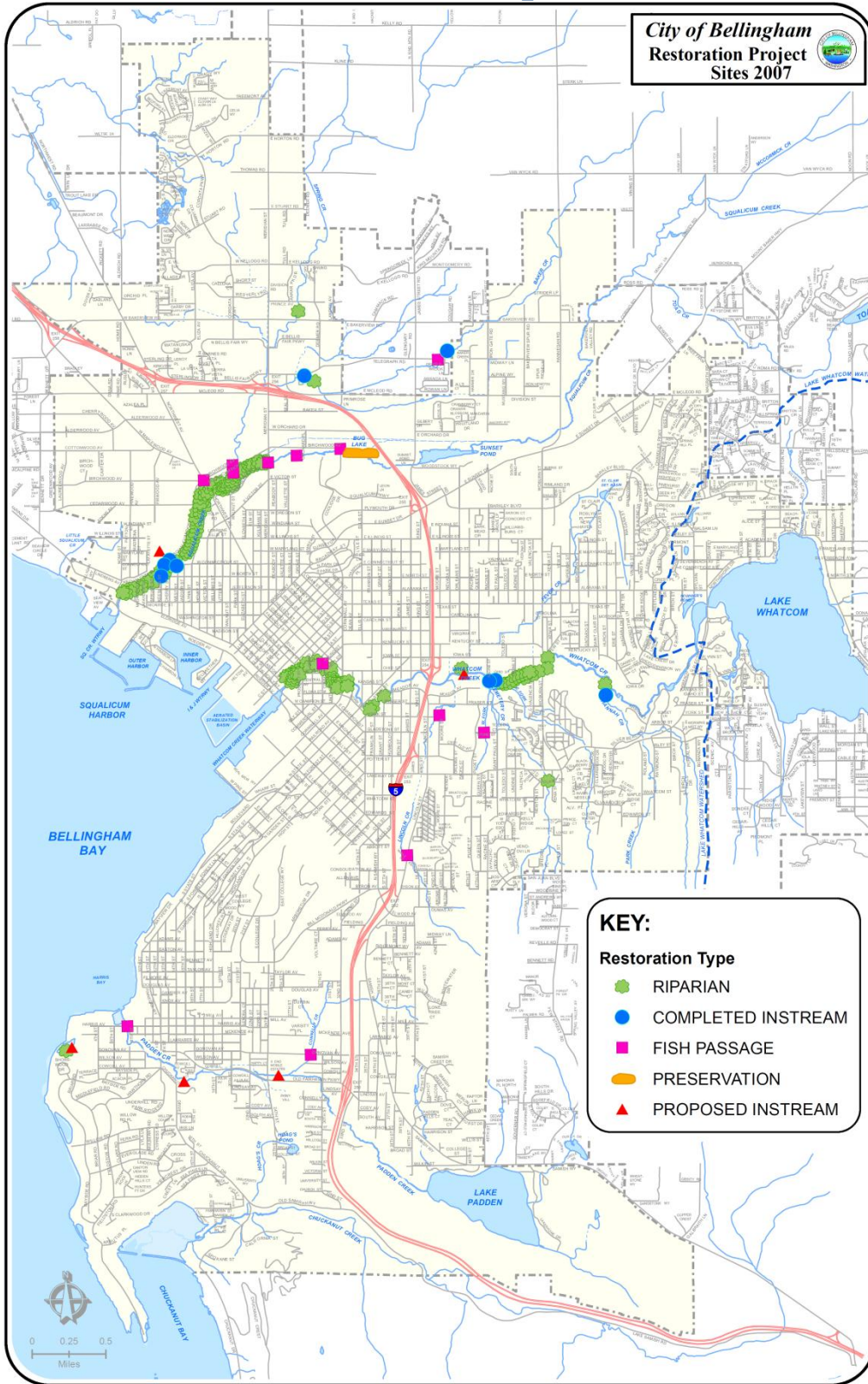
(COB, 2010)

Appendix E - Wetlands Map



(COB, 2004)

Appendix F - Restoration Map



(COB, 2006)

Appendix G - List of Diverse use types

Food Retail

- Supermarket
- Other food store with produce

Community-Serving Retail

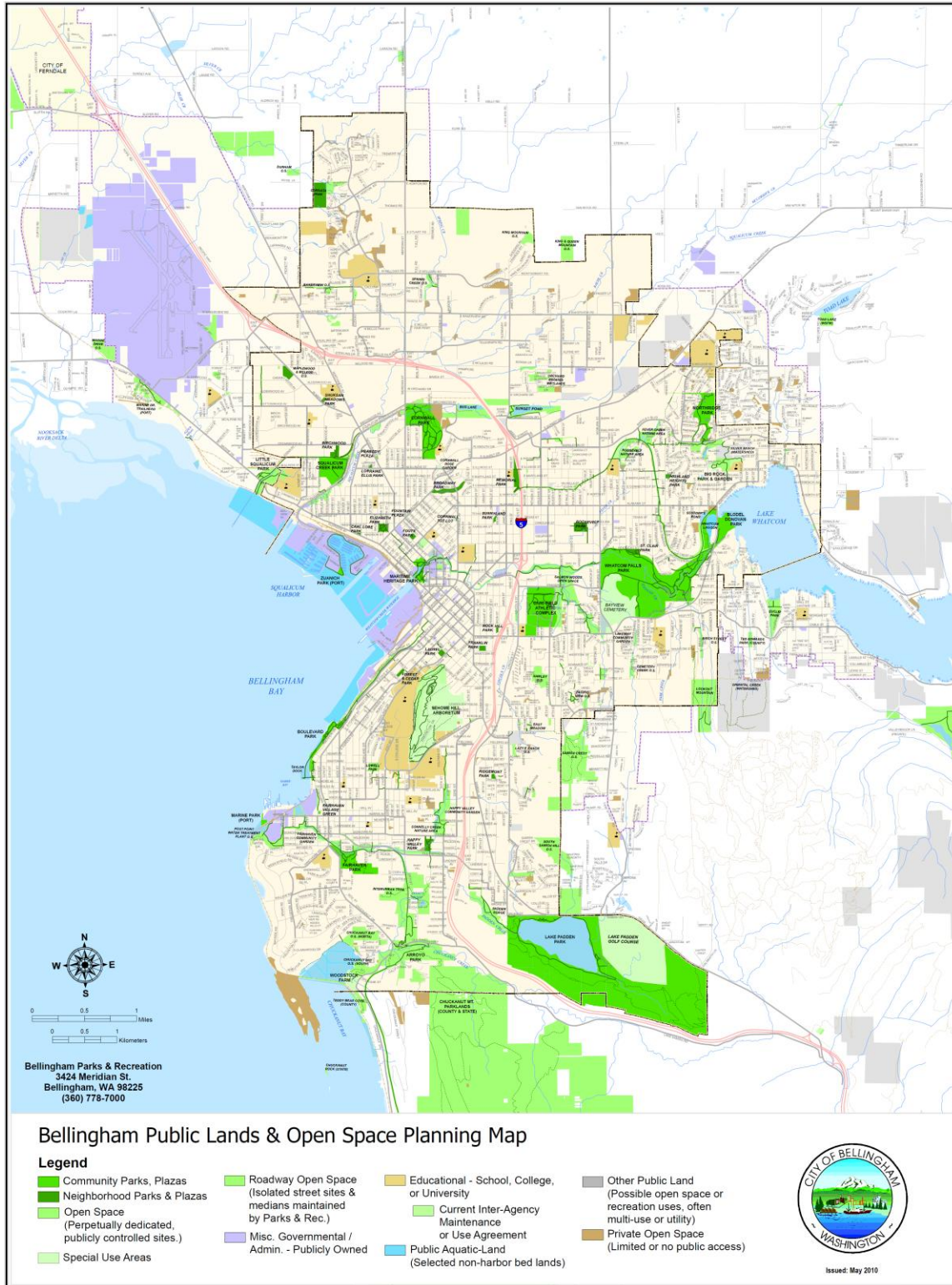
- Clothing store or department store selling clothes
- Convenience store
- Farmer's market
- Hardware store
- Pharmacy
- Other retail
- Services
- Bank
- Gym, health club, exercise studio
- Hair care
- Laundry, dry cleaner
- Restaurant, café, diner (excluding establishments with only drive-throughs)

Civic and Community Facilities

- Adult or senior care (licensed)
- Child care (licensed)
- Community or recreation center
- Cultural arts facility (museum, performing arts)
- Educational facility (including K–12 school, university, adult education center, vocational school, community college)
- Family entertainment venue (theater, sports)
- Government office that serves public on-site
- Place of worship
- Medical clinic or office that treats patients
- Police or fire station
- Post office
- Public library
- Public park
- Social services center

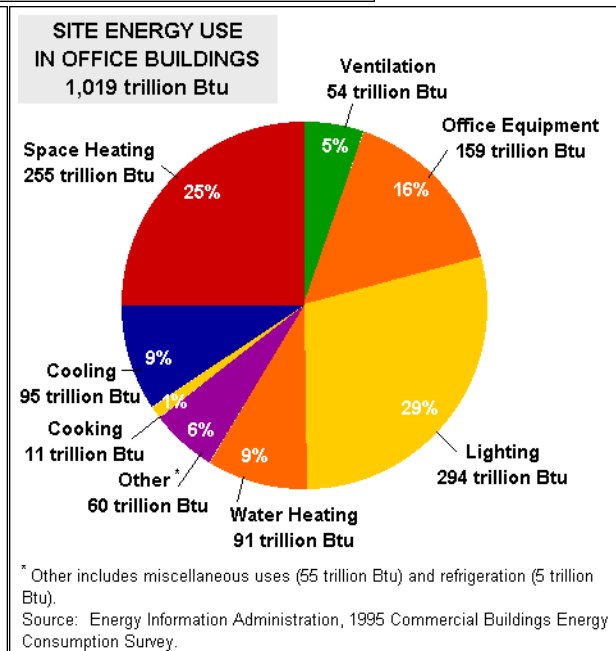
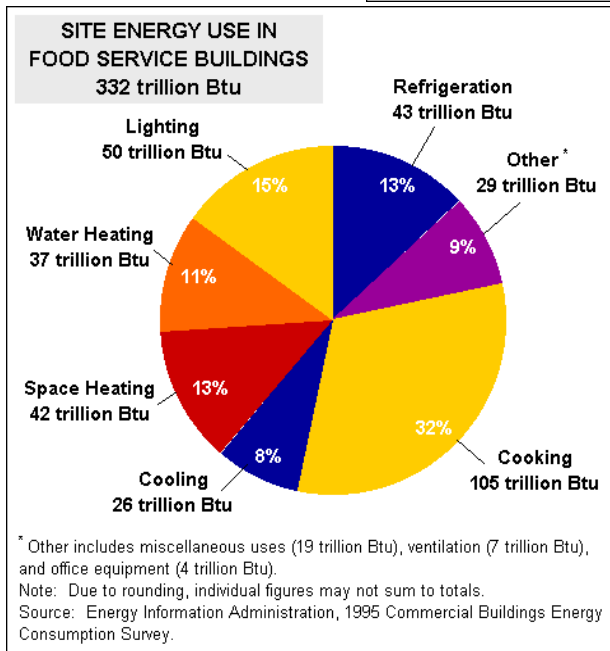
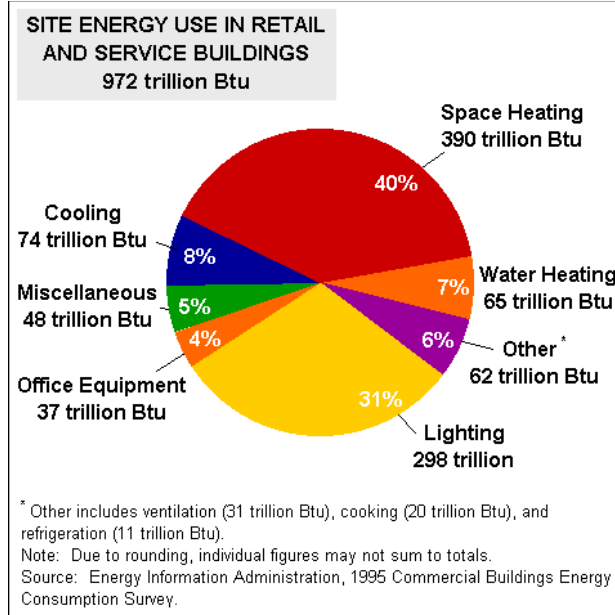
(USGBC, 2010)

Appendix H - Parks and Public lands Map



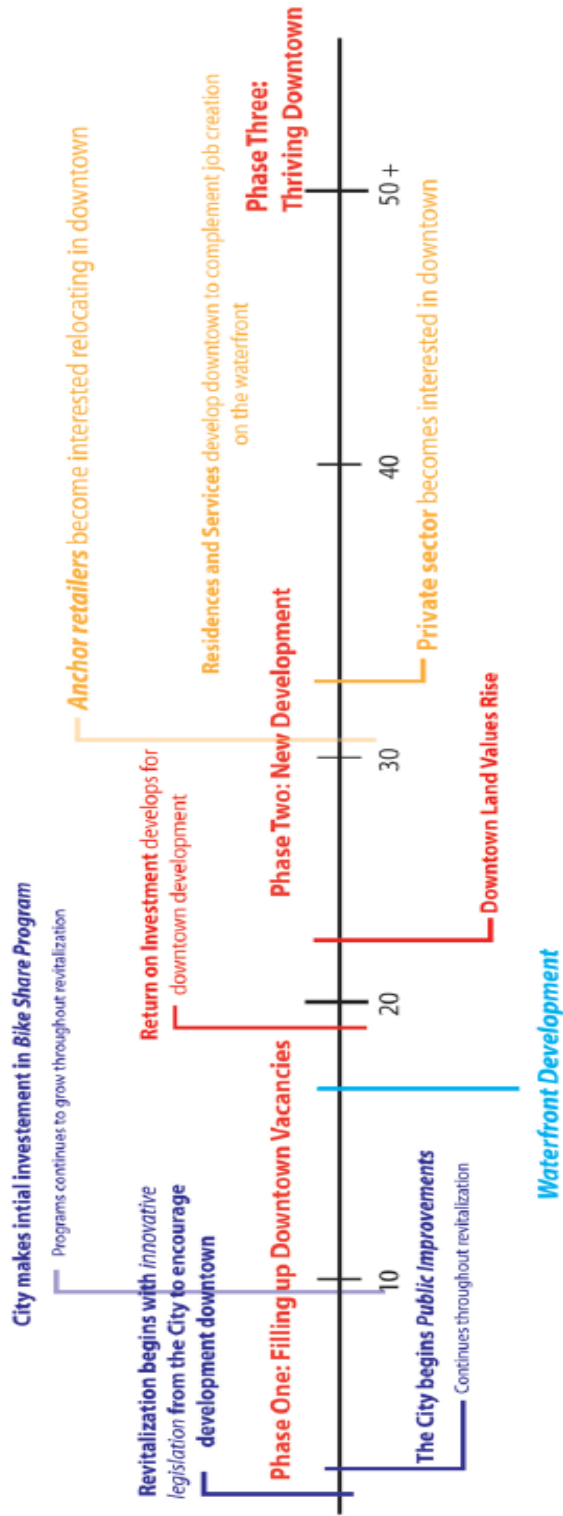
(COB, 2010)

Appendix I – Site Energy Use by Building Type



Appendix J – Project Phasing Timeline

Cornwall Revitalization Plan Feasibility Analysis Proposed Phasing Timeline



(Squires, Lauren. Sect4. Plan Implementation, Project Feasibility)

Definitions

Adjacent site: A site having at least 25% of its boundary bordering parcels that are each at least 75% previously developed. A street or other right-of-way does not constitute previously developed land; instead, it is the status of the property on the other side of the street or right-of-way that matters. Any fraction of the boundary that borders waterfront other than a stream is excluded from the calculation. A site is still considered adjacent if the 25% adjacent portion of its boundary is separated from previously developed parcels by undeveloped, permanently protected land averaging no more than 400 feet in width and no more than 500 feet in any one place. The undeveloped land must be permanently preserved as natural area, riparian corridor, park, greenway, agricultural land, or designated cultural landscape. Permanent pedestrian paths connecting the project through the protected parcels to the bordering site may be counted to meet the requirement of SLL Prerequisite 1, Option 2 (that the project be connected to the adjacent parcel by a through-street or non-motorized right-of-way every 600 feet on average, provided the path or paths traverse the undeveloped land at no more than a 10% grade for walking by persons of all ages and physical abilities).

Adjacent project site based on minimum 25% of perimeter adjacent to previously developed parcels, including allowance for permanently protected land between project boundary and previously developed parcels

Area median income: The median income of a county as determined by the U.S. Department of Housing and Urban Development.

Bicycle network: A continuous network consisting of any combination of physically designated in-street bicycle lanes at least 5 feet wide, off-street bicycle paths or trails at least 8 feet wide for a two-way path and at least 5 feet wide for a one-way path, and/or streets designed for a target speed of 25 miles per hour or slower.

Best Management Practice (BMP): Physical, structural or managerial practices that, when used together or alone, prevent or reduce the pollution of water, stormwater flow and sedimentation load. A BMP must be approved by the Department of Ecology or the municipality.

1. **Source Control BMP:** A BMP that is intended to prevent pollution from entering stormwater.
2. **Treatment BMP:** A BMP that is intended to remove pollution from stormwater.
3. **Flow Control BMP:** A BMP that is intended to mitigate the impacts of increased surface and stormwater runoff rates generated by development.
4. **Low Impact Development BMP:** A set of BMPs containing treatment and flow control solutions that are contained in the LID Guidance Manual.
5. **Experimental BMP:** Any treatment or methodology proposed for treatment or management of stormwater that is not in the DOE Manual (current edition) and is

being studied by the City, Whatcom County and/or the Washington State Department of Ecology for adoption as a BMP. (COB Municipal Code. 15.42.020 Definitions)

BTU: A BTU (British Thermal Unit) is a unit of energy that allows different energy sources to be compared through a common unit. It is the amount of energy required to increase the temperature of 1 pound of water by 1 degree Fahrenheit at normal atmospheric pressure.

Brownfield: Real property, undergoing expansion, redevelopment, or reuse of which may be complicated by the presence or possible presence of a hazardous substance, pollutant, or contaminate. A site can also be classified as a brownfield by being abandoned, containing garbage, or in another determined by local government.

Connectivity: The number of publicly accessible street intersections per square mile, including intersections of streets with dedicated alleys and transit rights-of-way, and intersections of streets with non-motorized rights-of-way (up to 20% of total intersections). If one must both enter and exit an area through the same intersection, such an intersection and any intersections beyond that point are not counted; intersections leading only to cul-de-sac are also not counted. The calculation of square mileage excludes water bodies, parks larger than 1/2 acre, public facility campuses, airports, rail yards, slopes over 15%, and areas non-buildable under codified law or the rating system. Street rights-of-way may not be excluded.

Floor-area ratio (FAR): The density of nonresidential land use, exclusive of parking, measured as the total nonresidential building floor area divided by the total buildable land area available for nonresidential structures. For example, on a site with 10,000 square feet of buildable land area, an FAR of 1.0 would be 10,000 square feet of building floor area. On the same site, an FAR of 1.5 would be 15,000 square feet of built floor area; an FAR of 2.0 would be 20,000 built square feet and an FAR of 0.5 would be 5,000 built square feet.

Infill site: A site that meets any of the following four conditions:

- a. At least 75% of its boundary borders parcels that individually are at least 50% previously developed, and that in aggregate are at least 75% previously developed.
- b. The site, in combination with bordering parcels, forms an aggregate parcel whose boundary is 75% bounded by parcels that individually are at least 50% previously developed, and that in aggregate are at least 75% previously developed.
- c. At least 75% of the land area, exclusive of rights-of-way, within a 1/2 mile distance from the project boundary is previously developed.
- d. The lands within a 1/2 mile distance from the project boundary have a preproject connectivity of at least 140 intersections per square mile.

A street or other right-of-way does not constitute previously developed land; it is the status of property on the other side or right-of-way of the street that matters. For conditions (a) and (b)

above, any fraction of the perimeter that borders waterfront other than a stream is excluded from the calculation.

- a) Infill project site based on minimum 75% of perimeter adjacent to previously developed parcels
- b) Infill project site based on minimum 75% adjacent to previously developed parcels using project boundary and selected bordering parcels

Multunit residential: consisting of four or more residential units sharing a common entry.

Native (or indigenous) plant: a plant species that did or would have occurred on the site or within the subject county prior to the widespread land alterations that accompanied European settlement. Cultivars of native plants may be considered native plants.

Paseo: a publicly accessible pedestrian path, at least 4 feet wide and no more than 12 feet wide, which provides shortcuts between buildings and through the block, connecting street frontages to rear parking areas, midblock courtyards, alleys, or other streets. A paseo may be roofed for up to 50% of its length and may be privately owned or publicly dedicated.

Planned occupancy: the highest estimate of building occupants based on planned use(s) and industry standards for square foot requirements per employee. The minimum planned occupancy for multiunit residential buildings is 1 person for a studio unit, 1.5 persons for a one-bedroom unit, and 1.25 persons per bedroom for a two- bedroom or larger unit.

Predevelopment: before any development occurred on the site. Predevelopment conditions describe the natural conditions of the site prior to any human alteration, such as development of roads or buildings.

Previously developed site: a site that, preproject, consisted of at least 75% previously developed land.

Preproject: before the LEED-ND project was initiated, but not necessarily before any development or disturbance took place. Preproject conditions describe the state of the project site on the date the developer acquired rights to a majority of its buildable land through purchase or option to purchase.

Subbase: A layer of aggregate material which lies in the subgrade level of a paved surface. This acts as a cushion as it is the main load-bearing layer for vehicular traffic.

Walkable: Walkable or Walkability pertains to the extent that a given area is pleasurable and accessible for pedestrian use. Factors that are evaluated are ease of crossing streets, being able to be seen by automobiles, and roadside cleanliness.

Social Capital: The consideration made for social groups when planning communities which accounts for qualitative necessities for human interaction. Robert Putnam defines it as “The collective value of all social networks and the inclinations that arise from these networks to do things for each other.” (McLean, 2002).

Sprawl: Defined as five components with Housing subdivisions, exclusively residential areas. Shopping centers, lacking in multiple-stories, offices, housing, and easily walkable streets. They are surrounded by large swaths of flat parking lots. Office parks and business parks, located near workplaces usually in box shapes surrounded by highways. Civic institutions, scattered around the town in nowhere in particular. Roadways, an extreme amount of roadways are present to allow for people to use automobiles everywhere desired. (Duany, 2000, pg. 5)

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