Winter 2010

Revitalizing the Alleyways of Downtown Bellingham, Washington: Environmental Impact Assessment

Brandon Gimper
Western Washington University

Danny Huth
Western Washington University

Cory Olson
Western Washington University

Jacqueline Quarre
Western Washington University

Stefanie Tetreault
Western Washington University

WESTERN WASHINGTON UNIVERSITY

Huxley College of the Environment

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Fall 2010

DR. TROY ABEL
ESTU 436: ENVIRONMENTAL IMPACT ASSESSMENT

Digital Release

Environmental Impact Assessment
Huxley College of the Environment

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(Brandon Gimper, Student)

Signature _____
(Danny Huth, Student)

Signature _____
(Cory Olson, Student)

Signature _____
(Jacqueline Quarre, Student)

Signature _____
(Stephanie Tetreault, Student)

Signature _____
(Dr. Troy Abel, Faculty Advisor)

Date 11/29/2010

Disclaimer

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.

Fact Sheet

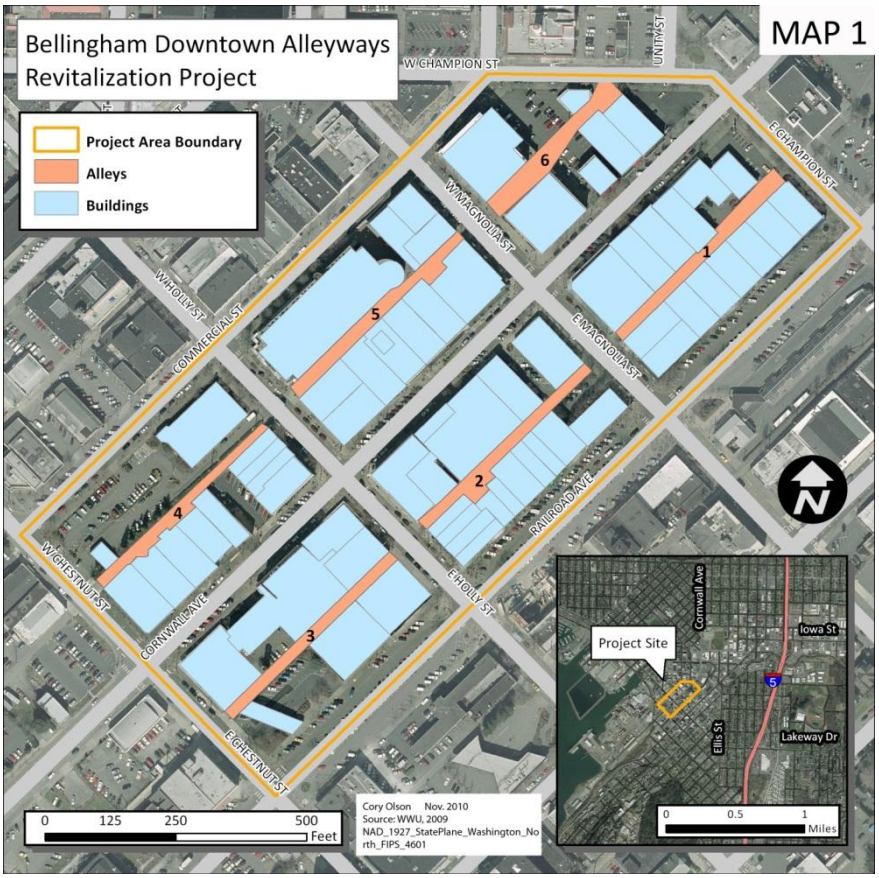
Title

Revitalizing the Alleyways of Downtown Bellingham, Washington

Project Description

The proposed project seeks to bring life and energy to underutilized sections of alleyways on either side of Cornwall Avenue in Bellingham's central business district. A major component of the revitalization project is proposing infill development to increase potential retail space, provide housing opportunities and create a more attractive pedestrian corridor. Other elements include capital improvements such as pervious alleyway pavement, consolidating dumpsters, improving lighting, installing archways, bike racks and benches, as well as burying power lines. The project also proposes restricting vehicle access with removable bollards and keeping deliveries to off hours.

Location of Project Site



There are six alleyway sections involved that are bordered by Chestnut Street, Railroad Avenue, Champion Street and Commercial Street streets in downtown Bellingham (Map 1).

Photographs of Project Site

Lead Agency

Bellingham Planning & Community Development Department
210 Lottie Street
Bellingham, WA 98225
Phone: (360) 778-8300

Responsible Official

Dr. Troy Abel, Assistant Professor, Department of Environmental Studies
ESTU 436: Environmental Impact Assessment
Western Washington University
Bellingham, WA 98225-9085

Authors

Brandon Gimper

Cory Olson

Danny Huth

Jacqueline Quarre

Stefanie Tetreault

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City of Bellingham Chambers

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Acknowledgements

Troy Abel	Assistant Professor, Western Washington University
Darby Galligan	Development Specialist, City of Bellingham

Chris Comeau	Transportation Planner, City of Bellingham Public Works Engineering
Alex Cleanthous	Planner, Whatcom County Planning Department
Paul Stangl	Assistant Professor, Western Washington University

Distribution List

City of Bellingham Planning & Community Development Department
210 Lottie Street
Bellingham, WA 98225

Whatcom County Planning and Development Services
5280 Northwest Drive
Bellingham, Washington 98226

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

Table of Contents

1. Executive Summary

The purpose of this Environmental Impact Assessment (EIA) is to evaluate the potential impacts on the natural and built environment that would result from the revitalization of downtown Bellingham's Cornwall Ave alleyway corridors. This EIA analyzes the potential impacts of three possible scenarios – the proposed action, the alternative action and the possibility of taking no action. The proposed action was prepared by the Western Washington University Urban Transitions Studio in 2010. The alternative action was prepared by our group and is intended to mitigate the negative environmental impacts of the proposed action. The elements of the environment investigated were selected from the elements listed by the State Environmental Policy Act (SEPA). Only the elements that are significantly impacted by the three possible actions are included in this report and the evaluation of some elements of the environment is combined in order to keep the narrative readable and focused, as suggested in the SEPA Rules (WAC 197-11-444). We evaluated the possible courses of action by analyzing the environmental impacts of each on these elements, represented numerically in our decision matrix and described in detail in the following document. Throughout the process our decisions were guided by our group mission to *set an example of proactive community planning that promotes a sustainable future.*

Our group constructed this mission statement from our broad academic and burgeoning professional backgrounds in environmental planning, policy, and science. Modern planning scholars have recognized the need for interdisciplinary collaboration to combat environmental crises such as climate change and pollution. Some suggest that "There will be no sustainable world without sustainable cities" (Girardet 2004, 17) (Tomalty 2009, 1). Agenda 21, created by the Division for Sustainable Development in the United Nations Department of Economic and

Social Affairs, supports this perspective as it provides guidelines for communities to improve their influence on the environment. It recognizes that "in industrialized countries, the consumption pattern of cities are severely stressing the global ecosystem" and that "sustainable land-use planning and management" is vital to reducing environmental harm and promoting concepts such as equal housing and quality of life (United Nations 2010, Agenda 21). In 2005 the City of Bellingham passed a resolution to participate in the five milestones of the Cities for Clime Protection (CCP) Program, a program sponsored by International Cities for Local Environmental Initiatives (ICLEI) to encourage actions promoted by Agenda 21 (City of Bellingham 2005, Resolution No. 2005-08). Inspired by this demonstration of local leadership, our group chose to focus our evaluation of the alleyway redevelopment around the planning practices that promote a sustainable future.

In following with our mission, in this report we chose to view the impacts of each action in context with the overarching development plans for Bellingham and Whatcom County. The Bellingham Comprehensive Plan seeks to implement infill strategies because estimates suggest that it could "double the residential grow capacity of the city" (Bellingham Comprehensive Plan 2010, LU-17). Infill promotes efficient land use, preventing the urban sprawl that Whatcom County already suffers from (Melious 2009). With a predicted population increase in Bellingham by 23,000 to 36,000 people by 2022 from the 2002 population of 69,260 people, the City will need to provide new commercial and residential spaces (LU-11). Based on these observations, in the case of no action we predict that the people and commerce that would be brought into the alleys by redevelopment would be forced elsewhere in Bellingham, likely onto undeveloped or minimally developed land such as the Lake Padden watershed (City of Bellingham 2010,

Bellingham Urban Growth Area Map). As a result, taking no action will have negative environmental impacts on some of the elements.

To summarize our analysis of the three actions, we chose to use a Goeller scorecard decision matrix. This method creates a decision matrix by listing the possible actions across the top of the matrix with criterion for those actions down the side (Patton, Sawicki 1993, 351). An ordinal scale (rank-ordering) is used to rank the qualitative variation of the impacts of each possible action (Patton, Sawicki 1993, 352). For our decision matrix the ordinal scale assigns 3 points for the best action, 2 for the intermediate action, and 1 for the worst action. The possible actions include the Proposed Action, Alternative Action, and No Action. The criteria are the environmental elements of the Natural and Built Environments impacted at the project site.

The Goeller scorecard method is "especially useful for displaying and comparing alternatives when more than a single decision maker will be involved in comparing and evaluating the alternatives, and when qualitative information is part of the analysis". The method "allows various decision makers to assign their own values and weights to the criteria" (Patton, Sawicki 1993, 355). Scorecards are useful across diverse disciplines in evaluating and demonstrating the differences between options. For example, James Jatkevicius uses a Goeller scorecard to analyze the three options for public library internet filtering based on the criterion of cost, political viability, legality and ethics, and technical feasibility (Jatekvicious 2003, Figure 2. Goeller Scorecard with Weighted Criterion). For our report, the use of a decision matrix streamlines our information into a single figure, enabling the reader "to understand the most significant and vital information concerning the proposed action, alternatives and impacts, without turning to other documents," as SEPA encourages (WAC 197-11-425). It is built off of

the detailed analysis described in the text, reflecting the overall trends for each element and action.

Our decision matrix is considered an aggregate model, where criterions are not assigned weights and therefore are considered equally. The other option would be to use a disaggregate model, which weights some criterion more heavily than others. This method was not chosen for our analysis because the Built Environment is inherently weighted higher because it contains three times the number of environmental elements compared to the Natural Environment. Thus weighting the criteria to represent the urban nature of the project site is unnecessary.

The aggregate method is criticized by some as too subjective for impartial decision making. Though valid, this criticism is not applicable to our project, for the purpose of this EIA report is to inform, not decide. Decision makers may take the perspective portrayed in our decision matrix as informed advice, not a final decision, mitigating the concern about subjectivity. The aggregate method is useful "as initial screening devices and in helping individuals or small groups with similar preferences select among options," serving the purpose of our report as an initial analysis of the information surrounding the proposed redevelopment of the downtown alleyways (Patton, Sawicki 1993, 350). With this purpose in mind we strove to provide objective, factually based analyses for each element of the decision matrix.

Decision Matrix

Element of the Environment	Action		
	Proposed Action	**Alternative Action**	**No Action**
Natural Environment			
Earth	1	2	3
Air	1	2	3
Water	2	3	1
Energy and Natural Resources	2	3	1
Built Environment			
Environmental Health	1	3	2
Noise	2	2	2
Land Use	2	3	1
Housing	2	3	1
Historical and Cultural Preservation	2	3	1
Light and Glare	2	3	1
Aesthetics	2	3	1
Transportation	2	3	1
Public Services	2	3	2
Public Utilities	2	2	1
Population Change	2	3	1
Community and Institutional Structures	2	3	1
TOTALS	**29**	**46**	**23**

KEY

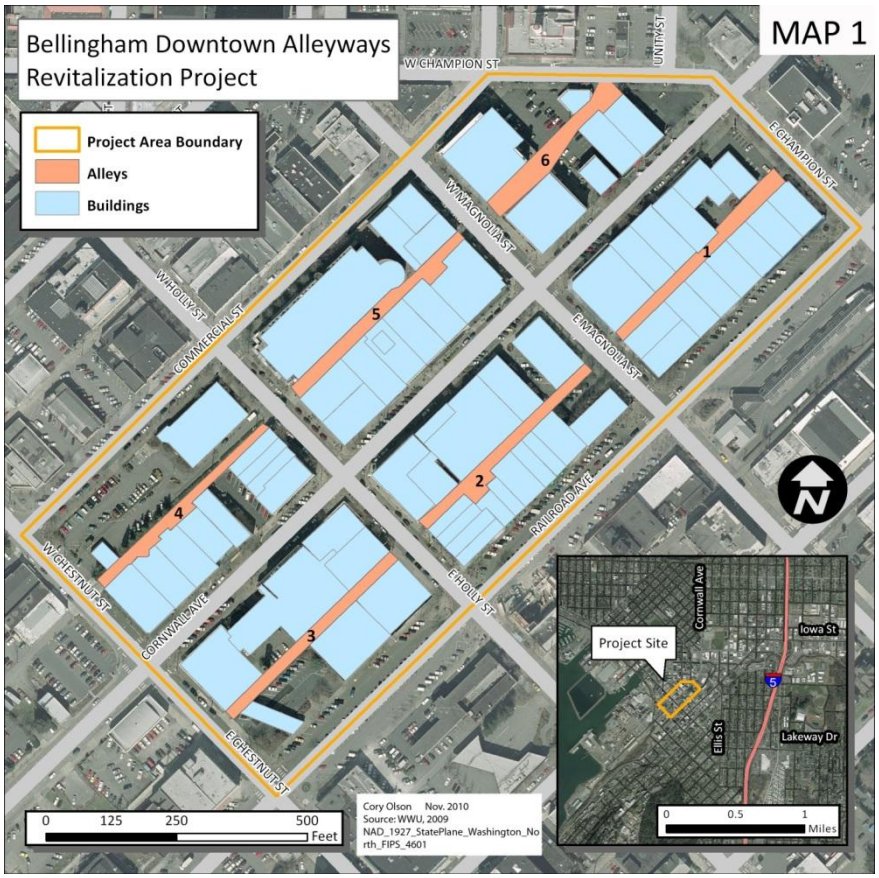
Best	3
Intermediate	2
Worst	1

This result likely came about because of the way we chose to formulate our alternative action. We started our evaluation by completing a SEPA environmental checklist for the proposed action. Through this we concluded that the proposed action constituted a Mitigated Determination of Non-Significance, because the proposal would create come negative impacts on the environment which could be mitigated (WAC 197-11-350). Accordingly, we prepared our alternative action to mitigate the significant impacts of the proposed action and to further

improve upon the positive impacts that the proposal provided. As demonstrated in the decision matrix the alternative action consistently scored higher or equal to each element, in which case and equal score meant that the impacts for either action were neutral. Overall, the alternative action scored 17 points higher than the proposed action. For these reasons, we accepted the alternative action as a Determination of Non-Significance as it creates the least negative impacts on the environment.

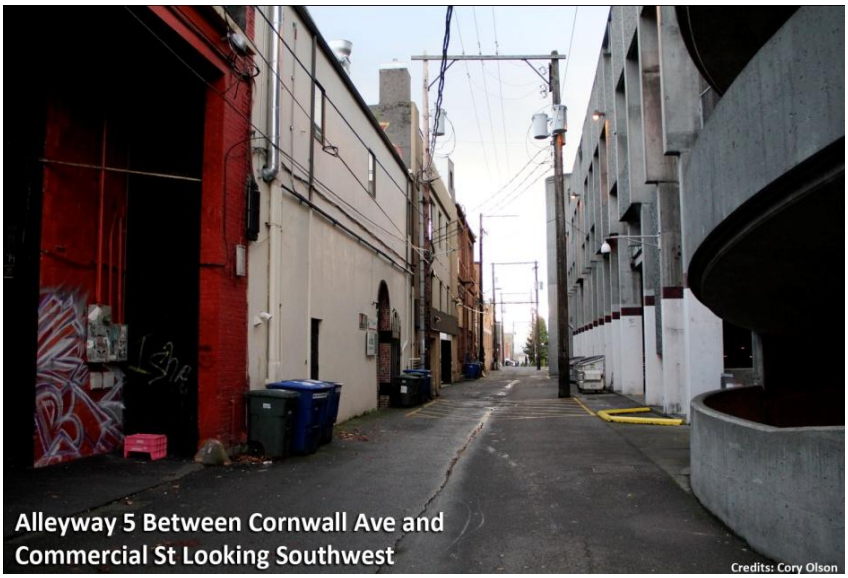
Current Conditions

The location of the proposed revitalization is the alleyway sections along either side of Cornwall Ave running from Champion Street to Chestnut Street. It is located in the central business district of downtown Bellingham, Washington. This area is surrounded by urban development zoned by the city for commercial use and includes a wide range of business types and industrial companies. Less than a half mile directly west lays the shoreline of Bellingham Bay and even closer to the north is Whatcom Creek. This area of the city's central business district is currently underutilized and dilapidated. There is great potential for development which would provide numerous benefits to the city.



The alleyways are generally avoided by pedestrians and through traffic and are primarily used only used for dumpster storage and some commercial deliveries to those businesses with alley access. Revitalizing this space would provide an attraction to pedestrian traffic resulting in more consumers and increased economic activity that businesses located in the store frontage of the alleyway area could benefit from.

In addition to the economic potential, the project proposes the inclusion of residential units as part of the revitalization. Space for an estimated 153 to 612 people depending on the height of the residential infill could be provided to support the cities ever-growing population (Calculation 0.4 and 0.5). This is all in line with the City of Bellingham's adopted Comprehensive Plan, the City Center Master Plan, the Whatcom County Comprehensive Plan and the overarching Washington State Growth Management Act. The ultimate goal of this project is to revive the alleyway corridors in the central business district of downtown Bellingham (Urban Transitions Studio 2010). This would improve local commerce, create housing and provide a unique cultural element to the City of Bellingham.



As is, the alleyway area on either side of Cornwall Avenue spanning from Champion to Chestnut Street is rundown. From the ground up, the pavement is sunken, cracked and dated; the buildings are draped with

hanging utility wires and pipes while their surfaces are beginning to crumble with age. Some businesses fronted on Cornwall Avenue have rear access to the alley though few are used as public entrances. When walking from one end to the other, the most prominent feature is the continuous row of garbage dumpsters and recycling containers. Though not commonly used for throughways, the alleys are often utilized for deliveries from venders to those businesses. The area holds, at full build out, an estimated potential 176,160 square feet for stores, cafes or residential buildings (Urban Transitions Planning Studio 2010).

Proposed Actions

The project was proposed by the Western Washington University Urban Transitions Studio 2010. It proposes a complete renewal of six sections of the alleyway corridor in downtown Bellingham's central business district. Overall, this course of action promotes better use of the alleys and will benefit the environment, justifying the overall score of 29 on the decision matrix. While the proposed action takes steps that will benefit the environment overall, it falters in some areas and is especially weak in the specificity of its plans. This contributes to its overall ranking as a Mitigated Determination of Non-Significance and its lower score on the decision matrix when compared to the alternative action.

Natural Environment

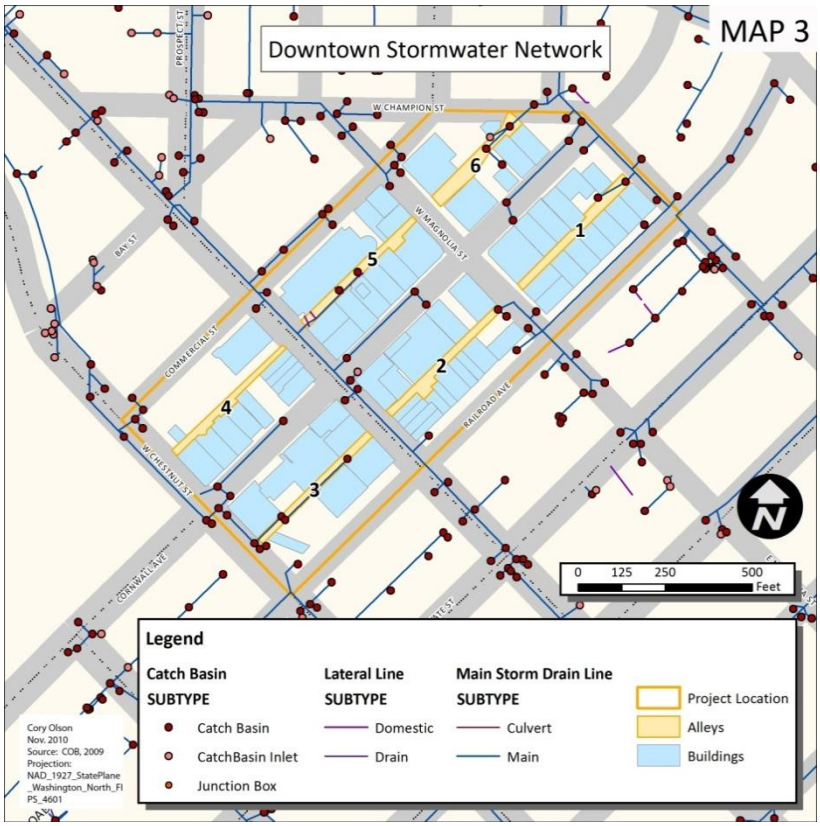
This EIA assesses three components of the natural environment; soil, air and water. Under existing conditions, the soil immediately underlying the mostly impervious surface of the selected alleyway sections is considered unnatural infill, anthropogenic in source and would be subject to soil erosion throughout the construction period (Natural Resources Conservation Service 2010) (Map 7). The first proposal element suggests the use of Best Management Practices (BMP) with the installation of Low Impact Development (LID) pervious surface designed to comfortably accommodate pedestrian and bicycle traffic while providing for better drainage in the alleyways.

Impacts on local air quality of the first proposal are minimal. There will be an estimated increase of 400 vehicle trips per day during peak travel times which will likely be only from short distances (The Transpo Group 2007). It is therefore likely that because increased fuel consumption and vehicle trips traveled will not increase significantly, air pollution from increased fuel consumption should not increase significantly. During the construction period emissions will be elevated with the use of heavy diesel powered machinery, further lessening local air quality.

There is no surface or ground water located within the boundaries of the proposed project. The area does not lie within the projected 100 year flood plain but does fall within the Whatcom Creek and Bellingham Bay watersheds (“Bay, Lakes & Streams” map, City of Bellingham, GIS data). Whatcom Creek is currently on Washington State’s 303(d) listing, indicating water quality impairment (Urban Streams Monitoring Program Report 2009). The first proposed action does not suggest dredging or filling any part of these water bodies. Since much of the storm

water runoff generated in the alleyway flows untreated into Whatcom Creek, the use of LID pervious surfaces will be beneficial to limit further pollution of the creek.

Energy and natural resource use will increase during the construction period with diesel fuel and electricity as the primary sources of energy (Matthews, Roth, Sharrard, 2007). After the alley infill is complete, there will an increase draw on electricity, gas, water, sewage, and potentially solar energy, although the current infrastructure of downtown Bellingham is adequate to handle these minimal increases.



Built Environment

Environmental impacts are not limited to the natural environment of the affected area. This is especially true in downtown Bellingham since there is already a well-established community infrastructure. This EIA goes on to analyze the potential impacts on the built environment in and around the alley corridors.

Short term noise pollution of the proposed action would be non-significant. Noises associated with construction and demolition must not unreasonably disturb the peace (City of Bellingham's Municipal Code § 10.24.120). Also, the simple physics of alleyway structure serve

to muffle noises in the corridor. The expected increase in vehicle and pedestrian traffic is not likely to cause significant increase in decibel level.

The downtown alleyway area is currently zoned for commercial use. The area holds a potential 176,160 square feet of commercial space (Urban Transitions Studio 2010). The proposed revitalization is consistent with City goals to accommodate projected population growth and the subsequent rise in demand for employment while reducing sprawl (Bellingham Comprehensive Plan). It designates infill buildings as "mixed use," which would incorporate housing on top of commercial space (Urban Transitions Studio 2010). However, it does not specify in detail what the housing will look like or how much of it will should be built.

In addition to commercial and residential concerns, the City emphasizes the importance of preserving local culture (Bellingham Comprehensive Plan LU-19). Within the proposal area, there are five buildings currently listed on the Local Historic Register, Washington Heritage Register, and the National Historic Register (Department of Archaeology and Historic Preservation 2009). The first proposal suggests designing themed alleys to incorporate local traditions such as Ski-to-Sea, Mt. Baker, logging, and other themes (Urban Transitions Studio 2010). With additional traffic and increased density, glare and light pollution would consequently increase as well. The proposal suggests the use of themed lighting in each alley in order to provide a unique look and feel during night-time operation.

The proposal also suggests that the aesthetic quality of the alleyway will be improved by creating a continuous row of store fronts which would be more interesting to pedestrians. It provides ways to further improve the aesthetic quality by restricting height limits and by infilling currently vacant lots with visually appealing storefronts, cafes or residential units. Additionally,

the proposal suggests burying utility lines, consolidating garbage dumpsters, utilizing decorative pavement and designing themed murals to provide an aesthetic appeal.

Vehicle traffic is currently not high in the downtown alleys. They are mainly accessed for commercial deliveries and utility maintenance (Urban Transitions Studio 2010). The proposal further discourages vehicle access and suggests phasing out public vehicle accessibility all together with the use of removable bollards. In addition, restrictions on vehicle use and the elimination of parking opportunities accessed through alleys would effectively provide priority to pedestrians and bicyclists. In order to organize and accommodate public parking to downtown employees and visitors, the proposal suggests eliminating surface parking entirely. By significantly reducing parking availability and redirecting drivers to the proposed mixed-use parking garage holding an estimated 260 spots on the south edge of city center, a forced reduction in vehicle trips would be seen. This is aimed at effectively mitigating emissions in order to maintain air quality. Transit service, pedestrian and bicycle amenities are additional proposed strategies proposed to reduce parking demand.

The City of Bellingham has implemented plans to provide sufficient emergency support proportional to the projected population growth. The fire and police departments currently hirer personnel based upon annual demand rates (Capital Facilities Element 2005, CF-26) (Capital Facilities Element 2002, CF-34). The estimated population increase projected as a result of the proposed revitalization is not expected to significantly impact emergency response efficiency. Additionally, if developers design residential units similar to the existing condos and apartments downtown, it is unlikely that the school system will be impacted as it is less likely for families to live in the housing units. The proposal also calls for regular maintenance of the revitalized

alleyway. Without regular upkeep, the area is likely to return to its current dilapidated state. This could increase the demand on services such as street sweeping.

The proposal does not analyze the capacity of the sewer or storm water system. It does not suggest mitigation efforts to compensate an inevitable increase in loading as a result of increased population and infill. However, it does suggest the use of LID pervious pavement which would complement the existing storm water system in runoff infiltration and drainage.

Using 2000 U.S. Census Block data for downtown Bellingham and housing estimates for a single story of residential above the proposed commercial infill, it is estimated that the proposal would bring in about 153 people as residents of the alleys (Calculation 0.4). Based upon the same data set, there are currently 87 people residing in the area, most of which live in the Leopold Retirement Center and are not subject to displacement. For those living in the alleys and future residents and visitors of the alleys, the redevelopment offers appeal to a diverse population. By promoting a range of commercial uses along with residential opportunity, a variety of individuals is expected to be drawn to the area.

The proposal as a whole offers a promising redevelopment plan, though it fails to specifically address the impacts of many of the actions that it proposes. The lack of specificity in many areas contributes to the lower scores of the proposed action elements on the decision matrix.

Alternative Actions

Natural Environment

The alternative action proposals are intended to mitigate the negative impacts of the proposed action and to provide options and variety in the decision making process when considering the significance of environmental impacts caused by the proposed project. While

project reviewers may pick and choose for each environmental element whether they will implement the proposed action or the alternative action, we have prepared our alternatives in a way that when used together, they create cohesive, comprehensive alternative development plan. The effective mitigation and enhancement of the impacts of the proposed action justifies the highest score of 46 earned by the alternative actions.

The proposed alternative to mitigate impact regarding soil erosion is to utilize a portion of the available infill area for the installation of pocket parks throughout the alleyways. Pocket parks will initially cause disruption and potential erosion but will later serve to increase storm water drainage in addition to providing an aesthetic appeal to the area (Figure 0.2, Figure 0.3)..

Alternative actions to mitigate air pollution include three strategies; limiting idle time of machinery to reduce burning unnecessary fuel, burn cleaner fuels such as low sulfur diesel (LSD) and biofuels, and install pollution control equipment on heavy machinery (U.S. EPA, Reducing Emissions from Construction Equipment, 2007)..

The increased risk of further impairing the quality of water in Whatcom Creek and Bellingham Bay will be mitigated by the alternate action proposal to install LID pervious surfaces, pocket parks and rain gardens throughout the area (Rimer et al. 1978) (Mitsch & Gosselink 2007). With increased traffic volume, the concentration of contaminants is likely to grow. These mitigation measures will provide increased drainage, aid in reducing flow to allow sedimentation in addition to providing time the necessary environmental for nutrient absorption which will lessen the risk of overwhelming Whatcom Creek and Bellingham Bay.

To decrease the amount fuel consumed by construction the alternative action would use fewer, more fuel efficient machines. This would mainly be accomplished through the use of large machinery equipped with generators that could power smaller machinery and decrease the

overall number of generators used. This would in turn decrease the amount of air pollution (Matthews, Roth, Sharrard, 2007).

Built Environment

In an attempt to mitigate adverse environmental health-related impacts, the alternative proposal emphasizes the importance of emergency personnel awareness and suggests the use of coarse gravel LID pervious substrate to line the area of clustered garbage dumpsters (Dawson 1997). This would reduce the impact of a possible spill containing concentrated pollutants that would otherwise flow directly into the creek. Concerns for asbestos contamination would be mitigated by the removal of any existing asbestos through the AHERA removal procedure, lessoning the environmental health risks (AHERA 1987).

Through surveying community members in the immediate vicinity, a time-of-day restriction of construction hours is suggested by the alternate proposal. This plan could be implemented to mitigate excess noise disturbances by limiting construction to off peak business hours.

To improve upon both Land Use and Housing the alternative suggests using the Old Town Development Plan as a model of effective mixed use development (Figure 0.4).. This plan emphasizes the importance of setting height restrictions to mitigate impacts of potential loss of historical buildings and vistas (Figure 0.5). Additionally, the Old Town Development plan provides a way to strategically incorporate affordable housing while utilizing various incentives to promote sustainable design (Bellingham Municipal Code § 20.35.070). Due to the close proximity and similarities in community structure, this will be a useful model for the revitalization of the downtown alleys.

The alternate proposal to mitigate impacts on local history and culture is to stress the importance of preserving the existing atmosphere of downtown Bellingham. While the creation of culturally appropriate themes in each alley does coincide with the personality of Bellingham, caution should be taken when choosing such themes. The proposal suggests the possibility of a "Chinatown" alley, which is arguably not consistent with the existing downtown atmosphere. Similar precautions should be taken when considering themed lighting in the alley. Excessive "themeing" could easily detract from the existing atmosphere and from historical structures and vistas that the City has committed to preserving.

The suggested use of LED lighting in the alternative proposal would lessen cost to the city and reduce light pollution by emitting fewer lumens. Also, by installing a motion activated light system, public safety would be improved and glare would be reduced during lower usage times.

Consistent with the previously described alternate proposals of mitigations to reduce adverse impact on the natural and built environment of downtown Bellingham, the alternately proposed mitigation suggested to provide more aesthetic appeal throughout the revitalization is to install interspersed pocket parks. In addition to added benefits to the natural environment, pocket parks would create islands of reprieve within the gray texture of the surrounding urban atmosphere. Also, structural considerations could again be borrowed from the Old Town Development Plan to be sure that no opportunity to preserve aesthetic quality is overlooked.

Due to foreseen complications in completely blockading vehicle access to the alleys, the alternate proposal is to restrict access with signage instead of bollards. This way, public traffic will be heavily discouraged while utility maintenance and emergency access will not be blocked.

Signage would give entitlement to pedestrians making the alleyway an undesirable throughway for public vehicle traffic (Figure 0.9).

The alternative parking strategy goes more in depth to address parking needs so as not to create more congestion or hamper economic vitality downtown. Several strategies are proposed as an alternative to dramatically reducing available parking. For example, maximizing mixed-use parking opportunities wherever possible and encouraging workers and business owners to park on the periphery of the city so as to avoid stagnant unnecessary congestion throughout the day. Emphasis on encouraging transit service and bicycle/pedestrian amenities is stressed as well.

The alternative proposal to compensate for increased emergency call volume likely to occur with the population increase is to require a "fire impact fee" and a "police mitigation fee". The fee would be paid by developers and calculated based upon the design plans (single/multi-family, office, retail, and/or restaurant). This system is modeled after the city of Issaquah, WA and their similar urban development plans (City of Issaquah Impact Fees 2010, 2-3). Additionally, the mixed use nature of the development might in itself contribute to lower crime rates and therefore a decrease need of police and fire services (Municipal Research and Services Center of Washington 1997). The City of Bellingham already has school impact fees to cover any increased education needs (Bellingham School District 2010, 8). To account for the increased maintenance needs of the alleys, the downtown street sweeping route for the main roads would be expanding to regularly cover the alleys as well (City of Bellingham 2010)..

With regards to sewage and storm water utilities, the alternative proposal emphasizes the value of pervious surfaces and installation of pocket parks, small bioswales and potentially green roofing to complement municipal storm drainage and mitigate pollution of Whatcom Creek and Bellingham Bay. Storm water catch basins and drainage lines will need to be installed in alley

sections two and four in order to reduce flooding risks. Upon analysis of each system and consideration of the estimated population growth, it was found that the increase in sewage expected to be generated by the revitalization will not significantly impact the existing system (Jim Bergner, personal communication, November 2010).

The increase in population caused by proposed alleyway development meets the Bellingham and Whatcom County's goals of promoting infill and providing housing to accommodate increased population. To improve upon the proposed action of meeting the standards by provide a single story of housing, the alternative action proposed four full stories of housing as seen in downtown Fairhaven (Figure 1.2). This would provide housing for 612 new residents and further increase the density of the downtown.

The alternative proposal further emphasizes the value of diverse commercial uses in addition to providing a more detailed plan for providing diverse housing opportunities. It suggests the use of incentives for developers to provide affordable housing through utilizing sustainable designs. Providing housing for mixed income brackets would further encourage diversity and improve equity in the redeveloped alleyway.

The higher scores of the alternative action elements on the decision matrix are likely due to the effort of each to mitigate the negative impacts of the proposed action or to further improve upon the positive impacts.

No Action

Finally, there exists the possibility of taking no action in the selected alleyways. This EIA includes an analysis of the potential impacts of this third scenario to add perspective to the changes suggested by the proposed action and the alternative action. As previously mentioned, we chose to consider the effects of taking no action on the City of Bellingham and Whatcom

County at large. Forgoing development downtown will likely force it into an urban growth area, expanding the sprawl of the City instead of efficiently using existing developed space. When compared to the other two actions, this alternative scored the lowest with an overall all score of 23 most due to the negative impacts that the development would have elsewhere in Bellingham.

Natural Environment

With no action taken on the natural environment, there will continue to be impervious surfaces throughout the alleyway area and risk of soil erosion will remain low. Storm water runoff will continue to stream down the alleyways with little to no infiltration and flow untreated directly into Whatcom Creek or Bellingham Bay. Vehicle traffic will not change from current conditions and the use of heavy construction machinery will not be necessary and will therefore yield no additional impact on air quality.

Built Environment

Impacts on the built environment will be similar in magnitude. Without action there will be no increased environmental health risks and no excess noise will be generated by construction machinery or higher vehicle traffic. An estimated 176,160 square feet of potential commercial space will remain underutilized. This square footage might be built at another site in the future as demand for commercial space increases, possibly posing significant environmental threats to other sites.

Outside of the Leopold Retirement Center, there is virtually no housing in the proposal area. Without the necessary zoning changes, housing conditions will remain the same. However, the increasing demand for housing in Bellingham might result in housing being built in other areas of the City, encouraging sprawl instead of infill. The alley will maintain its backstreet atmosphere with arguably no aesthetic quality. Traffic demand and vehicle usage will remain in

the realm of commercial delivery, utility maintenance and an uncomfortably narrow, poorly-lit throughway. With a no-action plan, improved parking would remain an importance to the city of Bellingham and supply would likely continue to be enhanced, consistent with the City Center Master Plan. There would also be no increased need for public utilities or maintenance of the alleyways. The space would go underutilized no increase in population would occur there, though it is bound to spread and increase elsewhere.

The lack of positive impacts of the no action and the presence of many negative environmental impacts caused elsewhere by forgoing redevelopment in the alleys contributes to the highly negative overall score on the decision matrix.

2. Natural Environment

2.1 Earth

Current Conditions

The Alleyway Corridors are located in-between Railroad Street and up to Commercial Street and are consistent with impervious asphalt, impervious concrete, and loose gravel. The alleyways are consistently flat with a gradual decreasing slope of ten feet over the entire site area. The alleyways consist of a mixture of commercial space buildings and delivery driveways for freight.

According to the web soil survey the site area is consistent with soil type 171 Urban land and 172 Urban land-Whatcom-Labounty complex (Natural Resources Conservation Service 2010) (Map 7). Slopes are generally between 0-3 percent. These soils are considered unnatural fill and a highly anthropogenic disturbed soil type by the development of downtown Bellingham. Identification of the soil series is not feasible. Soil type is moderately well drained because of a mixture of glaciomarine deposits. Permeability is moderate in the upper part of the Whatcom soil

and slow in the lower part. Available water capacity is high. Runoff is slow, and the hazard of water erosion is slight (Natural Resources Conservation Service 2010).

Proposed Action

The proposed action for this site is the incorporation of pervious concrete into the redesign of the alleyway. This resurfacing will require the digging up of all imperious surfaces and all soil will be vulnerable to soil erosion and possible storm water discharge into city streets during construction phase. The project calls for the possible burying of power lines that currently hang above the alleyways. The alleyway between Railroad Avenue and Cornwall Avenue are currently having the lines buried under the alleyway and replaced with asphalt pavement. Therefore when the revitalization project occurs, the Cornwall Avenue and Commercial Street alleyway will need their power lines buried if applicable to City's needs. Treatment for possible erosion has been controlled by the use of Best Management Practices (BMPs) to prevent any potential releases of sediment. All resurfacing would be with (LID) low impact development pervious surfaces designed for bike and pedestrian travel. Alleyway trenching would install a better storm water drainage system into alleyway to appeal to pedestrian foot travel.

The project calls for the infill of several open area spaces that currently contain some form of gravel or paved parking lots. The potential of an additional 65,920 square feet of additional surfaces will be added to the alleyways in the form of buildings (Figure 0.1). The existing 110,240 square feet of presently existing buildings are would most likely be left in their current conditions as impervious surfaces at this time. Though the installation of impervious roadways would mitigate some of the effects of increased building coverage, it may not entirely offset it. The need for mitigation justifies the score of 2 on the decision matrix because the

proposed action will create negative environmental impacts that taking no action would not and that the alternative action would begin to mitigate.

Alternative Action

If some of the infill locations selected in can be converted into pocket parks, this will increase the amount of infiltration of storm water into soil surfaces helping to alleviate impervious surfaces. These pocket parks would be modeled after the park located in downtown Fairhaven (Figure 0.2, Figure 0.3). The additional aesthetic beauty of the parks might increase foot traffic into the alleyway and promote additional economic value.

Figure 0.2 Shows the "Village Green," a pocket park in Fairhaven, Washington
http://bellinghamster.com/f.htm

Figure 0.3 The “Village Green” during a community event
http://foodconnections.blogspot.com/2010/08/bellingham-and-coupeville-small-farmers.html

The installation of LID pervious pavement in the alleyways would greatly improve the water quality of storm water runoff. By allowing runoff to slowly trickle through the pervious substrate, sediments settle and contaminants are given the time and necessary environment to naturally decrease in concentration. This would lessen the adverse impact of runoff on Whatcom Creek and Bellingham Bay. Besides the inclusion of pervious concrete into the alleyways, the inclusion of green grass strips with protective mats already utilized by the Boundary Bay Brewery’s beer garden would increase drainage and aesthetic look inside a very urban place (Island County Planning & Community Development, 2). Finally, to offset the additional imperious roofs of the new infill buildings, green roofs could be constructed on top of the new buildings. These activities could increase the amount of construction needed at each site to dispose of additional asphalt pavement and may require additional soil disturbance and erosion sources. Due to disturbing nature of construction, soil would still be consider altered and

therefore would carry a low negative impact. This action is slightly better for the soil compared to the proposed action, but still not as good as leaving the soil undisturbed, resulting in a ranking of 2 on the decision matrix.

No Action

If no action is taken the soils and impervious surfaces in the alleyways and the building space will stay the same. There will be no green roofing or improvements to the current alleyway drainage system in the Commercial Street and Cornwall Avenue area. The risk of erosion will continue to be low, with little to no infiltration into the covered soil. No surface pervious concrete (LID) surfaces would be installed at the site.

Again, if no action were taken, it is likely that another site for construction would likely be chosen. This site may be located inside the urban growth area and just as likely to be majorly disturbed just like the site downtown. As a result the impact score for no action in the decision matrix is a neutral score impact of 0. The downtown alleyways are not being disrupted and no construction is occurring, thus a neutral outcome for soils. Though the threat of threat of potential and eventual development of another area with the same purpose would be a negative outcome for soil site, it is likely that this negative impact would be similar to that in the alleyways and therefore is negligible. Because both the proposed action and the alternative action would still have some negative impacts on the environment, no action is the best course of action for this category because it leaves the soil as it is, resulting in a score of 3 on the decision matrix.

2.2 Air

Current Conditions

Bellingham is located on the Puget Sound in a region that experiences mild temperatures and weather patterns. Downtown Bellingham is surrounded mostly by residential neighborhoods

and is near some light and heavy industrial areas. Sea-breezes and mountain-induced flows create for a low pollutant level air shed.

Existing activities influencing air quality within downtown Bellingham are at a non-significant level. As of November 17th, 2010, air quality for Bellingham is at 11 on the Air Quality Index Chart calculated by the Environmental Protection Agency (Northwest clean air agency, 2005).

Quality Index Chart (AQI)			
AQI Values	**Level of Health Concern**	**Meaning**	**Colors**
When the AQI is:	*...air quality is:*	*...which means you may be affected in this way:*	*...look for this color:*
0 to **50**	**Good**	Air quality is considered satisfactory, and air pollution poses little or no risk.	**Green**
51 to **100**	**Moderate**	Air quality is acceptable; however, for some pollutants there may be a moderate health concern for a very small number of people who are unusually sensitive to air pollution.	**Yellow**
101 to **150**	**Unhealthy for Sensitive Groups**	Members of sensitive groups may experience health effects. The general public is not likely to be affected.	**Orange**
151 to **200**	**Unhealthy**	Everyone may begin to experience health effects; members of sensitive groups may experience more serious health effects.	**Red**
201 to **300**	**Very Unhealthy**	Health alert: everyone may experience more serious health effects.	**Purple**
301 to **500**	**Hazardous**	Health warnings of emergency conditions. The entire population is more likely to be affected.	**Maroon**
Above table taken from http://www.pscleanair.org/airq/basics/aqi.aspx			

Current pollutants consist of nitrogen oxides (NOx) and volatile organic compounds (VOC's) from the burning of fossil fuels. Particulate matter (PM) is also a pollutant that comes from industrial activities, vehicle and gas machinery emissions, as well as wood burning (Northwest clean air agency, 2005). Certain alleyways are unpaved which can add to PM increases from dust. None of these are directly related to activities within alleyways that would have any significant impact on the environment. Odor is at a not at a significant level, but potentially could be worse in the vicinity of dumpsters.

Proposed Action

Construction activities would contribute to short-term high concentrations during demolition and excavations. Emission levels from machinery would also lower local air quality during construction time (Matthews, Roth, Sharrard, 2007). Asbestos may be introduced during demolition and remodeling of most buildings due to existing building materials, many of which contain asbestos (U.S. EPA, Asbestos hazard emergency response act (AHERA), 1987). Some

construction activities may cause odors, but any of these would be short-term and most likely not effecting air quality.

Types of construction activities that will occur will be removal of old building materials with heavy machinery, construction of new buildings, possible construction of alley archways, and removal of power lines. Also, all alley ground surfaces will be repaved with low impact development (LID) pervious surfaces, and some areas excavated for burial of power lines (Theresa Loop personal communication, October 2010). All this will most likely be done with industrial diesel and gasoline machinery. Every building remodeled or demolished should be inspected by and AHERA building inspector (U.S. EPA 1987 Asbestos hazard emergency response act (AHERA)). The positive aspect of demolition and remodel of old buildings would be the removal of harmful asbestos within current structures which could potentially be dangerous if asbestos becomes suspended in the air during removal, but in the long run extremely beneficial.

As economic activity within downtown Bellingham increases, the number of consumers will increase as well. It's estimated that there will be an increase of 400 vehicles trips per day at peak travel hours if all proposed businesses open in the alleyways. An estimated 3250 vehicle trips is the current and 400 added would be a 12% increase (The Transpo Group 2007, 31). According to the central place theory, the distance and frequency of consumers' increases as the frequency of a good or service is purchased decreases (Johnson, Rimmer 1967). Proposed alleyway businesses consist of high frequency services such as coffee shops, restaurants, bookstores, design stores, and art galleries. If the theory holds true, 400 estimated new vehicle trips added should not be from great distances. It is likely that increased fuel consumption and

vehicle trips traveled will not increase significantly, therefore air pollution from increased fuel consumption should not increase significantly.

Weighing out positive and negative impacts on air quality, the proposed action would have a slightly positive impact on air quality. Increased pollution from construction would be minimal and potential exposed asbestos from remodels would be short-term, but the benefits of asbestos removal would be a much greater long-term benefit. Overall, this proposed action would have a low positive impact on the environment. When compared to the alternative action and no action, it scores a 2 on the decision matrix because it is better for the air than doing nothing at all but not as good as the actions proposed by the alternative action.

Alternative Action

An alternative for lowering air pollutants from the short-term construction would be to use more fuel and energy efficient machinery. This would mean "hybrid" engines, where large machines, such as excavators, would be equipped with larger engines and the ability to generate electricity in place of a small generator. This is because small generators (25 hp or less) commonly used for construction generate more NO*x per* hp than other larger engines (Matthews, Roth, Sharrard, 2007). This alternative would decrease the amount of nitrogen oxides and other pollutants emitted from small engines.

To reduce pollution during construction there are three steps that construction companies can do to reduce the amount of pollutants are let into the air. These include: reducing engine idle during construction, burning cleaner fuels like low sulfur diesel (LSD), clean diesel fuels, or biodiesel, and having pollution control equipment installed on all heavy machinery (U.S. EPA, Reducing Emissions from Construction Equipment, 2007).

With the City of Bellingham's proposed Transportation Mode Shift Incentive program in place, it is estimated that PM peak hour vehicle trips would only add up to 312 new vehicle trips, which would be a 9.6% increase (The Transpo Group, 2007, 31). The decrease in vehicle trips as well as decreases of fuel during construction would add to the proposed action in mitigating some pollutant sources. Adding to the already positive impacts of the proposed action justifies the higher ranking of this action at a 3 on the decision matrix.

No Action

Over time, current conditions within Bellingham would persist and would not have any significant impacts on air quality. The benefit of no action would be that asbestos exposure would not happen if there is no remodel. The negative impact this would also have would be that the asbestos would not be removed and would possibly be a problem in the future. Overall there would be no impact to air if no action is taken. Because the other two possible actions both have some degree of positive impacts on the environment, no action scores the lowest at a 1 on the decision matrix because it does not contribute any positive environmental impacts.

2.3 Surface and Ground Water

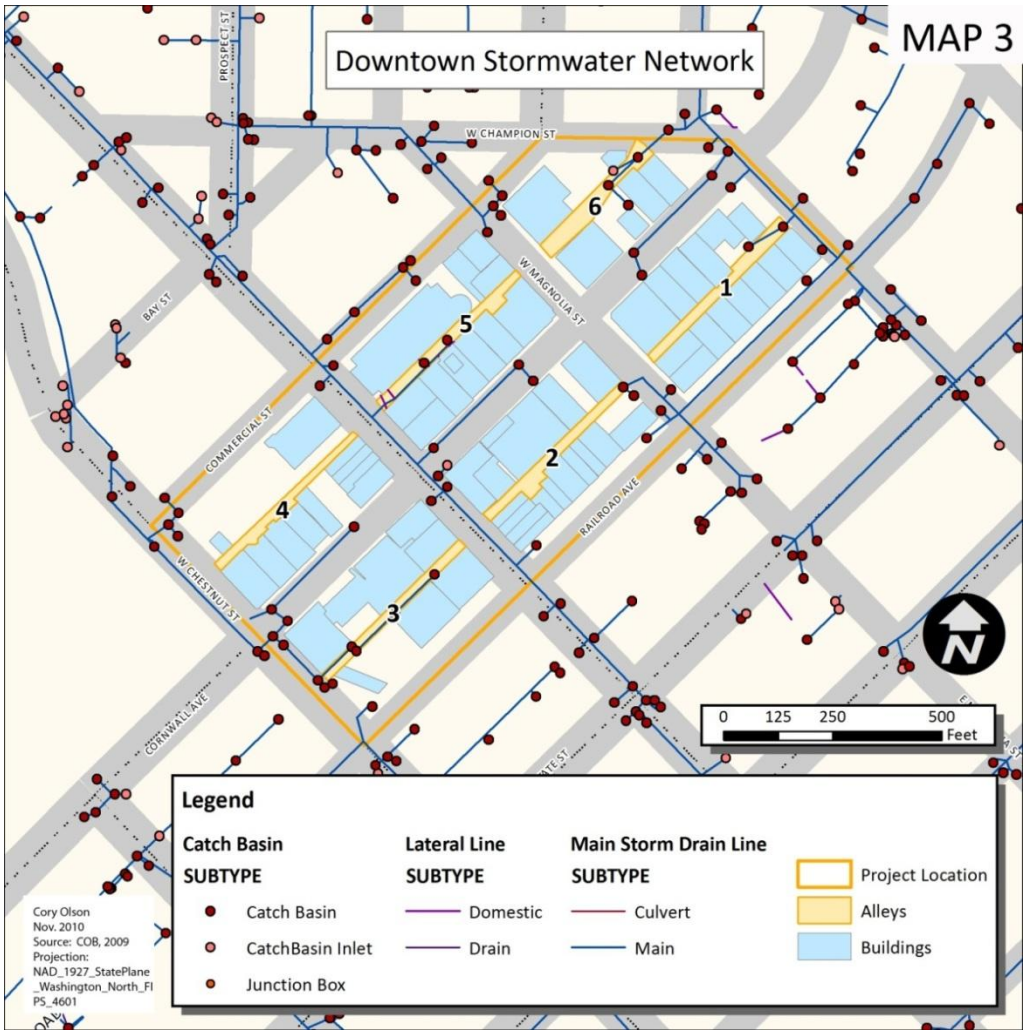
Current Conditions

There is no surface water on or in the *immediate* vicinity of the proposed site. The closest bodies of surface water lie just over 2,000 feet off the south end of Cornwall Avenue to the shoreline of Bellingham Bay and approximately 1,800 feet to the north is the shoreline of Whatcom Creek (just before it empties into Bellingham Bay) ("Bay, Lakes & Streams" map, City of Bellingham, GIS data).

The discharge of alleyway storm water runoff is diverted into either Whatcom Creek or Bellingham Bay via the City of Bellingham's existing municipal storm drainage system (William Reilly, personal communication, November 2010).

According to the City of Bellingham's 2009 Urban Streams Monitoring Program Report, Whatcom Creek is currently on Washington State's 303(d) listing, indicating evidence of water quality impairment. Whatcom Creek is specifically listed per standards of the Clean Water Act with regards to:

- Excess fecal coliform counts
- Decreased dissolved oxygen content and
- Elevated water temperature



The presence of fecal coliform indicates contamination from fecal sources. In 2009, Whatcom Creek did not meet the Class B (Secondary Contact Recreational) criteria of 200 colony forming units (CFU) per 100 milliliters of water with the caveat that not more than 10% of samples to exceed 400CFU / 100mL (Urban Streams Monitoring Program Report 2009). This data was collected at the site where Dupont Street intersects Whatcom Creek. It is interesting to note that samples taken from upstream sites, outside of downtown Bellingham, show lower concentrations of fecal-coliform (Urban Streams Monitoring Program Report 2009).

Though initial consideration may direct speculation towards upstream non-point fecal coliform sources such as recreational parks and residential lawn areas, the elevated fecal coliform concentrations below Dupont Street (closer to the discharge into Bellingham Bay) are potential results of substantial storm water runoff from contaminated impervious surfaces like parking lots and sidewalks, or possibly due to point-source pollution such as a leaking sewage line or discharge from combined sewer system overflows during major rain events (Gregory & Frick, USGS 1994). As discussed later in this document, the City of Bellingham has one remaining Combined Sewer-Storm Water Overflow point at the C Street overflow structure that discharges several hundred feet downstream into Bellingham Bay (Comprehensive Sewer Plan, 2009).

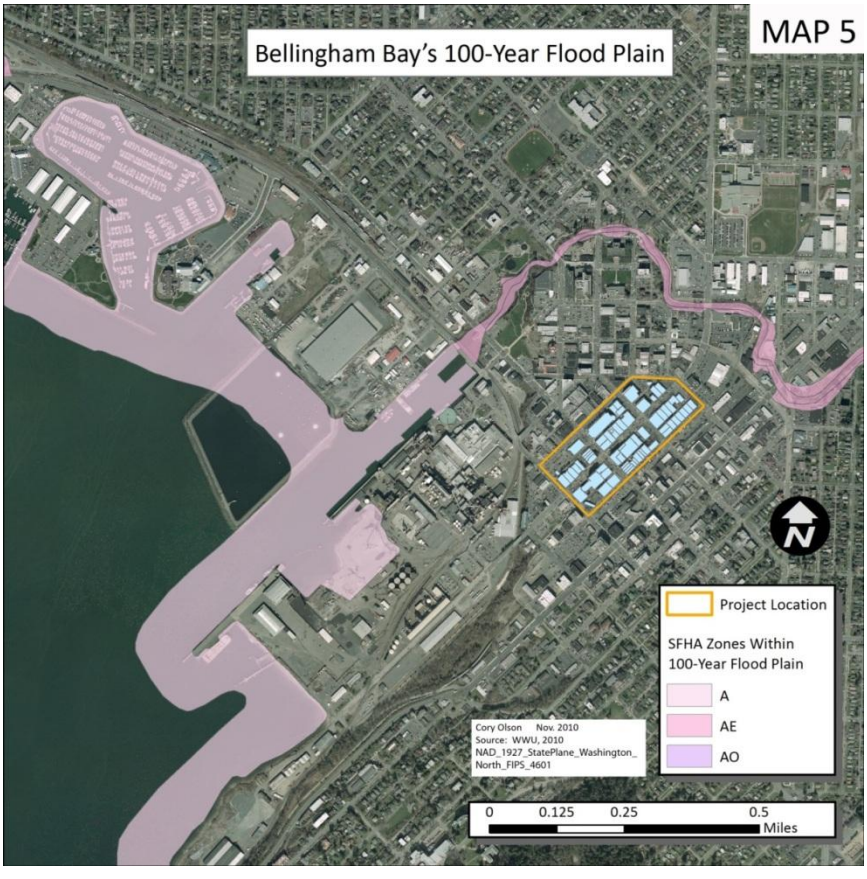
Current storm water runoff in the alleys.

Fish and other aquatic organisms depend heavily on the presence of adequate oxygen in their habitat (Koenig 2010). Oxygen in water is measured in its dissolved form. Organic matter existing in aquatic systems (from animal feces, failing septic systems, leaf litter, and urban

runoff – among other sources) supports microbial life. With increased organic matter, an increase in microbial activity will be observed and more oxygen will be consumed from the waters. In order to meet the Core Summer Salmonid Habitat Aquatic Life Use criterion, dissolved oxygen must remain above 9.5 mg/L (Class AA standards) (Urban Streams Monitoring Program Report 2009). In 2009, Whatcom Creek at Dupont Street reached average dissolved oxygen content of 10.6 mg/L though 30-40% of samples fell below the ALU standards equating to a Class B, secondary contact recreational use, ranking (Urban Streams Monitoring Program Report 2009).

Additionally, dissolved oxygen is inversely proportionate to temperature; as temperature rises; dissolved oxygen decreases (Riley 2009). Water temperature is critical to the aquatic life found in this system, especially salmon. In 2009, Whatcom Creek at Dupont Street met the WAC 173-201A-030 standard of *not* exceeding 18ºC with an average temperature of 11.9 ºC (Urban Streams Monitoring Program Report 2009).

Proposed action



Though there is no existing surface water within the immediate vicinity of the proposal, the north end of the proposed project falls within the boundary of Whatcom Creek watershed while the south end falls within the watershed of Bellingham

Bay ("Watersheds & Sub-basins" map, City of Bellingham, GIS data). The project does not propose to interfere with the natural structure of these systems and no part of the proposal suggests filling or dredging either of the water bodies. Also, no part of the proposed project lies within the 100 year flood plain of Bellingham Bay. This considerably reduces the risk of major flood to the area (Map 5).

The greatest impact on the local surface water bodies will be a direct result of increased storm water runoff. With the proposed infill of currently vacant spaces along the alleyway, runoff will be concentrated to a smaller area with less permeability. A number of studies have shown that the proposed use of pervious pavement would mitigate this impact. "The application of pervious asphalt leads to lower concentrations of pollutants in runoff," (Berbee et al. 1999). In addition to a significant reduction of suspended solids, overall runoff loads of heavy metals chromium, copper, lead, nickel, cadmium and zinc (common metals found in polluted urban runoff) were reduced by a factor of five from pervious asphalt compared with impervious (Berbee et al 1999).

The proposal does suggest mitigation efforts to reduce adverse impact on the natural environment though stronger despite the fact that more effective methods exist to further lessen adverse impact on local water quality exist. Compared to the alternative action, these mitigations are not as strong. However, when compared the no action the proposed action is more favorable because it keeps the inevitable surface and ground water increases within an urban area rather than in a potentially undeveloped, sensitive ecosystem. These comparisons support the ranking of 2 on the decision matrix.

Alternative Action

As highlighted in the discussion of impacts on Earth, the installation of LID pervious pavement in the alleyways would improve the quality of storm water runoff. Additional maintenance practices, such as increased frequency of street-sweeping, would further improve runoff quality before drainage into the already-contaminated Whatcom Creek (Rimer et al. 1978, Berbee et al. 1999). During the construction period excess sediment erosion carrying higher concentrations of contaminants is likely to occur. For this reason, summer construction would be preferred since the risk of a heavy rain event is less than if construction took place during other seasons.

Additionally, in the 1978 study conducted by Rimer et al., various land-use types were compared during storm events in order to assess the quality and quantity of runoff emanating from the different land cover types ranging from "low-activity rural (2.7% impervious area) to Urban-central business district (80% impervious area)". Their results concluded that "the level of nonpoint source pollution generally increases with increasing impervious area". The major exception to their conclusion was in the central business district where a higher frequency of preventative maintenance, such as street sweeping, in the urban land type resulted in reduced levels of suspended solids (SS) and solids-related pollutants, such as phosphorus and lead, in storm water runoff of the central business district area (Rimer et al. 1978). This justifies added emphasis to the mitigation effort of installation of pervious pavement to the alleyway surfaces in Downtown Bellingham.

To take further advantage of sustainable water quality improvement practices, the installation of rain gardens and bioswales would add to the efforts of reducing significant impacts on local surface waters. Similar to the way that pervious surfaces allow runoff to slowly

trickle through, rain gardens and bioswales are an aesthetically pleasing way to provide for water quality improvement and increased drainage. The larger the area allotted for biofiltration, the greater the efficiency of chemical and suspended solid retention will be. This is an obvious challenge in the compact, urbanized, downtown area, though the creative use of medians, traffic islands and rooftops can be designed to maximize permeable surface area (Mitsch & Gosselink 2007).

The use of appropriate, native, wetland vegetation, such as Red Osier dogwood (*Cornus stononifera*) and creeping buttercup (*Ranunculus repens*), in the gardens is an added strategy to slow runoff and reduce chemical concentrations downstream (Cooke 1997). Storm water biofiltration can reduce concentrations of suspended solids by 75%, nitrogen and phosphorus by 25 and 45% respectively, also lead and zinc metals by 75 and 50% (respectively) (Mitsch & Gosselink 2007). Plants and soil will provide an opportunity for evaporation and increased infiltration of excess runoff in addition to supporting the removal/adsorption of nutrients from the water before it is allowed to overwhelm the creek or the bay.

These strategies are intended to complement the existing storm water runoff utilities currently installed within the project area. The added mitigation efforts of the alternative proposal provide additional efforts to mitigate impact and improve environmental quality more so than the proposed alternative. Therefore, while the alternative still adds to the water runoff at the site, the mitigation efforts justify is higher score than the proposed action and therefore no action as well, at a score of 3 on the decision matrix.

No action

If the revitalization is not conducted in the downtown Bellingham designated Urban Growth Area, the projected local population increase will be forced to develop into more rural,

environmentally-pure, areas of Whatcom County. This scenario, carrying the highest degree of adverse environmental impacts, would be the worst-case alternative. For this reason, the no action alternative scored 1 on the decision matrix.

2.4 Energy and Natural Resources

Current Conditions

Utility infrastructure currently can support businesses connected to alleyways. Utilities consist of electricity, natural gas, water, and sewage. Current construction is underway to bury utility lines underneath alleys which will include water, sewage, electricity, and optic cables (Theresa Loop, personal communication, October 2010).

Proposed Action

Short-term standard energy uses for construction purposes should be expected. Most energy use during construction will be diesel fuel and electricity. If generators for electricity are used for construction, diesel fuel use will be the biggest energy use. If electricity from the grid is used then diesel consumption from generators will decrease. Once the project is complete, utility

use and energy consumption overall will increase with additions of new businesses and services within alleyways. This consists of increased electrical, natural gas, water, sewage, and potential use solar energy (Matthews, Roth, Sharrard, 2007).

Even though energy and natural resource use will increase, the increase in businesses in downtown where utility infrastructure already exists would have much less of an environmental impact then if this project was moved somewhere else within Bellingham's urban growth area. This would conserve on potential natural resources such as wetlands, forests, or undeveloped land elsewhere that would be modified or impacted if these businesses were put elsewhere. Therefore in comparison to moving the project elsewhere, the proposal is somewhat positive. However the alternative action improves upon the proposed action even further, supporting an intermediate score of 2 on the decision matrix.

Alternative Action

To decrease the amount of fuel used for machinery in construction and electricity use, the use of more fuel efficient and less individual machines could be implemented. The main target for decrease in fuel consumption would be a decrease in the amount of small generators used (25 hp or less). This can be accomplished by using large machinery (e.g. excavators) with a slightly larger engine that could run at normal power with a built in generator that could power small on-site equipment as well. This would decrease the number of small generators used, decreasing fuel consumption and also decrease the amount of air pollution (Matthews, Roth, Sharrard, 2007). This alternative mitigates the concern for additional energy use during construction, making it better for environment. Accordingly, the alternative action scores the highest on the decision matrix with a 3.

No Action

As described in the proposed action scoring, forgoing any redevelopment of the alleys would likely force the development to another site in Bellingham's urban growth area. This could result in the use of much more delicate natural resources than the alleys. While the energy use of the alleys would not change and therefore score a 0 alone, it can be assume that this energy use would simply be transferred to development elsewhere. Therefore, the combination of developing previously untouched land and still use the energy another site earns supports the lowest ranking for this action at a 1 on the decision matrix.

3. Built Environment

3.1 Environmental Health

Current Conditions

Currently, the alleyway area poses no obvious threat to environmental health. Due to the old-age and condition of the alleyway buildings, higher environmental risks may potentially come about as the project is carried out.

Proposed Action

Aside from ordinary hazards related to demolition and construction the proposal does not involve any additional environmental-health hazards. The potential for organic and chemical contamination and generation of toxic waste material (i.e. asbestos) may exist as construction proceeds and the renovation of older structures is investigated. Asbestos problems will be mitigated as needed per the Asbestos Hazard Emergency Response Act (AHERA 1987).

Within the proposal, the risk of fire, explosion or hazardous waste spill is also within normal range of routine construction risks and uncertainties (Dawson 1997). In response to this

potential, the Fire Department and trained personnel should be aware of the construction activity and associated risks then ready for the possibility of fire or spill. Also, for the purpose of safely organizing vehicle and pedestrian traffic, if at any point project construction should interrupt normal flow, there will be a need for police services. These precautions are an effort to mitigate environmental health hazards associated with the alleyway development.

The proposal suggests concentrating garbage dumpsters and recycle containers into one main area of each alley section (Urban Transitions Studio 2010, 37). Environmental health risks associated with this action include the concentration of any spill or leakage of the containers in addition to the concentration of fumes potentially given off by the waste. Depending on the type of waste generated by local activities, the possibility exists for hydrocarbon pollution of local surface water through accidental spills and deliberate dumping or continuous inputs through leaks. This could potentially yield significant adverse environmental impact (Hunter et al. 1979). This may or may not be an environmental health hazard, again depending upon the type of waste being generated by the local businesses which is unknown. The primary risk comes from the unmitigated risk of pollution by the clustered dumpsters. Based on these added risks the proposed action scored lower than the alternative action, which mitigates the risks, and equal to no action, which does not pose any added risk at the site but could pose significantly worse impacts if development was pushed into an environmentally sensitive area. Therefore it scored an intermediate ranking of 2 on the decision matrix, equally to that of no action.

Alternative Action

In an effort to mitigate any potential spillage or leakage of toxic waste material generated during or after construction, the proper transport and receptacles must be provided and easily accessible. As previously stated, emergency personnel will be aware of any potential fire,

explosion or spill hazards that come up during construction and demolition. With appropriate use of risk assessment and management, specific risks will be identified and minimized (Dawson 1997).

To mitigate the potential for concentrated waste leakage from the clustering of garbage dumpsters and recycle containers, they should be arranged on a coarse gravel/rock substrate in order to provide increased filtration of runoff. Without this preventative measure, storm water runoff would wash any potentially high-concentrated waste leakage directly into the drainage system and off into Whatcom Creek or Bellingham Bay. Additionally, with the remodel of buildings in the alleyway, any existing asbestos must be removed per AHERA procedure - further lessening the environmental health risks of the proposal (AHERA 1987).

The alternative action successfully mitigates the risk for environmental pollution through the clustering of the dumpsters. Instead of pollution increasing and entering the watershed, it will filter through a permeable surface and enter the established drainage system instead of adding to the runoff. Additionally, in the long term asbestos removal would count as a positive impact on the environment because it is no longer at the site, posing no risk. These factors led to the scoring of the alternative action as a 3 on the decision matrix.

No Action

If construction and demolition does not occur in the alleyway area, there will be no added environmental health risk. The public will continue to minimally utilize the alleys of downtown Bellingham and businesses will go about utilizing the length of the alley for their garbage dumpsters. The environmental risk of taking this project elsewhere in Bellingham would be about the same, although the risks of pollution to an undisturbed environment would be very high. This suggests that it should receive the same score as the proposed action, which would

increase risk downtown but also keep risk out of sensitive areas. Both actions scored an intermediate rank of 2 on the decision matrix.

3.2 Noise

Current Conditions

Bellingham's Central Business District is a dense commercial area surround by light-industrial and dense residential areas. Noise within alleyways is minimal with light vehicle and pedestrian traffic being the main noise source. Noise levels currently must fit within Bellingham Municipal Code 10.24.120 – Public Disturbance Noise.

Proposed Action

Short-term noise pollution would be non-significant. Construction noise pollution would consist of diesel engine running, some demolition and reconstruction of buildings, removal of concrete and digging with heavy machinery. Construction hours may not 'unreasonably disturb or interfere with the peace, comfort and repose of others' (Bellingham Municipal Code 10.24.120). Developers are likely accustomed to noise restrictions such as this; therefore it does not pose any significant obstacle for this project proposal.

Long-Term noise pollution would not substantially change. Alleyways can muffle loud noises. Location of businesses in alleys would most likely not draw in large enough crowds to cause high decibel levels. The most noticed change may be an increase in traffic and delivery trucks between the hours of 3 am and 9 am when all deliveries to businesses will be made (Urban Transitions Studio 2010). The lack of impact of both short and long term noise on the environment earns this proposed action a neutral intermediate score of 2 on the decision matrix, equal across all possible actions for this category.

Alternative action

In order to abide by Bellingham's Municipal Code, limited hours of construction operation based on the local community's preferences could be implemented. The acceptable hours of construction would be decided upon base on input from the community members within vicinity of the project location. This alternative would improved upon the proposed action by mitigating short-term construction noise possibly, but overall there would still be no impact on the built environment, earning it an neutral intermediate score of 2 on the decision matrix.

No Action

Current conditions would continue and noise pollution would be non-significant and have no impacts. Unutilized space would not be a likely attraction to any activity that produces high-volume noises. Therefore no action earned a neutral intermediate score of 2 on the decision matrix.

3.3 Land Use

Current Conditions

The site designated by the proposal is currently zoned for commercial use and is located in the Central Business District of Bellingham (City of Bellingham "Zoning Map" 2010). Commercial use does not have restrictions on use as mixed housing and residential (Bellingham Municipal Code 20.00.0303 2010). According to the Bellingham Comprehensive Plan, "the Greater Bellingham Area will need housing to accommodate the projected population growth of 31,600 during the planning period…the total demand is estimated to be housing for 27,920 people needed by the planning period 2022" (Bellingham Comprehensive Plan, LU-15). Additionally, forecasts indicate that "the amount of total employment that will be located in the Greater Bellingham Area will increase during the planning period to almost 70%" with broad

implications for the city, including "the provisions of housing," affordable housing, and "commuting patter and impacts on the city's transportation network" (Bellingham Comprehensive Plan LU-20). To accommodate these changes, the Comprehensive Plan stresses the strategy of improving "infill while protecting the character of existing neighborhoods" by "making more efficient use of the remaining developable land in the City" and "encouraging and facilitating urban center development" (Bellingham Comprehensive Plan LU-19).

In addition to the Comprehensive Plan, the City of Bellingham has a City Center Master Plan that describes planning goals for the city centers. According to this plan, "It is the City's overall goal to preserve and protect the unique character and qualities of the existing neighborhoods. All policies, proposed development code and zoning changes should be reviewed with this goal in mind" (City Center Master Plan LU-26). Additionally, this plan focuses on promoting "an economically health city center that is unique, attractive and offers a variety of retail, office, service, residential, cultural, civic, and recreational opportunities" (City Center Master Plan LU-26). Finally, in city centers it is important that "affordable, attractive, stable and diverse residential neighborhoods…be encouraged while providing a variety of housing opportunities" (City Center Master Plan LU-26).

Finally, the overarching Washington State Growth Management Act lays out a foundation of goals that it strives to achieve. Eight of the fourteen goals that closely relate to this proposal are listed below.

- Focus urban growth in urban areas.
- Reduce sprawl.
- Provide efficient transportation.
- Encourage affordable housing
- Encourage sustainable economic development.
- Protect the environment.
- Ensure adequate public facilities and services.
- Preserve historic resources

(Washington State Department of Community, Trade, and Economic Development)

In addition to the Whatcom County Comprehensive Plan, these three plans lay out guidelines by which to assess the impacts of the three potential course of action for the alleyways.

Proposed Action

The proposal to revitalize the downtown alleys meets many of the goals outlined by the City of Bellingham's Comprehensive Plan and City Center Master Plan. First, the proposal would bring increased employment opportunities and commercial space to the downtown, promoting an economically healthy and diverse city center that could accommodate some of the forecasted employment growth in the City. According to the proposal, the project would put into use 110,240 square feet of existing commercial space and add another 65,920 square feet of commercial space through infill and additions, totaling 176,160 square feet of potential commercial space in the alleys (Figure 0.1). This space could be filled with uses such as retail stores, restaurants, art galleries, and coffee shops/cafes, promoting economic activity and revitalizing energy in the downtown area (Urban Transitions Studio 2010, 37).

In terms of housing the current proposal presents the idea of incorporating it into the development, but does not detail how. The proposed action would have positive impacts on the environment, comparatively better than no action, which would force development into urban growth areas. However it is not as positive as the alternative action, which proposes a more detailed development plan. For this reason it scored 2 on the decision matrix.

Alternative Action

The alternative action for land use would be to create a more detailed plan for housing in the alleys. This plan is outlined in the Housing section of the report. In the Housing section, the alternative action ranked the highest at 3 because it detailed a plan for the mixed use housing development. This development plan enhances the land use alternative action as well, justifying

the score of 3 on the decision matrix for land use when compared to the less positive and negative options of the proposed action and no action.

No Action

If the proposal is not carried out, the alleyways will remain in their current state, predominantly used for back access to buildings and utility corridors. It would not provide any additional commercial space for Bellingham's predicted employment growth, just as it would not contribute to housing opportunities for the growing local population. The alleys will remain unwelcoming to pedestrians and possibly detract from the aesthetics of other redevelopment projects downtown. If the City decides to leave the alleys as is, the will forgo a significant opportunity to bring energy, economic opportunity, and housing to the downtown area. Additionally, with the population of Bellingham growing, it can be expected the commercial and residential space will be of demand in the near future. If the alley space is not utilized for these purposes, it will force developers to expand into urban growth areas, contributing to urban sprawl. Straying from the goals of the comprehensive plans suggests that taking no action would have highly negative impacts on the environment and therefore scores the lowest at a 1 on the decision matrix.

3.4 Housing

Current Conditions

Under the Whatcom County Comprehensive Plan the City of Bellingham is encouraged to "establish new residential developments at densities averaging six to twenty four units per net residential acre" (Whatcom County Comprehensive Plan 2010, 2-18). The proposal lists 65,920 square feet of infill and addition commercial space that will be added to the alleyways (Figure 0.1). The average household size in the City of Bellingham is 2.31 people (U.S. Census Bureau

2009). It may be assumed that each housing unit in this proposal will be approximately 1,000 square feet, the size of an apartment or condo (Alex Cleanthous, personal communication, November 2010). One acre contains 43,560 square feet; therefore the total alleyway proposal encompasses 1.52 acres of potential housing space (Calculation 0.1). If the proposal aims for the higher average density mark of 24 units per net residential acre, then it will need to provide for 36.48 housing units (Calculation 0.2). To investigate this, we added a hypothetical second story onto the 65,920 square feet of ground level commercial space for housing. Divided by the average housing unit size of 1,000 square feet, we found that the alleyways could provide 65.92 housing units (Calculation 0.3). This is well above the necessary 36.48 housing units to meet the Whatcom County recommendations. This density could be increased by building smaller apartments or adding additional stories, but presently two story developments of infill and additions would provide enough housing.

Proposed Action

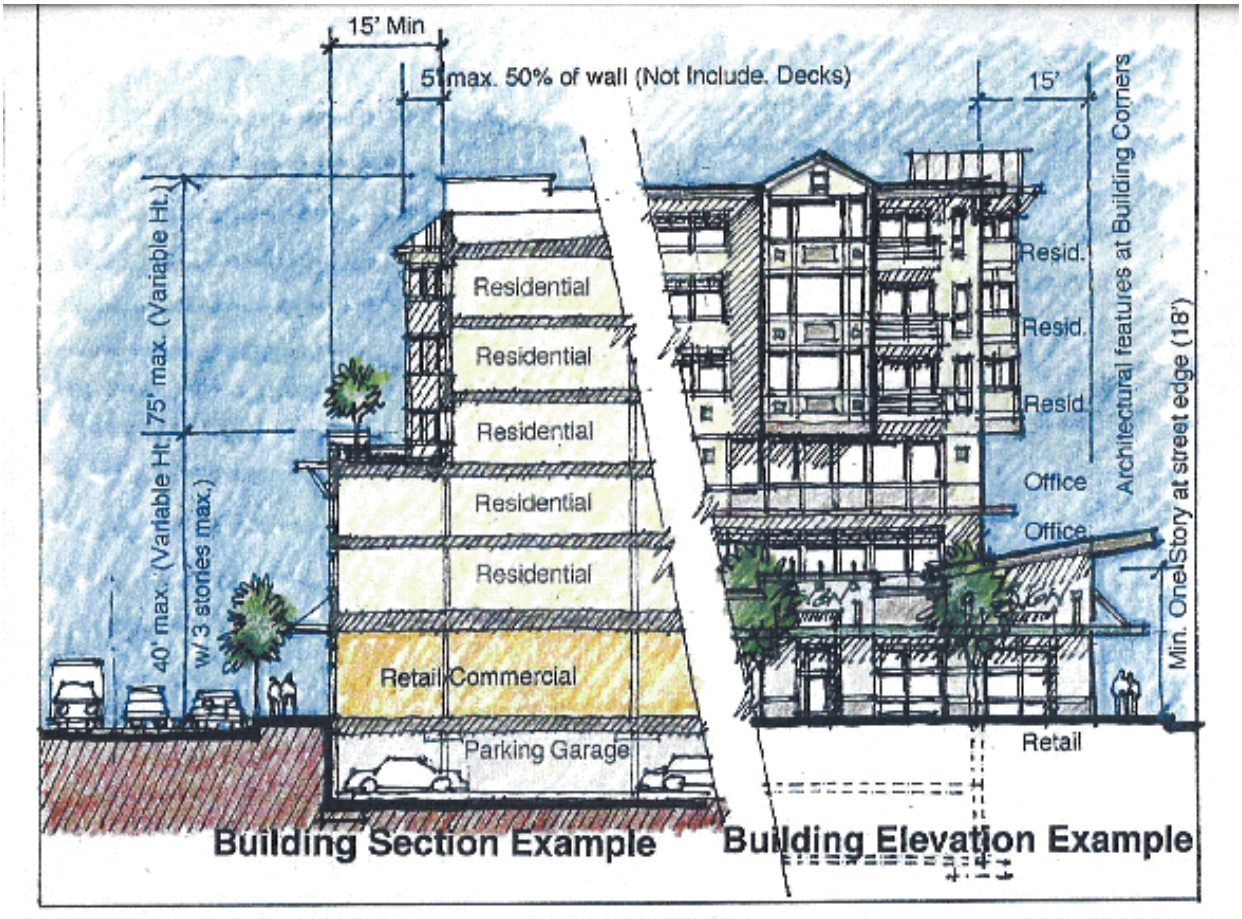
The proposal suggests that new commercial space be developed in the alleys and that "housing could be introduced" (Urban Transitions Studio 2010, 36). Beyond this, the proposal does not suggest how to address housing in the alleys. While the proposal takes the initiative to suggest housing, it is not ideal because it does not lay out plans for it. The alternative action is more specific than this action while no action could have very negative impacts on the environment, suggesting that this section be scored at 2 on the decision matrix for being the intermediate choice.

Alternative Action

The proposal briefly mentions the intention to include housing into the development, but does not describe how this should be carried out (Urban Transitions Studio 2010, 36). Both of

the City's plans highlight housing as a major planning issue, and it would be in keeping with plan to promote infill housing at this site. In order to examine the housing potential in the alleyways for this proposal, we have turned to the Old Town Development plans as a comparison. The Old Town Development is similar to this proposal in that it employs infill strategies to create mixed use buildings with commercial space on the bottom and residential space on the top (Figure 0.4).

Figure 0.4 Old Town Development Mixed Use Building Plan
(Bellingham Municipal Code §20.35.070)



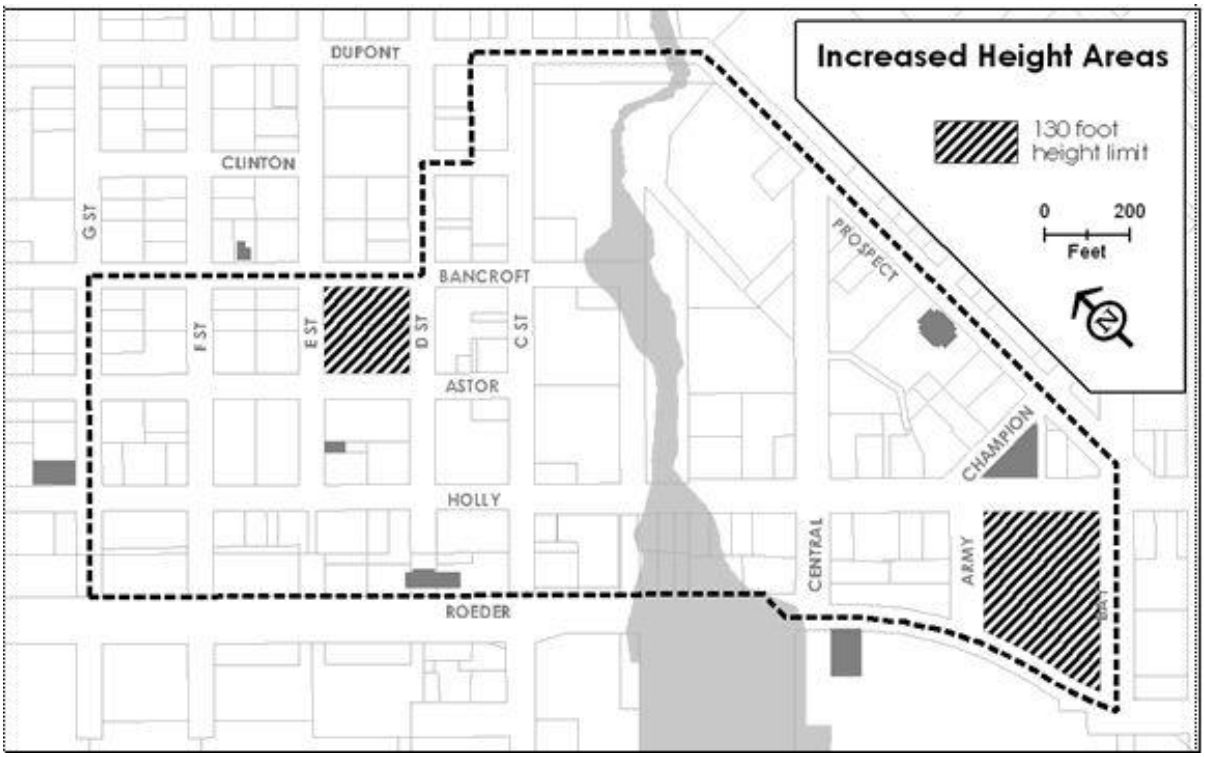
Additionally, the Old Town Development is planned for a similar environment to the alleys, with historic buildings and a historic character to maintain. As an alternative to the vague

suggestion for housing mentioned by the proposal, we propose that the alleys use the Old Town Development as guidelines for mixed use development.

The first change that would need to occur to make this possible is the rezoning of the alley corridors as mixed use or “urban village” instead of solely commercial. This would allow developers to confidently purchase property with the understanding that they could build residential units on it, promoting development interest. This kind of building has already been built in the Bellingham downtown, along Railroad Avenue between East Chestnut Street and East Holly Street. This block has a combination of night clubs, restaurants, retail shops, and offices with apartments or condos on top. If the alleys were rezoned they could accommodate development similar to this and the Old Town Development Proposal.

The first benefit of the Old Town Development is that it sets height limits for the infill. Most sites are set at 75 feet with the exception of a few areas limited to 130 feet and some limited at lower heights (Figure 0.5). Establishing buildings heights helps to plan the skyline of the city and ensure that views and cultural vistas are no obstructed by unregulated building.

Figure 0.5 Old Town Development 130 foot height limits
(Bellingham Municipal Code § 20.35.070)



The Old Town Development is also a good model for its incorporation of affordable housing and environmental sustainability. Affordable housing especially is highlighted by the City plans as extremely important. New residential structures in Old Town are incentivized to provide affordable housing in the new residential spaces. "Housing for low and middle income residents receives bonus floor area," earning "four square feet of bonus floor area" for "each square foot of floor area certified by the Planning Director as affordable housing," earning a maximum of 0.5 FAR, or floor-area ratio (Bellingham Municipal Code § 20.35.070). The spaces must remain permanently affordable by taking only purchasers or tenants whose "annual income, at the time of the household's initial occupancy of the single-family residence, is 80% of less of the median income" (Bellingham Municipal Code § 20.35.070). Living costs for residents must also remain below "38% of the gross household income at the time of purchase and the amount

of rent or mortgage repayment shall not exceed 30% of the gross household income" (Bellingham Municipal Code § 20.35.070). These requirements provide a system for maintaining affordable housing in the area. This could diversify the population in the area, as the housing would provide for residents from an array of socioeconomic divisions. We propose that the alley development install a similar set of incentives so as to promote the "diverse residential neighborhoods" that the City Center Master Plan desires (City Center Master Plan 2002).

A similar system of incentives is used to promote environmental sustainability in the Old Town Development. The Old Town proposal would distribute a maximum 0.5 FAR bonus for projects that are certified "as a minimum LEED Silver certification (or equivalent)" (Bellingham Municipal Code § 20.35.070). Projects can also gain up to 0.50 FAR for contributing to the Lake Whatcom Watershed Property Acquisition Program (Bellingham Municipal Code § 20.35.070). These incentives promote environmental sustainability by promoting sustainable design and land use in the downtown area. As one of the objectives of the proposal is to promote the ideas of a "green" community, extending environmental sustainability into the residential component of the project would be fitting with the overall objectives (Urban Transitions Studio 2010, 36).

The plan for the Old Town development would allow for the increased housing that Bellingham needs at densities that Whatcom County desires. Additionally, the specific standards for heights restrictions, affordable housing, and environmental sustainability make it much more in depth in comparison to the proposed action. Based on the improved specificity of the alternative action for housing and its success in meeting the standards outlined by the Whatcom Country Comprehensive Plan, the alternative action would have higher positive impacts on the environment, earning it a ranking of 3 on the decision matrix.

No Action

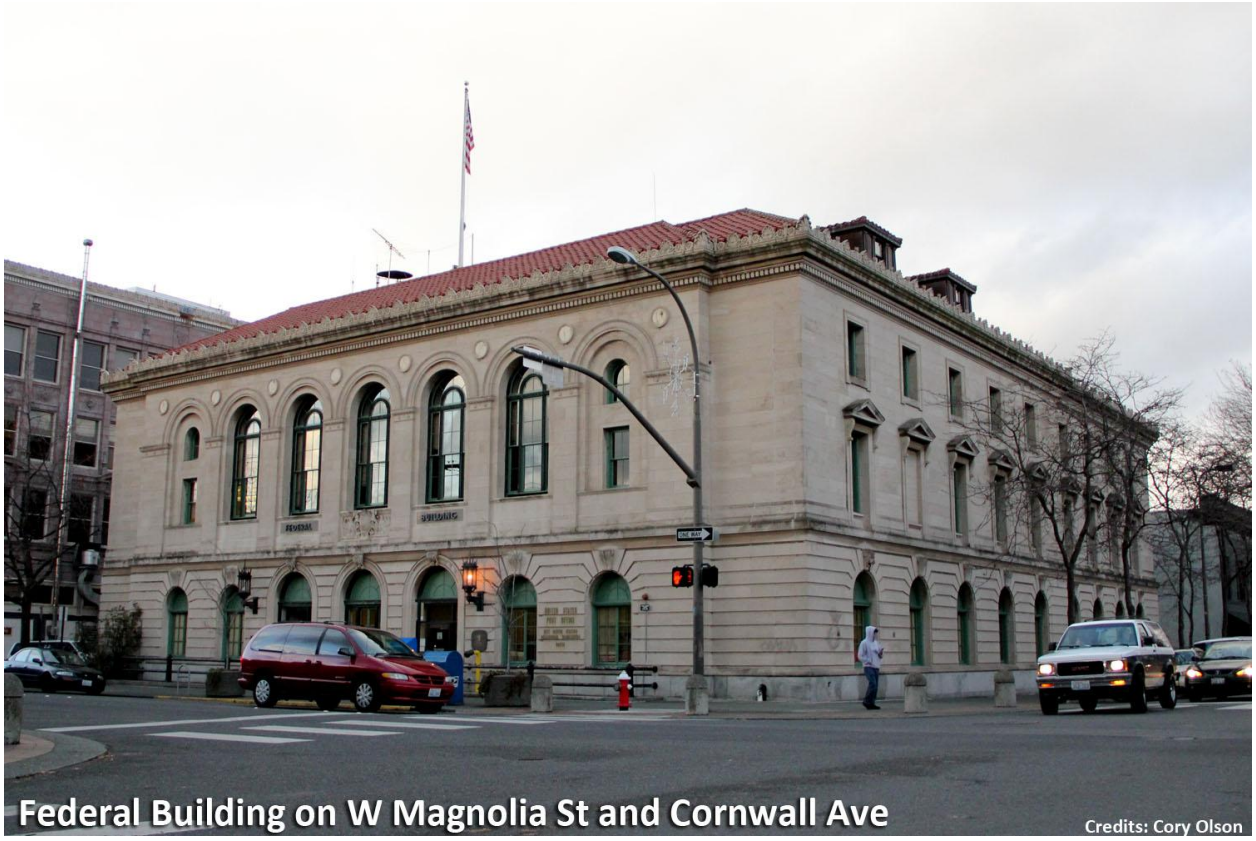
If no action is taken then the housing will remain the same. Currently there is virtually no housing outside of the Leopold retirement center. This would forgo the opportunity to take advantage of the underutilized space downtown for increased housing density in the city. Under the Whatcom County Comprehensive Plan the City of Bellingham is encouraged to "establish new residential developments at densities averaging six to twenty four units per net residential acre" (Whatcom County Comprehensive Plan 2010, 2-18). Taking no action would not make any progress towards achieving this goal. Arguably, developers might actually expand into urban growth areas a result of taking no action, actually decreasing the density of Bellingham and violating that goal of the comprehensive plans. This is the least desirable option when compared to the proposed action and the alternative action, scoring a 1 on the decision matrix.

3.5 Historical and Cultural Preservation

Proposed Action

In addition to commercial and residential concerns, the site includes five historic sites within its boundaries (Map 6). All five are listed on the Local Historic Register, Washington Heritage Register, and the National Historic Register (Department of Archaeology and Historic Preservation 2009). These buildings include:

1. B.P.O.E. Building 1412-1414 Cornwall Avenue
2. Leopold Hotel 1224 Cornwall Avenue
3. Montague & McHugh Building (Crown Plaza) 114 W. Magnolia Street
4. U.S. Post Office and Court House (Federal Building) 104 W. Magnolia Street
5. Bellingham National Bank Building 101-111 East Holly Street



According to the proposal, none of these sites are slated for infill or building splits, so no direct impacts on the buildings will have to be mitigated (Figure 0.6). However, building around the sites might indirectly affect the historic buildings, as lighting and views might be changed. These impacts are addressed in our alternatives section.

The proposal includes plans to create themed alleys, incorporating cultural themes such as Ski-to-Sea, Mt. Baker, Native American roots, logging roots, and themes that may not be typically associated with Bellingham (Urban Transitions Studio 2010, 36). This meets the City Center Master Plan's goal of incorporating culture into the downtown area. The proposal also suggests incorporating a "colored light theme for the evening" into the alleys to add practical lighting and a positive atmosphere (Urban Transitions Studio 2010, 37).

The effort to preserve historic structures and add to the cultural heritage of the downtown fits with the goals of the Bellingham Comprehensive Plan in that it works towards preserving the

culture of the area. However, it lacks additional measures to ensure that the true culture of the area is preserved past saving the buildings. Bringing life to the downtown through the proposed action would be more beneficial than taking no action, but the alternative action provides a stronger plan for cultural and historic preservation. Therefore the proposed action scored an intermediate ranking of 2 on the decision matrix.

Alternative Action

First, while the cultural themes downtown are a sound idea, the themes should reflect local culture. Currently the proposal suggests the possible incorporation of themes, such as Chinatown, that are "not typically associated to Bellingham" (Urban Transitions Studio 2010, 37). Using themes outside of the local culture may detract from the unique character of existing neighborhoods that the City Center Master Plans wants to maintain. Second, the proposal for a "colored light theme for the evening" could have a similar effect of detracting from the existing character (Urban Transitions Studio 2010, 37). While arguably the alleys have very little character to begin with, they are part of the overall downtown area, which has many historic buildings. Adding colored light might be suitable, but only if it is in keeping with overall downtown atmosphere.

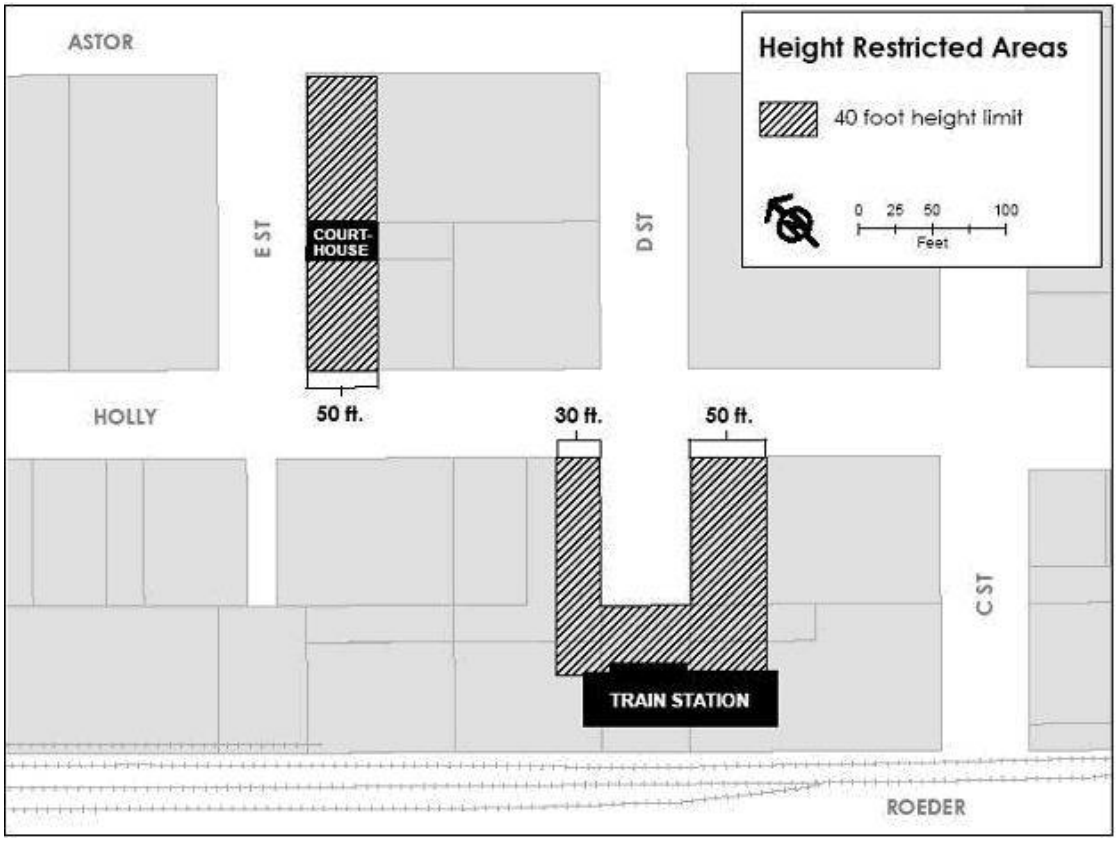
Third, height limits should be imposed on properties adjacent to historical buildings in order to maintain their historic qualities. The importance of these height limits are perhaps best demonstrate by the case of Grand Central Station in New York City, New York. Arguably one of the most beautiful buildings in the United States, Grand Central Station towered over surrounding buildings when it was first constructed. But now, in the era of the skyscraper, the Station is overshadowed by immense office builds, detracting from its majesty (Figure 0.7).

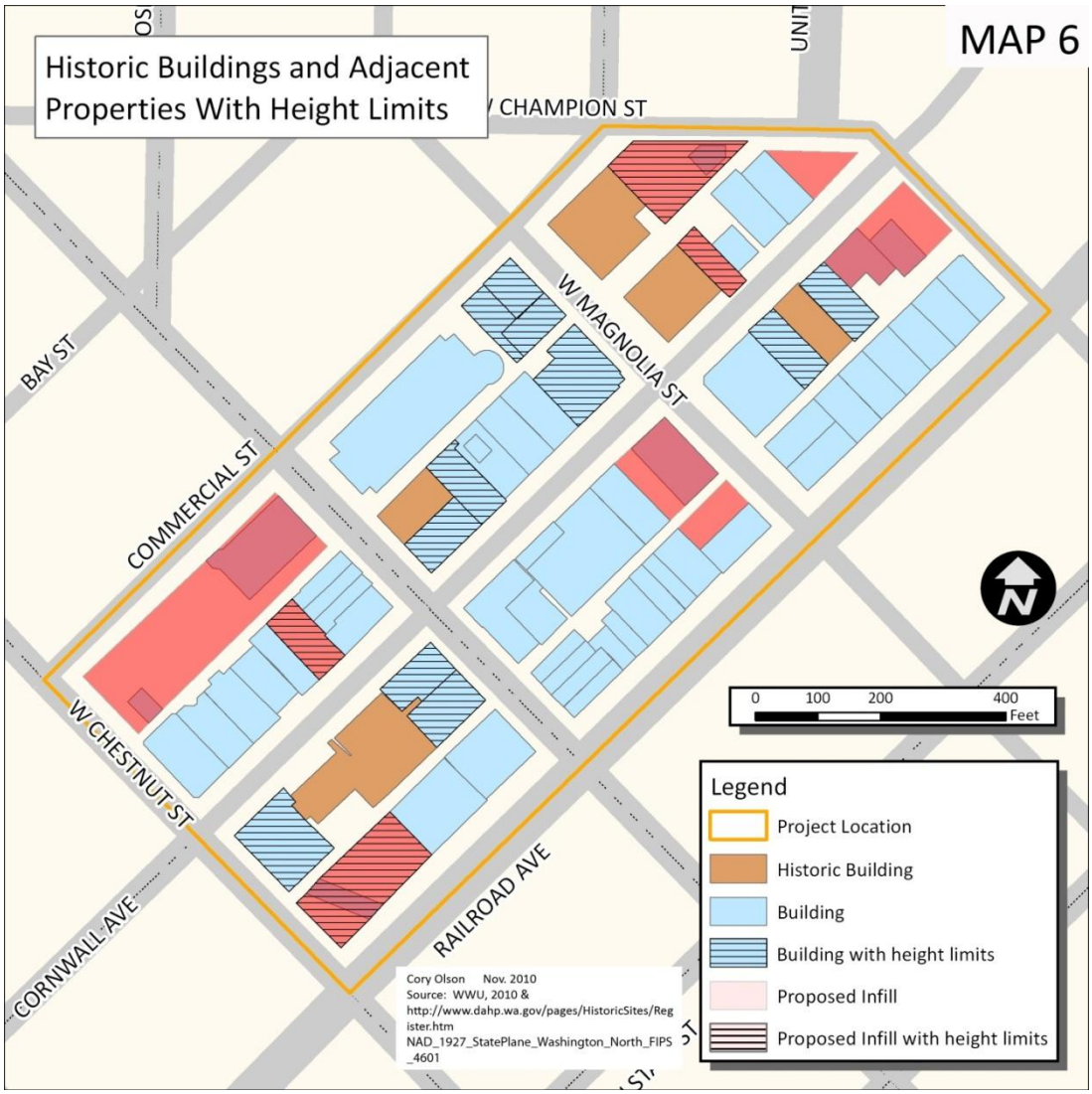
Though the alleys of Bellingham are certainly different from the streets of New York, the same potential exists for historic buildings to become overshadowed by new, tall residential and office buildings.

Figure 0.7 Grand Central Station surrounded by skyscrapers
(www.googlemaps.com)

To propose height limits for these buildings we again turn to the Old Town Development overlay plans. The height is limited “adjacent to historic buildings” and is “limited with views to cultural and geographic features of significance” at levels between 30 and 50 feet (Figure 0.8). This mitigates the impact of building around historic sites and vistas while still make the most out of each building site. We propose that the plan incorporate similar building height restrictions around historical buildings, which we have specified in (Map 6). This will work to maintain the historic character of the downtown and connect more seamlessly with other development proposals downtown.

Figure 0.8 Old Town Development 30-50 foot height limits for historic and cultural vistas
(Bellingham Municipal Code § 20.35.070)





The effort of the alternative action to keep motifs and lighting loyal to the historic and cultural heritage of Bellingham adds to the already positive impacts of the proposed action. Outlining the buildings that need height limits to preserve the views of the historic buildings takes an additional step to ensure historic preservation. Taking these extra steps justifies the higher score of 3 in the decision matrix for the alternative action.

No Action

If no action is taken, the historical sites will remain as they are. This is positive in the sense that the buildings remained unaltered, but negative in that the lack of activity and culture

surrounding the buildings detracts from the public appreciation of their beauty and historical significance. Taking no action would not physically harm the buildings, but it certainly would not attract positive attention or value to them either. Therefore taking no action ranks the lowest at a 1 on the decision matrix when compared to the other possible actions.

3.6 Light and Glare

Current Conditions

Current alleyway lighting is provided by standard day/night street lights. Some sections of alleyways are unlit or lighting is provided by a commercial store during hours of operation.

Proposed Action

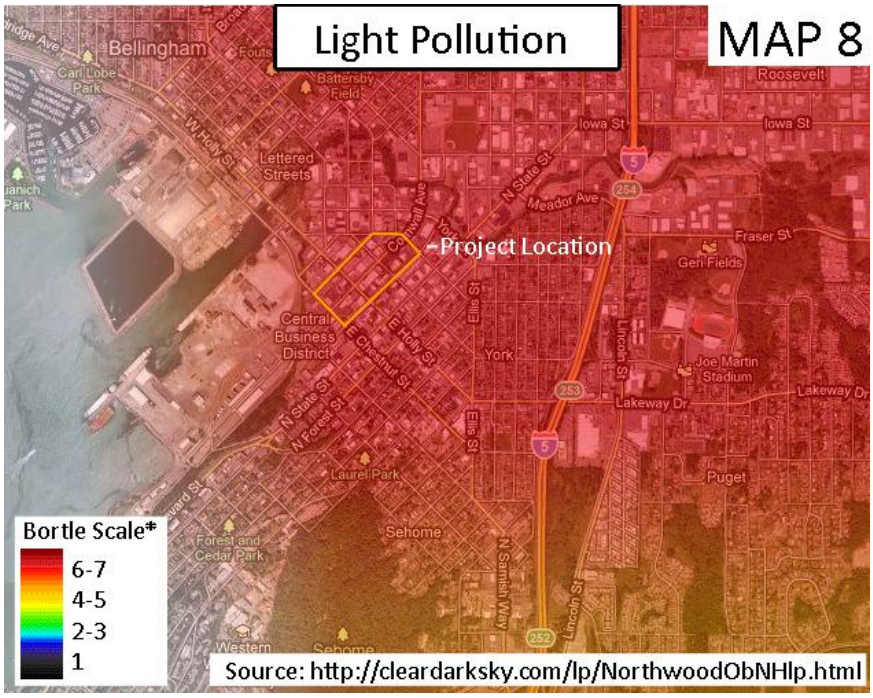
Additional development of the alleyway will add supplementary lighting into the alleyway along with the added traffic flow into the area. The project calls for the interjection of new themed lighting into the alleyways. The themed lighting will be dictated by cultural themes of Bellingham, such as a Ski to Sea theme and others (Urban Transitions Studio 2010). The use of theme lighting in the alleyway will potentially add to the aesthetic beauty of area during night time operations. Glare and light pollution would increase with the higher density structures and added businesses in the area. Additional light pollution in the area will negatively impact the environment while also benefiting the public safety; providing both positive and negative impacts at the same time. The alternative action takes steps to reduce light pollution while the no action assumes that the light pollution would relocate in a less light polluted area and cause more harm, suggesting that the proposed action should be ranked in the middle at a 2 on the decision matrix.

Alternative Action

The usage of light emitting diodes (LED) could save the city on the cost of lighting and the amount of lumens, light intensity, wasted into the environment in the form of light pollution. The line between public safety and proper lighting can be addressed with the usage of motion sensor lighting for low usage when no one is present and higher usage when people are present. These measures should cut down on glare impacts. If these measures are taken to reduce light pollution, theme lighting in the alleyway would not be feasible due to inefficiency of color bulb lighting or cost to produce specialized lighting systems. Energy efficiency and directed lighting to reduce the impact of glare earns the alternative action a higher ranking than the proposed action and no action on the decision matrix of 3.

No Action

If no action is taken the alleyways lighting system will remain unsafe for pedestrian business activity. Business lighting will remain the number one source of lighting for the alleyway system during hours of operation. City lighting will remain unchanged, but will not be suitable for adequate after hours pedestrian activity beyond normal business hours. No high efficiency lighting will be in place and light pollution will remain high in the area (Light Pollution Map 7).



Although taking no action in the alleyways would reduce the amount of light pollution by not adding any supplementary lights into the area, this positive impact would be negated by another area possibly being developed in a lower density area with fewer lights. This negative impact justifies the lowest ranking of this course of action at a 1 on the decision matrix.

3.7 Aesthetics

Current Conditions

The alleyways are used mostly for utility purposes. Businesses use the alleyway to store their dumpsters and make deliveries. There are many layers of power lines and other utility lines. The tallest building is about 11 stories high but most buildings are between 2 and 5 stories. Blank building faces and

parking lines most of the alleyway frontage. Most aesthetically displeasing activities are focused here so that the downtown's other streets can stay clean and clear of utility and delivery trucks.

Proposed Action

The project proposes infill buildings to create a continuous corridor that is more interesting to pedestrians. None of the new buildings would be any taller than existing buildings. The tallest building proposed is about 6 stories (Urban Transitions Studio 2010, 20). No views along the alleyway corridors would be blocked by new buildings. Lateral views would be blocked if new buildings occupy lots that were previously open spaces such as surface parking lots. Other improvements to aesthetics include burying utilities, consolidating dumpsters, improving lighting, and using decorative paving, and murals. These aesthetic improvements create a positive impact on the environment, improving the alleyways far beyond leaving them in their presently unattractive state. Accordingly, the proposed action ranks higher than no action in this section, but lower than the alternative action which would add more aesthetic elements such as pocket parks to the alleyways. This resulted in an intermediate score of 2 on the decision matrix.

Alternative Action

The infill development proposed will decrease the amount of open space downtown which adversely impacts the built environment. The alternative of interspersing pocket parks would help mitigate this problem by creating aesthetically pleasing islands of reprieve within the gray texture of the urban environment. A park would be especially attractive and beneficial if it created views of the waterfront district that will eventually be developed to the south.

To manage the aesthetic character of the alley, several building height considerations should be borrowed from the Old Town Sub-Area Plan (City of Bellingham 2008, 17). Building heights should be established so that:

1. Priority public views to the water are identified and maintained.
2. New construction does not overpower landmark buildings.
3. The scale of buildings creates a comfortable pedestrian environment.
4. Enough light is allowed to enter the alleys.

These measures in combination with the aesthetic improvements of the proposed action create the highest positive impact on the built environment so the alternative action receives a 3 on the decision matrix.

Figure 0.2 Shows the "Village Green," a pocket park in Fairhaven, Washington
http://bellinghamster.com/f.htm

Figure 0.3 The “Village Green” during a community event

http://foodconnections.blogspot.com/2010/08/bellingham-and-coupeville-small-farmers.html

No Action

The alleys would remain backstreets where poor aesthetics impact the quality of the pedestrian and bicycle network. Without aesthetic features that the proposal suggests, like decorative pavement and human scale design and lighting, the alley would remain undistinguished from the rest of the network and unattractive to street users. Improving the network’s visual identity is an important part of encouraging alternate mode choices (City Center Master Plan 2002, 7-2). The poor aesthetic qualities of the alleys: the gravel, power lines, dumpsters, pipes, and blank walls all heavily detract from the environment. Compared to the aesthetic improvements proposed by both the proposed action and the alternative action, no action is clearly the worst option, scoring a 1 on the decision matrix.

3.8 Transportation

Circulation

Current Conditions

Vehicles enter the alleyways primarily for accessing parking or to make deliveries to businesses. Vehicles also use the alley to access all of the utilities that are located in the alleys. The narrow width of the alleys and poor visibility discourages most through traffic.

Proposed Action

Vehicle traffic would be further discouraged and eventually phased out. The elimination of parking lots due to infill buildings will decrease the need for vehicles to access the alley. A restriction on the hours of vehicle use, with removable bollards, would also effectively cede all circulation priority in the alleys to pedestrians and cyclists. This action positively impacts the pedestrian network but could negatively impact vehicle circulation by creating delivery and utility access problems. The alternative action mitigates these issues while taking no action would simply force them into a less developed and potentially worse affected area. Therefore the proposed action for this section received an intermediate score of 2 on the decision matrix.

Alternative Action

Restricting vehicle access discourages vehicle use and thus reduces vehicle emissions that impact air quality. However this restriction could create significant impacts on the built environment. Important utilities operations being restricted to certain hours will create maintenance problems, and utility companies will likely be unwilling to dispatch their drivers late at night. Restricting deliveries is also a burden to business owners who may or may not see the worth of creating pedestrian only areas. The alternative is restricting vehicle access with signage instead of bollards. Utility vehicles would not be restricted, it would be up to the

business owners to control delivery times, and all other vehicles would be restricted as displayed by the signage. Assuming full build out of retail, residential and park spaces, there would be high pedestrian traffic at most hours of the day. Signage would give entitlement to pedestrians in the alley spaces, making it very difficult and uncomfortable for vehicle to enter the alleys and very slow for them to move through the alleys (Figure 0.9). This alternative keeps the positive impacts of a pedestrian only corridor, but mitigates the negative impacts to delivery and vehicle access. Therefore it earned the highest score of 3 on the decision matrix for being the best course of action out of the three in this category.

Figure 0.9 Automobiles attempting to navigate a "Yield to Pedestrians" zone at Pike Place Market in Seattle, Washington
http://catherine-dennis.com/bonustwo.html

No Action

No action would preserve the back street nature of the alleys that keeps undesirable vehicular uses off of the main street. Allowing the alleys to remain underutilized in this way would prevent potential improvements to the pedestrian network downtown. A friendly pedestrian environment is an important aspect of a successful downtown area and helps encourage alternative mode choices that reduce environmental impacts (City Center Master Plan 2002, 5-5). Without these improvements to the pedestrian network, the no action plan would create the highest negative impact on circulation. This is the worst option out of the three, justifying the score of 1 on the decision matrix.

Trips Generated

Current Conditions

Streets adjacent to the alleys experience PM peak hour vehicle trip volumes anywhere from 40 vehicles (on Commercial Avenue) to 1095 vehicles (on Holly Street). Cornwall Avenue gets about 200 vehicle trips during peak hours (The Port of Bellingham 2008, 3.12-12). The alleyway corridor does not currently attract a significant amount of trips because there are very few business and residences that front into the alley.

Proposed Action

The proposed square footage of infill retail and residential development has the potential to create about 400 net new PM peak hour vehicle trips (Bellingham Municipal Code, 2010). This number is based on an Institute of Transportation Engineers (ITE) trip rate for specialty retail and assumes a country wide average mode split and transportation concurrency level. There are several aspects of the proposal that would influence these factors and reduce the amount of vehicle trips generated:

1. The entire project area is within a quarter mile of a WTA GO Line.

2. The project is located within the City Center Urban Village district and contributes to the mixed use, pedestrian friendly district.

These two aspects are proven, by ITE research on mixed land use trip generation rates, to reduce vehicle trips (City of Bellingham, 2010, 3). In addition, the project employs many urban design features that contribute to alternative mode choices. These include human scale lighting, decorated pavement, street art and murals, and restricted vehicle access. All these factors contribute to fewer vehicle trips and create a low positive impact on the environment. While there are no negative impacts to mitigate, the alternative action still ranks higher than the proposed action because it adds additional suggestions for programs to reduce vehicle trips. Taking no action is less favorable than the proposed action because it would contribute to trips in lower density areas that would require perhaps more extensive mitigation. Accordingly, the proposed action scored a 2 on the decision matrix for being the middle choice.

Alternative Action

The alternative uses strategies to further reduce vehicle trips, thereby mitigating impacts from vehicle emissions and infrastructure construction. The City of Bellingham has proposed a Transportation Mode Shift Incentive program. This would be done through Transportation Impact Fee (TIF) reductions for developments that incorporate performance measures proven to reduce vehicle trip generation.

Transportation Impact Fees are used to balance the infrastructure costs of new development between developers and the city. The Transportation Mode Shift Incentive program uses TIF reductions to encourage “the appropriate type of development (infill) in the appropriate types of places (urban villages) that the Bellingham community has stated support for” (City of

Bellingham, 2010, 3). Vehicle trip reduction credits would be awarded that could reduce transportation impacts fees up to 50%. These credits are based on industry approved performance measures that are proven to reduce vehicle trips. Since they are proven methodologies, the vehicle trip reduction credits can be equated to actual percentage reductions in vehicle trips generated by the project (Figure 1.0).

All credits described by the table are voluntary and additive up to 50%. Vehicle trips generated by the project would be reduced by a minimum 22% reduction for being located in the City Center urban village and being within a quarter mile of a WTA Go Line. The three other voluntary programs would also reduce vehicle trips based on how many employees and residences participate. The project's trip generation rate after all these elements are factored in could be anywhere between 200 and 312 PM peak hour vehicle trips. Using these incentives to mitigate even more vehicle trips than the proposed action contributes to a higher positive impact on the environment. The increase detail in the transportation plans earns this action the highest score of 3 on the decision matrix.

No action

Leaving the alley spaces undeveloped would generate no new trips to downtown. This reduces the need to upgrade city center transportation infrastructure but also increases the chances that brand new transportation infrastructure would have to be built to accommodate the development that could be deferred to periphery areas in Whatcom County. Building new transportation infrastructure in low density periphery areas is the least environmentally friendly way to deal with population growth. Assuming the probable reality that development will happen in this county one way or another, the no action plan will therefore have a high impact on the

environment. Out of the three possible actions for this section, this is the worse, reflected by its score of 1 on the decision matrix.

3.9 Public Services & Utilities

Fire, Police, Schools, and Maintenance

Proposed Action

The expected population increase from the proposal may result in a need for expanded public services to accommodate and increased demand. Specifically, this site might require increased fire, police, schools, maintenance, and communications.

Bellingham Fire Department states that "The need for additional fire stations depends on the location and characteristics of future expansion of city boundaries and continued in-filling. Expanding city boundaries and the creation of dense "urban village" neighborhoods on the edge of city limits may limit the Department's ability to effectively respond to quickly suppress structure fire incidents within these areas"(Capital Facilities Element 2005, CF-26). The increased population size and density may increase the need for more fire support; however the central location of the alley development reduces the likelihood that another fire station or additional firefighters would be needed. In 2009 the Bellingham Fire Department had 7,412 fire unit responses and 3,939 aid unit responses (City of Bellingham 2010 Adopted Budget, 142). This present capacity suggests that the expected 153 to 612 additional residents to the downtown are unlikely to increase the call volume for Bellingham Fire Department above a manageable level. Additionally, the "replacement/relocation of the" Northwest Avenue Fire Station "will depend on the characteristics and pace of in-filling growth, especially along the waterfront, and growth in the northern part of the city" (Capital Facilities Element 2005, CF-27). The fire department already acknowledges the potential need for increased fire support, and if the

combined need of the City does exceed their current capacity, then they have a plan to address it through this new station.

The Bellingham Police also have a plan to accommodate the predicted population growth in Bellingham. They currently hire one patrol office per 750 calls for service per year and one investigate officer per 5 patrol officers (Capital Facilities Element 2002, CF-34). The revitalization of the alleys will likely bring more people into the alley area, perhaps requiring more police coverage; however it seems unlikely that with less than 612 expected residents and an atmosphere that is more conducive to safe activities, that 750 service calls per year will be generated from this site alone.

Wise city planning can actually serve as a crime prevention technique. Mixed use development, as proposed in this project "provides a higher level of activity around the clock that in turn provides more 'eyes' to keep watch and to discourage potential crimes" (Municipal Research and Services Center of Washington 1997). In addition, "increased pedestrian-level lighting" as proposed in this project can contribute to a reduction in crime rates (MSRC Washington 1997).

Though some residences may be added through this proposal, the demographics of the Bellingham downtown suggest that new residents will mostly be college students, young professionals, and retirees with few families with children. Therefore, the effects of this proposal on the schools should be minimal. However, if the developers chose to build single-family or multi-family dwelling units, they will be charged an impact fee of $1,854.000 or $1154.00, accordingly. These school impact fees "will be used to offset that portion of cost to construct a new elementary school that is related to new growth" (Bellingham School District 2010, 8).

Additionally, the maintenance of the alleys may change, for aesthetically pleasing storefronts and pedestrian the alleys will need upkeep to avoid returning to a dilapidated state. However, as the space is designated for commercial uses in which the building tenant or owner will likely be responsible for upkeep, the only foreseeable maintenance might include street sweeping and litter removal to maintain the LID surfaces.

The only negative impact foreseen for the proposed action is the increased need for maintenance of alley ways. The school service is covered by impact fees. While the police and fire departments seem to have already planned for population increases and infill, the proposal might be improved if it provided new sources of revenue to assist these services in expanding. Therefore the proposed action scores lower than the alternative action, which suggests methods for providing new sources of revenue for fire and police services. However the proposed action scores higher than no action because no action might force growth in periphery areas of the City, increasing the cost of extending fire, police, and school services to low density areas. These comparisons justify the score of 2 on the decision matrix for the proposed action.

Alternative Action

To mitigate the costs to the fire department and police for adding to their call volume, perhaps the proposal should include public service impact fee. For example, the City of Issaquah, WA has a fire impact fee that charges developers a fee according to the following standards:

- Single Family, Duplex, Single Family Attached (2+ units)……..$ 655.28/d.u.
- Multifamily……$ 898.72/d.u.
- Office……$ 210.62/1,000 s.f.
- Retail…… $ 673.97/1,000 s.f.
- Restaurant/Lounge……$ 6,363.13/1,000 s.f.

The city of Issaquah additionally requires a police mitigation fee, determined by the following standards:

- Single Family……$ 161.61/d.u.
- Multifamily……$ 134.05/d.u.
- Office……$ 0.11/s.f.
- Retail……. $ 0.42/s.f.
- Restaurant/Lounge……$ 2.64/s.f.

(City of Issaquah Impact Fees 2010, 2-3)

If the City of Bellingham implemented similar impact fees for this development, it would be able to charge developers based on their projects for the impacts that they create. Therefore even though this project will have a minimal impact on the fire and police services overall, the public services would still receive funding for an amount proportional to the increased need that the proposal instigated.

Additionally, the project proposal fails to address the increased maintenance that the project will cause. Currently, street sweepers clean the North/South downtown alleys every first Tuesday of the month between 2am 6am (City of Bellingham 2010). In comparison, the North/South streets of the Downtown/Central Business District are swept every Tuesday, as they are more visible and receive more traffic (City of Bellingham 2010). Street sweeping service could increase in the alleys by adding these two alley corridors to the main street cleaning schedule. The alleys will likely experience heavy foot travel and therefore would benefit from being serviced on a streamlined schedule with the main streets downtown. This would keep the new LID surfaces from becoming clogged by debris.

The mitigation efforts of service impact fees and increased street sweeping make the alternative action better for the environment that the proposed action. The impact fees especially not only address the issue of funding for police and fire services but go beyond to detail a plan of how to charge based on type and size of development. Accordingly, the alternative action scores the highest ranking of 3 on the decision matrix.

No Action

The fire, police departments, and school district of the City of Bellingham are prepared to deal with expanded population growth. However, forgoing infill in the alleys might encourage sprawl beyond simply commercial and residential spaces because new fire, police, and education facilities might need to be built to accommodate population growth on the fringes of their present range. In comparison to the proposed action, in which services can already handle the growth, and the alternative action which simply improves upon it, no action is clearly the worst option and therefore scored a 1 on the decision matrix.

3.10 Public Utilities

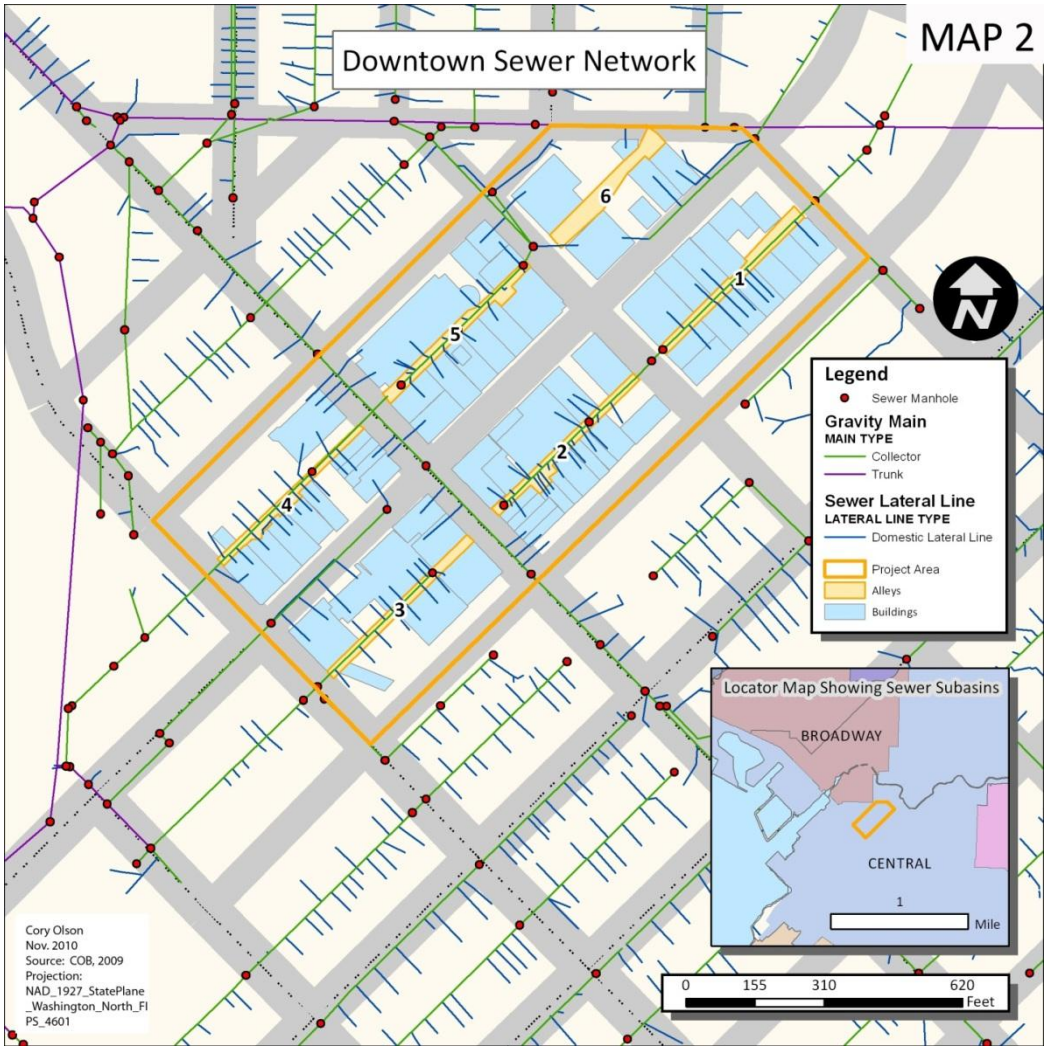
Sewage

Current Conditions

The area of the proposed project is currently equipped with a below-ground gravity fed sewage drainage system, illustrated in Map 2). Upon initial construction, the system was designed to be combined with storm water drainage. Though through the 1980's and much of the 90's, the city eliminated most of the storm connections in attempt to increase sewage treatment capacity at the Wastewater Treatment Plant (WWTP) (William Reilly, Jim Bergner, personal communication, November 2010). Today, very few combined sewer-storm collections exist. Those that do are mainly on older buildings of which roof storm drains are tied directly to the

sewage lines through the building's interior and would be very costly to disconnect. There is one remaining Combined Sewer-Storm Water Overflow point at the C Street overflow structure that discharges several hundred feet downstream into Bellingham Bay (Comprehensive Sewer Plan, 2009).

The sewage system of the alleyway area is tied to two trunk mains (>15" in diameter) with interconnecting 8" mains (Jim Bergner, personal communication, November 2010). Sewage is transported to the downstream treatment plant where it is treated to the secondary level before release it into Bellingham Bay (Comprehensive Sewage Plan, 2009).



Proposed Action

The proposal to revitalize the alleyways by providing over 170,000 square feet of commercial and/or residential development and to create an attractive pedestrian corridor in order to improve the economy and atmosphere of downtown Bellingham does not recognize the importance of assessing potential impact on the sewer system. Through infill and increased population drawn in, there will inevitably be an increase in sewage generated across the area. Assessment of the current equipment is necessary to determine whether or not the projected population increase will impact efficiency of the existing system or if modifications would necessary.

According to the City of Bellingham's 2009 Comprehensive Sewer Plan, the estimated per capita flow rate is 102 gallons of sewage per person per day (gpcd). With an approximate increase of 423 people, there will be a conservatively estimated increase of 43,146 gallons of sewage per day generated as a result of this proposal (equivalent to ~30gpm). This value does not reflect the daily fluctuations caused by workers, consumers and visitors alike contributing to the sewage generation of the revitalized area.

When inputting the estimated sewage volume increase into the city's sewage system model, returned impact on the system is minimal (Jim Bergner, personal communication, November 2010). The increased population brought in by this proposal, even during peak flow times, will yield a very small impact on the capacity and efficiency of the existing sewage system. With little to be mitigated and not much to be improved upon, both the proposed action and alternative action scored a 2 on the decision matrix for being intermediate choices, being a fairly neutral course of action.

Alternative Action

The basic connections would be required in order to link new businesses and residential units to the existing system for the required treatment of municipal and domestic sewage by the downstream WWTP. This would likely be done by tying 6" or 8" mains to the local 15" trunk mains. An 8" pipe can flow 350gpm (gallons per minute) at a minimum slope of 0.40% (nearly flat) and be at 80% capacity. The city of Bellingham considers 80% to be "full pipe" to allow for unseen variables (Jim Bergner, personal communication, November 2010).

With such minimal estimated impact on the existing system, other than establishing appropriate connections, little modification to the sewer system is required. As stated before, the lack of impact from both the proposed action and the alternative action earns both a neutral intermediate score of 2 on the decision matrix.

No Action

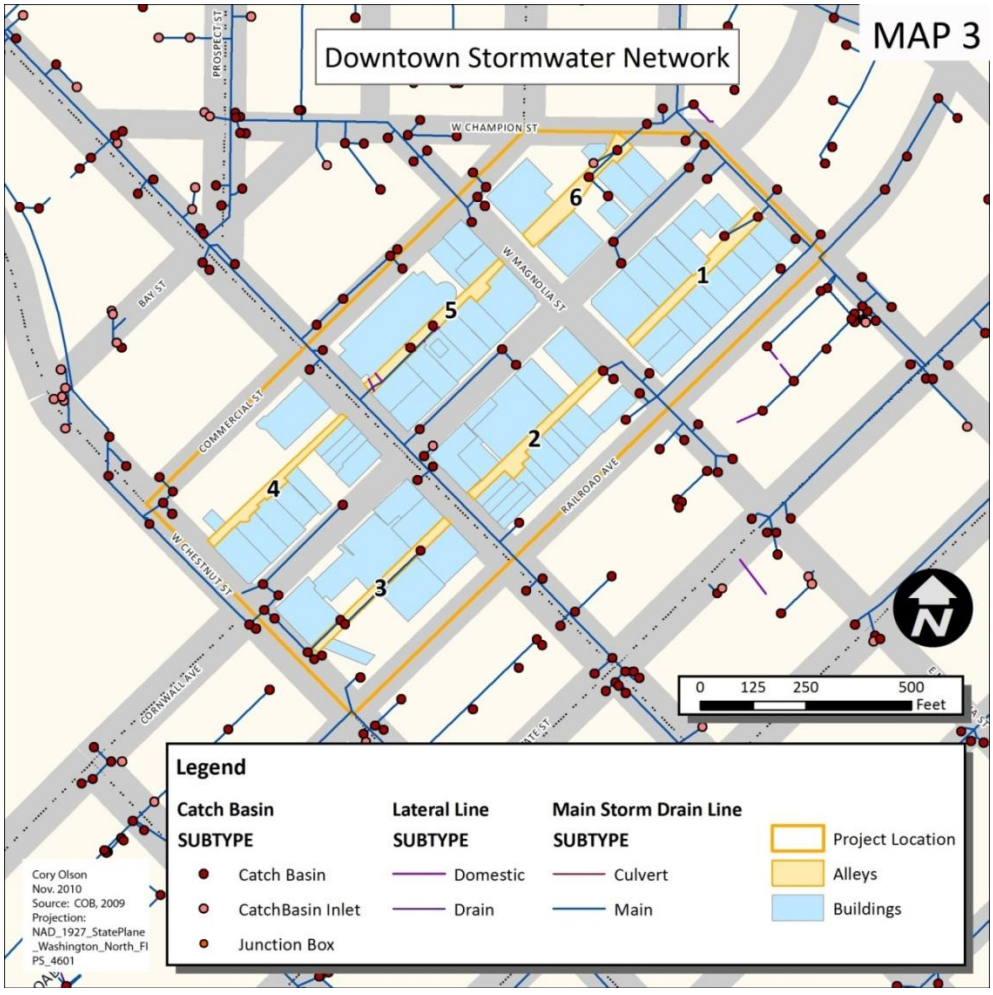
Without revitalization and the introduction of new business fronts and residences downtown, the projected population increase will be forced to develop outside of the City's urban growth area and would therefore likely yield adverse environmental impacts. For instance the expansion of development into new areas could require increased sewage and storm water treatment facilities and lines as opposed to the modification or full use of existing lines. The cost and environmental destructiveness of having to lay new lines and build new facilities contributes to high negative impacts on the environment. Compared to the actions of the proposed and alternative actions, which add to the system within its capacity, this is the worst course of action, earning a lower score of 1 on the decision matrix.

Storm water

Current Conditions

There are catch basins and drainage lines now in place in most of the alleyways, though alley sections two and four are currently unequipped with any method of storm water runoff collection or transport, at all (Map 3). In these areas, storm water mainly runs down the alleys and into catch basins at the main streets of downtown.

Storm water from this area is currently discharged at three locations. In the southernmost portion of the proposal, runoff is collected and discharged through a 30” pipe at the Whatcom Waterway at the end of Laurel St. This storm water is not treated prior to discharge into Bellingham Bay (William Reilly, personal communication, November 2010).



From the area around Holly and Magnolia Street, storm water runoff is discharged via a 36" pipe into Whatcom Creek, just south of Dupont Street. This water is treated to the primary level with a sedimentation vault before discharge to the creek (William Reilly, personal communication, November 2010).

The third, northernmost Champion Street region of the proposal drains untreated storm water runoff into a couple locations along Whatcom Creek (William Reilly, personal communication, November 2010).

Proposed Action

The proposal does not suggest any need to assess storm water drainage and existing system capacity. It does propose to utilize pervious pavement which would increase infiltration of storm water and decrease nutrient and contaminant loading into the municipal catch basins and drainage lines – as explained in the above in section 2.3 "Surface Water". The neutral affect of the proposed action on storm water contributes to the neutral intermediate score of 2 on the decision matrix for public utilities.

Alternative Action

The drainage system currently in place in the area of the proposal will most likely not be sufficient at meeting the projected demand. It will pose a problem during major precipitation events, resulting in local flooding due to lack of drainage with excess water. By installing and connecting the two lacking alleyway sections to the storm water drainage system, runoff will be better controlled in the event of a major storm.

During construction of the revitalization, pulses of high concentrations of eroded sediment and pollutants will potentially enter local surface waters via the storm water runoff drainage system (Soranno et al. 1996). Such materials may include increased sediment and

nutrient loading (Phosphorus etc.), increased organic contaminant concentrations (bacteria, pet wastes, etc.) and increased chemical contaminant concentration (from heavy machinery operation and increased vehicle traffic downtown) (Soranno et al. 1996).

By installing LID pervious surfaces throughout the revitalized alleyways, storm water runoff will be allowed to percolate through the ground which will reduce sediment and contaminant loading into local water bodies (Berbee et al. 1999). Additionally, the use of pocket parks, small bioswales and potentially green roofing will further improve runoff water quality and reduce contamination of the bay and Whatcom Creek (Berbee et al. 1999). These methods of water quality mitigation are intended to complement the existing drainage system. The additional measures do not significantly add or detract from the need for public utilities, therefore scoring a neutral intermediate score of 2 on the decision matrix.

No Action

With no action taken alley sections two and four will go on without catch basins or mainline drainage. Storm water will continue to flow untreated into Bellingham Bay or Whatcom Creek. In a worst-case scenario, development will occur in outside of the designated urban growth area and vast expanses of impervious surfaces will be required to accommodate the population increase. Rather than utilizing existing impervious buildings, Bellingham would add to its impervious surfaces. This would result in extremely adverse impacts caused by significant increase in storm water runoff into local watersheds. Again, compared to the other two course of action this is the worst, supporting the score of 1 on the decision matrix.

3.11 Population Change

Population size and Density

Proposed Action

The proposal has the potential to both displace and bring in new people to the alleys. To determine the number of people that would be displaced by this project, we relied on 2000 Census Block data. According to this source, 87 people reside within the area of the proposal (Figure 0.6). Therefore, potentially 87 people might be displaced by this project. However, the overwhelming majority of those people are concentrated in the Leopold Hotel, currently used as a retirement home. As no changes are proposed for the Leopold, it is likely that the proposal will displace only a handful of people if any at all.

One method of determining potential residents of the alleyway proposal is by using the housing unit average of 65.92 housing units and the average household size in the City of Bellingham of 2.31 people to determine how many residents mixed use development could attract (U.S. Census Bureau 2009). By multiplying these together, we find that approximately 153 people could live in the new proposal site (Calculation 0.4).

However, this number only accounts for one additional story of housing units above the proposed commercial space. While this meets the expectations of the Whatcom County Comprehensive Plan, it also bypasses the opportunity to concentrate even higher volumes of housing in the alleyways. Assuming that the proposed action simply would meet the expectations of the Whatcom County Comprehensive Plan it would be better than taking no action, which would force development elsewhere. However it would score lower than the alternative action because the alternative action outlines the housing plan that would bring in higher numbers and

densities of people to the alleyways. From this comparison the proposed action for this section would score a 2 on the decision matrix.

Alternative Action

In order to determine a higher potential increase in population for the alleyways, we turned to examples of multistory housing on top of commercial spaces. For example, in the Old Town Development Plan the mixed use buildings have five stories of residential space (Figure 0.4). This is very similar to the mixed use developments in the Fairhaven city center (Figure 1.2).

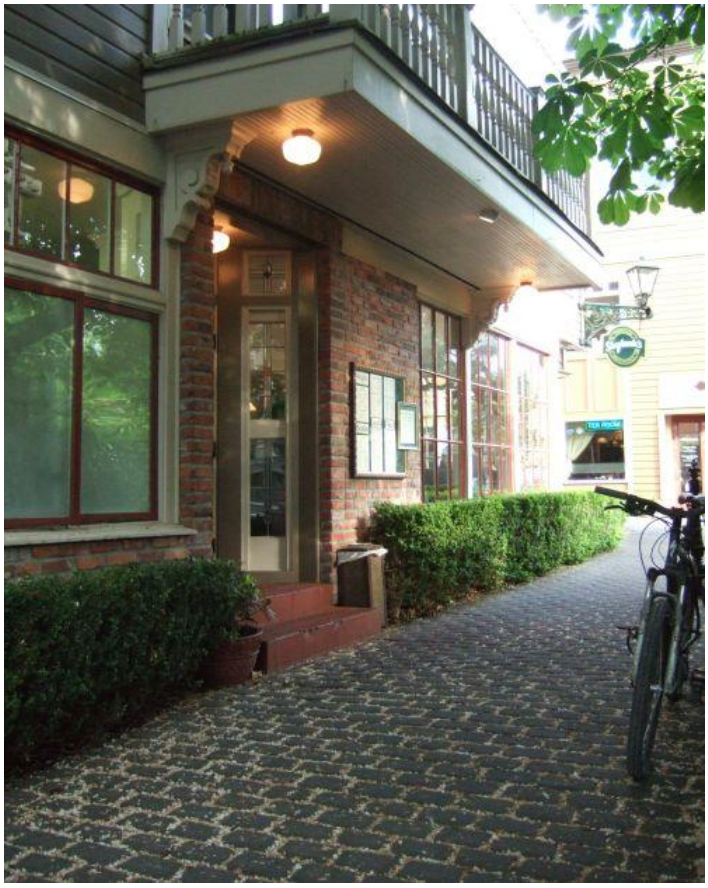
Figure 1.2 Mixed Use Development Building in Fairhaven, Washington

http://www.google.com/images

Accordingly, to find an alternative number of how many people the proposal might bring in, we chose the 2000 Census Block data for the downtown of Fairhaven to as a comparison. Like the project proposal, Fairhaven has mixed use development with commercial space on the

bottom of buildings and residential space on top. Fairhaven even incorporates alleys as pedestrian corridors as this proposal would (Figure 1.3).

Figure 1.3 Business in a pedestrian alleyway in downtown Fairhaven, Washington
http://www.recumbentblog.com/2009/05/28/last-day/



The data from downtown Fairhaven stated that 423 people reside in its relatively small downtown (Figure 1.4). Thus one might infer that the development proposal for the downtown alleyways of Bellingham could bring in roughly the same number of residents is mixed use development is used. To be more accurate, we multiplied the 153 that could occupy a single story of housing by four to match the number of stories in a typical Fairhaven mixed use residential building (Figure 1.2). This would project an increase in population of 623 people (Calculation 0.5). Using this estimate is better than attempting to estimate from the Old Town

Development model because in that model higher than three stories requires further setbacks that decrease the overall square footage per story. From the Fairhaven model it can also be inferred that the density of the alleys will increase significantly from this project. Currently the density is low, with only 17.683 people/acre density in the area with the highest population (Figure 1.3). In Fairhaven, the area with the highest population has a density of 53.7801 people/acre (Figure 1.4). Therefore, one might conclude that in areas of the alleys where population increases, the density will also increase, especially in this type of mixed use, high housing density development.

The alternative action supports an even higher population and density of people, exceeding the expectations outlined by the Whatcom County Comprehensive Plan. As it simply improved upon the proposed action, the alternative action scores the highest score of 3 on the decision matrix.

No Action

If the proposal is not implemented, the population will likely remain the same. It would take some revitalization effort to make the buildings along the alleys suitable for residential use, suggesting that without redevelopment not many more additional people will come to the area. Additionally, as is, the alleys are unwelcoming to pedestrians and lack the energy that attracts potential residents. This further decreases the likelihood of people moving into the buildings along the alleyways. The population change will likely occur elsewhere in Bellingham, possibly contributing to environmental destruction at another site. In keeping with the Land Use and Housing sections that directly deal with population increases, taking no action is the worst course of action, earning the lowest score of 1 on the decision matrix.

3.12 Community & Institutional Structures

Employment/income characteristics/housing, Employment/income/housing equity, Industrial/commercial diversity, and Planning/zoning activities

Proposed Action

The proposal would open up both housing and employment opportunities in the alleys. Additionally, it would diversify the commercial activity at the site. The proposal suggests commercial uses such as "art galleries, coffee shops/cafes, design stores, bookstores, restaurants," a movie theater and residential use for housing (Urban Transitions Studio 2010, 36). These different interests would draw an equally diverse set of people into the alleyways, creating a lively atmosphere in previously dismal spaces. Various levels of business, from coffee shops to offices, could provide an array of employment opportunities for individuals with different sets of skills. Increased business would better fit the commercial zoning of the alleyways because the space would be utilized for commercial activity rather than sit vacant.

The proposed action scores a positive 2 on the decision matrix for high positive impacts because it puts of the idea of diverse employment and housing but does not detail how to accomplish this outside of providing different job opportunities. There is no plan for ensuring housing equity, though the diverse nature of the downtown as a whole suggests that this might be assumed. Therefore while the increase in diversity and opportunity downtown ranks the proposed action higher than no action, it is ranked lower than the alternative action which addresses the issue of housing equity. This justifies the score of 2 on the decision matrix for the proposed action in this section.

Alternative Action

While the proposal already supports diverse commercial activity and employment opportunities, it does not outline its plans for providing diverse housing. As previously mentioned in the Housing section, the Old Town Development serves as an effective model for housing development in the alleyways. Developers of the alleys should be incentivized to provide affordable housing. They could be offered bonus square footage in their development for providing affordable housing, as demonstrated by the Old Town Development plans. Facilitating residential spaces that house mixed income brackets would contribute to the diversity of the downtown and improve housing equity in the alleyway redevelopment.

The alternative action improves upon the proposed action by simply adding to the already positive impacts of the proposed action. By adding specificity to the outline for affordable housing, it provides some guarantee that the residents of the redevelopments will be socioeconomically diverse. This improvement upon the proposed action supports the score of 2 on the decision matrix that the alternative action received.

No Action

If no action is taken to redeveloped the downtown alleys, industrial/commercial diversity will remain minimal and housing and employment will likely stay the same, as new commercial space will not be opened up for use. Without housing and employment opportunities, the effect of income characteristics for the area and housing equity would be negligible. Compared to the other two options, which increase the diversity and equity, this is the worst option, scoring a 1 on the decision matrix.

4. Summary of Findings and Recommendations

As described in the executive summary, this evaluation of the impacts of proposed action, alternative action, and no action on the Natural and Built Environments suggests that the alternative action is the most beneficial course of action for the redevelopment of the downtown alleyways. The decision matrix quantitatively rates to what degree each action affects each of the environmental elements (page 14). By summing the ratings of each of the elements, we found that taking the alternative action course would most positively affect the alleyways. This course of action scored a 46, compared to the lower scores of 29 for the proposed action and 23 for taking no action. This outcome likely arose due to the nature of each of the proposals. The alleyways currently are somewhat of a blank slate and the underuse of the available space contradicts city and county development plans, resulting in a negative score for leaving the alleyways as is. Additionally, forgoing development downtown might force the development to urban growth areas, adding to urban sprawl and the unsustainable use of land. The proposed action improves the alleyways, posing valid suggestions but overlooking many of the details of a redevelopment plan that significantly impact the environment. Thus, it received a slightly positive score but remained lower than the alternative action. The alternative action rates so highly because it addresses the negative impacts of the proposed action and improves upon its vague suggestions to suggest a more directed course of action that better protects the environment.

In summary, our alternative action would most positively affect the natural and built environment of the site because of the following measures. First, the alternative action keeps the suggestion of using LID surfaces to repave the alleyways mentioned by the proposed action. This alleviates some of the concerns over water and drainage in the alleyways. Additionally, course

gravel or rock would be incorporated under the clustered dumpsters to filter water and spills from the dumpsters. Pockets parks, green roofs, and bioswales would be incorporated into the alleyways to improve the aesthetics of the area and promote proper water drainage. Developing a specific plan for mixed use development and incorporating designs similar to that of the Old Town Development Plan would support city and county goals for housing infill, affordable housing, equitable housing, diversity, and sustainability. Similarly, setting height limits like those in the Old Town Development Plan for redevelopment would preserve the historic and cultural elements of the alleyways. Adhering to local themes for the alleys and forgoing the use of colorful theme lights for efficient sensor LED lights would also preserve the historic and cultural character of the alleys and add to energy efficiency. In order to reduce transportation impacts, the alternative action would create agreements with employers for commute trip reductions, discounted or free bus passes, and voluntary car share programs. The alleys would encourage pedestrian use by deterring vehicle traffic with signs. Finally, through the processes of construction, the alternative action suggestions summer construction to reduce polluted runoff, community determined construction hours to mitigate noise concerns, and hybrid construction equipment that generates power as it runs.

Through these methods, the alternative action improves upon the proposed action to create a minimally environmentally impacting redevelopment proposal. We highly recommend the alternative action, in part or whole, as the appropriate course of action for the downtown alleyway revitalization based on our analysis. Taking this environmentally responsible action would comply with the requirements of SEPA while dually enhancing the economic, social and cultural atmosphere of Bellingham’s downtown.

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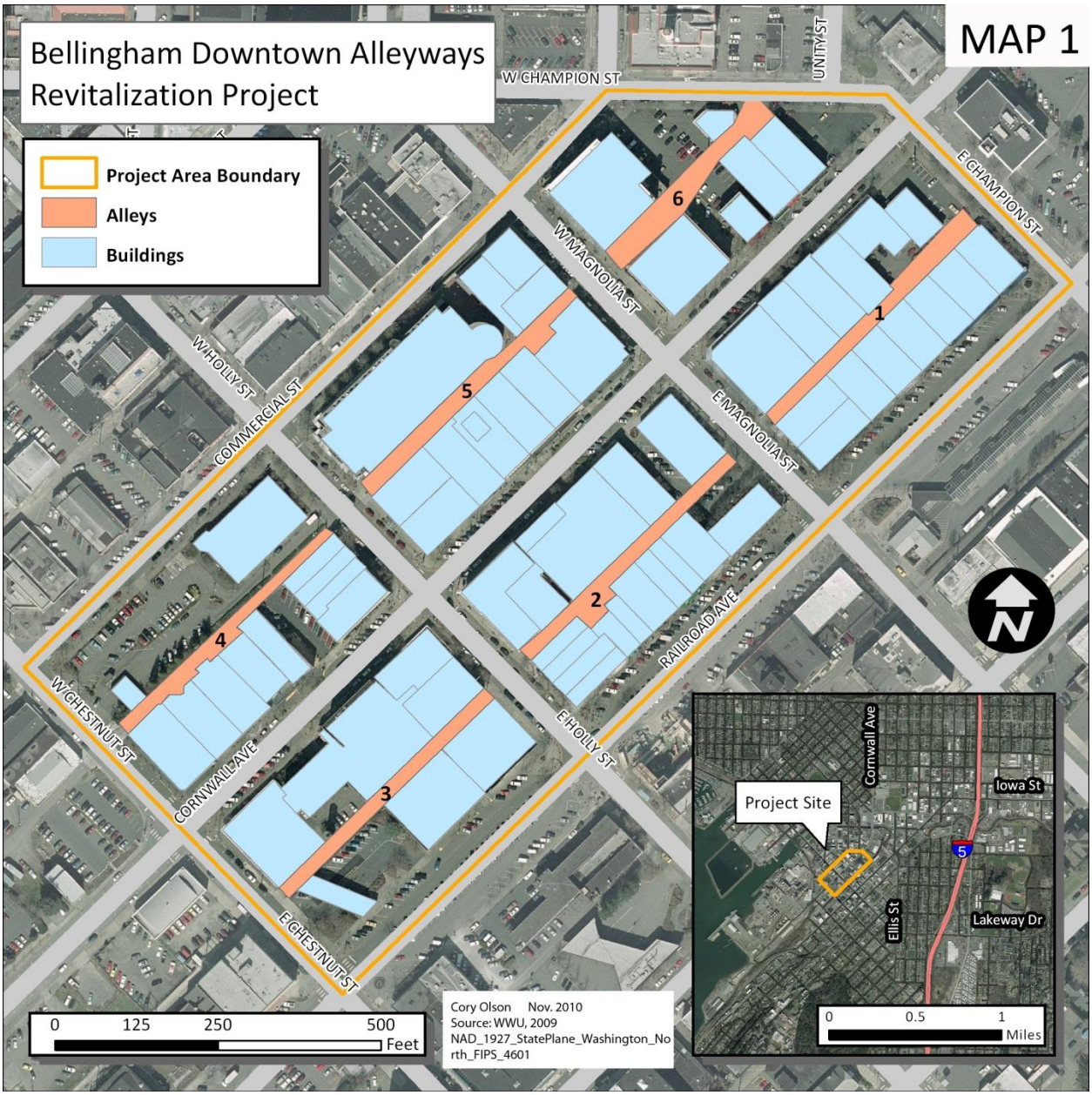
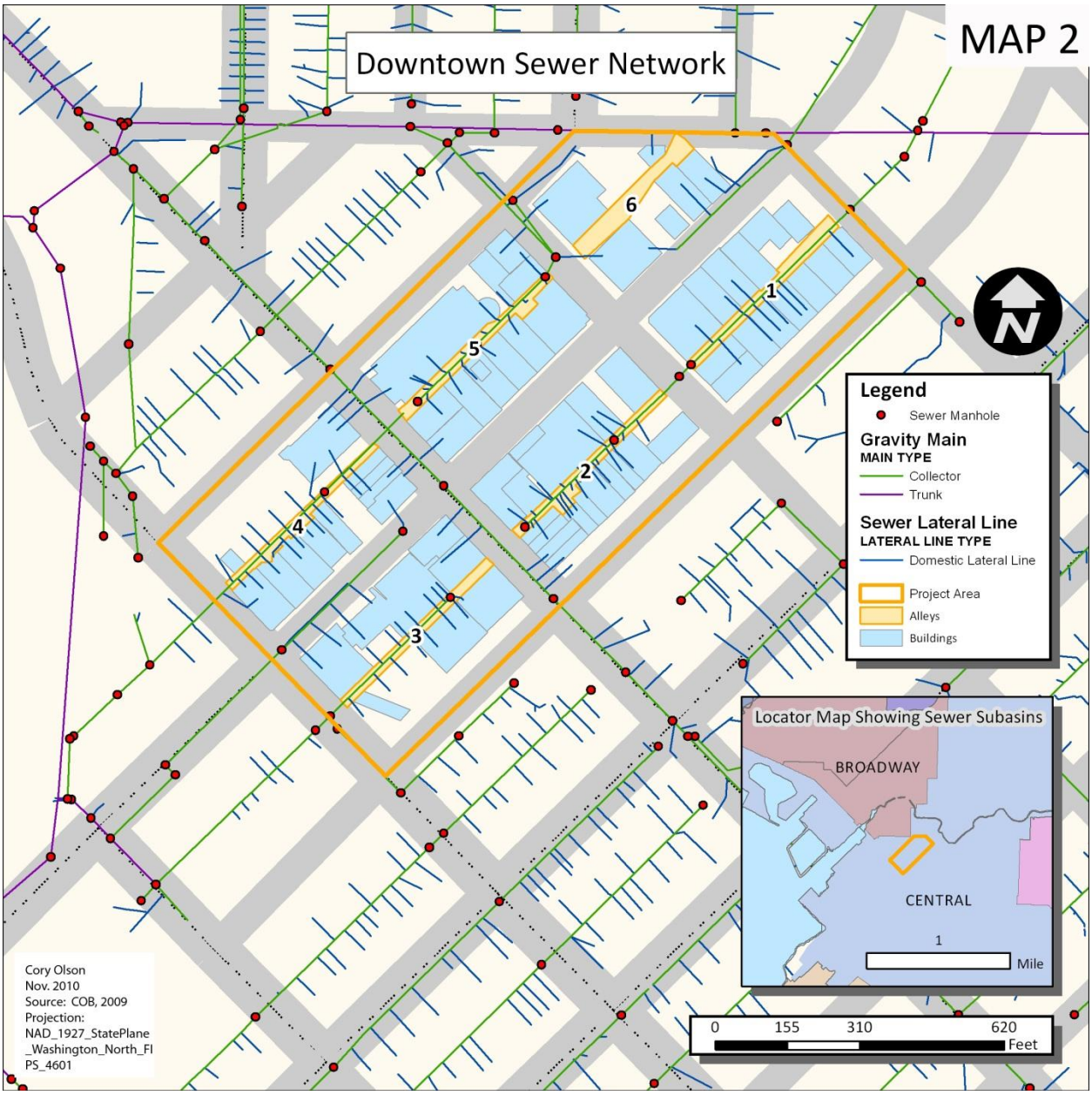
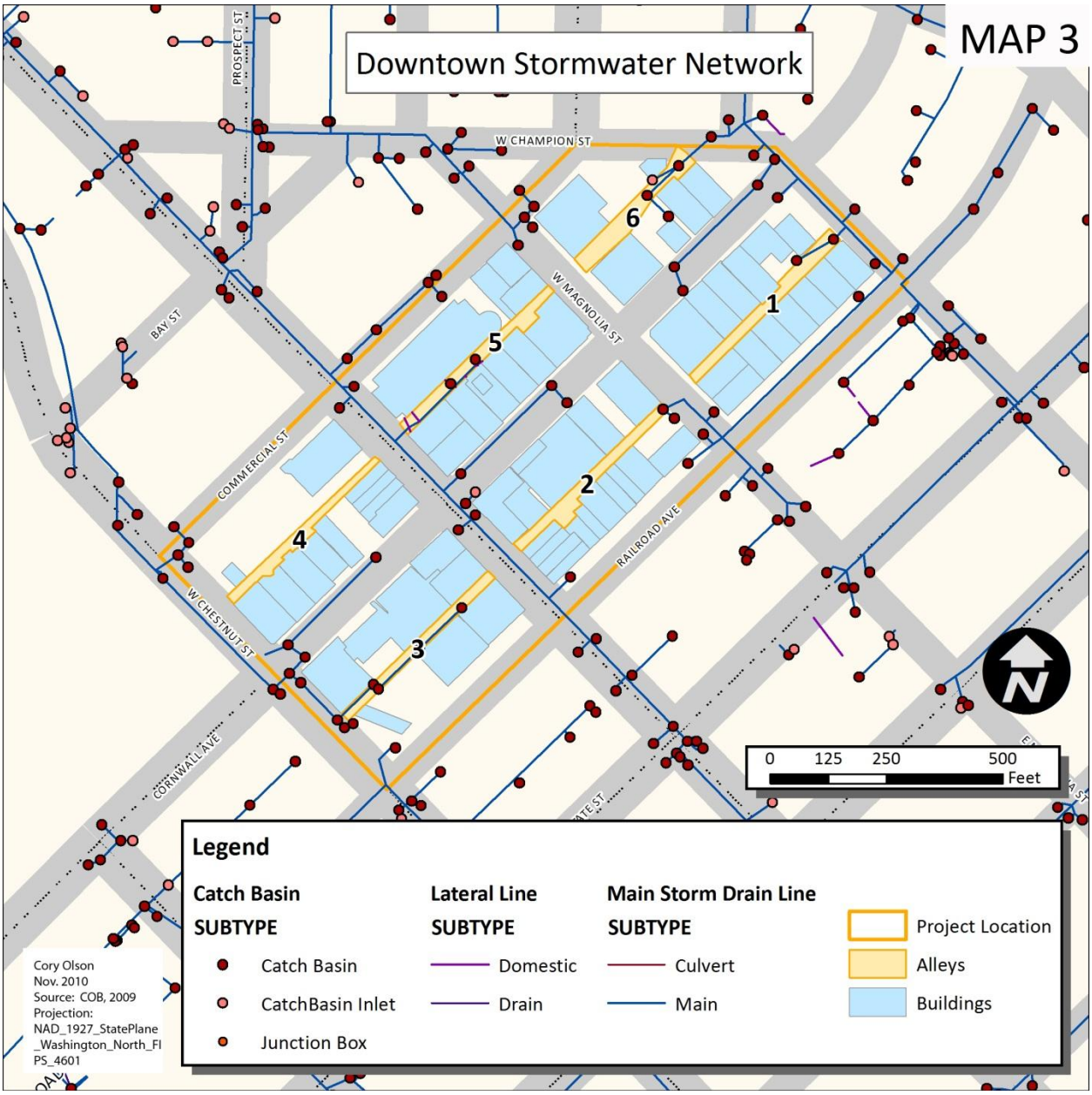
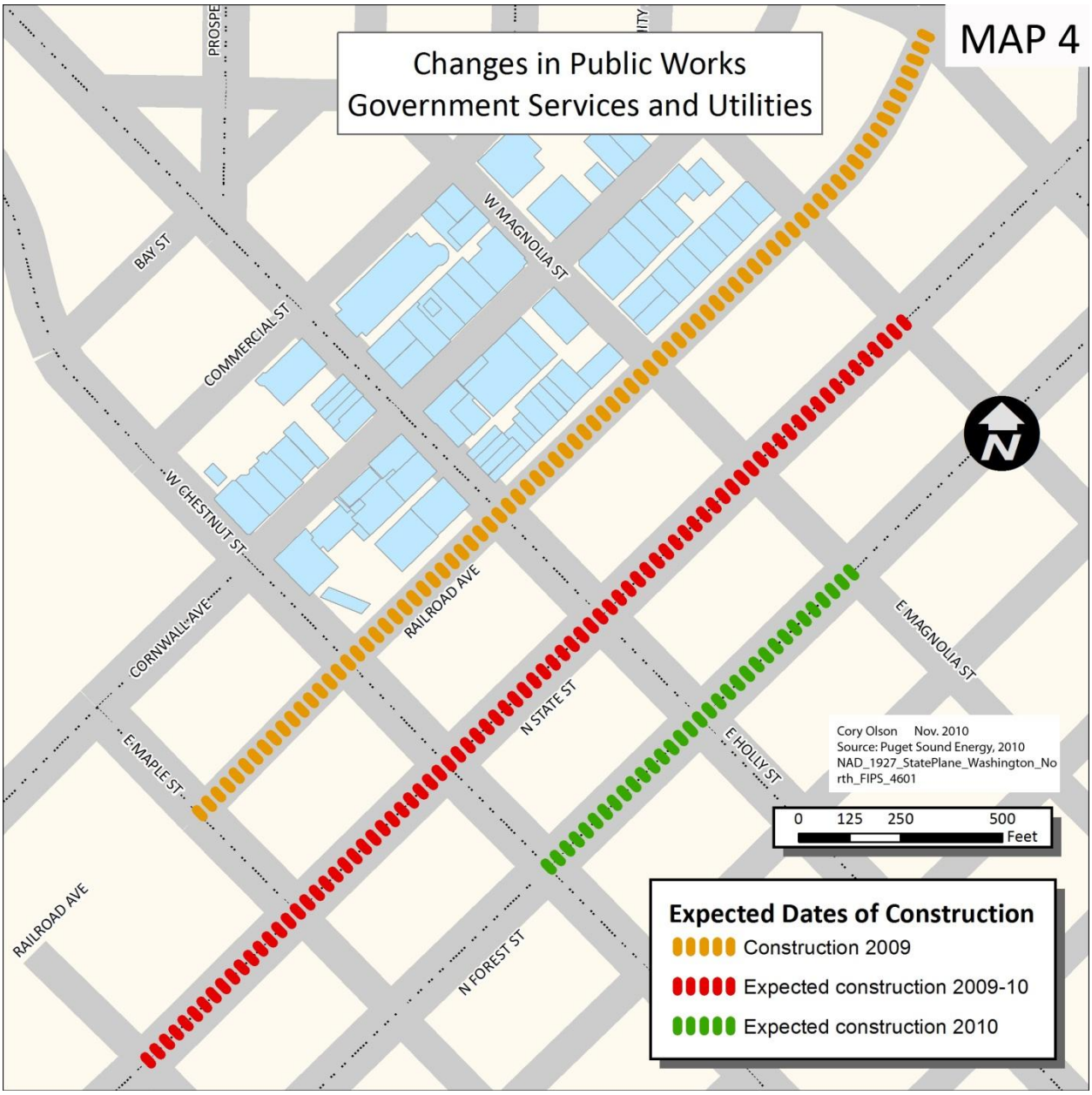
Appendices

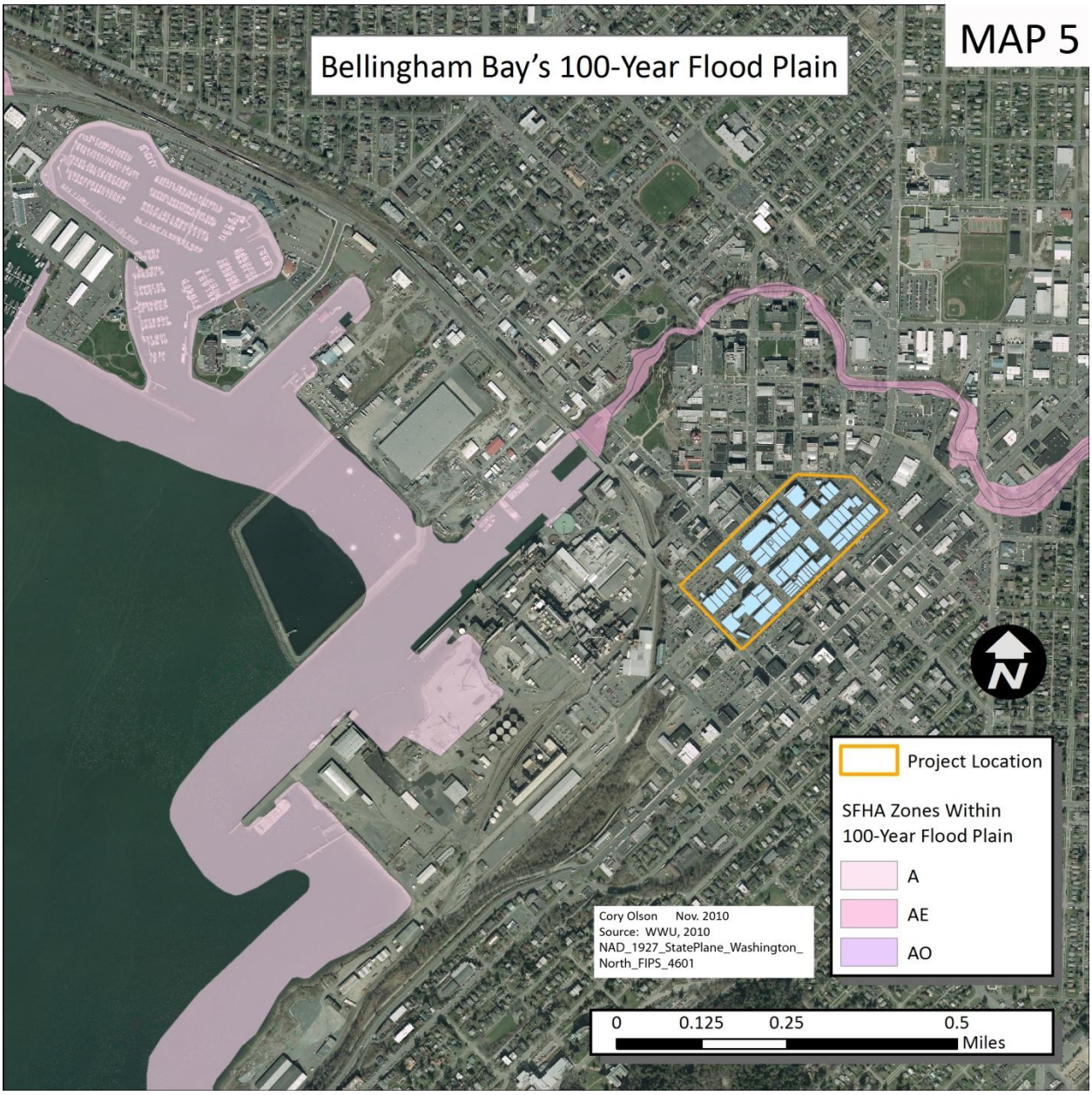
Map Index

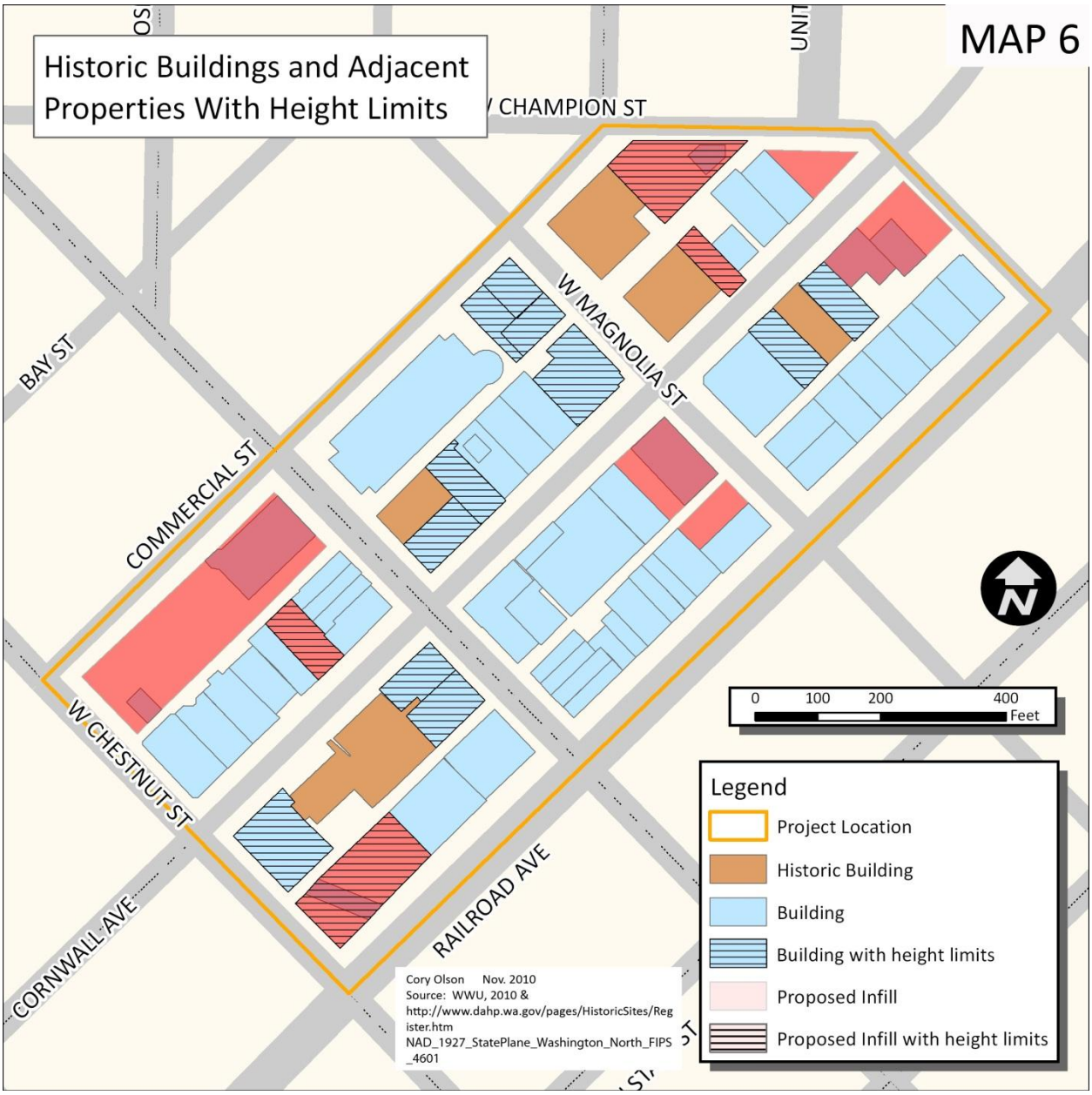


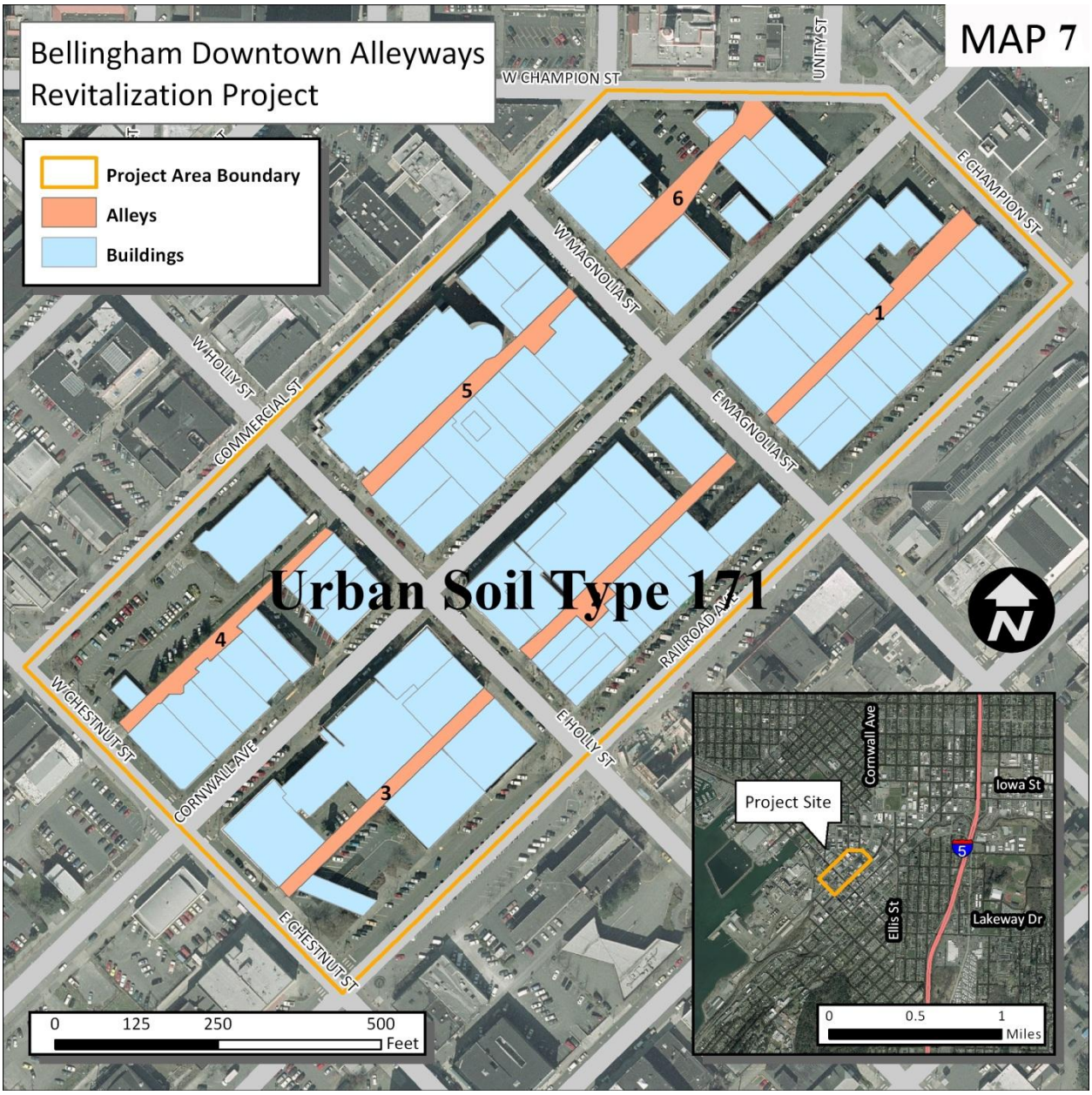

MAP 2
Downtown Sewer Network
1
2
3
4
5
6
Legend
Sewer Manhole
Gravity Main
MAIN TYPE
Collector
Trunk
Sewer Lateral Line
LATERAL LINE TYPE
Domestic Lateral Line
Project Area
Alleys
Buildings
Locator Map Showing Sewer Subasins
BROADWAY
CENTRAL
1
Mile
0
155
310
620
Feet
Cory Olson
Nov. 2010
Source: COB, 2009
Projection:
NAD_1927_StatePlane
_Washington_North_FI
PS_4601


MAP 3
Downtown Stormwater Network
PROSPECT ST
W CHAMPION ST
W MAGNOLIA ST
BAY ST
COMMERCIAL ST
RAILROAD AVE
W CHESTNUT ST
CORNWALL AVE
1
2
3
4
5
6
0 125 250 500
Feet
Legend
Catch Basin
SUBTYPE
Catch Basin
CatchBasin Inlet
Junction Box
Lateral Line
SUBTYPE
Domestic
Drain
Main Storm Drain Line
SUBTYPE
Culvert
Main
Project Location
Alleys
Buildings
Cory Olson
Nov. 2010
Source: COB, 2009
Projection:
NAD_1927_StatePlane
_Washington_North_FI
PS_4601


MAP 4
Changes in Public Works
Government Services and Utilities
W MAGNOLIA ST
BAY ST
COMMERCIAL ST
W CHESTNUT ST
CORNWALL AVE
RAILROAD AVE
E MAGNOLIA ST
N STATE ST
E HOLLY ST
E MAPLE ST
RAILROAD AVE
N FOREST ST
Cory Olson Nov. 2010
Source: Puget Sound Energy, 2010
NAD_1927_StatePlane_Washington_North_FIPS_4601
0 125 250 500
Feet
Expected Dates of Construction
Construction 2009
Expected construction 2009-10
Expected construction 2010


MAP 5
Bellingham Bay's 100-Year Flood Plain
Project Location
SFHA Zones Within
100-Year Flood Plain
A
AE
AO
Cory Olson Nov. 2010
Source: WWU, 2010
NAD_1927_StatePlane_Washington_
North_FIPS_4601
0 0.125 0.25 0.5
Miles


MAP 6
Historic Buildings and Adjacent Properties With Height Limits
CHAMPION ST
W MAGNOLIA ST
BAY ST
COMMERCIAL ST
W CHESTNUT ST
CORNWALL AVE
RAILROAD AVE
0 100 200 400 Feet
Legend
Project Location
Historic Building
Building
Building with height limits
Proposed Infill
Proposed Infill with height limits
Cory Olson Nov. 2010
Source: WWU, 2010 &
http://www.dahp.wa.gov/pages/HistoricSites/Register.htm
NAD_1927_StatePlane_Washington_North_FIPS_4601


Bellingham Downtown Alleyways
Revitalization Project
MAP 7
Project Area Boundary
Alleys
Buildings
Urban Soil Type 171
W CHAMPION ST
UNITY ST
E CHAMPION ST
W MAGNOLIA ST
E MAGNOLIA ST
W HOLLY ST
COMMERCIAL ST
RAILROAD AVE
E HOLLY ST
W CHESTNUT ST
CORNWALL AVE
E CHESTNUT ST
1
3
4
5
6
Project Site
Cornwall Ave
Iowa St
Ellis St
Lakeway Dr
0 125 250 500 Feet
0 0.5 1 Miles

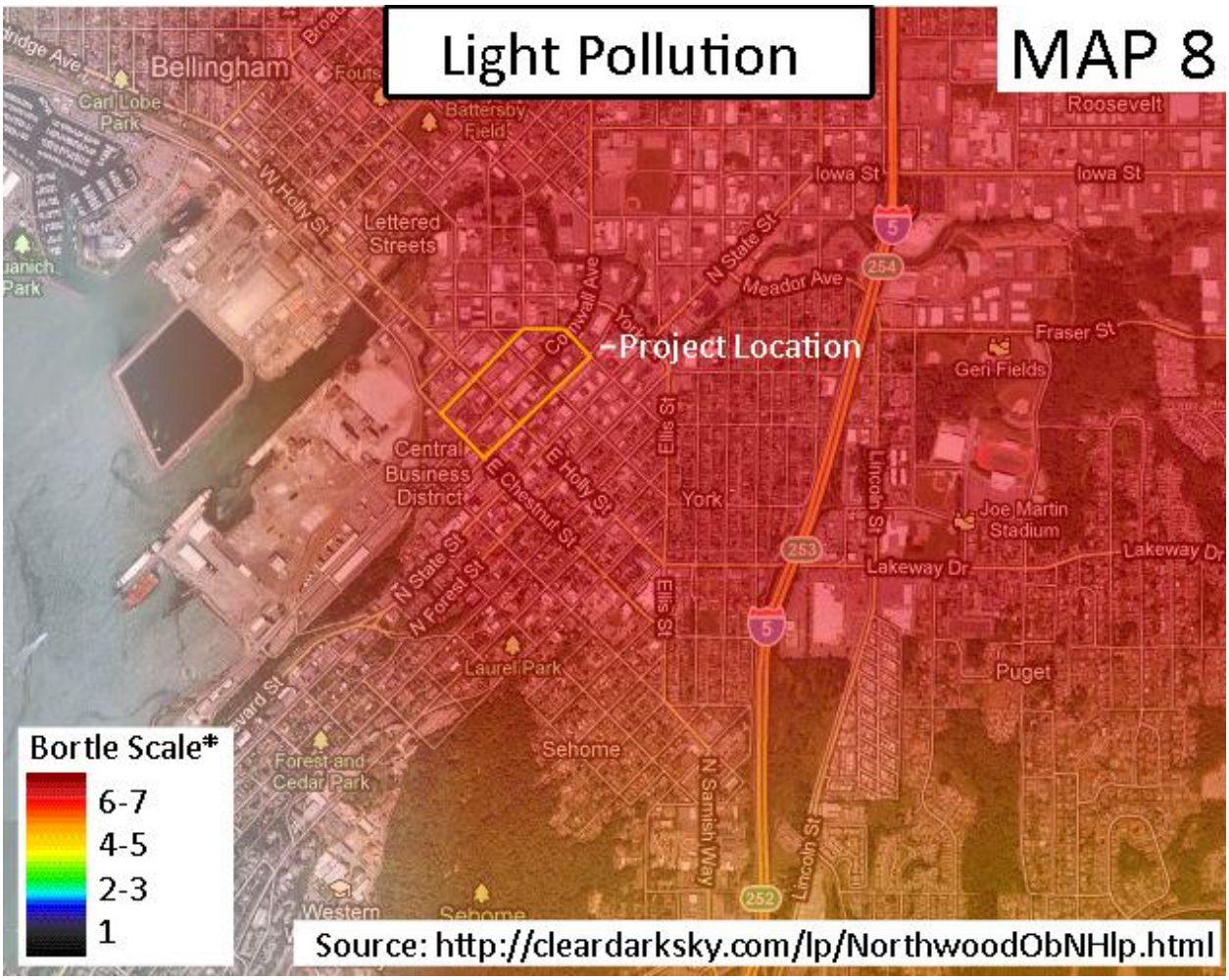

Light Pollution
MAP 8
Bellingham
Carl Lobe Park
Battersby Field
Lettered Streets
W Holly St
Iowa St
N State St
Meador Ave
Roosevelt
Fraser St
Geri Fields
Project Location
Central Business Distrct
E Chestnut St
E Holly St
Ellis St
York
Lincoln St
Joe Martin Stadium
Lakeway Dr
N Forest St
Laurel Park
Puget
Sehome
Forest and Cedar Park
N Samish Way
Western
Bortle Scale*
6-7
4-5
2-3
1
Source: http://cleardarksky.com/lp/NorthwoodObNHlp.html

Figure Index

Figure 0.1 Shows Potential amount of retail square footage in alleys

(Urban Transitions Studio, 35)

	Alley 1	Alley 2	Alley 3	Alley 4	Alley 5	Alley 6	**TOTALS**
Potential Alleyway Store Square footage **(current buildings)**	24, 280 ft^2	25,590 ft^2	14,360 ft^2	15,400 ft^2	17,520 ft^2	13,090 ft^2	**110,240 ft^2**
Potential Alleyway Store Square Footage **(infill buildings and additions)**	16,240 ft^2	8,680 ft^2	8,200 ft^2	19,880 ft^2	4,400 ft^2	8,520 ft^2	**65,920 ft^2**
Total Potential Alleyway Square Footage	40,520 ft^2	34,270 ft^2	22,560 ft^2	35,280 ft^2	21,920 ft^2	21,610 ft^2	**176,160 ft^2**

Figure 0.2 Shows the "Village Green," a pocket park in Fairhaven, Washington
http://bellinghamster.com/f.htm

Figure 0.3 The “Village Green” during a community event
http://foodconnections.blogspot.com/2010/08/bellingham-and-coupeville-small-farmers.html

Figure 0.4 Old Town Development Mixed Use Building Plan
(Bellingham Municipal Code §20.35.070)

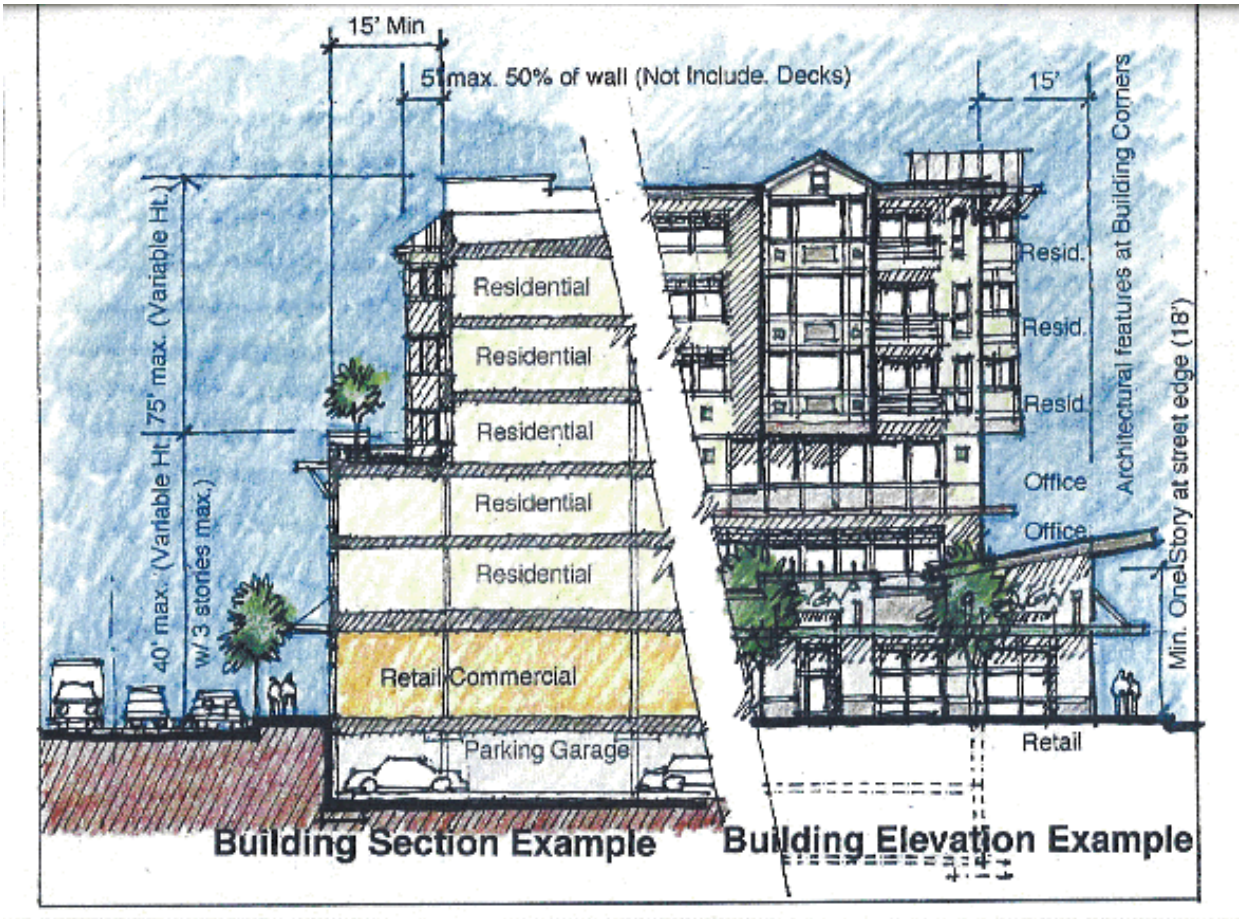


Figure 0.5 Old Town Development 130 foot height limits
(Bellingham Municipal Code § 20.35.070)

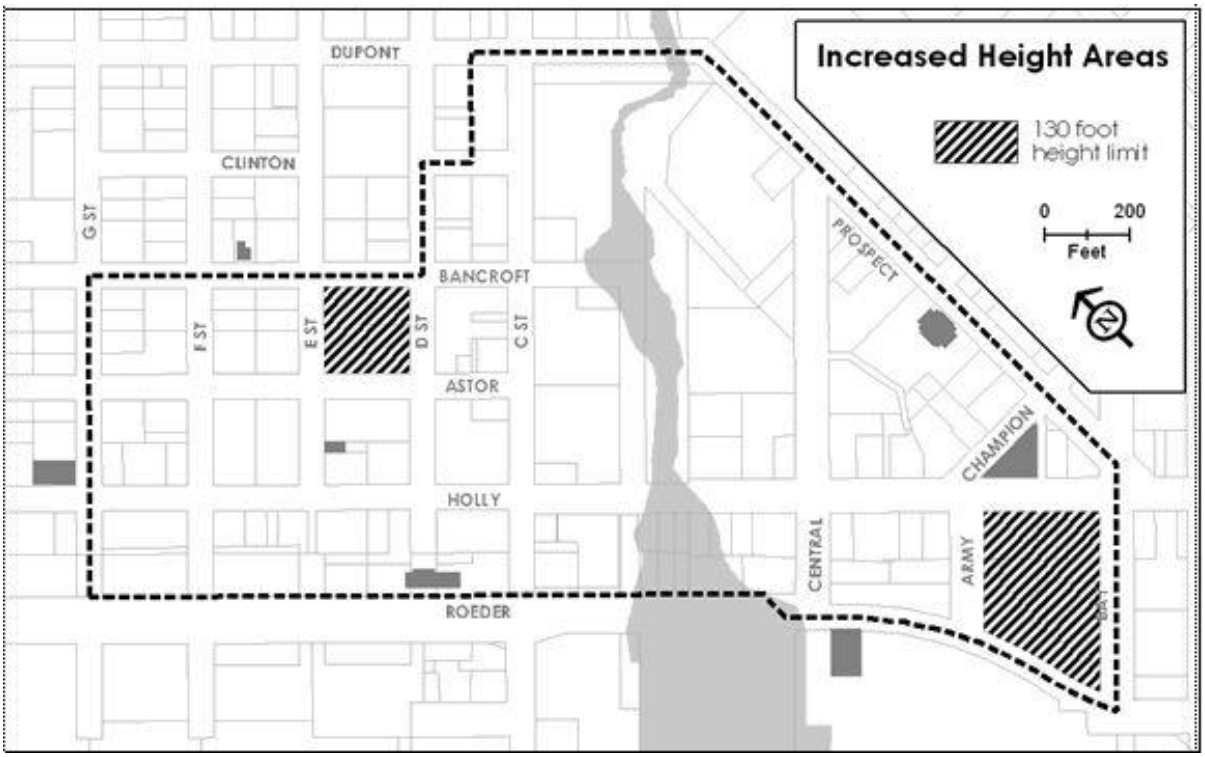


Figure 0.6 Proposed infill and building splits
(Urban Transitions Studio 2010, 36)

Figure 0.7 Grand Central Station surrounded by skyscrapers
(www.googlemaps.com)

Figure 0.8 Old Town Development 30-50 foot height limits for historic and cultural vistas (Bellingham Municipal Code § 20.35.070)

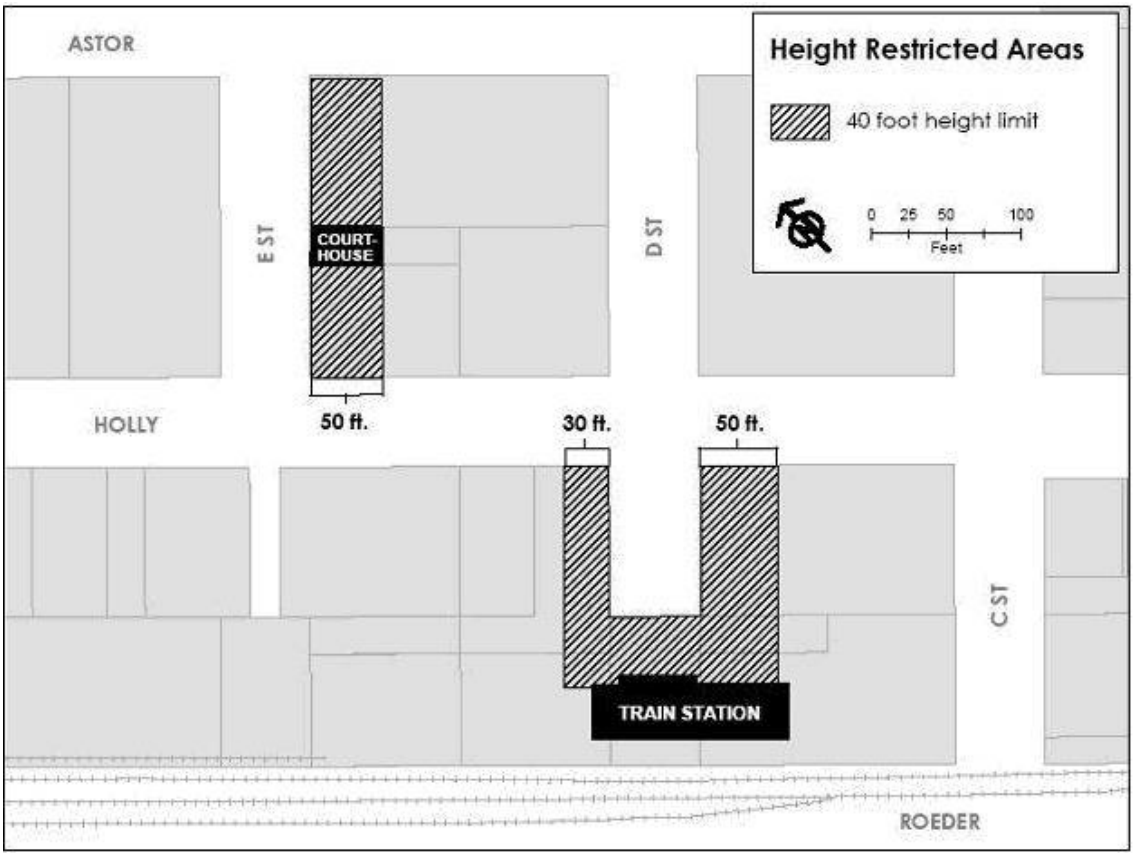


Figure 0.9 Automobiles attempting to navigate a “Yield to Pedestrians” zone at Pike Place Market in Seattle, Washington
http://catherine-dennis.com/bonustwo.html

Figure 1.0 Urban Village Vehicle Trip Reduction Credits Table

URBAN VILLAGE VEHICLE TRIP REDUCTION CREDITS

Menu of Location Factors and Performance Measures to Reduce Vehicle Trips

Note: Reductions below are additive and may not exceed a total of 50%

1.) MIXED USE URBAN VILLAGE LOCATION 15%

(Based on ITE Internal Trip Capture - Mixed Use Urban Environment)

2.) WTA TRANSIT PROXIMITY (Only one transit proximity reduction below may be used)

Development fronts on a high-frequency WTA GO Line **10%**

Development within 1/4-mile of WTA GO Line **7%**

Development fronts on standard WTA Route (< 60 min) **5%**

Development within 1/4-mile5 of standard WTA Route (< 60 min) **2%**

3.) EMPLOYER MANDATORY COMMITMENT TO COMMUTE TRIP REDUCTION (CTR)

CTR/TDM commitment combining economic incentives with transportation services **10%**

4.) VOLUNTARY ANNUAL WTA TRANSIT PASS PROVISION (Non-CTR)

2-year transit pass provided for residential units = 1% per unit pass **1%**

2-year transit pass provided for employees = 1% per employee pass **1%**

5.) VOLUNTARY CAR SHARE PARTICIPATION OR PROVISION (Non-CTR)

Car Share Vehicle(s) Parked On Residential or Employment Site = 2% per vehicle **2%**

Car Share membership fee provided for residential units = 2% per unit **2%**

Car Share membership fee provided for employees = 2% per employee **2%**

Figure 1.1 Bellingham Alleyway Population and Density
(U.S. Census 2000)

AreaAcre	Pop2k	HU2k	Pop_Acre	HU_Acre
3.2143	0	0	0	0
4.2394	2	1	0.4718	0.2359
4.1188	0	0	0	0
4.1473	11	10	2.6523	2.4112
4.1831	0	0	0	0
4.1848	74	97	17.683	23.1791

Figure 1.2 Mixed Use Development Building in Fairhaven, Washington
http://www.google.com/images

1.3 Business in a pedestrian alleyway in downtown Fairhaven, Washington
http://www.recumbentblog.com/2009/05/28/last-day/

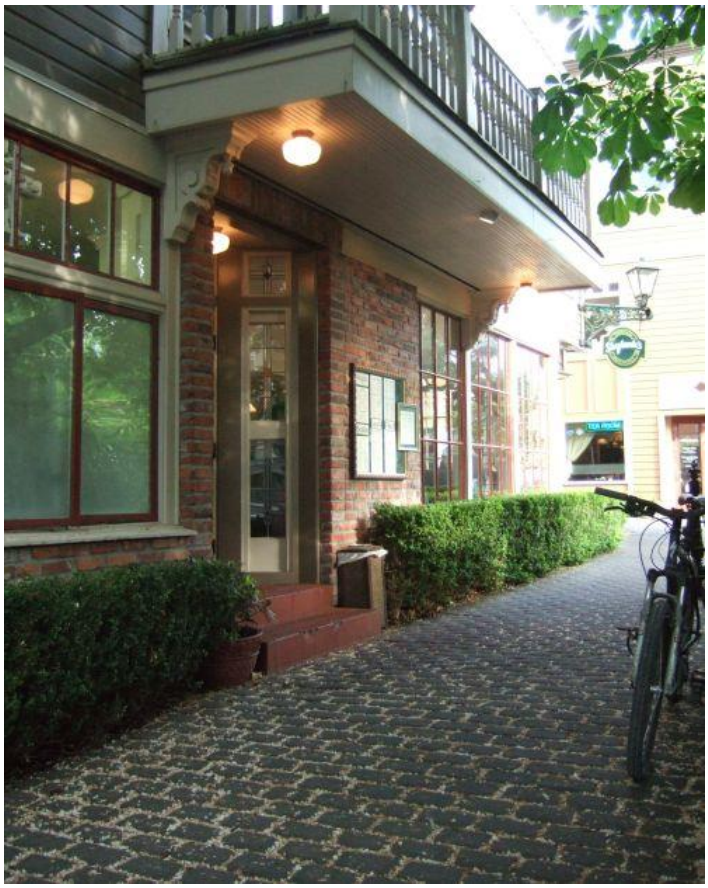


Figure 1.4 Downtown Fairhaven Population and Density
(U.S. Census 2000)

AreaAcre	Pop2k	HU2k	Pop_Acre	HU_Acre
1.7978	0	0	0	0
7.7299	0	0	0	0
6.2468	0	0	0	0
7.1053	4	2	0.563	0.2815
1.8594	0	0	0	0
1.8764	0	0	0	0
1.8604	0	0	0	0
1.8635	0	0	0	0
1.9338	104	101	53.7801	52.2288
4.0831	47	23	11.5109	5.633
3.1366	16	6	5.1011	1.9129
3.969	38	20	9.5742	5.0391
4.0505	7	3	1.7282	0.7406
3.6834	9	5	2.4434	1.3574
3.9957	22	7	5.5059	1.7519
3.9236	44	18	11.2142	4.5876
3.8753	30	15	7.7413	3.8707
4.9875	21	7	4.2105	1.4035
4.0096	28	13	6.9832	3.2422
3.9266	33	15	8.4042	3.8201
3.8925	20	11	5.1381	2.8259

Calculation Index

Variables:

65, 920 square feet = square feet of proposed infill and additions in the alleyways

1,000 square feet = estimated housing unit size for this proposal

2.31 people = average household size in the City of Bellingham

1 acre = 43,560 square feet

24 units of housing = number of units per residential acre needed to fulfill the Whatcom County Comprehensive Plan suggestions to the City of Bellingham

Calculations:

Calculation 0.1

65,920 square feet/ 43,560 square feet/ 1 acre = 1.52 acres

Calculation 0.2

24 housing units x 1.52 acres = 36.48 housing units

Calculation 0.3

65,920 square feet/ 1,000 square feet = 65.92 housing units

Calculation 0.4

65.92 housing units x 2.31 people = 152.2752 people, rounded to approximately 153 people

Calculation 0.5

153 people/story x 4 stories = 612 people