APPENDIX B: PEDESTRIAN NEEDS ANALYSIS

TECHNICAL MEMORANDUM

Memorandum

Date: November 14, 2011

Re: Draft Project Memorandum #4: Needs Analysis Summary

Contents

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1 Introduction

This memorandum summarizes the inputs and analysis for determining pedestrian needs and identifying critical pedestrian corridors in the City of Bellingham. These critical pedestrian corridors provide the basis for the development of master plan project recommendations.

The analysis and project recommendations have been developed with the understanding that all roadway and trail corridors potentially serve pedestrian travel. However, with limited resources it is valuable to define a core connected network that provides access to services and destinations throughout the City. The needs analysis takes into account where people in Bellingham live, work, play and travel. This analysis seeks to identify what routes are most likely to be used for frequent pedestrian travel and where improvements can address a clear nexus between existing and potential supply of pedestrian facilities and demand for those facilities.

Key goals for the needs analysis include the identification of the following:

- Areas of high pedestrian demand;
- Specific routes of high pedestrian demand;
- Current barriers to walking;
- Areas with existing pedestrian safety issues and;
- Areas with gaps in supply of pedestrian infrastructure.

2 GIS Needs Analysis Methodology

This GIS suitability analysis is based on a technique devised by a prominent landscape architect, Ian McHarg. His influential book *Design With Nature* (1969) accentuated the importance of considering the natural environment when introducing new development and infrastructure. McHarg was an early pioneer of GIS analysis and established innovative techniques for route planning using photographic map overlays. McHarg asserted that in order to find the most suitable route, one must determine the least social cost, meaning factors that would impact social values would have to be considered. Once identified, each factor was mapped on individual transparent sheets using three different color shades (with darker shades representing more social cost). The sheets were overlaid into a single stack revealing the most suitable route location. McHarg's photographic map overlay analysis paved the way for the foundation of modern day GIS analysis.

This analysis adapts McHarg's methodology for use in the City of Bellingham. The Pedestrian Suitability Analysis model uses a quantitative modeling approach discussed in detail in this report to identify and prioritize pedestrian corridors by overlaying GIS data pertinent to a citywide study.

New tools have been developed in the last 10 – 15 years that complement the overlay analysis pioneered by McHarg. These tools, such as Shortest Path Analysis, rely on the advancements in computer processing power and geospatial software to make these processing techniques viable in a master planning process. Combining McHarg's overlay technique with a shortest path analysis of likely pedestrian routes to destinations allows us to identify suitable pedestrian routes throughout the city and gauge likely usage patterns with some accuracy. The results of the GIS analysis are refined using factors such as public comment and locations of pedestrian related crashes to create a robust network of corridors that comprise a primary network for pedestrians as well as recommend improvements.

Models serve as an effective means to understand how factors in a complex system interact by providing a simplified version of the system for study. However, by definition they are abstractions of realty, and are constrained by the quality of available data and the complexity of the system under consideration. This suitability analysis provides a general understanding of conditions for people who walk in Bellingham including where they live, work and play. In the process of simplification some details of existing conditions are obscured. The model acts as an aid for the project team in development of the pedestrian network.

2.1 Pedestrian Suitability Analysis

The PSA model was developed to evaluate current pedestrian activity levels in the City of Bellingham, Washington.

The analysis:

- Quantifies factors that impact pedestrian activity;
- Locates pedestrian network gaps as potential projects and;
- Identifies pedestrian corridors that are likely to be highly traveled.

PSA identifies areas where people are most likely to walk. The analysis assigns weighted values to available GIS feature datasets based on their relative impact on walking. PSA also assigns values based on distances to features to which people are likely to walk. This technique assigns scores to the roadway network and can therefore be used to develop priority travel corridors as well as prioritize and evaluate potential infrastructure projects. The metrics fall into categories of pedestrian **demand** (e.g., where people live, work and play) and **supply** (e.g., existing sidewalks, curb ramps and crosswalks). Table 1 describes the metrics used:

Table 1. PSA Metrics Overview

Category	Metric
Live	Population density, household income, vehicle ownership, journey to work mode
Work	Employment density by job sector, college enrollment density
Play	Proximity to points of interest and schools
Transportation and Roadway Quality	Proximity to public transportation, roadway characteristics

Aggregating these metrics generates a map that can be used to model activity levels and to evaluate pedestrian needs, thus prioritizing projects that have the greatest impact on the largest number of people. The analysis is based on data obtained from the City of Bellingham and the US Census Bureau. The following sections present the inputs and analysis methodology.

2.2 Pedestrian Demand – Live

PSA utilizes a variety of demographic data as indicators of where potential volumes of pedestrian activity will be generated. Base population density, percentage of households without immediate access to a car, median house hold income, and the percentage of people already walking to work, are all contributors to this category. Data from the 2010 US Census and the 2005 – 2009 American Community Survey (ACS) are utilized in this analysis. Different datasets used to develop this factor are available at varying levels of geographic aggregation: 2010 US Census data is typically available at the block level while ACS data are typically provided at the census tract level. Consultant team and City staff review of the results ensure the greatest level of possible accuracy.

A composite 'Live' score is a function of population density, median income, vehicle ownership, and journey to work data. While these features occupy the same geographic space, population density is weighted twice as heavily as other factors to reflect the factor's relative importance. Table 2 describes the features analyzed in this category, and Figure 1 in the Appendix illustrates the results of the 'Live' analysis.

Table 2. Data for Trip Generator Model - Live

Category	Feature Dataset
Live	Population Density
	% of Pedestrian Commuters
	% of Households Without Vehicles
	Median Income

2.3 Pedestrian Demand – Work (Daytime Population)

Other key indicators of pedestrian demand are places of employment and college student population density. Employment information is obtained from the InfoUSA database provided by the City of Bellingham. Jobs are classified as either industrial/professional or retail/commercial and densities were calculated at the census block level. Retail and commercial jobs are considered to generate more pedestrian demand than manufacturing jobs as these locations tend to draw in customers and generate foot traffic. The enrolled college population of major institutions is included in this analysis to capture the high daytime population of these environments. Population densities are assigned values based on geometrical intervals, overlaid, summed and scaled to create a composite 'Work' score. Table 3 describes the features analyzed in this category; Figure 2, located in the Appendix, illustrates the results of the 'Work' analysis.

Table 3. Data for Trip Generator Models - Work

Category	Feature Dataset
Work	Industrial Job Density
	Commercial or Retail Job Density
	College Enrollment Density

2.4 Pedestrian Attractors – Play

PSA identifies activity areas by utilizing geographic features that are likely to attract pedestrians. Points are assigned to a variety of features comprising the 'Play' category, recognizing that certain features are more likely to attract walking trips than other features. Once identified, concentric circles (referred to as buffers) are drawn around each feature type at increasing distances from the feature's center point. Weighted distance values are assigned to each buffer. Features analyzed in the 'Play' analysis are included in Table 4.

Table 4. Data for Attractor Models - Play

Category	Feature Dataset
Play	Parks
	Recreation Centers
	Public Buildings
	Libraries
	Visitor Centers
	Post Secondary Schools
	High Schools
	Middle Schools
	Elementary Schools
	Regional Malls
	Small Shopping Centers
	Large Shopping Centers, Urban Core or Urban Villages

For example, a $^{1}/_{8}$ mile buffer is assigned a higher value than a ½ mile buffer. The buffers used for PSA correspond to distances that a pedestrian will be willing to walk. The values assigned to each feature were multiplied by the weighted distance values for each distance buffer. Refer to Table 4 for specific features and Table 5 for the distance scoring measures used in this portion of the model. The results of the 'Play' analysis are shown in Figure 3, located in the Appendix, and described at the end of this section.

Table 5. Weighted Distance Values

PSA Distance Metrics (Miles)	Weighted Values
1/8	1
1/4	0.8
1/3	0.6
1/2	0.4
1	0.2

Buffered features were treated according to the weighted values shown in Table 5 and aggregated into the composite PSA analysis. Areas with high concentrations of 'Play' features identify high existing and potential pedestrian demand.

2.5 Live, Work and Play Results and Composite PSA Supply

Figures 1 through 3 in the Appendix depict the results of the 'Live,' 'Work' and 'Play' analyses. Following analysis and validation by the project team, these metrics were compiled into a single 'Demand' metric depicting relative high and low levels of expected pedestrian demand throughout Bellingham. The resulting composite pedestrian demand map was used to develop the Primary Pedestrian Network and subsequent draft project list.

2.5.1 Live Findings

The 'Live' scores, shown in Figure 1 in the Appendix, shows the relative probability that the census tract will generate more pedestrian trips based on information about population density as well as areas where the proportion of people who frequently walk as a form of transportation is likely to be higher as indicated by a lower median income and lower rates of vehicle ownership. The areas with the highest 'Live' score include the Alabama corridor, portions of the Cordata and Birchwood neighborhoods, the York and Sehome neighborhoods and the eastern portion of Happy Valley.

Neighborhoods surrounding the downtown core scored higher than the downtown core, which is consistent with the current lower residential density in downtown. Though residential densities in the Puget neighborhood are high around Lakeway, the results in this area are moderated by higher median incomes and car ownership. In addition, a shared census tract with the Lake Whatcom area is likely impacting the overall score for the area. Higher median income resulted in lower 'Live' scores in the Edgemoor, Samish and South neighborhoods.

As noted in the discussion of the methodology earlier in this document, the model has some limitations based on available data and the complexity of system. For this analysis, data was aggregated to either census tract or block. The size of the tracts and blocks vary throughout the city, in some cases encompassing areas that have different land use and densities of people living and working in the area. For this reason, the visual representation of higher verses lower Live, Work and Play scores may be skewed within the neighborhoods. For example, in the South neighborhood, areas around Chuckanut Drive show relatively higher 'Live' scores. However, the overall density in this area is low and the score driven by population north of the Fairhaven Parkway due to distribution throughout the tract or block boundaries. This trend can also be seen along the waterfront in the Central Business District. Industrial areas are shown with higher 'Live' scores, however, the score is driven by residential areas of the downtown.

2.5.2 Work Findings

The 'Work' score (Figure 2, Appendix) highlight the areas that are likely to have higher pedestrian trips during daytime hours. In Bellingham, the campuses of Western Washington University, Bellingham Technical College and Whatcom Community College, act as pedestrian activity hubs for staff and students who typically walk, cycle, take transit, or drive to campus and then take shorter trips to campus or surrounding destinations on foot. Other areas with significant 'Work' scores include the downtown core, Fairhaven, other urban village nodes, and commercial development along higher order arterial roadways such as Meridian Street, Northwest Avenue and Alabama Street. It should be noted that this metric does not take into account the pedestrian friendliness of these areas, simply the density of daytime populations. 'Work' scores are influenced by the presence of post-secondary institutions, mixed use development and dense employment areas such as business parks. Increased employment density can contribute to increased pedestrian activity if desirable destinations are present.

2.5.3 Play Findings

As shown in Figure 3 in the Appendix, 'Play' areas dense with pedestrian-friendly destinations received the highest scores. Notable locations on the map include post-secondary institutions with community centers, ball fields and other amenities, the downtown core, Barkley Village, portions of the Birchwood, Columbia and Cornwall Neighborhoods, the neighborhoods surrounding downtown and Fairhaven and portions of the Lakeway Corridor. Areas with greater urban densities had a higher 'Play' score; this is especially true for older neighborhoods with a greater mix of land uses. Despite this trend, neighborhoods with relatively low 'Play' scores often had one significant feature or amenity resulting in a 'hot spot' (e.g., the areas surrounding Big Rock Park in the Silver Beach neighborhood). These dispersed 'Play' hot spots indicate that many Bellingham residents are within walking distance to one or several destinations within their neighborhood.

2.5.4 Composite Demand Findings

Areas with the highest composite demand, shown in Figure 4 in the Appendix, share high scores in the Live, Work and Play metrics and therefore are clear areas of Bellingham that will continue to generate and attract people walking. These areas should have continued investment in pedestrian infrastructure. Areas with the highest pedestrian demand include the downtown core, the James Street corridor south of Alabama, portions of the Columbia neighborhood along Northwest Avenue, the area surrounding Western Washington University and areas of Fairhaven. Neighborhoods surrounding the downtown generally scored in the second highest and third highest tiers. Bands of higher pedestrian demand generally follow arterials, such as Lakeway Drive and indicate the presence of denser residential development and commercial destinations. Outlying neighborhoods exhibited increased pedestrian demand when a play score was significantly higher, for example in close proximity to parks. Pedestrian demand was generally lower east of I-5 and south of Lakeway Drive.

2.6 Pedestrian Supply –Transit/Roadway Quality

Roadway characteristics largely comprise the "transit/roadway quality" category. As a first step, a graphic depiction of sidewalk coverage by neighborhood was produced (Figure 5, located in the Appendix). This provides a baseline to help validate the next steps of the supply analysis. Where 'Play' identifies activity areas in broader terms, roadway quality identifies the quality of a route to and from 'Live,' 'Work,' and 'Play.' PSA therefore defines roadway quality or the supply of infrastructure for walking through the measures described in Table 6 and shown in Figure 6, located in the Appendix, with composite demand.

Table 6. Data for PSA Transit/ Roadway Quality

Category	Feature Dataset
Transit/ Roadway Quality	**Transit** (presence or absence)
	Crosswalk (presence or absence)
	Block Length
	Connected Intersections per Square Mile
	Sidewalk Width
	Greater than 8 feet
	5-8 feet
	4 feet
	Less than 4 feet
	ADA Compliance (Intersection)
	Curb ramps are complete
	50% of curb ramps present
	No curb ramps present
	Intersection Control (signal or no signal)
	Illumination (lighting present or absent)
	Sidewalk Completeness

2.6.1 Composite Supply Findings

The quality of existing pedestrian facilities varies throughout the city. Generally, pedestrians walking in the downtown core and neighborhoods directly north of downtown (e.g., in the Sunnyland Neighborhood and in the Lettered Streets neighborhood) will find complete, well-lit sidewalks, opportunities to cross arterial streets at protected locations and a relatively complete supply of curb ramps. Conditions in other neighborhoods are more varied, though conditions tend to be more consistent along corridors (e.g., Alabama, Lakeway and Northwest Avenue). Although arterial roadways are not the most comfortable pedestrian facilities, providing complete sidewalks or sidepaths to provide separation for pedestrians on these roads is more critical based on generally higher motor vehicle travel speeds. When overlaid with the composite demand, the supply map (Figure 6 in the Appendix) can be used to develop customized capital and programmatic pedestrian improvement strategies.

3 Primary Pedestrian Network Development

While all roadways and trails are part of the pedestrian network, there are corridors that serve as critical connections between destinations and act as pedestrian 'highways' within the system. The supply and demand models developed in the previous steps provide the basis for a recommended pedestrian network of critical corridors. A review of the supply and demand maps (Figures 4 through 6 in the Appendix) show high pedestrian demand throughout the city and various levels of supply throughout the system. This overlay analysis is combined with the Shortest Path Analysis, collision data and public input described in the next sections to produce a refined Primary Pedestrian Network.

3.1 Utilitarian Destinations Shortest Path Analysis

Network Analyst tools for ArcGIS are used to measure the shortest distances from grocery stores and elementary schools along the roadway network to residential parcels. This Shortest Path Analysis tool is important to understand the links in a roadway network that provide the most connected routes for residential access to destinations. Grocery stores and elementary schools are common neighborhood oriented destinations that generate local walking trips. Providing safe and walkable access to these services is an important element of the pedestrian network that helps to ensure equitable access to healthy food and education. The PSA information is critical for understanding broad spatial relationships and needs throughout the City. However, the Shortest Path Analysis provides more localized information and has several additional benefits:

- Accurately depicts true roadway distances (turn-by-turn) to and from destinations used such as the proxies used in our analysis - schools and grocery stores
- Identifies the most likely travelled roadways by quantifying the number of times roadway segments are overlapped by the service area's linear features (as several destinations are accessed using the same roadways)

Shortest Path Analysis is a suitable input for developing Bellingham's Primary Pedestrian Network and highlights utilitarian access to key neighborhood destinations, while the 'Play' metric more generally highlights potential destinations in clusters or groups. This analysis is sensitive to the importance of maintaining an equitable routing hierarchy in more urban, suburban, and rural areas of the City. The results, shown in Figure 7 in the Appendix, provide a snapshot of roadway links that are likely to be used by pedestrians to access grocery stores and public elementary schools in Bellingham with thicker lines representing paths more likely to be traveled. Arterial roadways were well represented in this analysis as well as a number of residential roadways that provide access along parallel roadways or provide access to arterial roadways. Non-arterial roadways particularly notable for high numbers of likely walking trips include Sylvan Street, Pine Street, Cedar Street, Alvarado Drive, York Street and Lakeview Street.

3.2 Pedestrian Involved Collisions

In order to validate the primary pedestrian network derived from the PSA analysis and adjust as needed, a review of pedestrian -involved collisions was completed. The collision data from 2006-2010 (in Figure 8 in the Appendix) was overlaid on the preliminary primary network to assess potential improvement needs for safety and areas for study. With the exception of a few collisions on residential streets which did not merit inclusion into the primary network, all collisions were located on the identified primary network shown in total in Figure 9 in the Appendix.

It comes as no surprise that there are high collision rates in areas of high demand. Areas with many commercial and social attractions, as well as transit routes, attract greater numbers of pedestrians and motorized vehicles - increasing the opportunities for conflict. The City of Bellingham collects and monitors data regarding pedestrian involved collisions within City limits. Detailed collision information is collected for 'high collision corridors' in the following locations: Bill McDonald Parkway, Chestnut, Cornwall, Holly, Lakeway, Magnolia, Meridian, Sunset, Woburn and Alabama. These corridors provide connected and contiguous routes making them attractive for both pedestrians and motor vehicles.

Previous analysis of pedestrian involved collisions showed that 70 percent of the crashes on 'high collision corridors' involved a pedestrian crossing the road in either a marked or an unmarked crosswalk. Motorist inattention or violation of the pedestrian right of way was the contributing factor for 80% of those collisions where the pedestrian was in the crosswalk. While this indicates more education and enforcement are needed in relation to motorists' behavior, specific high crash locations should be reviewed to determine if infrastructure improvements could improve safety.

Specific locations for study include the following:

- Intersection of Bill McDonald Parkway and Samish Way
- Intersection of Meridian and Westerly (Washington State Department of Transportation)
- Intersection of Lakeway Drive and Lincoln Street
- Downtown Intersection Safety Study (currently Chestnut and Forest has the highest collision rate)

These locations will be added to the proposed projects lists as areas for future study.

3.3 Key Public Input

In order to ensure that the pedestrian network reflects specific neighborhood needs and addresses general public desires for the walking environment, public input and past planning efforts were also considered in the network development.

Projects on the Community Pedestrian Project Request (CPPR) list were overlaid on the priority network generated from the PSA and Shortest Path analyses. The CPPR list was developed based on the locations of potential projects identified in the Bellingham Comprehensive Plan, neighborhood planning processes, and the Bicycle and Pedestrian Advisory Committee. The review sought to ensure that key projects and concerns identified in this list would be addressed or incorporated within the primary pedestrian network and proposed projects for the Master Plan.

In addition, key findings, locations of concern and open ended comments from the Bellingham Pedestrian Master Plan public survey were reviewed.

Key points that were considered include:

- Public preference for access to destinations on major roadways, but also for options for walking on trails and low volume roads;
- Access to schools and safety improvements for vulnerable users;
- Providing connections through short paths that connect isolated streets and;
- Connecting trails to the road network and trail crossings of streets.

Other issues that did not impact network development, but have implications for future projects include:

- Concerns about safety on trails;
- Lack of lighting on trails, at key intersections and along major transit corridors and;

- Challenges to crossing I-5 and inadequate facilities around the interchanges.

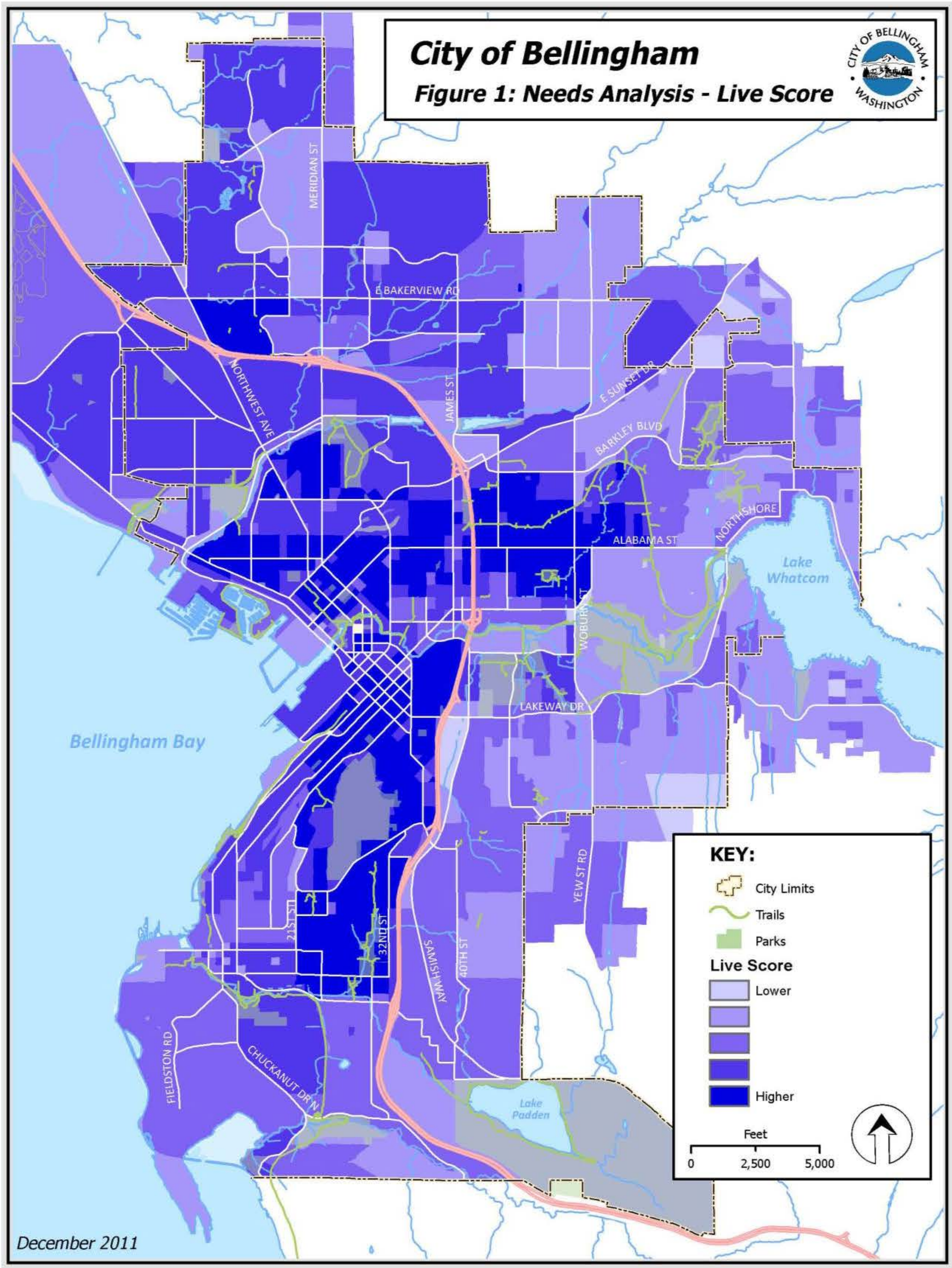
The public input provided information that led to the inclusion of accessways and off road connections to the network, as well as additional intersections and areas of study.

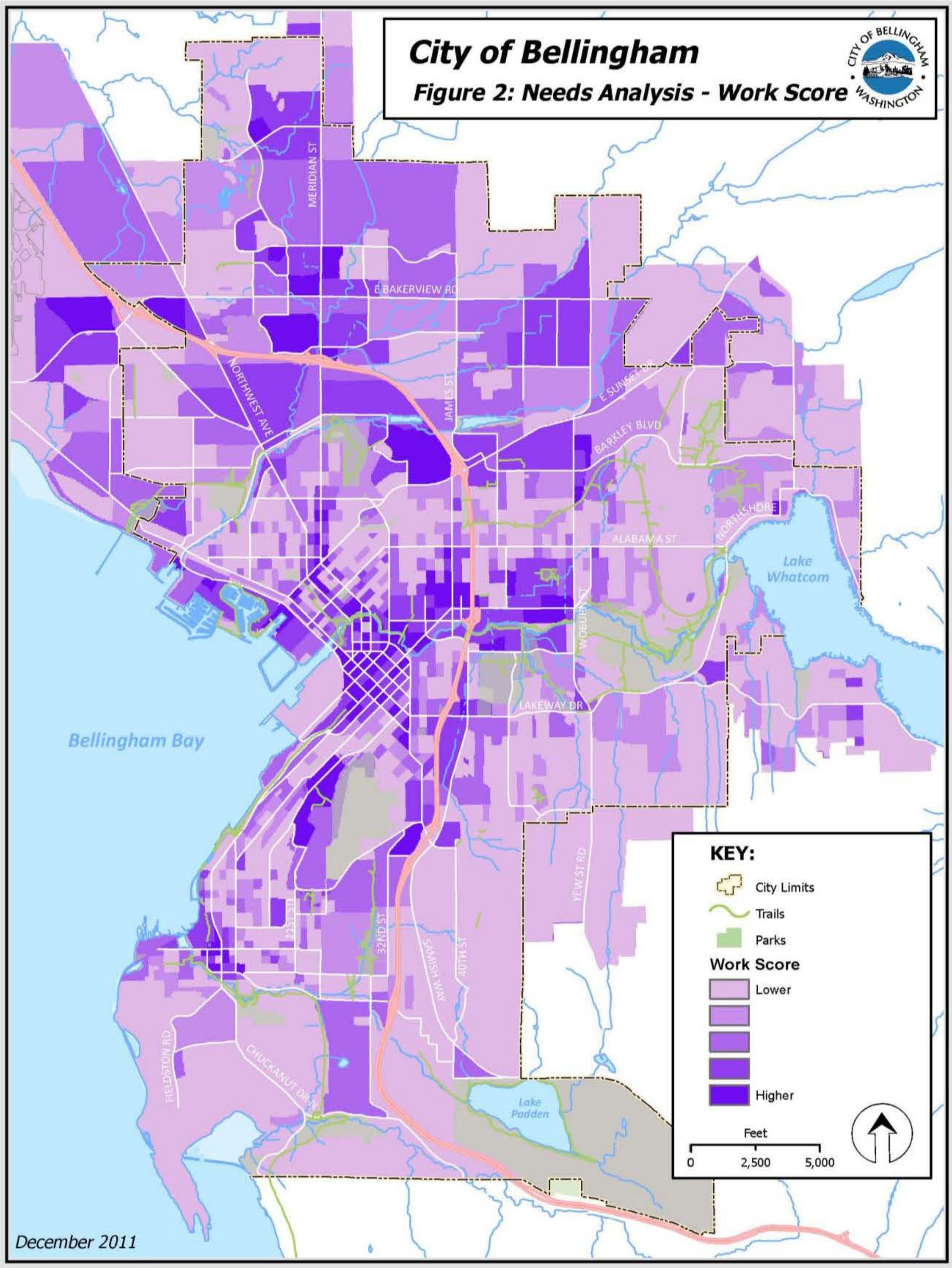
4 Recommended Primary Pedestrian Network

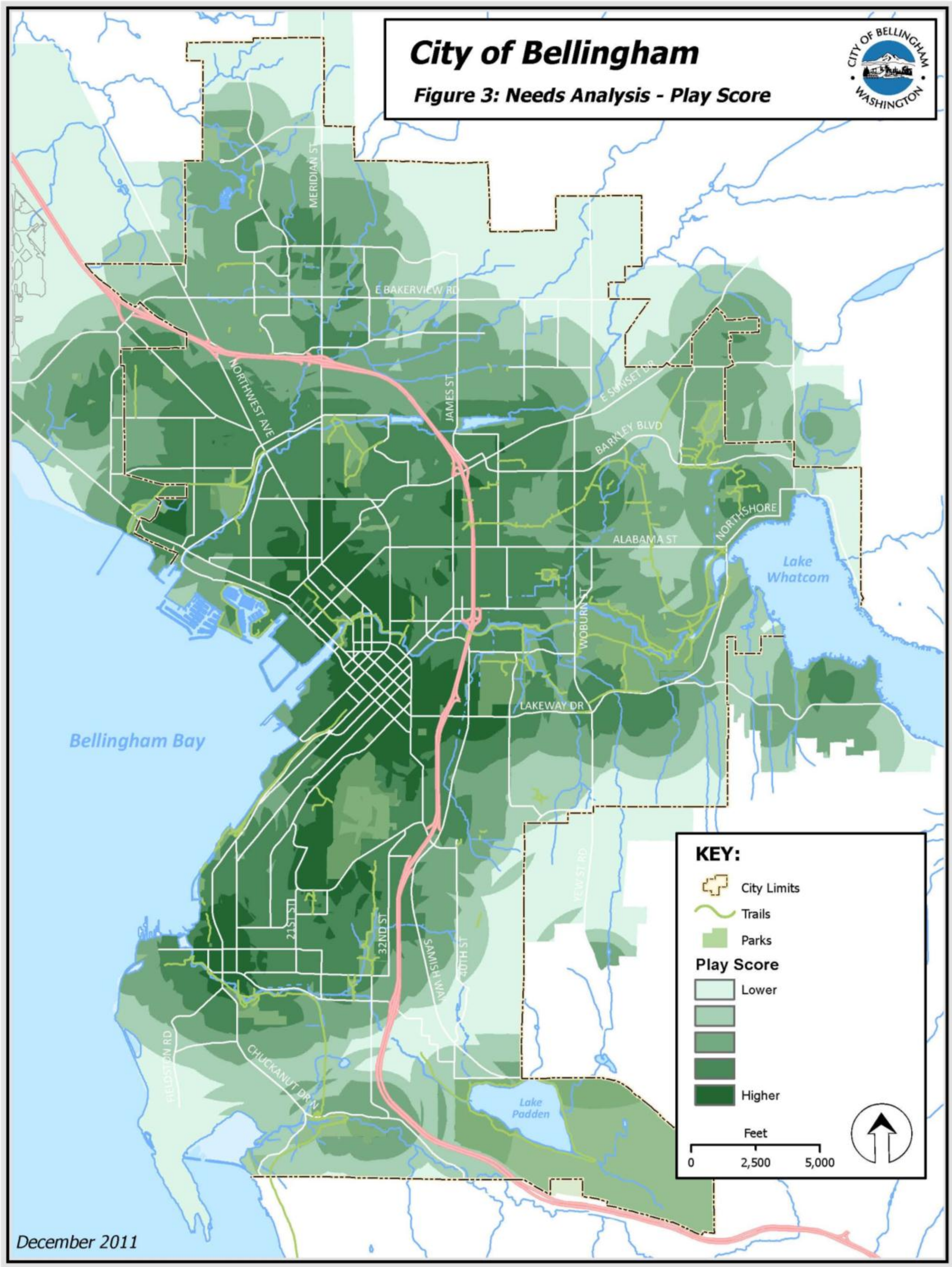
The PSA and Shortest Path Analysis, combined with a qualitative review of crash locations and public input, yielded a robust Primary Pedestrian Network that provides access points and continuous routes throughout the community.

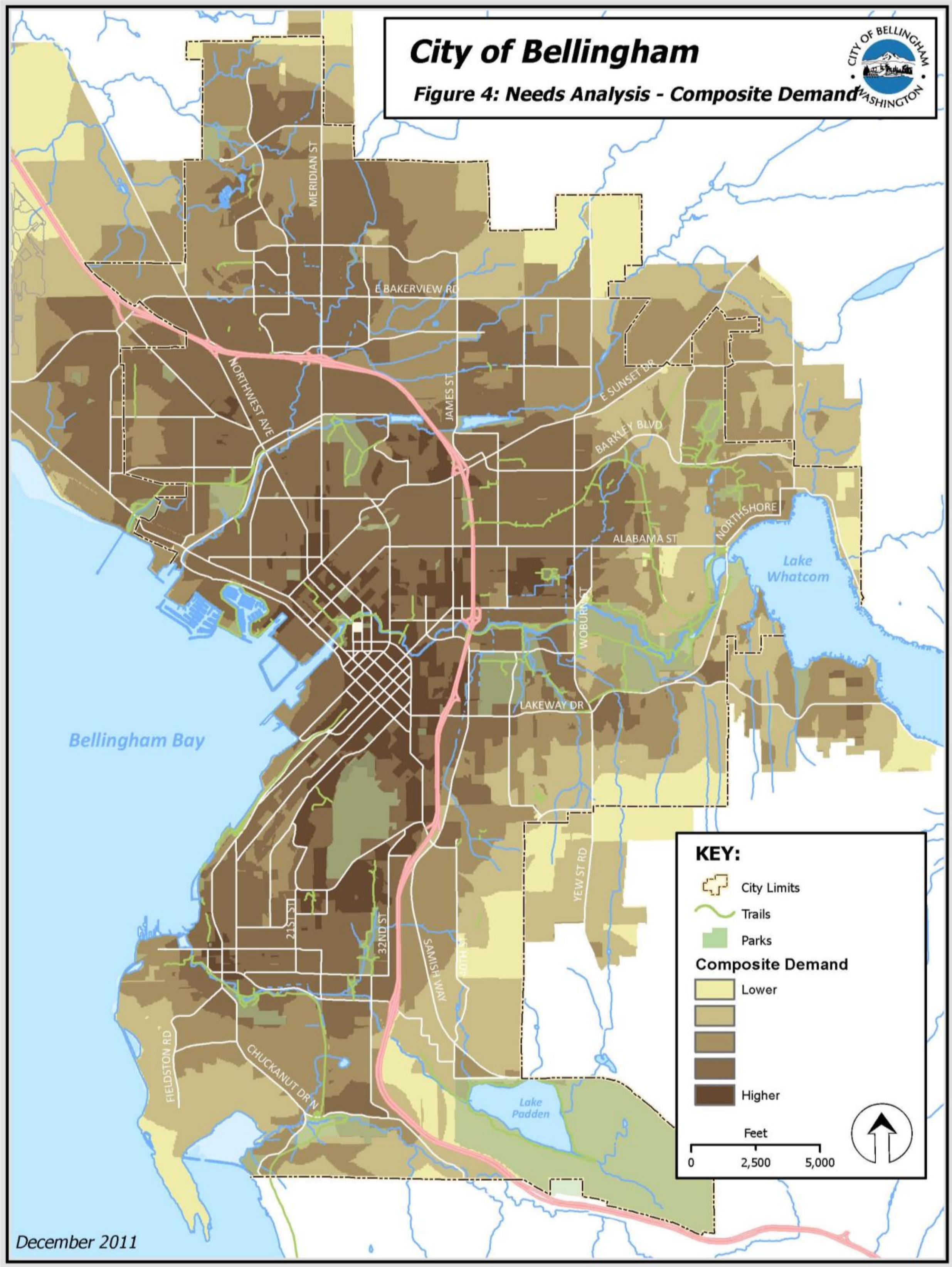
The recommended network is shown in Figure 9 in the Appendix. The network provides the basis for the Pedestrian Master Plan project list, which was developed after the needs analysis and is summarized in project memorandum #5.

Appendix: Figures 1-9


City of Bellingham
Figure 1: Needs Analysis - Live Score
CITY OF BELLINGHAM WASHINGTON
MERIDIAN ST
E BAKERVIEW RD
NORTHWEST AVE
JAMES ST
E SUNSET DR
BARKLEY BLVD
NORTHSHORE
ALABAMA ST
Lake Whatcom
WOBURN ST
LAKEWAY DR
Bellingham Bay
YEW ST RD
21ST ST
32ND ST
SAMISH WAY
40TH ST
FIELDSTON RD
CHUCKANUT DR N
Lake Padden
KEY:
City Limits
Trails
Parks
Live Score
Lower
Higher
Feet
0
2,500
5,000
December 2011


City of Bellingham
Figure 2: Needs Analysis - Work Score
MERIDIAN ST
E BAKERVIEW RD
NORTHWEST AVE
JAMES ST
E SUNSET DR
BARKLEY BLVD
NORTHSHORE
ALABAMA ST
Lake Whatcom
WOBURN ST
LAKEWAY DR
Bellingham Bay
YEW ST RD
32ND ST
SAMISH WAY
40TH ST
FIELDSTON RD
CHUCKANUT DR
Lake Padden
KEY:
City Limits
Trails
Parks
Work Score
Lower
Higher
Feet
0
2,500
5,000
December 2011


City of Bellingham
Figure 3: Needs Analysis - Play Score
CITY OF BELLINGHAM WASHINGTON
E BAKERVIEW RD
MERIDIAN ST
NORTHWEST AVE
JAMES ST
E SUNSET DR
BARKLEY BLVD
NORTHSHORE
ALABAMA ST
Lake Whatcom
WOBURN ST
LAKEWAY DR
Bellingham Bay
YEW ST RD
21ST ST
32ND ST
SAMISH WAY
40TH ST
FIELDSTON RD
CHUCKANUT DR
Lake Padden
KEY:
City Limits
Trails
Parks
Play Score
Lower
Higher
Feet
0
2,500
5,000
December 2011


City of Bellingham
Figure 4: Needs Analysis - Composite Demand
CITY OF BELLINGHAM WASHINGTON
MERIDIAN ST
E BAKERVIEW RD
NORTHWEST AVE
JAMES ST
E SUNSET DR
BARKLEY BLVD
NORTHSHORE
ALABAMA ST
Lake Whatcom
WOBURN ST
LAKEWAY DR
Bellingham Bay
YEW ST RD
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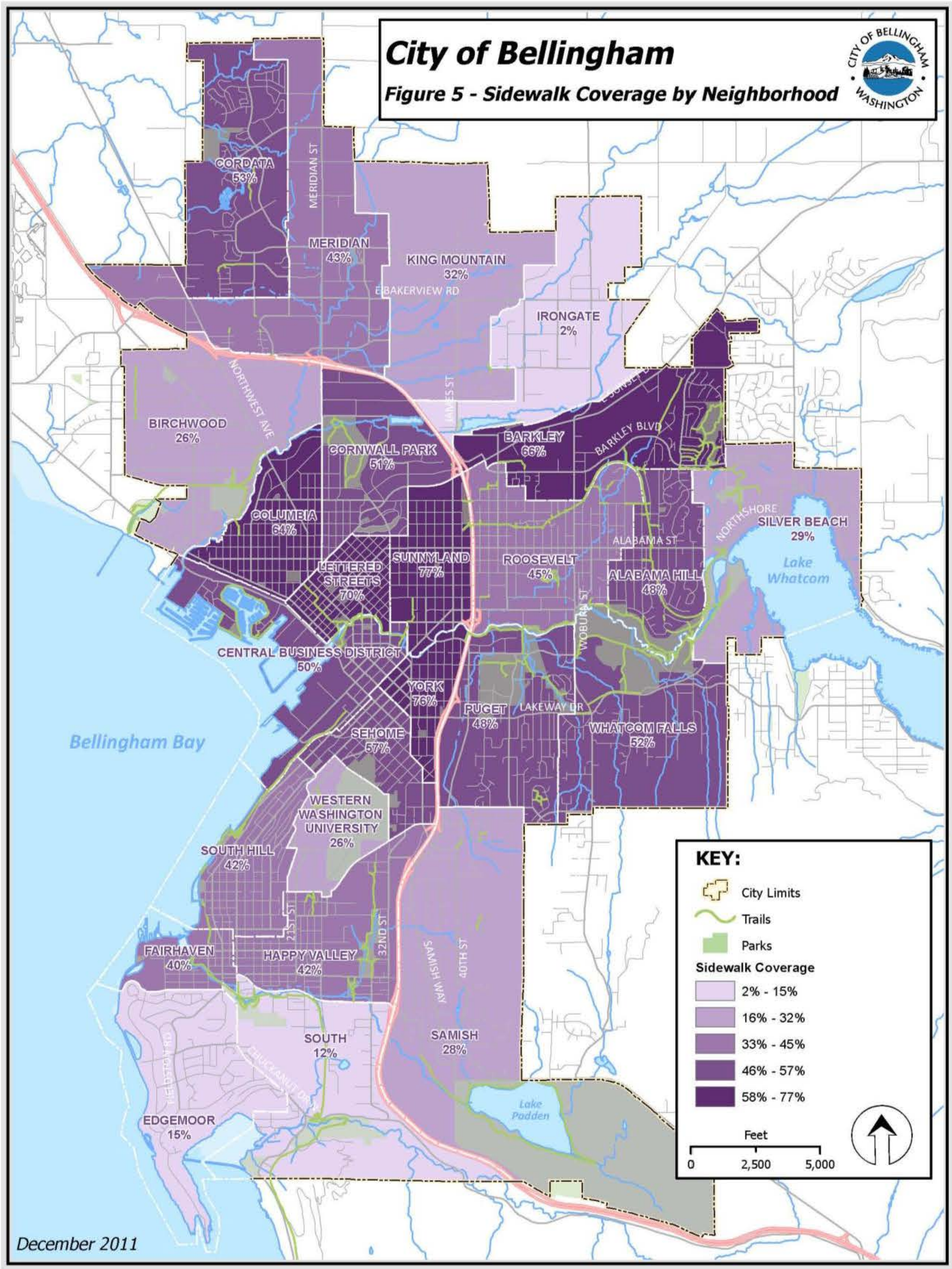
December 2011


City of Bellingham
Figure 5 - Sidewalk Coverage by Neighborhood
CITY OF BELLINGHAM WASHINGTON
CORDATA
53%
MERIDIAN ST
MERIDIAN
43%
KING MOUNTAIN
32%
E BAKERVIEW RD
IRONGATE
2%
NORTHWEST AVE
JAMES ST
BIRCHWOOD
26%
CORNWALL PARK
51%
BARKLEY
66%
BARKLEY BLVD
COLUMBIA
64%
NORTHSHORE
SILVER BEACH
29%
ALABAMA ST
LETTERED STREETS
70%
SUNNYLAND
77%
ROOSEVELT
45%
ALABAMA HILL
48%
Lake Whatcom
WOBURN ST
CENTRAL BUSINESS DISTRICT
50%
YORK
76%
PUGET
48%
LAKEWAY DR
WHATCOM FALLS
52%
SEHOME
57%
Bellingham Bay
WESTERN WASHINGTON UNIVERSITY
26%
SOUTH HILL
42%
21ST ST
32ND ST
SAMISH WAY
40TH ST
FAIRHAVEN
40%
HAPPY VALLEY
42%
SOUTH
12%
SAMISH
28%
CHUCKANUT DR
EDGEMOOR
15%
Lake Padden
KEY:
City Limits
Trails
Parks
Sidewalk Coverage
2% - 15%
16% - 32%
33% - 45%
46% - 57%
58% - 77%
Feet
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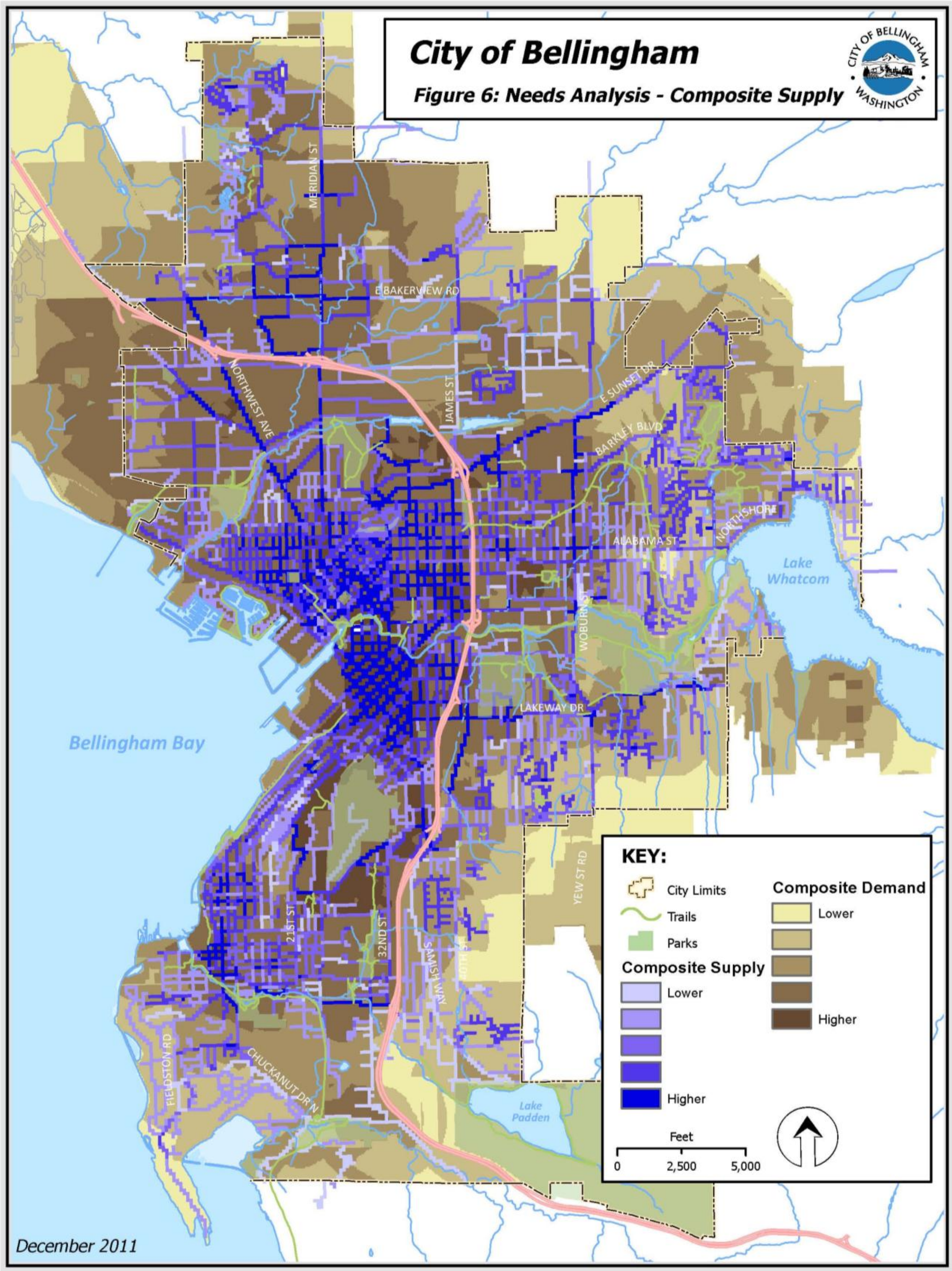
2,500
5,000
December 2011


City of Bellingham
Figure 6: Needs Analysis - Composite Supply
CITY OF BELLINGHAM WASHINGTON
MERIDIAN ST
E BAKERVIEW RD
NORTHWEST AVE
JAMES ST
E SUNSET DR
BARKLEY BLVD
NORTHSHORE
ALABAMA ST
Lake Whatcom
WOBURN ST
LAKEWAY DR
Bellingham Bay
YEW ST RD
21ST ST
32ND ST
SAMISH WAY
FIELDSTON RD
CHUCKANUT DR N
Lake Padden
KEY:
City Limits
Trails
Parks
Composite Supply
Lower
Higher
Composite Demand
Lower
Higher
Feet
0
2,500
5,000
December 2011


City of Bellingham
Figure 7 - Residential Access to Public Schools and Grocery Stores
CITY OF BELLINGHAM WASHINGTON
KEY:
City Limits
Urban Growth Area
Parks
Schools
Grocery Stores
Trails
Network Use
Lower
Higher
Feet
0
2,500
5,000
Bellingham Bay
Lake Whatcom
Lake Padden
MERIDIAN ST
E BAKERVIEW RD
NORTHWEST AVE
JAMES ST
E SUNSET DR
BARKLEY BLVD
NORTHSHORE
ALABAMA ST
WOBURN ST
LAKEWAY DR
YEW ST RD
21ST ST
32ND ST
SAMISH WAY
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CHUCKANUT DR N
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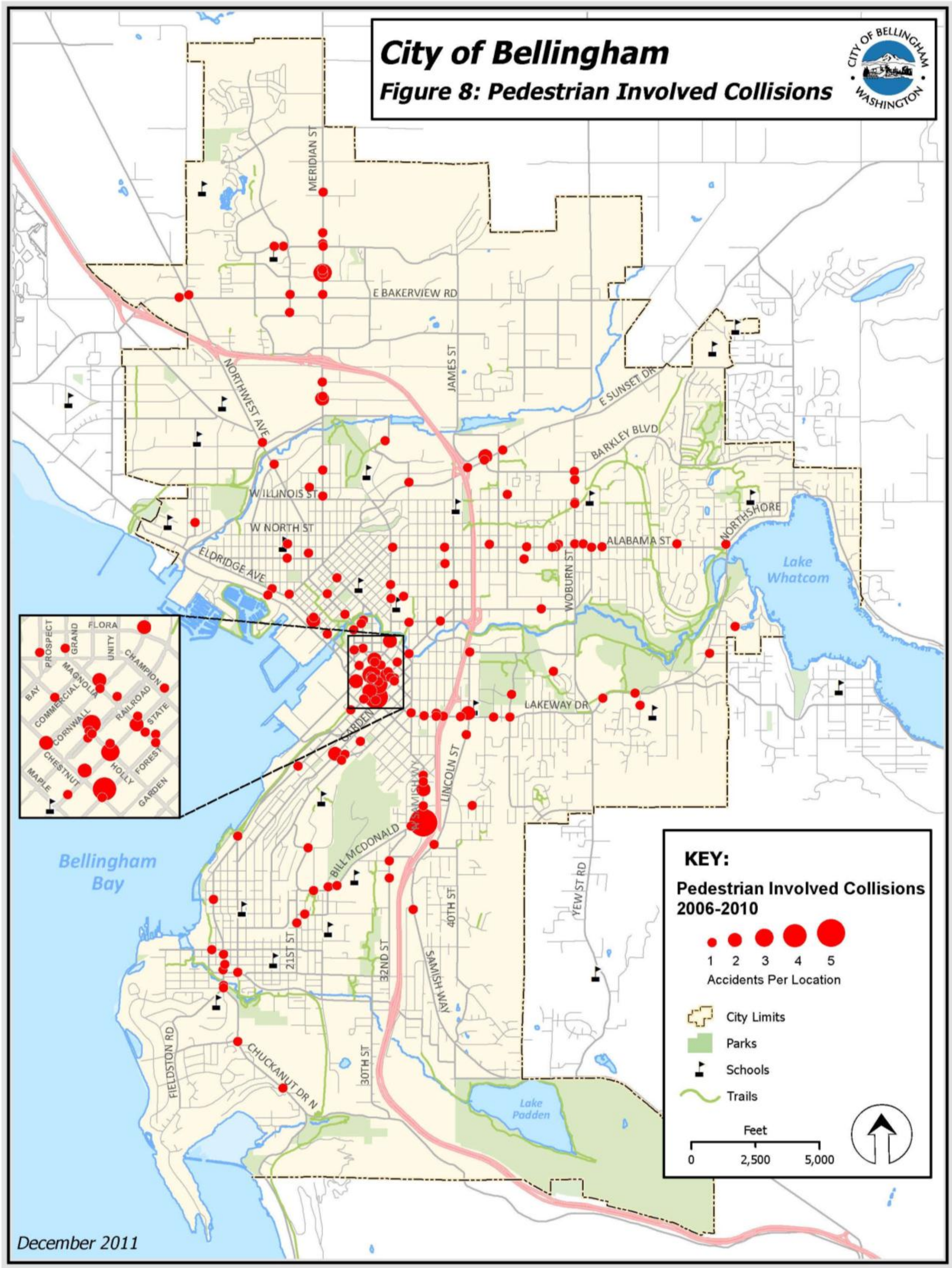
City of Bellingham
Figure 8: Pedestrian Involved Collisions
CITY OF BELLINGHAM WASHINGTON
KEY:
Pedestrian Involved Collisions 2006-2010
1 2 3 4 5
Accidents Per Location
City Limits
Parks
Schools
Trails
Feet
0 2,500 5,000
Bellingham Bay
Lake Whatcom
Lake Padden
MERIDIAN ST
E BAKERVIEW RD
JAMES ST
NORTHWEST AVE
E SUNSET DR
BARKLEY BLVD
W ILLINOIS ST
W NORTH ST
ELDRIDGE AVE
ALABAMA ST
NORTHSHORE
WOBURN ST
LAKEWAY DR
GARDEN
LINCOLN ST
SAMISH WAY
BILL MCDONALD
21ST ST
32ND ST
40TH ST
YEW ST RD
30TH ST
FIELDSTON RD
CHUCKANUT DR N
FLORA
PROSPECT
GRAND
UNITY
CHAMPION
BAY
MAGNOLIA
COMMERCIAL
RAILROAD
STATE
CORNWALL
CHESTNUT
HOLLY
FOREST
MAPLE
December 2011


City of Bellingham
Figure 9: Primary Pedestrian Network
CITY OF BELLINGHAM WASHINGTON
MERIDIAN ST
E BAKERVIEW RD
JAMES ST
NORTHWEST AVE
E SUNSET DR
BARKLEY BLVD
W ILLINOIS ST
W NORTH ST
ELDRIDGE AVE
ALABAMA ST
NORTHSHORE
WOBURN ST
Lake Whatcom
LAKEWAY DR
GARDEN
N SAMISH WY
LINCOLN ST
BILL MCDONALD
Bellingham Bay
YEW ST RD
40TH ST
21ST ST
32ND ST
SAMISH WAY
FIELDSTON RD
CHUCKANUT DR N
30TH ST
Lake Padden
KEY:
Primary Pedestrian Network
Urban Growth Area
Schools
Existing Sidewalks
Primary Trail
Secondary Trail
Trails Recommended in 2008 Parks, Trails, & Open Space Plan
Parks
City Limits
Feet
0
2,500
5,000
July 2012