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To: Dave Ramsay, City Manager

From: Daryl Grigsby, Public Works Director
David Godfrey, P.E., Transportation Engineering Manager

Date: February 19, 2009

Subject: ACTIVE TRANSPORTATION PLAN

RECOMMENDATION**:**

It is recommended that the Council adopt the Active Transportation Plan.

BACKGROUND DISCUSSION:

More People, More Places, More Often An Active Transportation Plan s the title of the update to the existing Non-motorized Transportation Plan. Work on the update was overseen by the Transportation Commission. A non-motorized transportation plan for the City is called for in the Comprehensive Plan.

On January 20, 2009 Council held a study session to review the draft Plan. Suggestions for changes were proposed by Council to the Plan's goals in the timing of school walk route completion. Changes reflecting these comments were proposed by staff and approved by Council at the February 3, 2009 Council meeting.

Throughout January public outreach was held with various groups including:

- January 8, Planning Commission
- January 13, South Rose Hill/ Bridle Trails
- January 14, Elementary school Reps
- January 14, Park Board
- January 22, Juanita Neighborhood Association
- January 26, Houghton Community Council

Comments were received at each of these meetings and the plan was changed, in most cases to, incorporate those comments. In addition, several citizens provided detailed comments through email and other methods. Also, Feet First a pedestrian advocacy group, submitted a letter (attached) with a number of suggestions. Most of the Feet First comments were incorporated into the Plan. The Transportation Commission suggested that the Active Transportation Plan was not the place to require Health Impact Assessments, but that the Council might want to consider the topic outside the Plan. On January 28 the Transportation Commission received other public comments, reviewed major comments that had been received prior and gave direction on how to incorporate changes.

Almost all the comments that were received were accommodated in some way in the plan; in some cases through small changes like an added sentence and in other cases through more major additions of new goals or sections of the plan. A summary of the changes to the Plan from the version Council saw at the January 20 study session is below:

- Make the school walk route goal more inclusive i.e. include Jr. High and High School students. (page 20)
- Rewrite the goals for school walk route completion as directed by Council (page 20)
- Add objectives under the safety goal that focus on education and on encouragement (page 18)
- Add objective under the Add facilities for pedestrians goal for pedestrian wayfinding for paths and connectors (page 18)
- Expand the treatment of obstructions to walking in goal 6; remove physical barriers to walking. (page 22)
- Call for expansion of bicycle parking outside of downtown under goal 8 Make bicycling more convenient. (page 23)
- Expand the discussion of transit (page 51)
- Expand discussion of neighborhood plans (page 62)
- Expand discussion of traffic calming to include relationship of vehicle speed and pedestrian injuries (page 76)
- Expand introduction to Section 5 Prioritizing Construction of Sidewalks to include more descriptive information about how the information is to be used. (page 88)
- Simplify the missing sidewalk section of Section 5 (page 94)
- Add a "total score" map to Section 5 (page 100)
- Change the bicycle network projects: remove restriping for bicycle climbing lane on NE 124th Street, add bicycle lane construction on 122nd Avenue, and restriping project on 116th Avenue in Bridle Trails/South Rose Hill and add a connection over I-405 at NE 90th Street. (page 108)
- Add a water trails section (page 120)
- Complete appendices (pages 121-150)
- Add more language throughout the plan to better address Seniors and others with limited mobility. (various)
- Numerous graphic and editorial changes (various)

There may still be some formatting errors that will corrected before the final copy of the document is produced.

feet first

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January 27, 2009

City of Kirkland
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Dear City of Kirkland Transportation Commissioners:

I am writing regarding the City of Kirkland's Draft Active Transportation Plan.

As the only voice for pedestrians throughout the Puget Sound region, Feet First applauds the City's efforts to invite walking as a preferred choice for transportation and recreation.

Active transportation plays an important role in improving health, the environment, safety and community engagement. We are also mindful of the fact that the greater social and physical environments also shape community structures more conducive to promoting physical activity.

The City of Kirkland's Active Transportation Plan provides a more comprehensive planning framework. The research is increasingly clear; communities developing walkable and bikable infrastructures with links to destinations of interest will have more physically active residents.

Below I have identified elements to be added or expanded upon in the Active Transportation Plan:

1. Incorporate a more comprehensive use of education, encouragement and evaluation into the plan. Working with engineering and enforcement elements indentified in the plan this will lead to increase use in public investments.

2. Address speeding in arterials and neighborhoods under enforcement. Speeding kills and creates a barrier for people to walk.

3. Include policies under obstructions to address construction zone sidewalk/walkway access (section 7). Preserve the sidewalk during construction to minimize crossings for the pedestrian. Pedestrians access should be a priority on the City of Kirkland roadways.

4. Identify target audience e.g. students, parents, seniors. Segment this audience to understand the barriers and benefits.

5. Address crossing guards for school children. Crossing guards are an essential element to safe routes to schools and strong communities. They provide youth the ability to safely cross the street, act as a role model for good pedestrian behavior and are integral members of the community, providing eyes on the streets around schools.

6. Incorporate into this plan a Health Impact Assessment (HIA). An HIA would examine the actual impact of the Active Transportation Plan will have on the residents of Kirkland. Performing an HIA would:

- Develop predictors of the impact would have on regional health
- Analyze the plan through a health perspective to safeguard it has not overstepped an important element
- Develop cross-departmental support for the plan through its multidisciplinary approach.

Thank you for your consideration to these comments.

Sincerely,

Lisa Quinn
Executive Director

City of Kirkland

March, 2009

More People, More Places, More Often

AN ACTIVE TRANSPORTATION PLAN

Cyclists • Pedestrians • Equestrians

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Cover
"Bicycle Abstract" 32 x 28 Acrylic on canvas © 2008 Janet Karam, Denison TX www.funkytown-art.com used by permission of the artist

PREFACE

When the City of Kirkland's first Non-motorized Transportation Plan was adopted in 1995, such plans were relatively rare. That has changed; now, almost every city has a plan for walking and cycling. This change from a novelty to a necessity is reflected in the title of this Plan. Success in planning for walking and cycling as transportation is no longer a matter of establishing them as valid modes of travel, it's about increasing participation. That is to say, *more people* walking and cycling *more places, more often*. The term *Active Transportation* replaces Non-motorized in the title recognizing walking and cycling for what they are rather than for what they are not. Realizing the vision in this plan's title will require new facilities, along with programs for education and enforcement. It will also require special attention to children, seniors and those with disabilities.

In 2001, when this Plan was last updated, the City of Kirkland's Geographic Information System was not as fully developed as it is today and since 2001 several analytical tools have been developed to help improve safety of active transportation modes. This Plan relies heavily on the use of GIS for development of the prioritization system for construction of pedestrian projects described in Section 5. An improved database for crash data makes possible the information on reported crashes shown in Section 2. The ability to easily conduct on-line surveys and post documents online has drastically increased the number of people who were able to participate in and comment on the development of this Plan versus earlier plans.

The Cross-Kirkland Trail, a multi-use trail on the Eastside Rail Corridor, is closer than ever to becoming a reality because of a potential agreement between the Port of Seattle, King County and the BNSF railroad. Still, there are many details to be worked out. Realizing construction of the trail is the first priority of many of Kirkland's citizens.

In Kirkland there are strong concerns about how the City should develop and the impact of automobiles on our citizens' quality of life. More citizens are looking for ways to incorporate physical activity into their everyday routines. The City Council has joined with other cities in a pledge to help reduce its carbon footprint. A strong commitment to Active Transportation, through accomplishing the goals laid out in Section 1, will be fundamental to seeing the City manage these concerns.

<Signed for Council by Mayor>

<Adoption date>

ACKNOWLEDGEMENTS

Without the support of the citizens of Kirkland, completion of this Plan would not have been possible. The City of Kirkland would like to specifically thank the following groups and individuals for their contributions and cooperation in preparing *More People, More Places, More Often*.

City of Kirkland City Council

Jim Lauinger, *Mayor*
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Jessica Greenway
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Ken Hite, Suzanne Kagen, Lorraine Trosper *for review of equestrian section*
Deidre Johnson, *for detailed review and editing*
Owen Paulus, *for research on sharrows and other cycling topics.*

EXECUTIVE SUMMARY

This Plan is prepared to comply with the call for a Non-Motorized Plan in the Comprehensive Plan. The title *More People, More Places More Often* indicates the plan vision. It is an update of the 2001 Non-Motorized Transportation Plan and is renamed an Active Transportation Plan to better reflect the positive nature of walking and cycling. Its purpose is three fold:

- Present a specific list of objectives to be accomplished in order to improve active transportation (see Section 1; goals)
- Serve as a handbook for Active Transportation (see Sections 2 and 3)
- Provide a way of prioritizing projects for construction (see Sections 5 and 6)

The Plan is focused around eight Goals, each of which has specific objectives and strategies for meeting the goal:

Goal G1. Develop the Cross Kirkland Trail
Goal G2. Reduce crash rates
Goal G3. Add facilities for pedestrians
Goal G4. Increase the number of children who use active transportation to travel to and from school.
Goal G5. Improve safety for people crossing streets
Goal G6. Remove physical barriers to walking
Goal G7. Improve on-street bicycle facilities
Goal G8. Make bicycling more convenient

Section 2 covers existing conditions. Sidewalks exist on at least one side of all but three miles of its busiest streets. Looking at all streets, about 25% have no walkway on either side. Currently funded projects will complete elementary school walk routes so each school has about than 80% of its walkways complete on at least one side of the street. Goal G3 calls for completion of walkways on one side of all principal and minor arterials by 2016 while Goal G4 calls for completion of walkways on one side of all arterial and collector school walk routes by 2019.

Existing bike lanes provide basic coverage for Kirkland's cyclists, but there are still important missing links, particularly on 116th Avenue NE in the South Rose Hill/Bridle Trails neighborhood and on 100th Avenue NE in Juanita.

Three quarters of accidents involving cyclists or pedestrians occur at intersections. The numbers of accidents have remained fairly steady over the past 10 years. The Plan calls for measuring crash rates (crashes/distance traveled) and reducing them by 10% between 2010 and 2015.

Section 3 describes existing policies and programs. The Zoning Code and Public Works' Pre-approved Plans work together to provide guidance on when and how facilities are constructed. There are a number of programs to support active transportation already in place. Some examples include Senior Steppers, the signed Lakeview Walk, and Bike to Work Month.

The online survey which was fielded in 2007, and the results of which are detailed in Section 4, provided valuable insight into the preferences of Kirkland's citizens through over 700 responses. The survey data was used to shape the goals of the Plan as well as influence the programmatic elements in Section 7.

The survey results also determined the factors that entered into the walkway evaluation in Section 5. This Plan proposes a new system for prioritizing sidewalk construction projects based on proximity to destinations, missing sidewalks, existing walkway conditions and fiscal considerations.

Section 6 proposes a bicycle network and identifies projects needed to improve it. Projects fall into one of three categories; those that can be completed through striping with little or no construction, those that need major construction and those that would support construction of a trail on the Eastside Rail Corridor. The striping projects are to be completed in three years, the construction projects in 10 years and a section of the Cross-Kirkland trail is to be open by 2015.

Section 7 contains programmatic elements that complement the network elements in Sections 5 and 6 . These include efforts to remove sidewalk obstructions, add bicycle parking and make it easier for bicycles to activate traffic signals. Section 7 describes an ADA Compliance Plan that will document steps necessary to make walkways more accessible for all users. This is called for as a part of Goal G6.

Section 8 is an updated equestrian section that has been developed with direct input from those in Kirkland's equestrian community. Section 9 briefly describes water trails.

Extra detail and supporting material is at the end of the Plan in its appendices.

TABLE OF CONTENTS

Preface i

Acknowledgements ii

Executive Summary iii

Table of Contents v

Index of Tables ix

Index of Figures ix

Index of Maps xi

Section 1: Introduction 13

Background/History 13

Purpose 15

Vision 15

Guiding Principles 17

Goals, Objectives and Strategies 17

Demographics 25

Section 2: Current Conditions 27

General 27

Pedestrians 27

Crosswalks 27

Lighting evaluation 32

Safety evaluation of uncontrolled crosswalks 32

Walkways 33

Barriers 41

Cycling 42

Intersections 42

On-street bike lanes 42

Signing and wayfinding 42

Barriers 43

Parking 43
Crashes 46
Crash data management 46
Pedestrian crashes 46
Cyclist crashes 50
Transit 51
School walk routes 51
Maintenance 57
Pedestrian facilities 57
Bicycle facilities 59
Section 3: Existing Plans and Programs 60
2001 Non-motorized Transportation Plan 60
Comprehensive Plan 60
General 60
Neighborhood Plans 62
Capital Improvement Plan 63
General 63
Project ranking 63
Other projects 66
Development Guidelines 67
Where is sidewalk required? 67
Connecting Paths 68
Street widths 68
Pre Approved Plans 70
Street Design Guidelines 70
Crosswalk review 70
Pedestrian and cyclist counts 72
Washington State Department of Transportation Plan 73

Traffic control during construction 73
Other Programs 73
Police Department pedestrian stings 73
7 hills of Kirkland 73
Walk Your Child to School Week 74
Bike to Work Month 74
Active living task force 74
Senior steppers 74
Signed walks 75
Commute Trip Reduction Programs 75
Traffic calming 76
Complete Streets Ordinance 76
Staffing 76
Transportation Commission 76
Public Works Department 77
Kirkland Walks Team 77
Interagency partnerships 77
Section 4: Online Survey Results 78
Pedestrian survey 78
Cyclist survey results 83
Section 5: Prioritizing Construction of Sidewalks 88
Introduction 88
Access potential 89
Missing sidewalks 94
Existing conditions 98
Surface 98
Width 98
Fiscal 102

Combining factors 102

Section 6: Cycling Network and projects 103

Defining a network 103

Cross Kirkland Trail 104

Locations that need improvement 106

Potential projects 106

Section 7: Programmatic elements 112

Pedestrians 112

Americans with Disabilities Act Transition Plan 112

wayfinding for paths and trails 112

Obstructions 112

Safety at intersections 112

Crosswalk safety review 113

Bicycles 113

Wayfinding signs 114

Bicycle parking 114

Traffic signals 115

Street sweeping 115

NE 116th Street/Juanita Drive/98th Avenue NE intersection 116

Section 8: Equestrian System 117

Introduction 117

Existing facilities 117

Proposed facilities 118

Action items 119

Section 9: Water Trails 120

Appendix A On-line Survey 121

Appendix B Crash data 126

Appendix C Prioritization of sidewalk projects 129

Appendix D Transportation Project Evaluation Form 137

INDEX OF TABLES

Table 1 Evaluation criteria for 2007 lighting survey 32

Table 2 Miles of walkway by functional classification and type of completion 34

Table 3 Miles of sidewalk needed to complete sidewalk network and associated costs 39

Table 4 Centerline miles of school walk routes by street type and walkway completion type 53

Table 5 Completion costs of school walk routes 57

Table 6 Sidewalk and ramps constructed by pavement overlay program 66

Table 7 Size and requirement for common street elements 68

Table 8 Common local street widths 69

Table 9 Cyclist and Pedestrian counts, fall 2008 72

Table 10 Relative weighting between and within destination types. 90

Table 11 Segment scores based on street classification, school walk routes and walkway completion. 94

Table 12 Points for projects based on existing surface conditions 99

Table 13 Points for projects based on existing walkway width 99

Table 14 Points for projects based on fiscal factors 102

Table 15 Regional destinations that connect to streets in Kirkland 103

Table 16 Bicycle network projects that require construction 109

Table 17 Bicycle system improvements that require striping 110

Table 18 Bicycle projects that involve the Eastside Rail Corridor 111

Table 19 Equestrian projects 119

Table 20 Data used for computing access score 129

Table 21 Example of proximity to parks calculation 131

Table 22 Major category factors 132

Table 23 Final adjustment factors 132

INDEX OF FIGURES

Figure 1. Early sidewalks on Market Street. 14

Figure 2 Land use types as percentages of total acreage. 25

Figure 3 Demographic profile of Kirkland....26

Figure 4 Bridge over I-405 at NE 100th Street 27

Figure 5 Countdown signal heads....27

Figure 6 Miles of walkway needed to complete network, by street type....39

Figure 7 Walkway completion by type of roadway 40

Figure 8 Detailed walkway completion by centerline miles of street type.... 40

Figure 9 Walkway completion as a percentage of street classification 41

Figure 10 Railroad bridge at Kirkland Way 41

Figure 11 Annual number of pedestrian crashes fatal and non-fatal 1997-2007....47

Figure 12 Annual number of cyclist crashes 1997-2007.... 50

Figure 13 Crashes involving cyclists at intersections, by vehicle action 1996-2007.... 51

Figure 15 School walk route completion by street type 55

Figure 14 Inventory of school walk route completion by school 55

Figure 16 Detailed completion of school walk routes....56

Figure 17 Detailed completion of school walk routes by street type; percentage 56

Figure 18 Installation of rubber sidewalk panels on 103rd Avenue NE 58

Figure 19 Overhead flashers at a former site of in-pavement lights 59

Figure 20 Cumulative CIP spending by transportation project type 1997-2007....65

Figure 21 Relationship between previous plans and project evaluation....65

Figure 22 Crosswalk near the Casa Juanita.... 66

Figure 23 A path connects the cul-de-sac on the left with the street on the right 67

Figure 24 Example of an illustration from Chapter 110 of the Kirkland Zoning Code.... 69

Figure 25 Sample drawing from Pre-approved Plans 70

Figure 26 Page 2 of the Design Guidelines for Pedestrian Oriented Business Districts 71

Figure 27 Walk your child to school week at AG Bell School 74

Figure 28 Senior Steppers....74

Figure 29 Traffic calming device....76

Figure 30 Frequency of walking trip by purpose as reported by survey respondents.....78

Figure 31 Priorities for selecting criteria by which pedestrian improvement construction projects should be evaluated.....79

Figure 32 Responses to the question: Where are the most problematic locations for walking in Kirkland? Sorted by major category 80

Figure 33 Responses to the question: Tell us more about anything that would make walking in Kirkland easier? 81

Figure 34 Responses to the question: Where is an excellent location for walking in Kirkland? Grouped by location. 82

Figure 35 Age and gender of respondents to the pedestrian survey 82

Figure 36 Frequency of bicycling trip by purpose as reported by survey respondents 83

Figure 37 Priorities for selecting criteria by which bicycle improvement construction projects should be evaluated..... 84

Figure 38 Responses to the question: Where are the most problematic locations for biking in Kirkland? Sorted by major category 85

Figure 39 Responses to the question: Tell us more about anything that would make biking in Kirkland easier? sorted by group 86

Figure 40 Responses to the question: Where is an excellent location for biking in Kirkland? Grouped by location. 87

Figure 41 Age and gender of respondents to the bicycle survey 87

Figure 42 Project sidewalk prioritization process 88

Figure 43 Proposed prioritization system for sidewalk construction projects 89

Figure 44 A sample chart from Guidelines for Pedestrian Crossing Treatments 113

Figure 45 Two types of bicycle wayfinding signs used communities surrounding Kirkland 114

Figure 46 Information is printed on stickers and placed on bicycle racks in Chicago 115

Figure 47 Marking that could be used at traffic signals to indicate where cyclists should stop.....115

INDEX OF MAPS

Map 1 Kirkland and surrounding cities 16

Map 2 Annual daily traffic volumes 2005 28

Map 3 Kirkland's topography provides a challenge to cyclists and pedestrians.....29

Map 4 Locations of pedestrians flags and locations of in-pavement lights 31

Map 5 Street functional classification....35
Map 6 Sidewalk completion by street segment....36
Map 7 Bicycle racks in downtown Kirkland....43
Map 8 Existing on street bicycle lanes....45
Map 9 Pedestrian crashes 2003-2007....48
Map 10 Cyclist crashes 2003-2007....49
Map 11 A portion of the A.G. Bell Elementary School Walk Route....52
Map 12 School walk routes....54
Map 13 Priority Pedestrian Corridors from 2001 Plan....61
Map 14 The Lakeview walk route....75
Map 15 Pedestrian access scores....92
Map 16 Pedestrian access scores shown on segments....93
Map 17 Missing sidewalk scores....96
Map 18 Existing condition score: material....97
Map 19 Sum of Access, Missing Sidewalk and Existing surface scores....100
Map 20 Bicycle network....105
Map 21 Bicycle network and improvements....108
Map 22 Existing and proposed equestrian routes....118
Map 23 The Lakes-to-Locks Water Trail....120
Map 24 Bus Routes used in Access analysis....133
Map 25 Commercial areas used in Access analysis....134
Map 26 Parks used in Access analysis....135
Map 27 Parks used in Access analysis....136

SECTION 1: INTRODUCTION

BACKGROUND/HISTORY

The City of Kirkland is committed to improving the ease and safety with which people can bicycle and walk. At the policy level, this commitment is reflected in our first-in-Washington-State Complete Streets Ordinance and in the policies of our Comprehensive Plan. In a more practical sense, it is reflected in Kirkland's innovative Pedestrian Flag program and at in-pavement light installations at crosswalks. The Senior Stepper Program encourages scores of older Kirklanders to walk for recreation and transportation. Crosswalk stings are an example of the Police Department's commitment to enforcing laws that protect pedestrians. Kirkland's lakefront is known regionally as a perfect place to stroll or cycle.

As more people realize the health benefits of incorporating regular exercise into their everyday lives, the number of those who are walking and bicycling are increasing. Sensitivity to the negative effects of reliance on petroleum based transportation is also increasing the number of those choosing to walk and bike. Transit usage is increasing sharply in Kirkland and every transit trip begins and ends with a walking or cycling trip. With bicycle racks on every bus, more people are discovering the freedom provided by combining a bicycle trip with a transit trip.

Kirkland is recognized as a regional and national leader in active transportation, but there is still much to be done to improve both cycling and walking. Primarily, there are key missing links in both the sidewalk and on-street bike networks. In addition, there are important programmatic needs yet to be met such as improved bicycle parking and wayfinding. Too many sidewalks are obstructed with tree branches and too many walkers do not feel comfortable crossing streets. More work needs to be done to make sidewalks accessible for those who are disabled.

Guidance from the Comprehensive Plan

"Policy T-2.5: Maintain a detailed Nonmotorized Transportation Plan (NMTP).

The NMTP is a functional plan that provides a detailed examination of the existing pedestrian, bicycle, and equestrian systems, criteria for prioritizing improvement, and suggested improvements. The NMTP designates specific City rights-of-way and corridors for improved pedestrian, bicycle and equestrian circulation, and sets design standards for non-motorized facilities"

As Kirkland's land use plans become reality, there is less room for cars. Constructing wider streets to better accommodate cars is expensive and makes neighborhoods less livable. This means that walking and biking will become more important forms of transportation and the facilities needed to accommodate them will also grow in importance.

When Peter Kirk founded Kirkland, automobiles were the expensive, difficult to maintain toys of the rich. Because of poor roads, bicycle use was limited. Railroads, horses, feet and ferries provided mobility in Kirkland at that time. With the introduction of the Model T, auto ownership began to climb. After World War II, transportation in Kirkland, like the rest of the nation became dominated by cars.

Today, the ability to safely and easily walk and bike in Kirkland is an important issue for its citizens. In fact, when citizens are asked what their most important concerns are, pedestrian safety is often at or near the top of the list.

Figure 1. Early sidewalks on Market Street.

Kirkland's first Non-motorized Plan was developed in 1995, and it was a ground breaking document because it answered the need for a comprehensive approach to active transportation for the first time and its development was supported by an unprecedented amount of community interaction. The Plan was updated in 2001, largely keeping the 1995 structure but updating goals, project lists and maps.

In 2000, the City Council authorized a School Walk Route Committee to determine highest priority segments for sidewalks on school walk routes. In 2002, Council approved exploration of a bond measure to fund sidewalk construction but ultimately decided not to pursue voter approval.

At City Council direction, in 2003 The Transportation Commission undertook a review of all marked, uncontrolled[1] crosswalks in Kirkland. This analysis resulted in a series of recommendations, most of which have been completed.

Each year, City funded sidewalk construction projects are completed through the Capital Improvement Program. This includes not only specific sidewalk projects but also curb ramps (compliant with current standards for those with disabilities) built as a part of street overlays, crosswalk improvements and sidewalk constructed as a part of larger roadway projects.

Private developments are required to build frontage improvements that include sidewalk, although this has not always been the case; this subject is covered in more detail on Page 53.

Bicycle lanes are also created by construction of public and privately funded projects. Most of Kirkland's bicycle facilities have been created by restriping existing roadways to more equitably allocate space between cars and bicycles. Bicycle parking is provided by new developments that require more than six car parking stalls.

The City of Kirkland has worked with various groups to promote the interests of walkers and cyclists. The Washington Traffic Safety Commission (WTSC) has supported Kirkland's pedestrian safety efforts. The Commission helped to fund the initial in-pavement light installations and grants from the WTSC have supported the pedestrian flag program and police emphasis on crosswalk enforcement. Parent-Teacher groups have donated many hours working with City staff to improve conditions for children who walk to school. The Cascade Bicycle Club was an inspiring force behind adoption of Kirkland's Complete Street Ordinance .

[1] Uncontrolled crosswalks are those where vehicles are not required to stop unless pedestrians are present.

PURPOSE

A "non-motorized transportation plan" is called for in the City's Comprehensive Plan and the Plan describes its basic purposes. They are: examining existing facilities, establishing criteria for prioritizing improvements and setting design standards.

This Plan covers the current boundaries of the City of Kirkland (Map 1). It focuses mainly on transportation by foot or by bicycle while Section 8 covers equestrian issues and Section 9 describes water trails.

Past plans have been used primarily as a source for determining routes that should be given priority for construction of facilities for walkers and cyclists. This document continues to fulfill that purpose.

The Plan is also a handbook for those interested in active transportation. It answers common questions about safety and maintenance and collects facts about cycling and walking in one document.

A third purpose of the Plan is to create a framework and sense of urgency for improving conditions for active transportation. Each Plan goal each includes specific objectives and strategies to help ensure its completion.

Plan Vision:

More people cycling and walking; in more places and more often.

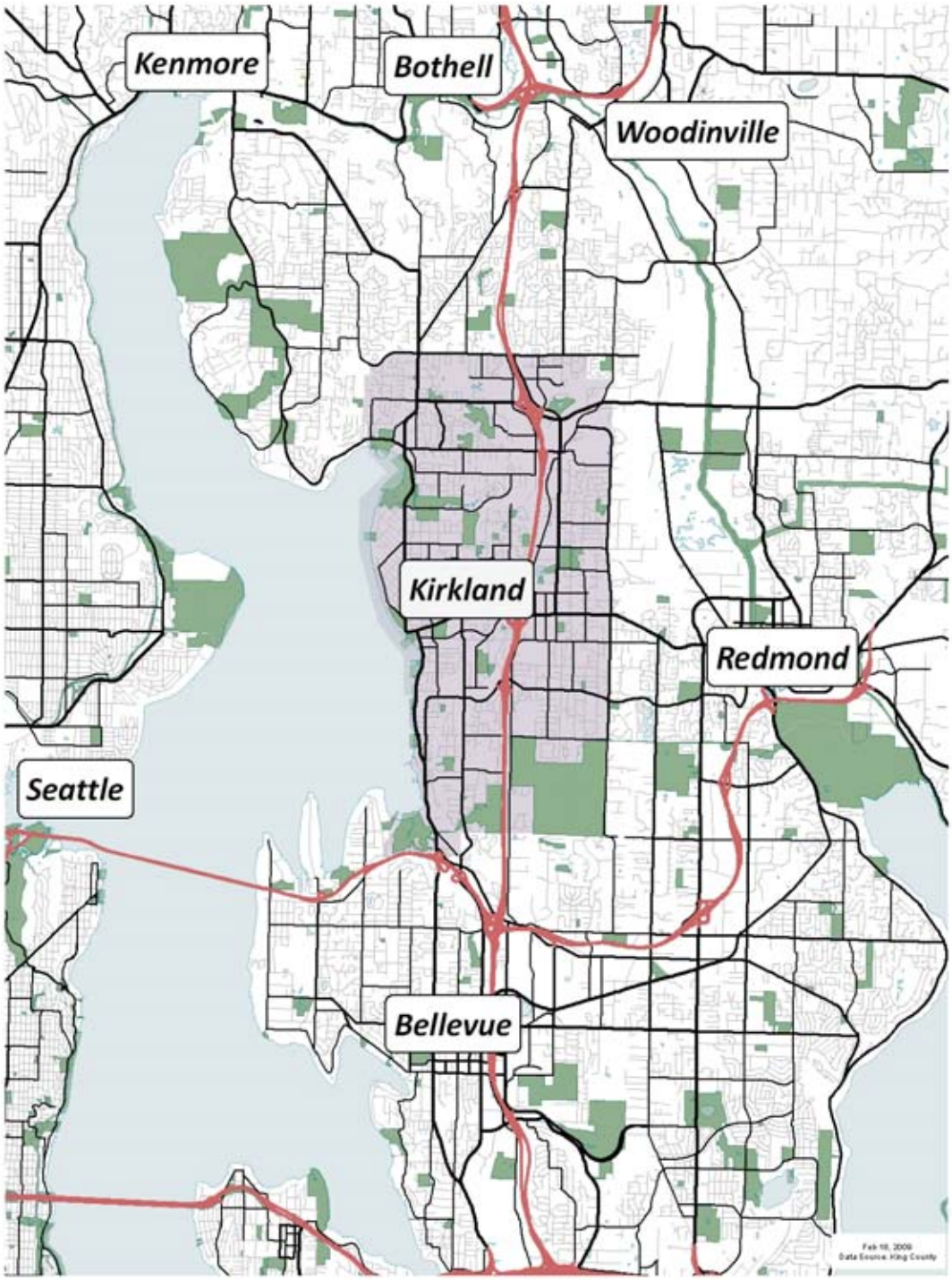
VISION

The vision for active transportation in Kirkland is

More people walking and biking; in more places and more often.

This vision suggests that active transportation becomes less out of the ordinary or as it is sometimes referred to, "alternative" and something many people do every day. In order to expand the number of people using active transportation, barriers to usage such as perceived danger and inconvenience will have to be removed. To expand the way people use active transportation, more places will have to be connected through good facilities of all kinds; including accessible sidewalks, clear directional signing and ample bicycle parking for example.

Map 1 Kirkland and surrounding cities



GUIDING PRINCIPLES

Three principles support the goals, objectives and strategies that follow. They reflect increasing safety and convenience in a way that is tailored to the specific needs of Kirkland.

Kirkland's active transportation environment is:

- safe
- convenient
- shaped by the requests and needs of the community.

Progress toward implementing all these principles can be accomplished simultaneously. Therefore, many of the goals and objectives listed below support more than one of the Plan's three guiding principles.

GOALS, OBJECTIVES AND STRATEGIES

The goals, objectives and strategies that follow represent a to-do list of sorts. Progress on these goals is to be reported annually to the Transportation Commission and the City Council with progress toward goal G4 is to be reported semiannually.

Goal G1. Develop the Cross Kirkland Trail
Goal G2. Reduce crash rates
Goal G3. Add facilities for pedestrians
Goal G4. Increase the number of children who use active transportation to travel to and from school.
Goal G5. Improve safety for people crossing streets
Goal G6. Remove physical barriers to walking
Goal G7. Improve on-street bicycle facilities
Goal G8. Make bicycling more convenient

Goal G1 Develop the Cross Kirkland Trail.
For more than 15 years, the railroad right-of-way that passes through Kirkland has been seen as the preeminent site for developing an exceptionally useful off-road, shared use facility for active transportation. See Page 87.

Objective G1.1 By 2015, open a section of Cross-Kirkland Trail on the Eastside Rail Corridor.

Strategy G1.1.1 Thoroughly understand the process which King County and Port of Seattle will use to develop the trail and proactively work to make Kirkland an area where the trail is developed first. *Timing: current through completion of plan for development of trail.*

Goal G2 Reduce crash rates
Almost everyone agrees that decreasing crash rates is the most important measure of success this Plan can have. Fortunately, many of the factors that contribute to convenience (a crosswalk treatment that makes it easy to cross the street, for example), also contribute to safety. This makes improvements that reduce crash rates likely to also increase the number of people using active transportation, as described in Section 7.

Objective G2.1 Reduce rates for crashes involving pedestrians and rates for crashes involving cyclists by 10% between 2010 and 2015.

Strategy G2.1.1 The strategy for this objective is to quantify the effects of all the other safety-related goals, objectives and strategies. It is assumed that a reasonable estimate of volume for pedestrians and bicycles will not be established before 2011 (see objective G2.2.) *Timing: Annually beginning after completion of strategy.*

Reporting on progress

As mentioned in the text, progress toward achieving the strategies, objectives and goals in this plan will be reported on regularly to both the Transportation Commission and the City Council. The effectiveness of various projects such as those in Objectives 2.3 and 2.4 will also be reported on.

In particular, the ranking system for prioritizing construction of sidewalk projects (described in Section 5) will require careful analysis. After it has been used for a CIP cycle, it will need to be fine tuned to make sure that it is prioritizing projects that fit with the goals of the plan and with the desires of the City Council and Kirkland's citizens.

Objective G2.2 Develop a reliable and accurate measure of pedestrian and cyclist volumes by 2011.

Strategy G2.2.1 Beginning in 2009, establish an annual count program at key locations to measure bicycle and pedestrian volumes and calculate crash rates. Adjust and modify the program is subsequent years to provide meaningful data. *Timing: Annually.*

Strategy G2.2.2 Partner with WSDOT to continue the count program started in 2008. If the WSDOT program is not available, work with Cascade Bicycle Club to get volunteers to make counts at the 2008 locations. *Timing: By August 2009 for September/October counts.*

Strategy G2.2.3 Expand count locations to include crossings of I-405 and east-west screen lines[2] at southern, central and northern locations. *Timing: Include all crossings of I-405 in fall 2009 counts, include one additional east-west screen line in subsequent years.*

Objective G2.3 Increase the number of people walking and cycling through programs that focus on encouragement. Add or improve an encouragement element each year.

Strategy G2.3.1 Build on programs such as: developing a city walking map that focuses on active transportation, improving the network of signed walks (see page 75), bike to work day/month (see page 74), walk your child to school week (see page 74). *Timing: Annually.*

Strategy G2.3.2 Secure funding to develop programs that encourage walking and cycling. *Timing: On-going as grant or other funding opportunities become available.*

Objective G2.4 Increase the number of people walking and cycling through programs that focus on education. Add or improve an education element each year.

Strategy G2.4.1 Build on programs such as the educational videos produced by the City of Kirkland (see page 74). *Timing: Annually.*

[2] Screen lines are imaginary lines that "cut" across streets for counting purposes. An east-west screen line across the middle of Kirkland would include counts on all the major north/south streets at the same latitude. For example counts would be made at the 10000 block of 132nd, 124th, 116th Avenues along with the 1800 block of 6th Street, 3rd Street and Market Street.

Strategy G2.4.2 Secure funding to develop programs that educate walkers and cyclists. *Timing: On-going as grant or other funding opportunities become available.*

Goal G3 Add facilities for pedestrians.

One of the most common questions received by the Public Works Department is, "How can I get sidewalk on my street?" Most of Section 5 is devoted to prioritizing sidewalk construction projects in a way that meets the vision and supporting principles of the Plan.

Objective G3.1 By 2016, complete sidewalk on one side of all principal and minor arterials.

Strategy G3.1.1 Select projects for CIP funding using criteria in this Plan. *Timing: begin with the next CIP in 2010.*

Objective G3.2 Plan and install a pedestrian wayfinding system for paths and connectors by 2013.

Strategy G3.2.1 Prepare a plan for wayfinding signage and priorities for its implementation. *Timing: Complete by December 2010.*

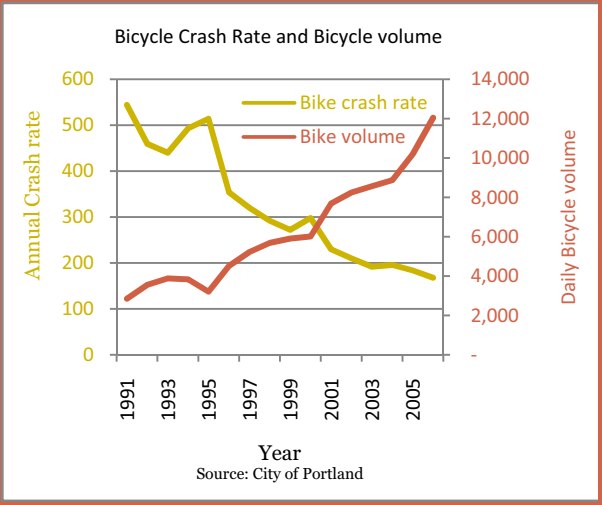
Strategy G3.2.2 Complete installation of 50% of the signage *Timing: Complete by December 2012.*

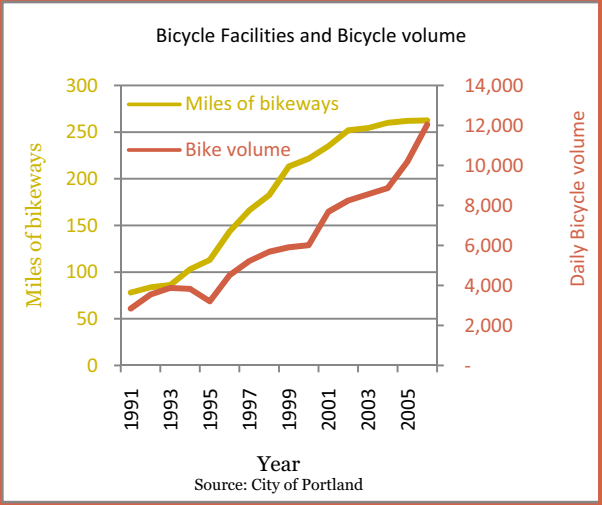
Strategy G3.2.3 Complete installation of 100% of the signage *Timing: Complete by December 2014.*

Strategy G3.2.4 Pursue opportunities for regional cooperation and grant funding. *Timing: On-going.*

Portland, OR experience

In Portland, the number of crashes per cyclist has decreased while the number of cyclists has increased. The increase in cyclists is paralleled by an increase in bicycle facilities. Portland officials explain this as a "positive feedback loop": as more facilities are built, more cyclists ride, as more cyclists ride, drivers become more aware of cyclists and safety increases. As safety increases, more cyclists feel safe and the number of riders increases again. With more riders there is increased justification for more facilities . This theory makes sense because the two main reasons people choose not to bicycle involve lack of safety and convenience.





The two charts above quantify what's been happening in Portland. Bicycle volume is measured across four main bicycle bridges over the Willamette River. Crash rate represents an indexing of annual reported crashes to daily bicycle trips across those four main bicycle bridges.

Goal G4 Increase the number of children who use active transportation to travel to and from school.

The goal of getting children to walk to school is often lost in a discussion of how construction of school walk routes should be prioritized. Completing facilities is an important part of getting more children to walk to school, but other techniques should also be considered. A discussion of existing school walk route completion is in Section 2. Under the proposed project ranking system, school walk routes are weighed more heavily than before. This is described in Section 5. This goal also includes an objective of identifying and treating the specific barriers to walking to school.

Objective G4.1 Complete sidewalk on one side of all school walk route segments of all arterials and collector streets by 2019.

Strategy G4.1.1 Select projects for CIP funding using criteria in this Plan. Balancing the needs of those who walk to school with those who walk for other purposes, add sidewalk to school walk routes; give higher priority to filling gaps and building on the busiest streets first. *Timing: Biannually with CIP program.*

Strategy G4.1.2 Council will establish a School Walk Route "set-aside" program with sufficient funding to insure completion of Objective G4.1. *Timing: in time for inclusion in the 2012-2017 and subsequent CIP programs.*

Objective G4.2 Complete sidewalk on one side of highest priority school walk route segments of all arterials and collector streets by 2016.

Strategy G4.2.1 Convene a group of elementary school representatives to identify highest priority segments for each school *Timing: Complete in time for incorporation into 2012 CIP.*

Strategy G4.2.2 Using the ranking system in this plan, select projects for CIP funding. *Timing: Biannually with CIP program.*

Strategy G4.2.3 Council will establish a School Walk Route "set-aside" program with sufficient funding to insure completion of Objective G4.2. *Timing: in time for inclusion in the 2012-2017 and subsequent CIP programs.*

Objective G4.3 Develop a project at one or more elementary schools to increase the number of children walking to that school by 10% by 2014.

Strategy G4.3.1 Select candidate school, measure walking rate. *Timing: Complete by 2010*

Strategy G4.3.2 Secure grant funding. *Timing: On-going as grant or other funding opportunities become available.*

Strategy G4.3.3 Develop a social marketing program to understand and address barriers to walking. *Timing: On-going as grant or other funding opportunities become available.*

Strategy G4.3.4 Implement program. *Timing: On-going as grant or other funding opportunities become available.*

Objective G4.4 Determine interest in active transportation and implement appropriate programs at Kirkland Jr. High, Lake Washington High School and Juanita High School by 2010.

Strategy G4.4.1 Meet with group of parents and students at KJHS and student groups at high schools to discuss opportunities for active transportation *Timing: during 2009-2010 school year.*

Strategy G4.4.2 Develop set of possible improvements/programs to increase active transportation based on interest. *Timing: during 2009-2010 school year.*

Strategy G4.4.3 Secure funding as needed and implement findings from strategy G4.4.2. *Timing: On-going as appropriate following completion of strategy G4.4.2.*

Goal G5 Improve safety for people crossing streets.
The discussion of crashes in Section 2 indicates that most crashes happen when people are crossing the street. Analyzing street crossings with a variety of tools has the best chance of reducing crashes.

Objective G5.1 Develop a plan for implementing safety improvements at crosswalks.

Strategy G5.1.1 Building on the 2003 review, conduct a review of crosswalks using the new *Guidelines for Pedestrian Crossing Treatments* document (see Page 113). *Timing: Complete by June 2010.*

Strategy G5.1.2 Develop recommendations for consideration by the Transportation Commission and the City Council. *Timing: Complete by December 2010.*

Objective G5.2 Implement programs specifically targeted at reducing pedestrian crashes at signalized intersections

Strategy G5.2.1 Investigate the Pedestrian Intersection Safety Index as a means for evaluating the safety of crossings at signalized intersections. *Timing: Complete by June 2010.*

Strategy G5.2.2 Develop recommendations for consideration by the Transportation Commission and the City Council. *Timing: Complete by December 2010.*

Strategy G5.2.3 Pursue funding opportunities for Social Marketing campaigns to increase the number of walkers that look for turning vehicles at signalized intersections. *Timing: On-going as grant or other funding opportunities become available.*

Objective G5.3 Improve lighting at all uncontrolled crosswalks on higher volume streets where lighting is currently below average.

Strategy G5.3.1 Propose a set of projects to improve lighting at locations that are below average based on 2007 consultant study (see page 32). *Timing: Complete by 2009.*

Strategy G5.3.2 Consider funding of lighting in next and future CIP programs. *Timing: 2010 and biannually.*

Strategy G5.3.3 Pursue outside funding to improve lighting. *Timing: Apply for grant opportunities as they become available.*

Objective G5.4 Monitor performance of "take it to make it" pedestrian flags.

Strategy G5.4.1 Continue the measurement of Pedestrian Flag usage in downtown each March/April.

Strategy G5.4.2 Compare measurements to target goal of 40% usage by March/April 2010.

Strategy G5.4.3 Pursue outside funding opportunities to offset costs of current program. *Timing: On-going as grant or other funding opportunities become available.*

Objective G5.5 Perform a pilot Road Safety Audit

Strategy G5.5.1 Conduct a Road Safety Audit at the intersection of NE 116th Street and 98th Avenue NE. *Timing: Complete by December 2009.*

Strategy G5.5.2 Compile the results of the audit, formulate recommendations for actions. *Timing: Complete in time for development of 2010 CIP.*

Strategy G5.5.3 Complete actions/propose CIP projects as appropriate. *Timing: Complete in time for 2010 CIP.*

Strategy G5.5.4 Identify other locations that could benefit from Road Safety Audits. *Timing: Complete by June 2010.*

Funding the Plan's goals

This plan contains a wide variety of goals. Some require funding, but the funding is already in place to help achieve them. For example, funding from the Capital Improvement Program builds sidewalks and stripes bicycle lanes.

A number of objectives have several strategies that work together; some of which require funding and some which do not. For example, funding for purchase and installation (strategies G8.1.2 and G8.1.3) of bicycle wayfinding hasn't been identified. On the other hand, progress on strategies G8.1.1, developing a plan for signing; and G8.1.4, pursuing grants for funding wayfinding signing; can be made without new funding. Every objective has at least one strategy that can be accomplished without additional funding, but many objectives have one or more strategies for which funding has not been identified.

Still other objectives can be accomplished without any outside funding. For example, Objective G8.2 concerns the codification of parking requirements and should be completed through normal staff work.

Goal G6 Remove physical barriers to walking.

Obstructions to sidewalks are a common nuisance for walkers in Kirkland. Little work has been done to understand what the real causes are and how obstructions can efficiently be reduced. The current methods used to address obstructions are described in Section 2. Kirkland is making progress toward reducing barriers to people who cannot easily negotiate commonly occurring street elements such as curbs and this work needs to be documented. See Page 112.

Objective G6.1 Reduce the number of sidewalk obstructions due to brush, debris, sidewalk maintenance, construction projects and waste/recycling containers.

Strategy G6.1.1 Develop a measure of the number of obstructions. *Timing: Complete by December 2009.*

Strategy G6.1.2 Examine the process through which obstructions are identified and cleared. *Timing: Complete by June 2010.*

Strategy G6.1.3 Prepare a set of improvements to that process including a specific goal for reduction in obstructions for consideration by the Transportation Commission. *Timing: Complete by December 2010.*

Objective G6.2 Develop an ADA Compliance Plan

Strategy G6.2.1 Prepare a plan for consideration by the Transportation Commission and adoption by the City Council. *Timing: Complete by December 2010.*

Goal G7 Improve on-street bicycle facilities

Many accommodations for bicycle travel can be made by restriping streets so that space is reallocated to bicycles and away from cars. In other locations, construction is required to create enough area for adequate bicycle facilities. Improvements of both kinds are the subject of Section 6.

Objective G7.1 Complete all marking-related improvements to the bicycle network by 2011.

Strategy G7.1.1 Prepare a design for the various projects. *Timing: Incrementally, beginning in 2009.*

Strategy G7.1.2 Add projects to CIP pavement marking contract. *Timing: Incrementally, beginning in 2009.*

Strategy G7.1.3 Through the pavement maintenance program, restripe inside lanes on multi-lane arterials to 10' wide. *Timing: Complete in time for the January 2011 revision of the pre-approved plans.*

Objective G7.2 Complete all construction-related improvements to the bicycle network by 2018.

Strategy G7.2.1 Program improvements from the construction related list by way of the CIP *Timing: biannually.*

Goal G8 Make bicycling more convenient

Some of the clearest support in the on-line survey was for the elements described below. These are discussed in more detail in Section 7. Improving bicycle parking, maintaining clear bicycle facilities, helping cyclists activate traffic signals and adding directional signs (wayfinding) were popular with many cyclists.

Objective G8.1 Plan and install a bicycle wayfinding system by 2013.

Strategy G8.1.1 Prepare a plan for wayfinding signage and priorities for its implementation. *Timing: Complete by December 2009.*

Strategy G8.1.2 Complete installation of 50% of the signage *Timing: Complete by December 2011.*

Strategy G8.1.3 Complete installation of 100% of the signage *Timing: Complete by December 2013.*

Strategy G8.1.4 Pursue opportunities for regional cooperation and grant funding. *Timing: On-going.*

Objective G8.2 Improve the way bicycle parking is codified by 2010.

Strategy G8.2.1 Modify the pre-approved plans to include a standard for bicycle racks and their installation. *Timing: Complete in time for the January 2010 revision of the pre-approved plans.*

Strategy G8.2.2 Change the Zoning Code to require bicycle parking as a part of standard right-of-way improvements. *Timing: Complete by December 2010.*

Objective G8.3 Add 10 new two-position bicycle parking racks in downtown Kirkland and 10 in other commercial areas of the city by 2014.

Strategy G8.3.1 Identify potential locations and design for racks including a public involvement process. *Timing: Complete by December 2010.*

Strategy G8.3.2 Secure funding. *Timing: Based on the results of G8.3.1., may be done in increments.*

Strategy G8.3.3 Complete installation of racks. *Timing: December 2014.*

Objective G8.4 Add pavement markings at signalized intersections to indicate where cyclists should stop in order to activate the signal.

Strategy G8.4.1 Implement a pilot program of marking at eight signalized intersections as a part of the City's standard pavement marking program. *Timing: Complete by fall, 2009.*

Strategy G8.4.2 Identify final locations where markings are needed. *Timing: Complete in time for the 2010 pavement marking contract.*

Strategy G8.4.3 Based on results of the pilot project, modify pre-approved plans to include markings as part of standard installations at traffic signals. *Timing: Complete in time for the January 2010 revision of the pre-approved plans.*

Strategy G8.4.4 Install 50% of markings. *Timing: Complete by fall 2011.*

Strategy G8.4.5 Install 100% of markings. *Timing: Complete by fall 2012.*

Objective G8.5 Reduce the amount of debris in on-street bicycle lanes.

Strategy G8.5.1 Develop a measure for the amount of debris. *Timing: Complete by December 2009.*

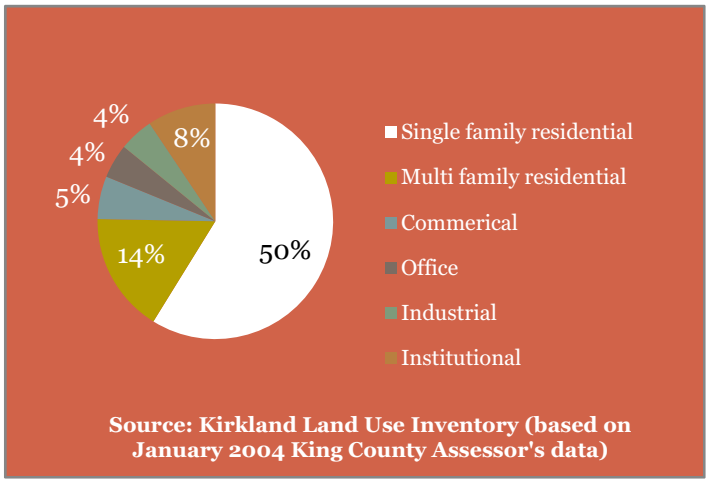
Strategy G8.5.2 Review the sources of debris and their causes. Explore measures that can be used to reduce the amount of debris from these causes. Review best practices from other agencies. *Timing: Complete by June 2010.*

Strategy G8.5.3 Prepare a set of recommendations including a specific goal for reduction of debris for consideration by the Transportation Commission and adoption by the City Council. *Timing: Complete by December 2010.*

DEMOGRAPHICS

The material in this section comes from the City of Kirkland's 2005 Community Profile[3]. That report draws upon the 1990 and 2000 Census and other local data. Figure 3 summarizes demographic information.

Figure 2 Land use types as percentages of total acreage.



With an estimated April 1, 2005 population of 45,740, Kirkland is the eighth largest city in King County and the eighteenth largest city in the State. Since its incorporation in 1905, the City of Kirkland has grown to approximately 12 times its original geographic size. This growth occurred via numerous annexations throughout the decades along with the consolidation of the cities of Kirkland and Houghton in 1968. The City grew significantly during the 1940s and 1960s when it at least doubled in size. The 1980s also were a significant growth period for the City, due to the annexations of Rose Hill and South Juanita in 1988.

Since 1990, the percentage of Kirkland's children under the age of 18 has decreased from 20.7% to 18.5% while the percentage of seniors over age 65 has increased from 9.6% to 10.2%. Kirkland has seen a steady decrease in average household size from 2.31 persons per household in 1980 to 2.28 persons per household in 1990, to 2.13 persons per household in 2000. The primary reason for this decline in average household size is a decrease in the number of children per household. The percentage of single person households in Kirkland has increased over the past decade, from 30.1% of households in 1990 to 35.6% in 2000.

There are approximately 7,000 gross acres of land in Kirkland. The developable land use base, which excludes all existing public rights-of-way, totals 5,200 net acres of land in Kirkland. Of the total developable land use base in Kirkland, 72% is zoned for residential use and 28% is zoned for non-residential uses.

Sixty four percent of the developable land use base is actually developed with residential uses. Since 1991, residential land uses have increased 13% (see Figure 2). 30% of the developable land use base is actually developed with non-residential uses. Parks and open space uses account for 8% and vacant land accounts for 5% of the Kirkland land use base. Kirkland has approximately 15,266,000 square feet of existing floor area dedicated to non-residential uses. Of that developed total, 4,906,000 (42%) are office uses, 3,464,000 (30%) are commercial uses, and 3,349,000 (29%) are industrial uses. The largest percentage of commercial and industrial uses is located in the Totem Lake neighborhood and the largest percentage of office uses is located in the Lakeview neighborhood.

[3] http://www.ci.kirkland.wa.us/__shared/assets/Community_Profile_20043320.pdf

Figure 3 Demographic profile of Kirkland

STATISTICAL PROFILE ON KIRKLAND

City Information, 425.587.3000

DEMOGRAPHICS

2000 Census Population

Current Population in 2005	45,740
Population, 2000 Census	45,090
Estimated Population 2022	56,507
Population Growth, 1980-1990	113%
Population Growth, 1990-2000	12%

2000 Census Age Structure

17 and under	18.5%
18 to 64	71.3%
65 and over	10.2%
Median Age	32

2000 Census Race and Ethnic Categories

Non-Hispanic White	85.3%
Black or African American	1.6%
Asian and Pacific Islander	8.0%
Native American and other	0.5%
Hispanic or Latino*	4.1%
Other/Two or more ethnicities	1.7%

The City of Kirkland has a total land area of 7,000 gross acres and 5,200 net acres.

The city incorporated in 1905. Kirkland absorbed Houghton in 1968 and annexed Juanita and Rose Hill in 1988.

In 2004, Kirkland's population ranks 8th in size in King County and 18th in Washington.

Sources:

ARCH
City of Kirkland Community Profile, 2004
City of Kirkland Finance Department
City of Kirkland Planning Department
Municipal Research Services Center
Puget Sound Regional Council
Rentonmarket.com/select/comparisons.htm
Seattle-Everett Real Estate Reports
Suburban Cities Association of King County
Washington State Employment Security Department

EMPLOYMENT

2004 Major Businesses and Employers

Evergreen Hosp.	2188
Lake Washington School District	617
City of Kirkland	428
Kenworth Truck Co. (PACCAR)	397
Costco Wholesale	380
Univar	301
Lake Washington Technical College.	200
Fred Meyer #391	188
IBM Corporation	175
Lake Vue Gardens	170

2000 Census People Working/Living in Kirkland ..... 6,211 or 23.0%

2003 Total Workforce **30,865**

Construction and Resources	2,316/7.5%
Education	1,314/1.9%
Finance/Insurance/Real Estate	2,156/7.0%
Government	3,267/10.6%
Manufacturing	1,902/6.2%
Retail	4,164/13.5%
Services	13,656/44.2%
Wholesale Trade/Transportation/ Communications/Utilities	2,090/6.8%

Employment Target

Additional jobs by 2022	8,880
Total jobs by 2022	41,184

2000 Number of Business Units .. 2,208

Services	981
Retail Trade	342
Finance, Insurance & Real Estate	237
Wholesale Trade	233
Construction	208
Manufacturing	79
Transportation, Communication, Utilities	46
Other (includes Agriculture, Fishing, etc)	46
Government and Education	35
Agricultural Production	1

HOUSING

2000 Census Housing Unit Count	**22,577**
Single Family	11,314
Multifamily	11,263
Households, 2000 Census	20,736
Average Household Size, 2000 Census	2.13
Household Growth Target Range 1992-2012	5,328 - 6,346
Housing Unit Growth Target Total	**26,800**
2001-2022 Additional Units	5,480
Housing Capacity	27,974

INCOME

1990 Census Median Income (adjusted for inflation)	$51,636
2000 Census Median Income	$60,332
1990 Census Person at Poverty Level	2,220/5.7%
2000 Census Persons at Poverty Level	2,337/5.3%
2003 Average Single-Family Home Price:	$363,935
2003 Average Apartment Rent	$1,142

DEVELOPMENT ACTIVITY

2004 Total New Residential Permits Issued	**447**
**Single-family	170
ADUs	4
Multi-family	31
Residential Units Demolished	102
2004 Total Building Permit Valuation	**$181,702,628**

2003 Land Use Inventory Acreage by Use (not including right-of-way)

Single-family	3,018	Industrial	150
Multi-family	708	Utilities	91
Commercial	399	Institutions	540
Office	358	Parks	424
Vacant	281		

SECTION 2: CURRENT CONDITIONS

GENERAL

Figure 4 This bridge over I-405 at NE 100th Street helps tie neighborhoods together

From the perspective of a cyclist or walker, Kirkland is a relatively easy place in which to travel. Although Interstate 405 forms a barrier to mobility as it cuts the City from north to south, there are three bridges spanning I-405 that are exclusively for cyclists and walkers. At the other six street crossings, walkers and cyclists are adjacent to relatively high volume, high speed general purpose traffic (Map 2). The Eastside Rail Corridor also bisects the City from north to south but holds the potential of being an outstanding off-road trail for bicycling and walking uses. With the exception of I-405 and a handful of other multilane arterials, Kirkland's transportation system consists of two and three-lane streets with speed limits of 35 MPH or less. Kirkland's hills (Map 3) provide a challenge to walkers and cyclists. Facilities for disabled pedestrians are increasing in number but many places need improvements in order to comply with current standards remain.

Because there are only a few multilane high speed arterials, bicycling is relatively easy and pleasant on the vast majority of Kirkland's streets. However, there are still some key links that only heartiest of cyclists use.

The shore of Lake Washington, downtown Kirkland, and the former highway bridge across Juanita Bay are all examples of wonderful places to walk in Kirkland. Most local streets are welcoming to pedestrians, but there are still a number of locations where traffic volumes and or speeds are moderate to high and where sidewalk is missing, narrow or uncomfortably close to traffic. Sometimes crossing streets is difficult because of rude drivers or because of the need for better lighting or other measures.

PEDESTRIANS

CROSSWALKS

Figure 5 Countdown signal heads show the time remaining to safely cross the street

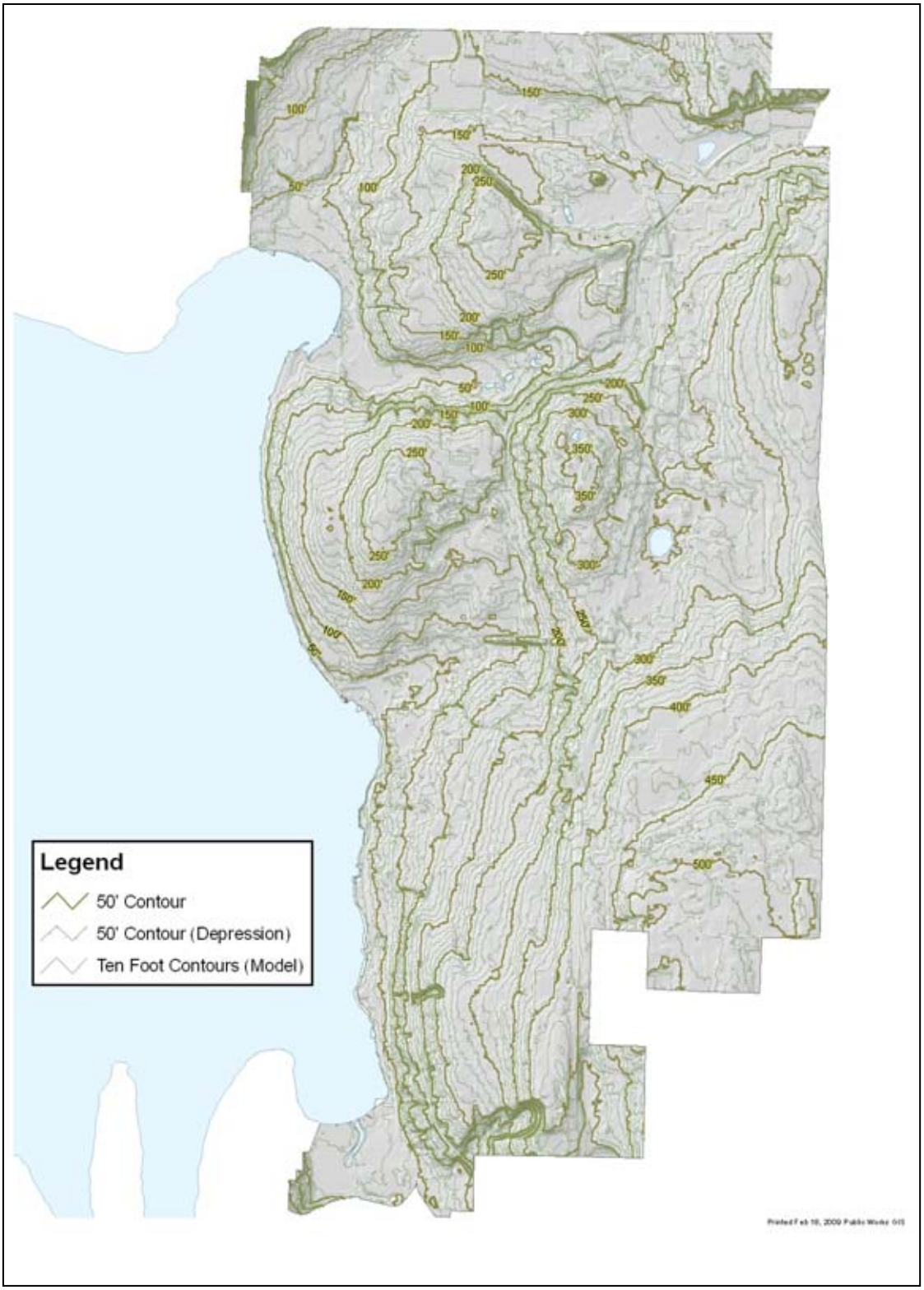
Traffic Signals

All traffic signals in the City of Kirkland have crosswalks and pedestrian signals. Countdown pedestrian signal heads are replacing standard heads and are being installed on new projects. Pushbuttons that give visual and audible feedback are replacing those that do not.

Pedestrian signals that make an audible tone during the "walk" phase are installed at about 10% of traffic signals. City of Kirkland policy is to install such signals wherever they are requested. Historically these have been requested by people with serious vision impairment. "Walk" and "Don't walk" intervals are being changed to meet new standards that call for longer flashing "Don't walk" intervals. These changes are a result of new data on walking speeds of pedestrians that show speeds assumed in the past were too high.

Map 2 Annual daily traffic volumes 2005

Map 3 Kirkland's topography provides a challenge to cyclists and pedestrians.



In-Pavement lights

In-pavement flashing lights were first installed in the City of Kirkland at two crosswalks in 1995. Because of their popularity and effectiveness, the number of installations has grown to 30 locations (see Map 4). Unfortunately, maintaining in-pavement lights has proven to be difficult (see page 57). With proper installation, newer model in-pavement lights are reasonably durable.

Pedestrian Flags

Pedestrian flags are now used in large and small cities across the country but they started in Kirkland in 1997. This program was suggested to City staff by a citizen who had seen a similar program in Japan. Like in-pavement lights, the number of pedestrian flag locations has grown from only a few locations to over 70 (see Map 4). In the downtown area, City staff maintains the flags. In other areas of the city, flag locations are maintained by volunteers. City staff ensure that the volunteers have the necessary flags and the volunteers then make sure that the holders are filled with flags. Recent research[4] shows that pedestrian flags are an effective at increasing pedestrian safety at crosswalks, especially when considered in the context of other possible treatments.

In 2007, work began to examine and redesign Kirkland's pedestrian flag program. Funded by a grant from the WSDOT, the aim of the work was to increase usage of pedestrian flags . A 67% increase was seen in flag usage as a result of the changes.

Advance stop bars at crosswalks

Usually, stop bars (pavement markings that indicate where drivers should stop as they approach an intersection or crosswalk) have been placed about 4' before crosswalks. Advance stop bars are placed about 40' before crosswalks. Advanced stop bars are placed at uncontrolled crosswalks on multi-lane streets. By encouraging motorists to stop farther from the crosswalk, sight

Take it to Make it

These examples illustrate how the pedestrian flag program has been changed to overcome barriers to usage.

Barrier: **Flags not available;** existing holder is only capable of holding 8 flags. Strategy: **Redesign holder;** use bucket style holders which hold up to 20 flags.

Barrier: **Pedestrians feel safe without flags.** Strategy: **Place messaging on bucket**, develop **slogan** which conveys need to use flags.

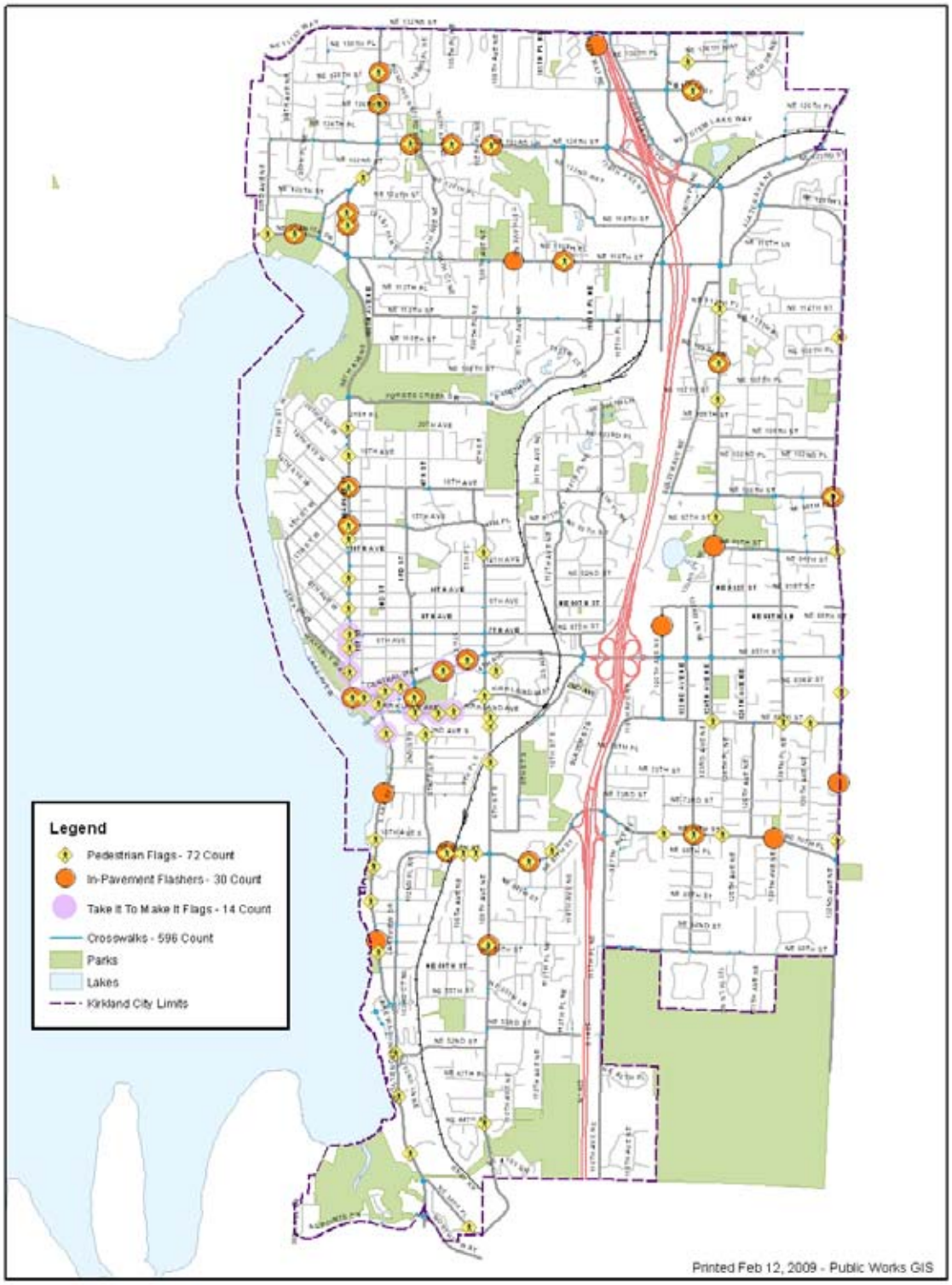
Take It to Make It

Barrier: **Pedestrians don't know what flags are for.**
Strategy: **Redesign flag** from orange to yellow to make use clear and to match standard warning sign.

Barrier: **Flags are not a norm**; people feel odd using them**.**
Strategy: Promote use by **partnering with merchants** and **other means** such as distributing coasters to bars and restaurants.

[4] TCRP report 112/NCHRP report 562 Improving Pedestrian Safety at Unsignalized Crossings, Transportation Research Board, 2006.

Map 4 Locations of pedestrians flags and locations of in-pavement lights



distance for vehicles in adjacent lanes is increased, reducing the chance of a double threat crash. Double threat crashes occur when one lane of traffic stops for a pedestrian, the pedestrian begins to cross the street but traffic in the other lane, unseen by the pedestrian, does not yield. In 2003, the City of Kirkland received a grant from the Washington Traffic Safety Commission to study the effectiveness of advance stop bars at uncontrolled crosswalks. Four locations were studied; a "test" pedestrian crossed the street and the number of vehicles failing to yield was measured both before and after advance stop bars were installed. The number of motorists failing to yield was reduced by about 20% with the bars and accompanying signs.

LIGHTING EVALUATION

Adequate lighting is a critical part of providing a safe crossing for pedestrians. In 2007, a review of lighting at each uncontrolled crosswalk on Kirkland's arterial streets was undertaken. A transportation consulting firm was hired to evaluate each crosswalk during hours of darkness and evaluate the adequacy of lighting on a 1-10 scale for each approach using the criteria in Table 1.

Table 1 Evaluation criteria for 2007 lighting survey

Ranking	Description
10	Good lighting uniformity and visibility of pedestrians off roadway, Good geometrics, Clear pedestrian and roadway channelization, No blocking foliage/buildings/ fences/cars/walls
9	
8	Above average lighting conditions, Buildings or vegetation present but does not create a blockage of pedestrians
7	
6	Average lighting conditions, Some blockage from vegetation/parking, Average roadway lighting illumination/uniformity
5	
4	Some missing channelization and signing, Lacking sidewalk continuity, Lighting illuminance/uniformity could use some improvement
3	
2	Inability to see pedestrians, Excessive glare or absence of light, Vegetation/parked vehicles blocking view of pedestrians and/or signage
1	

Of 92 crosswalks evaluated, the consultant recommended that crosswalks ranked at 3 and below be given highest priority for improvement. There are 24 crosswalks that have at least one approach rated 3 or below. At the other end of the spectrum, 13 crosswalks have both ratings at 8 or above.

Staff examined the poorest rated crosswalks and made immediate improvements such as trimming trees and other obstacles that blocked light from the crosswalk. At other locations it was relatively easy to install additional lighting. There was no easy remedy at some locations and those have become candidates for funding through the Capital Improvement Program and pedestrian safety grants and form the basis for Objective G5.3

SAFETY EVALUATION OF UNCONTROLLED CROSSWALKS

In 2003, the Transportation Commission oversaw an evaluation of uncontrolled crosswalks in Kirkland. A ranking system was used to give each crosswalk a ranking based on the volume, speed of traffic and the number of lanes to be crossed. This ranking system was developed for the Federal Highway Administration[5] and divides crosswalks into three categories:

[5] Safety Effects of Marked Versus Unmarked Crosswalks at Uncontrolled Locations Federal Highway Administration, FHWA HRT-04-100.

N = A marked crosswalk alone is not adequate for the location
P = A marked crosswalk alone is possibly an adequate treatment
C = The crosswalk is a candidate for a marked crosswalk alone.

Over 120 crosswalks in Kirkland were evaluated. The Commission gave special attention to those crosswalks that had an "N" ranking along with those that had more than three crashes in the past 10 years and at least one crash in the past five years.

WALKWAYS

The maps and other information about walkways in this Plan are based on a 2004 inventory. This information is reported by street segment. Segments are pieces of street between two intersecting streets.

Most existing walkways are 5' wide concrete sidewalk. In areas so designated in the Comprehensive Plan or Zoning Code, sidewalks are wider and in a few places they are more narrow. There are also sections of asphalt path that are separate from the roadway and a small amount of gravel pathways.

The charts and tables in the following pages indicate the extent to which Kirkland's walkway network is complete. Information is broken down by both the two general categories–those with complete walkway on at least one side of a segment and those with neither side complete—and by six detailed categories of completion. Additionally, the information is sorted by street functional classification. Functional classification is important because it is a good predictor of auto volume. Although principal arterials make up a small fraction of the miles of streets, they carry most of the auto volume. Local streets make up more than half of the street miles but they each carry relatively little auto volume. The other street classifications fall somewhere in between these two extremes. Pedestrians need sidewalks most on higher volume streets. Functional classifications are shown in Map 5.

Street Functional Classification

There are four functional classes:

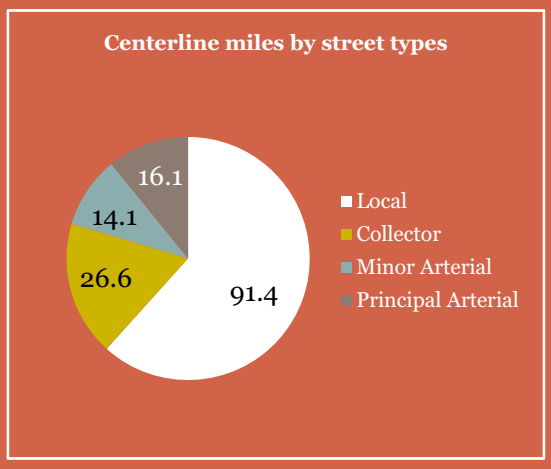
- principal arterial
- minor arterial
- collector
- local streets

Principal arterials connect to regional locations. NE 116th Street is an example of a principal arterial.

Minor arterials provide connections between principal arterials and serve as key circulation routes. 108th Avenue NE is an example of a minor arterial.

Collectors distribute traffic from arterials to local streets. NE 80th Street is a collector street

Local access streets give access to individual properties and connect to collectors.



As noted in Table 2, about 60% of streets in Kirkland have walkways on at least one side. All new development projects, including single family homes, must construct sidewalks where it is

Table 2 Miles of walkway by functional classification and type of completion

General condition	Specific condition: presence by side of street	Local Street		Collector		Minor Arterial		Principal arterial		TOTAL	
		Miles	%	Miles	%	Miles	%	Miles	%	Miles	%
Walkway not complete either side	no walkway	31.7	34.7	3.1	11.5	1.0	6.8	0.9	5.5	36.7	24.7
	some/none	12.2	13.4	2.2	8.3	0.8	5.9	0.4	2.2	15.6	10.5
	some/some	6.8	7.5	2.2	8.4	0.6	4.1	0.7	4.5	10.4	7.0
	Sub total No side complete	**50.8**	**55.6**	**7.5**	**28.2**	**2.4**	**16.8**	**2.0**	**12.2**	**62.6**	**42.2**
Walkway complete on one or both sides	complete/none	15.1	16.5	6.9	26.0	1.5	10.8	1.9	11.5	25.4	17.1
	complete/some	7.0	7.7	5.8	21.7	1.8	12.9	0.8	4.9	15.4	10.4
	complete/complete	18.5	20.3	6.4	24.1	8.4	59.5	11.7	71.4	45.0	30.3
	Sub total one side complete	**40.6**	**44.4**	**19.1**	**71.8**	**11.7**	**83.2**	**14.4**	**87.8**	**85.8**	**57.8**
TOTAL		**91.4**	**100**	**26.6**	**100**	**14.1**	**100**	**16.4**	**100**	**148.4**	148.4

missing along the public street frontage of their property. The major exception is for dead-end streets of less than 300 feet in length. Sidewalks are not required on these short cul-de-sacs.

Because of their maintenance costs, gravel paths are usually interim treatments. In some other areas, pedestrians share wide paved shoulders with cyclists. The former highway bridge at Juanita Bay is the city's longest section of formal shared use facility.

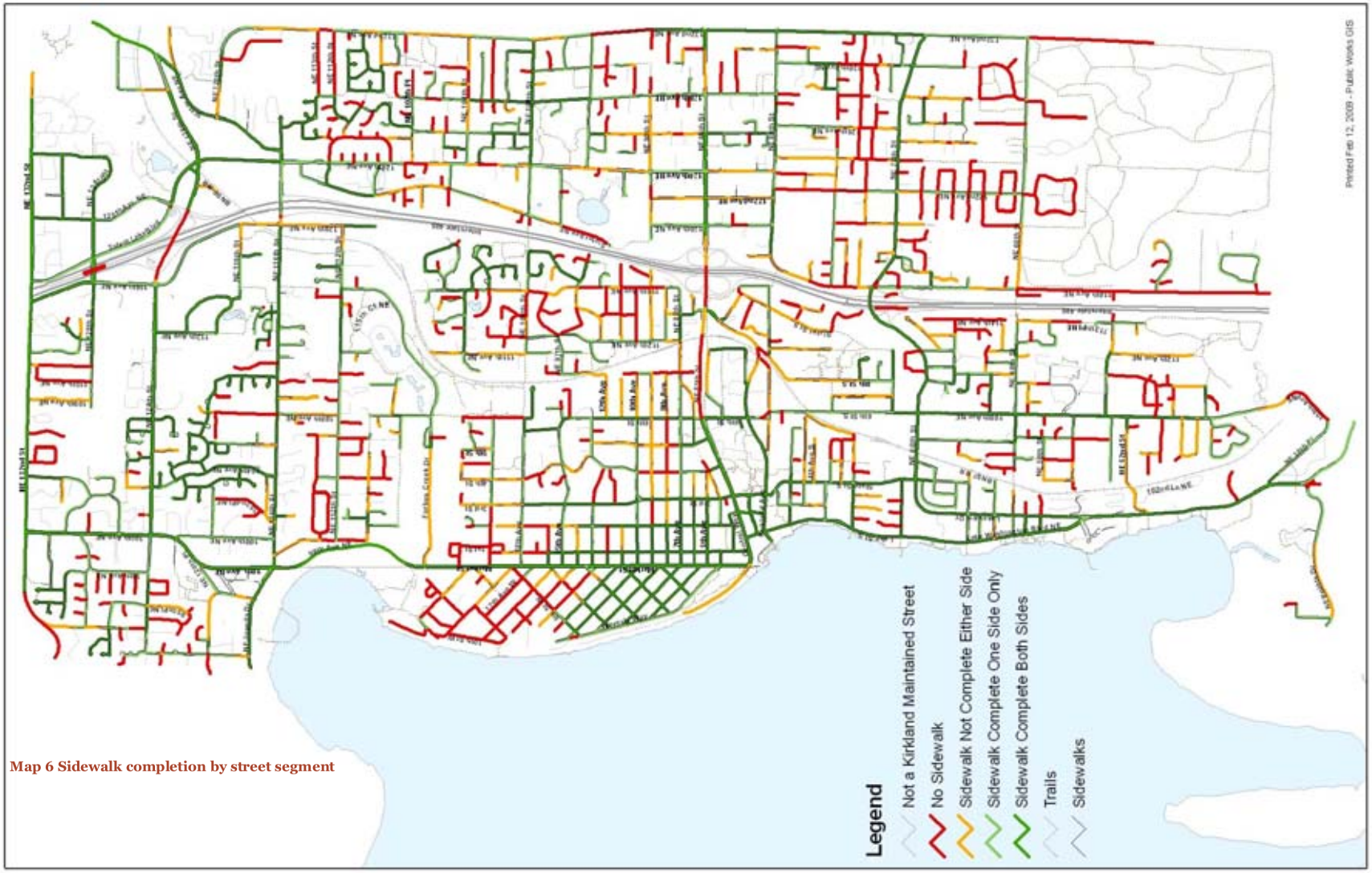
There are six different categories of walkway completion. They are listed below from most complete to least complete:

1. Walkways are complete on both sides of a segment.
2. Walkways are complete on one side of a segment and the other side has some walkway present but it is not complete.
3. Walkways are complete on one side, but there is no walkway on the other side of the segment.

Street Segments

Street segments used in the analysis of sidewalk completion are pieces of street between intersections. Examples of street segments in a portion of the Norkirk neighborhood are shown in brackets on the map below. There are about 2000 segments in Kirkland.

Map 5 Street functional classification



Map 6 Sidewalk completion by street segment

4. There is some walkway on both sides of a segment, but neither side is complete.
5. There is some walkway on one side of a segment, but no walkway on the other.
6. There is no walkway on either side of the segment.

These six categories can be collapsed into two general categories:

- Walkways are complete at least on one side.
- Walkways are not complete on either side.

In this analysis, even when adjacent segments have sidewalk complete on one side, it doesn't mean that sidewalks are continuous along the two adjacent segments. For example, it could be that the sidewalks are complete on the north side of the first segment and the south side of the adjoining segment. Both segments would be reported as "sidewalk complete on one side" but a walker would have to cross the street to use both pieces of sidewalk. This is rarely the case however. On most streets, sidewalks are completed along one side. Map 6 shows sidewalk presence and indicates several categories of sidewalk completion.

Table 3 provides an estimate of the sidewalk remaining to be completed by street type, and a cost estimate based on a typical 2008 construction cost of $300/lin. ft. for sidewalk. Sidewalk construction costs can vary depending on the physical conditions of the location such as slopes and whether or not drainage is required. In addition to the construction cost, the cost of design and an 10% contingency is also included. The purpose of these estimates is to give a planning level range of the cost of completing various portions of the network. When actual projects are being considered for construction a much more detailed analysis will be completed.

Completion of additional sidewalks is covered under goal G3. Objective G3.1 calls for completion of walkway on both sides of all segments on principal and minor arterials.

Goal G6 describes completion of an ADA Transition Plan (see page 97). Meeting this goal will require analysis and inventory of existing facilities and a plan to make all areas accessible and compliant with the ADA.

Figure 6 Miles of walkway needed to complete network, by street type

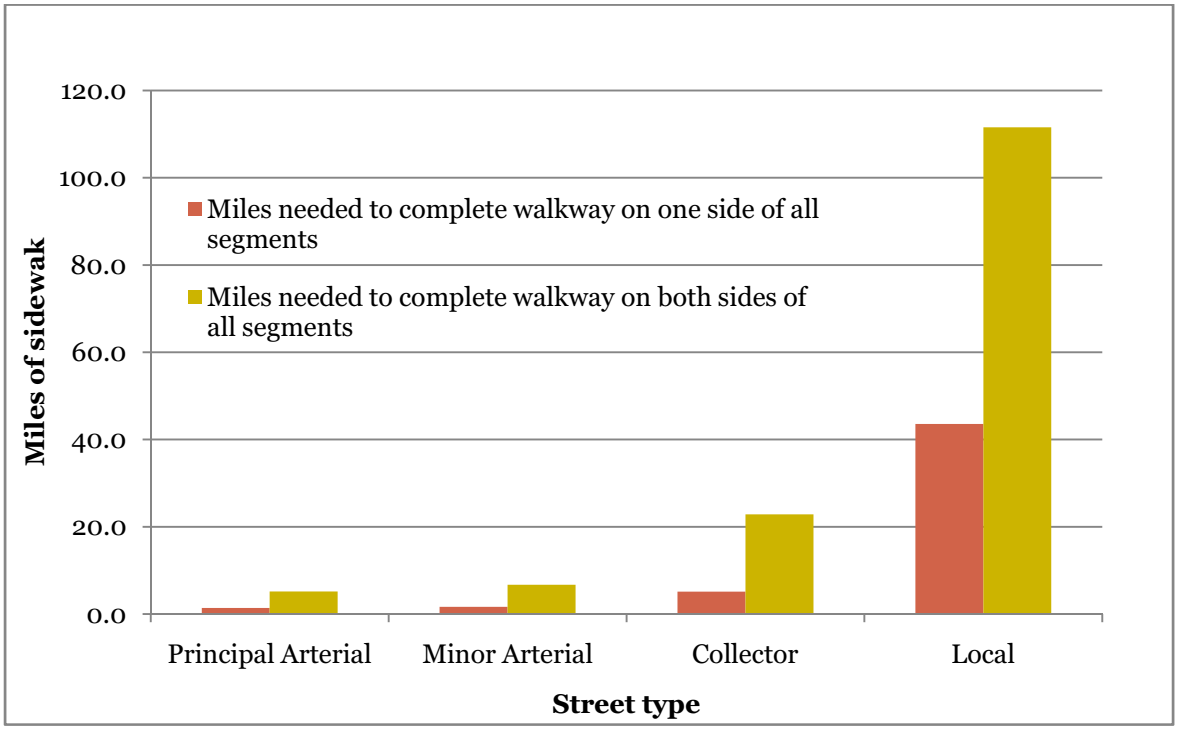


Table 3 Miles of sidewalk needed to complete sidewalk network and associated costs

Street type	*Needed to complete one side of all segments*		*Needed to complete both sides of all segments*	
	Length (mi)	Cost ($M)	Length (mi)	Cost ($M)
Principal Arterial	1.4	3.2	5.2	11.9
Minor Arterial	1.7	3.8	6.7	15.4
Collector	5.1	11.8	22.8	52.2
Local	43.6	100.1	111.5	256.2
Total	**51.7**	**118.9**	**146.3**	**335.9**

Cost estimate based on typical 2008 cost of $300/lin. ft for construction plus 35% of construction cost for project design plus 10% of construction cost as contingency. Estimate only, actual costs will vary.

Figure 7 Walkway completion by type of roadway

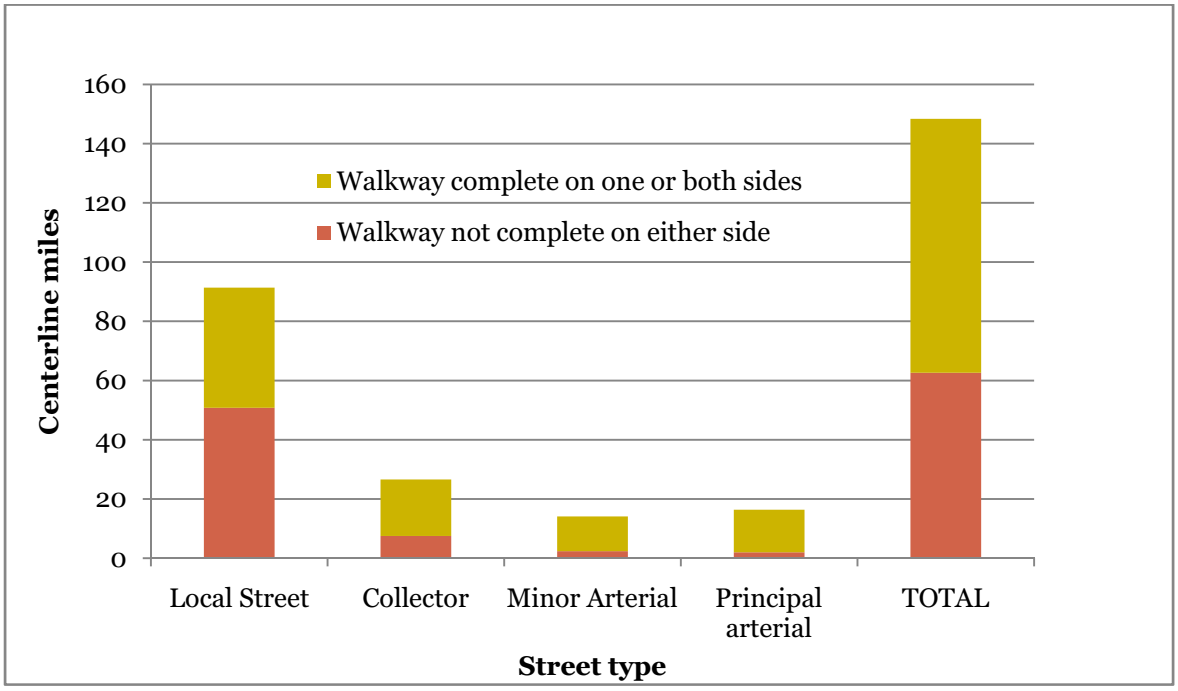


Figure 8 Detailed walkway completion by centerline miles of street type

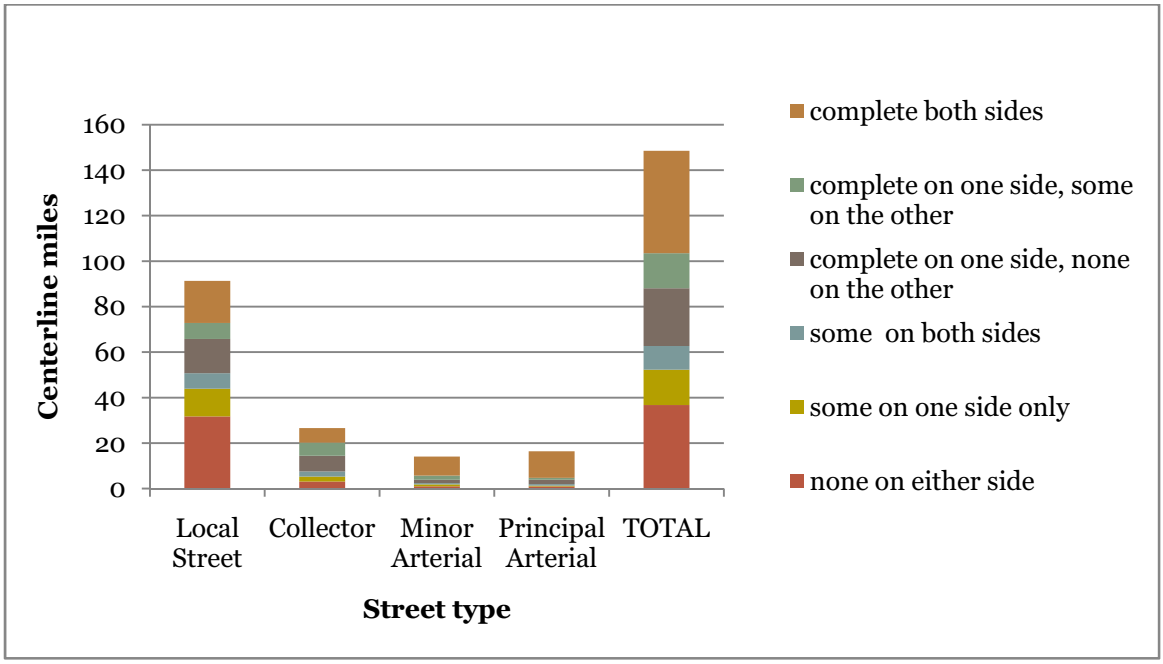
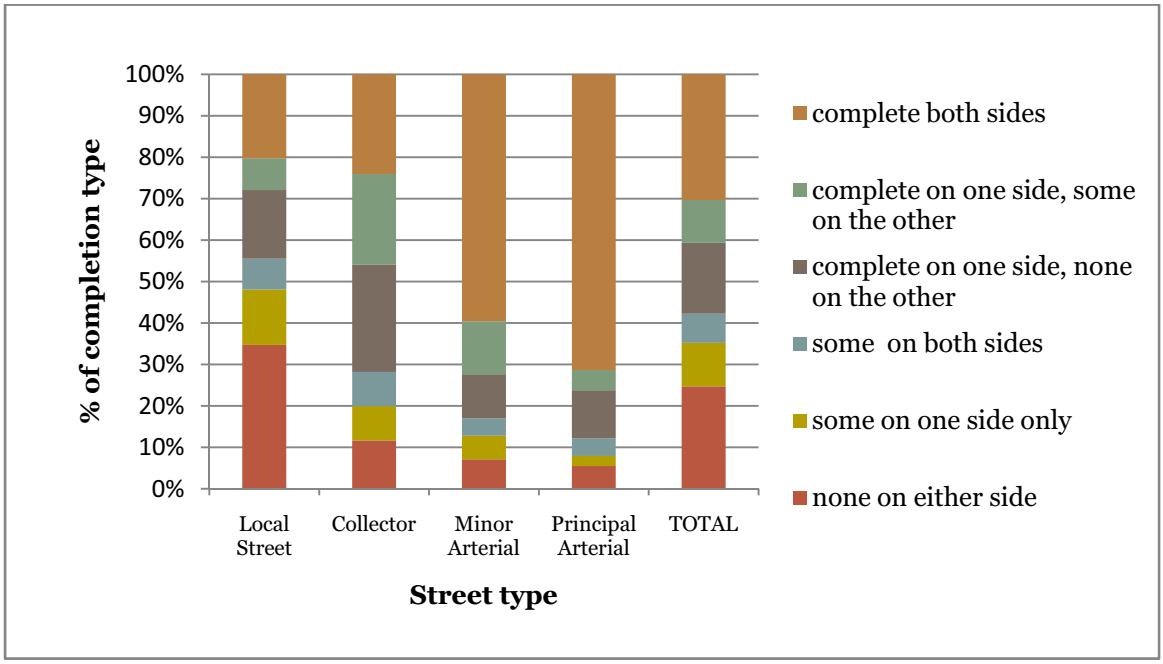


Figure 9 Walkway completion as a percentage of street classification



BARRIERS

Figure 10 Railroad bridge at Kirkland Way. This low and narrow bridge is difficult for cyclists, walkers and tall vehicles.

I-405 presents a major barrier to walkers, but it is a lesser barrier than it once was. The cloverleaf interchange at NE 85th Street, built in the 1960's has no accommodations for pedestrians. The rebuilt interchange at NE 116th Street, the first phase of which was built in 2006, and which is planned for completion in 2010, will incorporate generous facilities for allowing walkers to safely cross under I-405. Modern design for pedestrian facilities are also illustrated in the direct access ramp at 128th Street. The three pedestrian bridges across I-405 corridor also help to mitigate the barrier that I-405 presents to pedestrian travel. A large concrete bridge carries the Eastside Rail Corridor over Kirkland Way near Railroad Avenue. This structure was built in the early 20th century and is a barrier to easy passage for walkers and cyclists because of its narrow portal. The structure also limits sight distance somewhat from nearby intersections. Although steps are being taken to remove them, there are many features around Kirkland that are barriers to those who have difficulty walking. The ADA Transition Plan identified in Goal G6 (see page 112) addresses these barriers.

CYCLING

INTERSECTIONS

Often, bicycle lanes end as they approach signalized intersections. This is usually because extra auto lanes are present at the signal and roadway space is not allocated to bicycles. There are some locations where restriping could eliminate or minimize these discontinuities across intersections. On the other hand, some experts believe that striping bicycle lanes through intersections, causing cyclists to pass on the right of cars, make cyclists susceptible to "right hook" crashes where right turning cars strike cyclists in bicycle lanes.

Cyclists feel that it is difficult to activate traffic signals. Most traffic signals in Kirkland use inductive loops buried in the pavement to detect vehicles and bicycles. When the traffic signal senses the presence of a vehicle, it responds with the appropriate signal display. The problem comes when cyclists don't know where to stop in order to be sensed by the signal. The City of Kirkland does not currently mark loops so that cyclists know where to stop at traffic signals. This topic is addressed more fully on Page 115.

Detection at traffic signals

Most of the signals in Kirkland use loops of wire buried in the pavement to detect the presence of vehicles. An electrical current is passed through the wire creating a circuit. When a vehicle passes over the wire, the properties of the circuit are changed, that change is detected by the traffic signal controller and the signal indications are changed.

The most sensitive parts of the loops are at their edges, and when loops are visible, it's fairly easy to position a bicycle in a way that activates the signal. Unfortunately, most cyclists aren't aware of this and even if they are, sometimes loops are under the top layer of pavement and can't be seen.

Another type of detection involves video cameras. They detect vehicles based on changes in pixels of a video image of the lanes approaching the signal. The City of Kirkland has a handful of intersections that use video detection.

Video detection is considered easier for cyclists, but during times of darkness it can also be problematic.

ON-STREET BIKE LANES

As shown in Map 8, current on street bicycle facilities in the City of Kirkland provide reasonable coverage on the main north-south corridors with fewer complete east-west corridors. Almost all bike lanes are at least 5' in width. Most miles of any city's street inventory are local streets with low car volumes traveling at relatively low speeds and therefore do not need bicycle lanes. This is true of Kirkland as well. A proposed bicycle network and improvements are discussed in Section 6.

Pavement condition is important to cyclists for both safety and comfort. Pavement Condition Index (PCI) is measured on a scale between 1 and 100 called PCI. Kirkland's current overall PCI is 65. Arterials are 55, with collectors at 69. Due to differences in measuring, it is difficult to directly compare Kirkland's pavement condition index with that of other nearby cities, but qualitatively speaking, they are similar.

SIGNING AND WAYFINDING

Although some signs exist, Kirkland does not have a standard application of bike lane signs. Proposed changes to the standards for highway and street signing eliminate requirements for signs that indicate the presence of on street bike lanes. Kirkland does not currently have bicycle-specific wayfinding (directional) signs. Like most of the communities on the Lake Washington Loop route, Kirkland has not signed this regional bike route.

BARRIERS

A major regional barrier to bicycle travel is the prohibition of bicycles on the floating bridge portion of State Route 520. Construction of such facilities has always been a part of the bridge replacement program, but replacement is not scheduled until at least 2016.

The discussion of I-405 as a barrier to pedestrian travel on Page 41 is also applicable to bicycle travel. Newer facilities; NE 128th Street, NE 116th Street (when completed), and NE 100th Street all have good bicycling facilities while the older interchanges at NE 70th Street, NE 85th Street and NE 124th Street have poor or no facilities for cyclists. This is a function of the standards that were in use when the facilities were constructed. As borne out by the survey of cyclists, the most difficult streets to bike on Kirkland are Central Way between 6th Street and 132nd Avenue NE, NE 124th Street between 100th Avenue NE and 132nd Avenue NE and, to a lesser degree, 100th Avenue between NE 116th Street and NE 132nd Street. The last of these was noted on the Cascade Bicycle Club's *Left by the Side of the Road*[6] project as a key regional missing link because of the connections it makes to other regional facilities.

PARKING

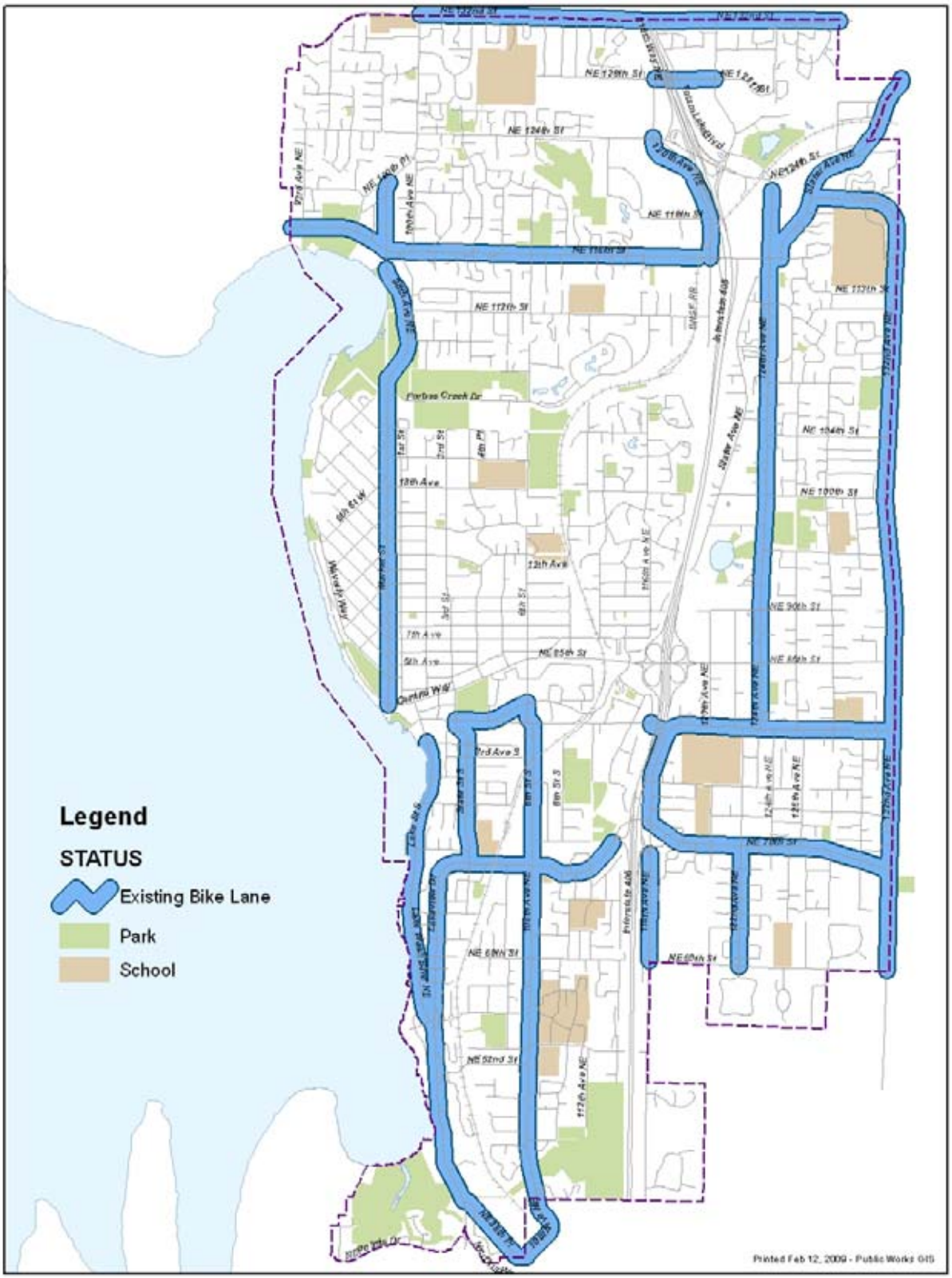
Section 105.32 of the Kirkland Zoning Code requires all new development except single family and duplex developments with six or more parking stalls to have bicycle parking. Bicycle parking must be in a well lit, visible, sheltered area within 50 feet of the building entrances. One bicycle parking stall shall be provided for each 12 automobile parking stalls, but this can be modified based on the nature of the project. Kirkland does not currently have standards for the design of racks. Objective 8.2 (page 23) calls for improvements in the way bicycle parking is codified.

Map 7 Bicycle racks in downtown Kirkland. Black triangles show locations of racks, circles are 300' in radius.

[6] *Left by the Side of the Road: Puget Sound Regional Bicycle Network Study Assessment and Recommendation*, 2006, Cascade Bicycle Club.

Map 7 shows the existing public racks in downtown Kirkland as black triangles. The grey buffers of 300' are intended to indicate the area of coverage assuming that the maximum distance a user would walk and correspond to a walk of about two minutes. Although some areas are covered by multiple racks, other areas are not covered at all. The eastern part of downtown is better covered than is the western part. This corresponds to the newer development and public facilities that have been developed there. Objective G8.3 calls for additional bicycle parking facilities to be added both in downtown and in other parts of the City zoned for commercial land use.

Map 8 Existing on street bicycle lanes



CRASHES

CRASH DATA MANAGEMENT

The City of Kirkland maintains separate databases for crashes involving pedestrians and those involving cyclists. The software that supports these databases is called PBCAT[7]. It was developed by the University of North Carolina Highway Safety Research Center for the Federal Highway Administration and is distributed for free.

Detailed information for each reported[8] crash is included in the database, such as information about the people involved, the weather, lighting and surface conditions, injury severity and directions of travel. Contributing causes are also included. Each crash location is coded so that it can be tracked in the City's Geographic Information System. PBCAT allows crashes to be typed by the action of each vehicle, pedestrian or bicycle involved. This makes it possible to sort and analyze crashes by a set of standardized crash types. For example; bicycle going straight in bicycle lane/vehicle turning right at intersection. Appendix B contains a gallery of descriptive charts based on crash data from 1996-2007.

Pedestrian crash facts 1997-2007

37% of pedestrian crashes happen during the months of November, December and January.

About one-fourth of all crashes happen when pavement is wet and about one third happen after dark.

A little more than a quarter of pedestrian crashes happen during the PM drive time; between 4:00 and 7:00.

97% of crashes involving pedestrians result in some injury and 33% of them are incapacitating injuries. That rate increases to 50% incapacitation for those over 55.

Males and females are equally likely to be involved in pedestrian crashes.

Non-intersection crashes account for 29% of all crashes (17% at mid-block locations and 12% at driveways).

66% of all crashes involve a pedestrian at a crosswalk.

The pedestrian was using a crosswalk in 80% of the crashes that occur at intersections and in 58% of midblock crashes.

At unsignalized intersections, 50% of the crashes involve driver's failure to yield as the main contributing factor.

PEDESTRIAN CRASHES

Figure 13 shows that the annual number of pedestrian crashes has remained relatively steady over the past 11 years. This is despite increases in the number of people walking. Crashes over the most recent five years are shown on Map 9. It is difficult to draw specific conclusions about why the number of crashes per unit of exposure has decreased. It is probably due to a number of factors including engineering, education and enforcement efforts. It is also likely that as the number of pedestrians increases drivers become more aware of them. Years like 2003 where there are a very small number of crashes or like 2002 where there are a particularly large number of crashes are not attributable to any particular factor. They are seen as normal fluctuation around the average.

Figures 11 and 12 show that almost ¾ of pedestrian crashes happen at intersections. Of those that happen at signalized intersections, turning vehicles are involved with 68% of them. At unsignalized intersections, half the crashes involve vehicles that did not yield.

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[7]PBCAT is an acronym for Pedestrian and Bicycle Crash Analysis Tool http://www.walkinginfo.org/facts/pbcat/index.cfm
[8] Reported crashes are those for which a police report is completed. Police reports are completed when a collision results in $700 or more in property damage or an injury.

Because there is little documentation about the amount of pedestrian activity in other cities, it is difficult to compare Kirkland's crash experience with that of other cities. Goals G2 and G5 include strategies to address crashes at intersections and to measure pedestrian volume so that accident rates can be computed.

Figure 11 Pedestrian crashes at signalized intersections by vehicle action 1997-2007 The green segment of the left circle represents crashes at signalized intersections.

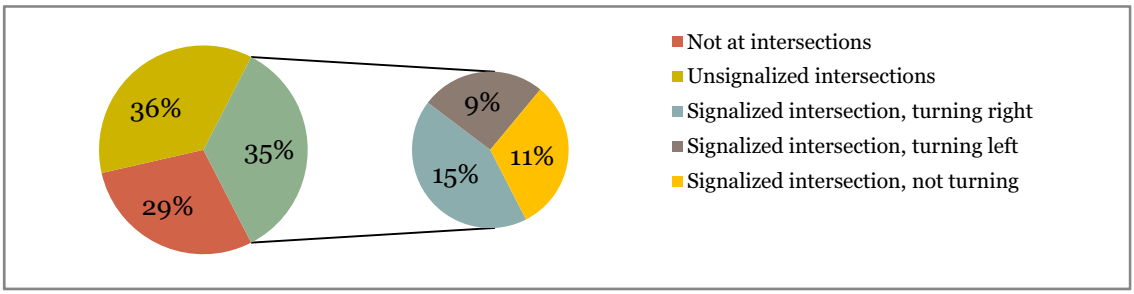


Figure 12 Pedestrian crashes at unsignalized intersections by vehicle action 1996-2007 The gold segment of the left circle represents crashes at unsignalized intersections.

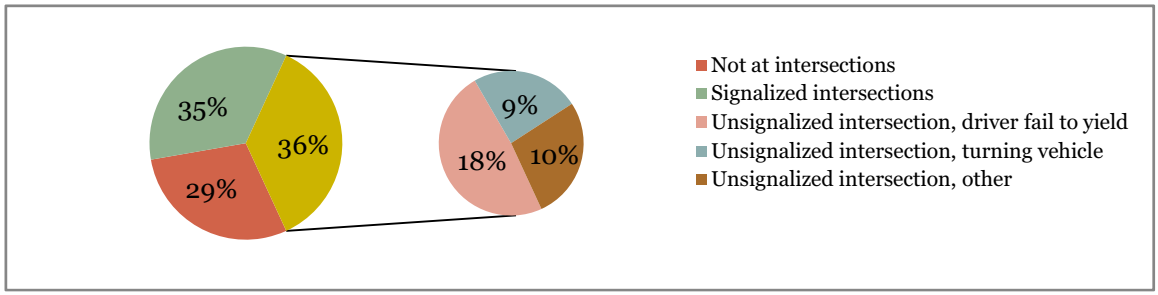
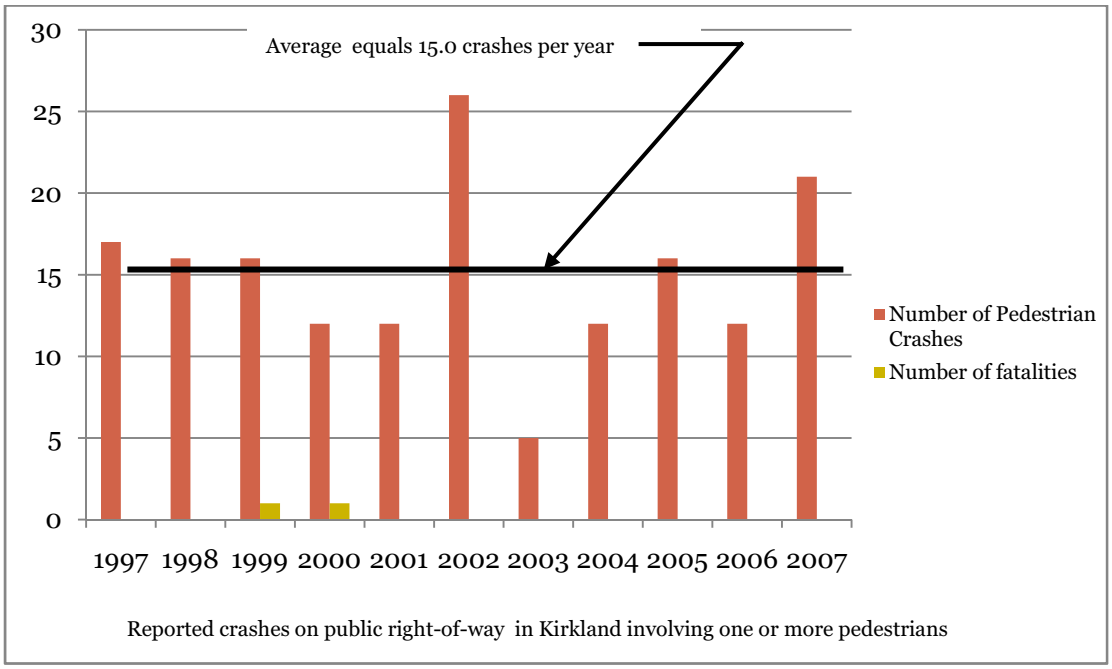
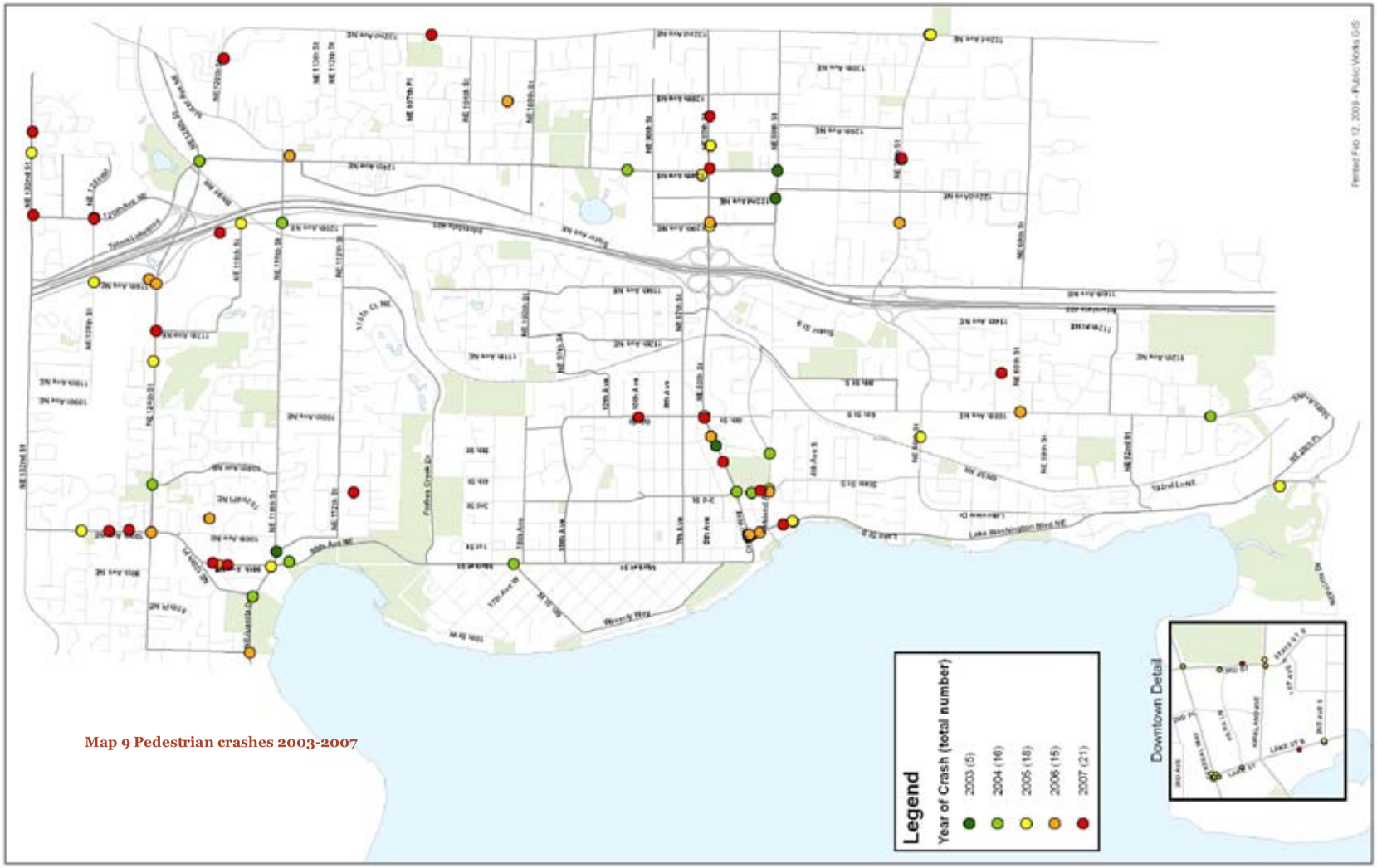


Figure 11 Annual number of pedestrian crashes fatal and non-fatal 1997-2007





Map 9 Pedestrian crashes 2003-2007

Map 10 Cyclist crashes 2003-2007

CYCLIST CRASHES

Figure 14 shows the annual number of bicycle crashes has remained relatively steady over the past 11 years. Map 10 shows locations of crashes from the period 2003-2007. Although each of the past six years has been at or above average, the number of crashes is so small that it is hard to call it a trend. Most years are within three crashes of the average, with the two outlier years averaging to almost exactly the 11 year average. Reliable estimates of the rate at which cycling miles are increasing or decreasing are not available; therefore, the rate of cycling crashes is unknown. It is unlikely that the number of miles cycled is decreasing; indicating the number of crashes per mile cycled is probably decreasing.

Bicycle crash facts 1997-2007

59% of bicycle crashes happen during the five months from May to September.

About three-fourth of all bicycle crashes happen on dry pavement during daylight .

Almost half of bicycle crashes happen during the PM drive time; between 4:00 and 7:00.

Just over half the crashes involve motorists that failed to yield.

84% of crashes involving bicycles result in some injury and 18% of them are incapacitating injuries.

Males are more than four times more likely (81% to 19%) than females to be involved in pedestrian crashes.

Cyclists were using a crosswalk/sidewalk in 43% of all bike crashes, a bike lane in 31% and was in the travel lane in 26% of all crashes.

Like crashes involving pedestrians, about ¾ of crashes involving cyclists happen at intersections. At intersections, crashes are almost evenly split between those that involve turning vehicles and those that do not (see Figure 15).

Figure 12 Annual number of cyclist crashes 1997-2007

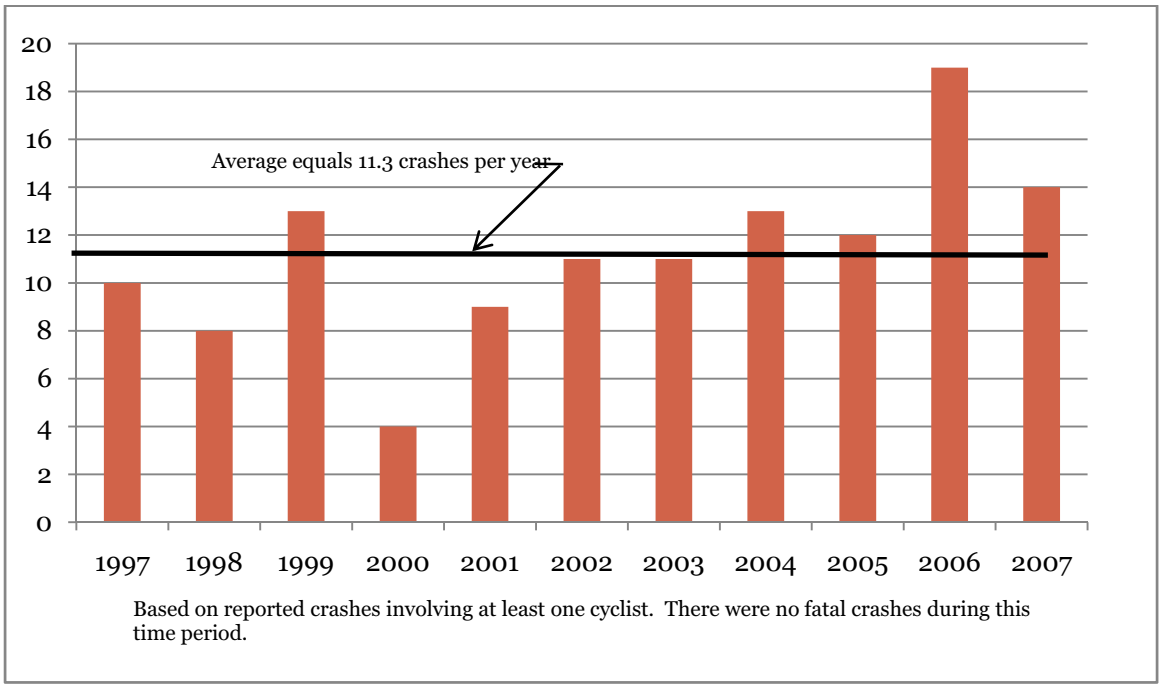
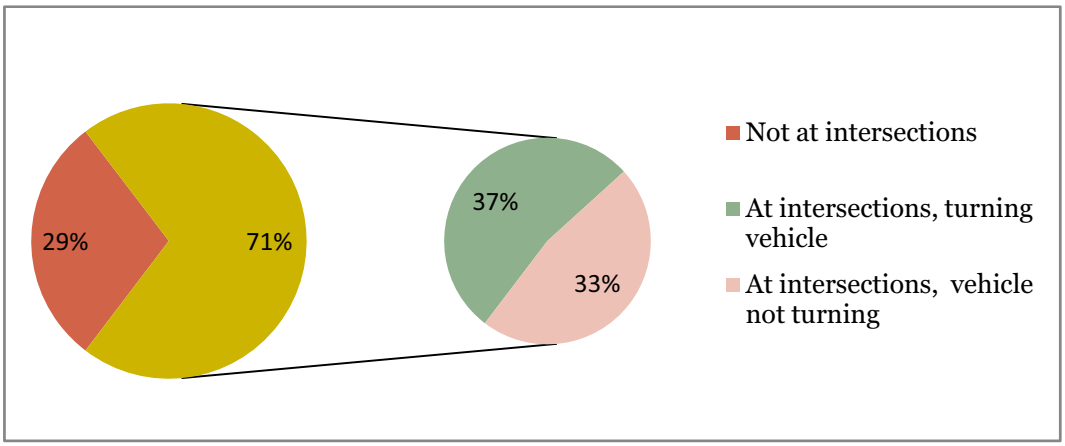


Figure 13 Crashes involving cyclists at intersections, by vehicle action 1996-2007. The gold section of the left circle represents crashes at intersections.



TRANSIT

Transit is closely associated with cycling and walking. Transit helps pedestrians and cyclists expand the range of their trip making by allowing passage over and along barriers like freeways. For those who have difficulty walking longer distances or who don't have access to a car, transit is particularly important way of providing mobility. Every transit trip begins and ends with either a walking or cycling component. It is outside the scope of this plan to comment on the amount of transit service which Kirkland receives, but this plan does take specific steps to support transit service that is provided. Transit is an important consideration in the ranking of sidewalk construction projects as described in Section 5 and is considered when locations for bicycle parking are being analyzed (see page 114).

Both transit agencies that serve Kirkland - Sound Transit and King County Metro - have bicycle racks on every coach in their fleets. Most racks hold two bicycles, but racks that hold three bicycles are under development. Transit operates mainly on principal and minor arterials, but also on a few high volume collector streets. Sidewalk exists on both sides of most of these streets (see Figure 8, page 40).

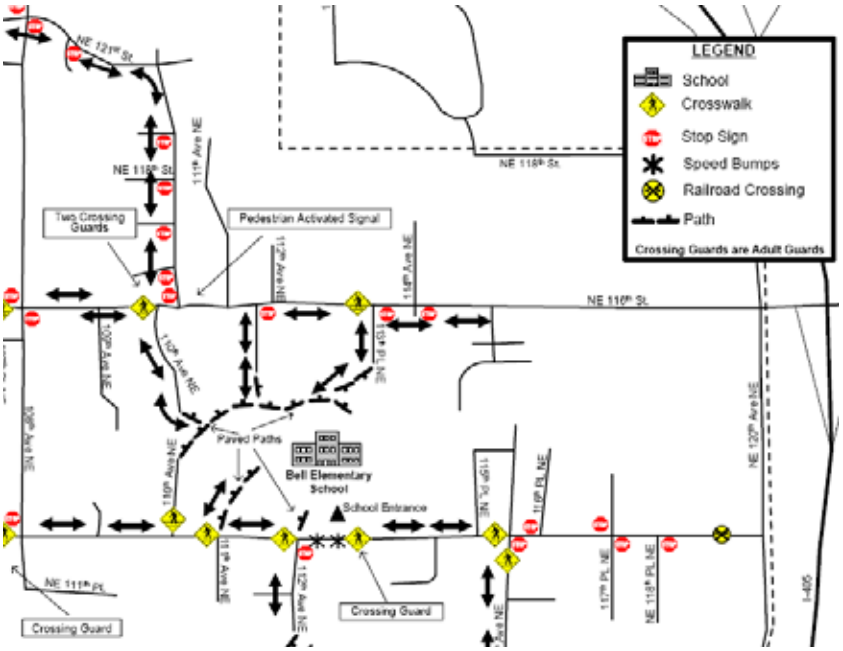
Of the approximately 322 bus stops in Kirkland, about 9% have shelters and about 88% are accessible for handicapped lifts. King County Metro runs a bicycle locker program that includes facilities at the Kingsgate and South Kirkland Park & Rides, as well as the transit center in downtown Kirkland. Bicycle racks are also available at South Kirkland Park & Ride and the downtown transit center.

SCHOOL WALK ROUTES

Kirkland has seven public elementary schools[9] within its borders that have school walk routes (SWR). The Lake Washington School District is responsible for producing a safe school walk route map for each school. Each map describes in detail the preferred walk routes within approximately a mile of each school. Map 11 is a sample of such a map. The District considers the presence of sidewalk when it determines the routes. For example, if there is sidewalk on only one side of a street, that side is designated as the walk route. If there is sidewalk on both sides of a

[9] Community School is an elementary school in Kirkland. Because it is a choice school it does not have a designated school walk route.

Map 11 A portion of the A.G. Bell Elementary School Walk Route



street, then both sides are designated as the walk route. Note that because the School District prepares the school walk routes, and because they only produce them for public elementary schools, the term "school walk routes" as used in this document is synonymous with the term "public elementary school walk routes". The Lake Washington School District is also responsible for funding and locating school crossing guards. The School district does not operate school buses for high school students. Students receive passes to use Metro Transit instead.

Kirkland has just over 30 miles of school walk routes (see Map 12). The majority of SWR are on local and collector streets. There is about one mile on principal arterials and about five miles on minor arterials. Almost 80% of the routes have walkways on at least one side. Table 4 describes walk route completion by roadway classification. Goal G4 addresses increasing the number of children who walk to school.

In response to a funding opportunity, in October of 2000, the City Council created a School Walk Route Committee including residents, parents, representatives from the School District and others. In May of 2002, after numerous meetings, discussions, open houses and interaction with the various schools, the City Council approved their recommendations. These recommendations included:

- Build $1 M worth of "priority" SWR projects as identified by each school
- Rank other identified SWR's using the CIP Project Evaluation Criteria
- Explore possibility of a Sidewalk Bond ballot measure to provide funding for sidewalks
- "Call" concomitant agreements that would fund sidewalks through private funding. (see Page 53 for more information about concomitant agreements.)

Priority SWR projects were completed at all seven elementary schools by the Fall of 2002, and other routes continue to be evaluated for funding. After further study, a sidewalk bond measure was not pursued and the concomitant process was modified. Including the priority improvements that were undertaken in 2002, approximately $2.2 M has been invested in improvements along school walk routes over the last few years. Between the time that the inventory of school walk routes that was done in preparation for the School Walk Route Advisory Committee in 2001 and today, significant progress was made in completing the walk routes around schools as shown in Figure 16. As a result of concerted efforts to improve school walk routes, the number of routes that have sidewalk on at least one side of the street has increased to a minimum of 80%.

Table 5 summarizes the number of miles of sidewalk left to complete the school walk route system. It also shows the estimated cost to complete the system. Some segments on school walk routes are on short dead-end streets and other locations where sidewalk is either not desired or not necessary. This means that achieving "100%" completion of sidewalks on school walk route system is not possible.

Table 4 Centerline miles of school walk routes by street type and walkway completion type

General condition	*Specific condition: presence of walkway by side of street*	*Local Street*	*Collector*	*Minor Arterial*	*Principal Arterial*	*Total*
Walkway not complete either side	None on either side	2.2	0.6	0.0	0.0	2.8
	Some on one side only	0.8	1.3	0.5	0.0	2.5
	Some on both sides	0.7	0.4	0.0	0.0	1.1
	Subtotal neither side complete	3.7	2.3	0.5	0.0	6.5
Walkway complete on one or both sides	Complete on one side, none on the other	1.9	3.8	0.5	0.0	6.2
	Complete on one side, some on the other	2.1	3.6	0.2	0.0	5.9
	Complete both sides	3.3	3.6	3.9	1.0	11.8
	Subtotal at least one side complete	7.2	11.0	4.6	1.0	23.9
TOTAL		**11.0**	**13.3**	**5.1**	**1.0**	**30.4**

Map 12 School walk routes

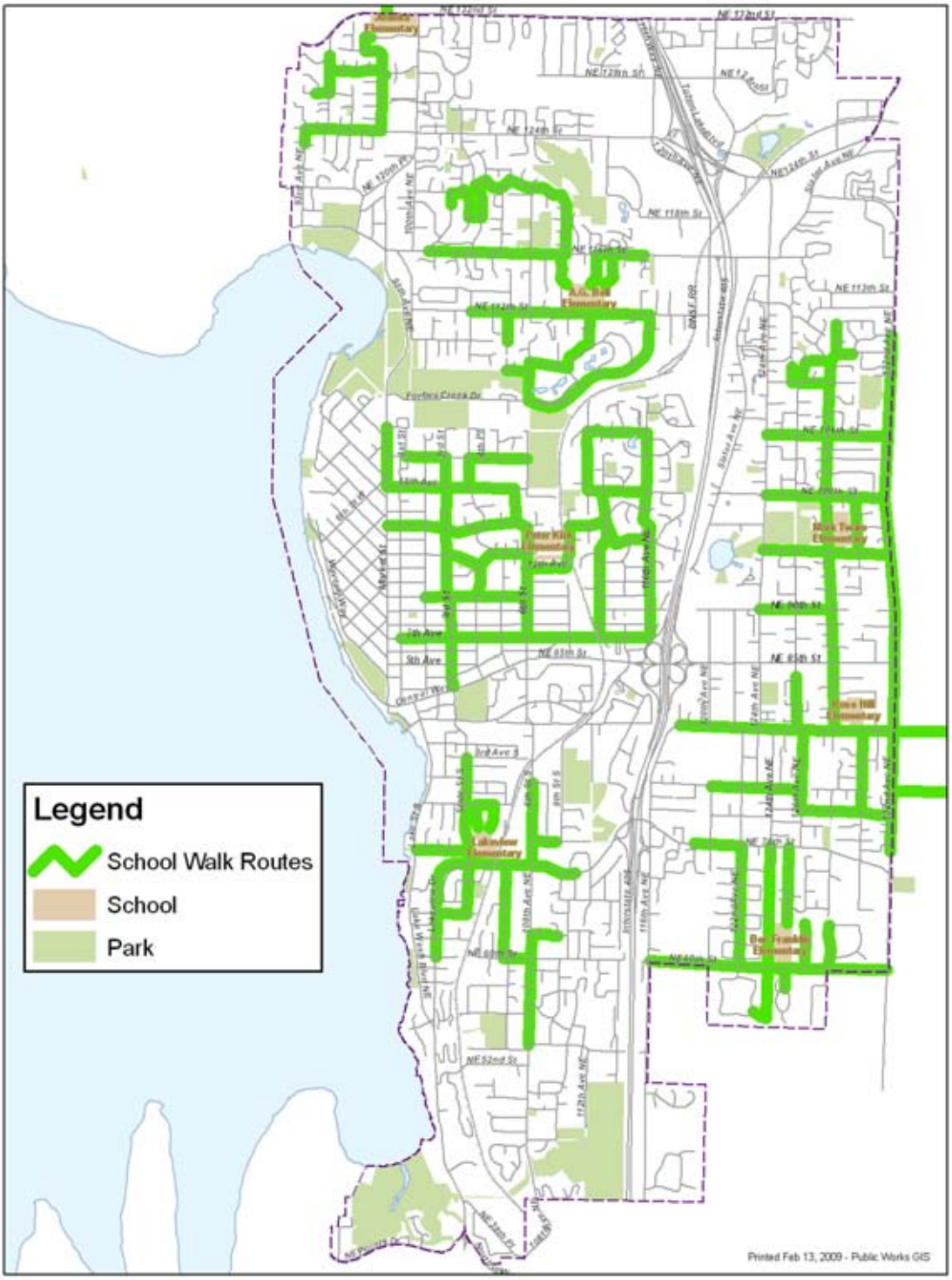


Figure 14 Inventory of school walk route completion by school. Funded projects reflected in projected columns.

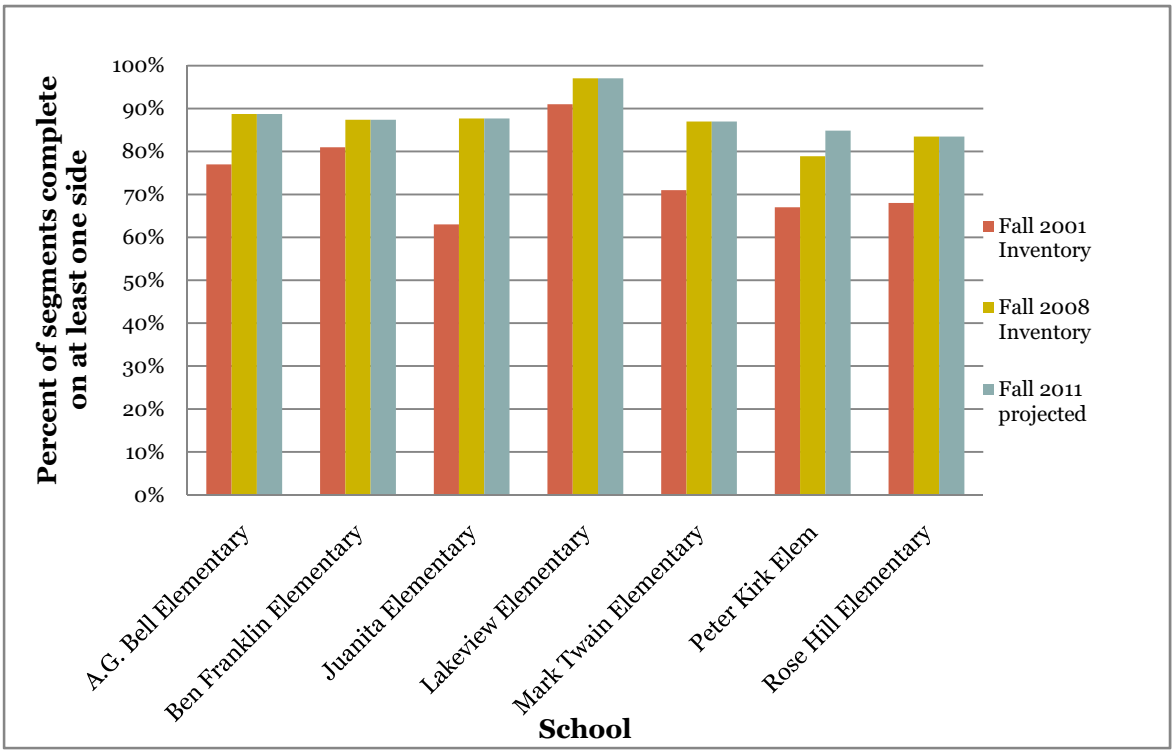


Figure 15 School walk route completion by street type

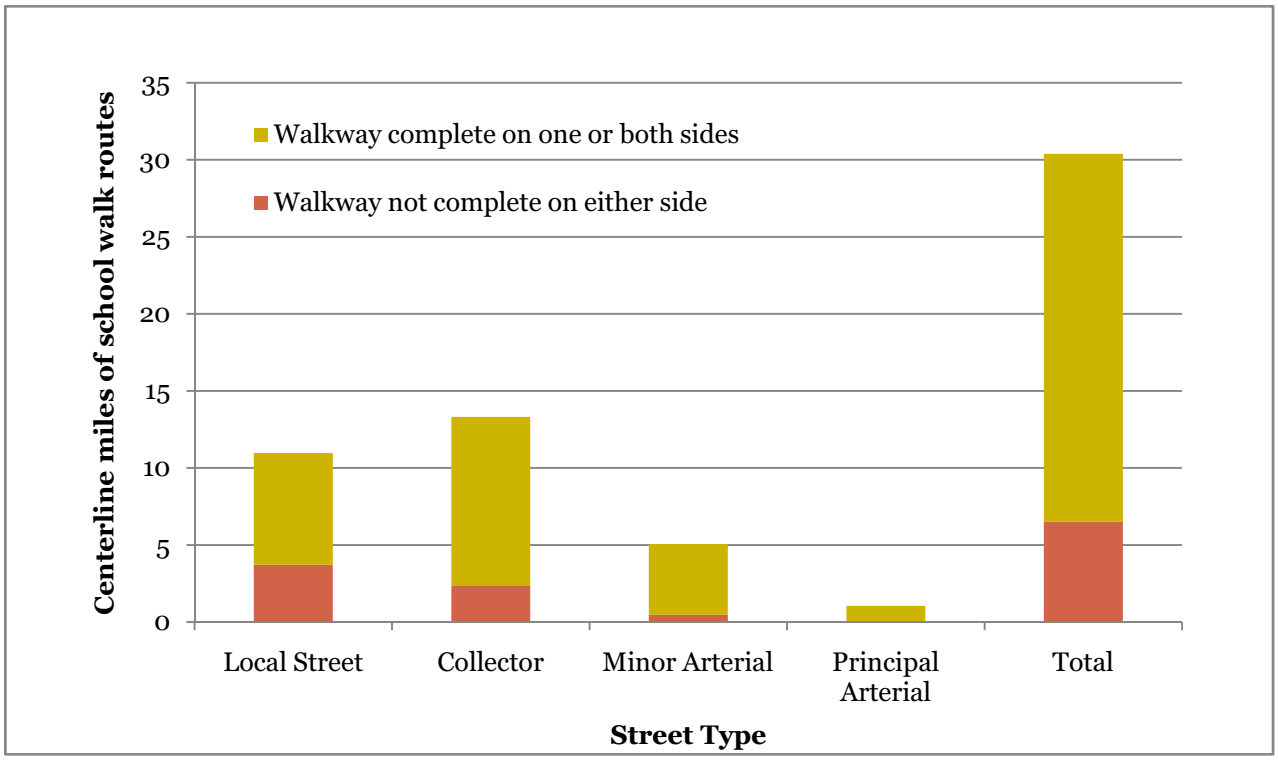


Figure 16 Detailed completion of school walk routes

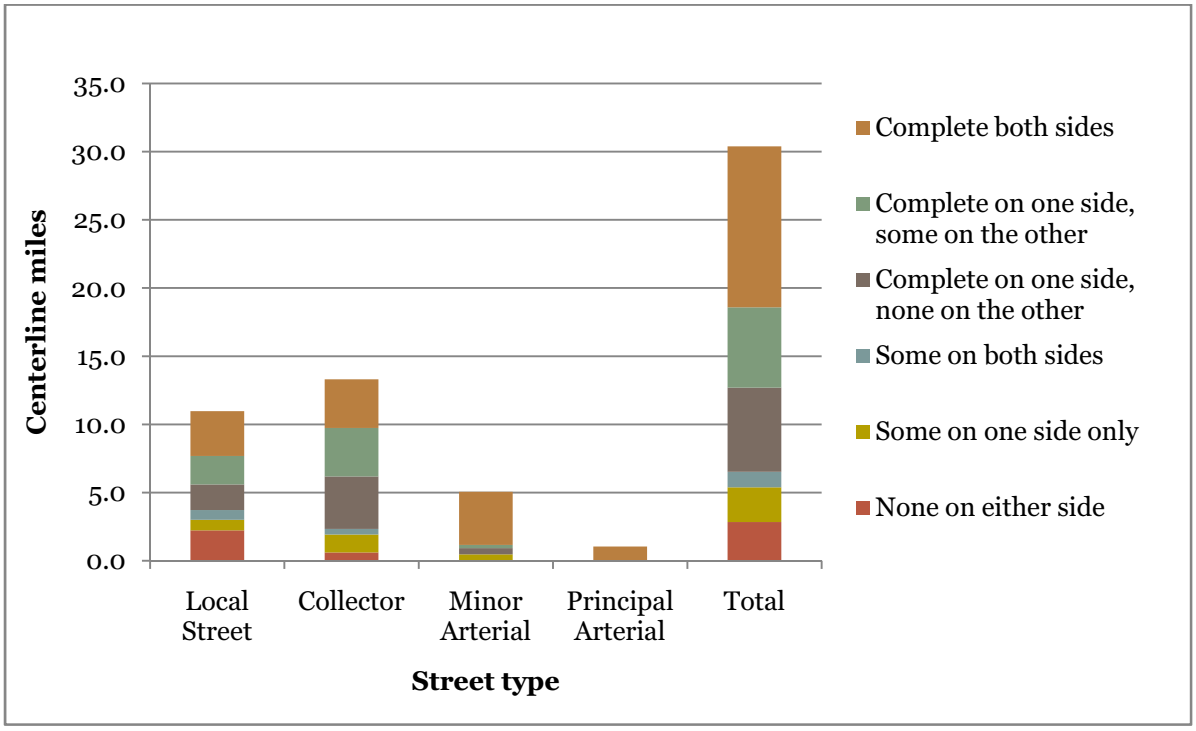


Figure 17 Detailed completion of school walk routes by street type; percentage

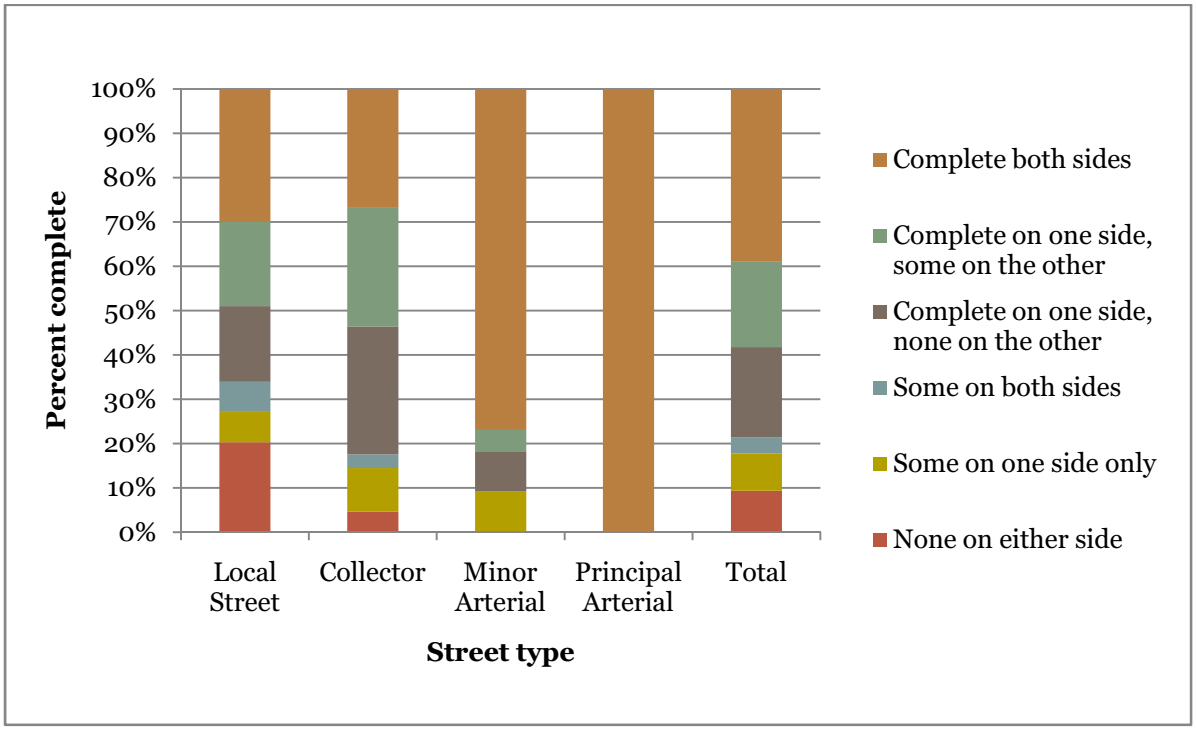


Table 5 Completion costs of school walk routes

Street type	Needed to complete one side of all segments		Needed to complete both sides of all segments	
	Length (mi)	Cost ($M)	Length (mi)	Cost ($M)
Principal Arterial	0.0	0.0	0.0	0.0
Minor Arterial	0.2	0.4	1.3	2.9
Collector	1.6	3.6	10.1	23.3
Local	3.2	7.4	10.0	22.9
Total	**5.0**	**11.3**	**21.4**	**49.0**

Cost estimate based on typical 2008 cost of $300/lin. ft for construction plus 35% of construction cost for project design plus 10% of construction cost as contingency. Estimate only, actual costs will vary.

MAINTENANCE

PEDESTRIAN FACILITIES

According to the Kirkland Municipal Code, sidewalk maintenance is the responsibility of the adjacent property owner. Nevertheless, the Public Works Department has several programs to address sidewalk maintenance.

Concrete sidewalks are constructed by forming separate panels of sidewalk each about 10' long. When the sidewalk is new, all the panels are at the same level, creating a smooth walkway. Tripping hazards are caused when these sidewalk panels shift relative to each other by ½" or more. An inventory of all the walkways in Kirkland was conducted in 2004. This survey indentified a number of offsets which have been corrected. When new problems are reported to the City several methods are used to remove the offset. The most common treatment is to grind a portion of the higher panel, but sometimes the entire lower panel is raised or material is placed on top of the lower panel to bring it up to the level of the higher panel.

Tree roots pushing on sidewalk panels is the cause of most of the offsets in the sidewalk system. Improper installation or damage by heavy vehicles can also cause offsets but this is rare. City policy is to protect the trees versus the sidewalk; in other words, trees are not removed because their roots are damaging sidewalks. There are several strategies that are used to accomplish this. Rubber sidewalk has been used as a pilot project; the rubber sidewalk is able to flex and maintain a smooth surface even when roots push on it. Asphalt is more

What does the Kirkland Municipal Code say?

Although the City has several programs that help property owners maintain sidewalk, the law holds adjacent property owners responsible for the cost of sidewalk maintenance. Here are the applicable section of the KMC:

19.20.020 Abutting property owner to maintain sidewalk in safe condition.

It shall be the responsibility of the owner of property abutting upon a public sidewalk to maintain the sidewalk at all times in a safe condition, free of any and all obstructions or defects, including but not limited to ice and snow. (Ord. 2654 § 1 (part), 1982)

19.20.030 Expense of maintenance and repair to be borne by abutting property and owner thereof.

The burden and expense of maintaining sidewalks along the side of any street or other public place shall devolve upon and be borne by the owner of the property directly abutting thereon. The abutting property owner shall also be responsible for performing and paying for sidewalk repairs to the extent the need for repairs is caused by the actions or omissions of the abutting property owner. (Ord. 4123 § 1, 2008: Ord. 2654 § 1 (part), 1982)

flexible than concrete and can also be used in areas where tree roots are damaging standard sidewalk. Simply moving the sidewalk so that it avoids trees is also sometimes possible.

Figure 18 Installation of rubber sidewalk panels on 103rd Avenue NE

In some cases, sidewalk panels themselves crack or otherwise deteriorate. In these cases, asphalt sections are sometimes used as an interim replacement for the damaged concrete. Concrete is restored as a component of the pavement maintenance program when the street pavement is overlaid. Currently, the Capital Improvement Program also includes $200,000 per year to make repairs to sidewalks.

Although they have a lower initial cost, the shorter life and therefore higher maintenance cost of asphalt paths give them a higher lifecycle cost than concrete sidewalks. Gravel paths have an even greater maintenance cost and are used only as a short term solution; typically where concrete or asphalt is to be installed soon or where special users such as horses need a softer surface.

The most common sidewalk maintenance complaints are about obstructions in the walkway. This is usually landscaping, brush, or tree branches that reach across the sidewalk. Because it is the responsibility of the adjacent property owners to maintain a clear sidewalk when the city receives a complaint that sidewalk is obstructed several steps go into resolution of the complaint. First the complaint is checked to see if it is a safety hazard that warrants immediate action. If it is, City staff removes the obstruction. If it is not an immediate hazard, a letter describing the problem is sent to the adjacent property owner. The letter explains that the property owner has two to three weeks to remove the obstruction. If the work is not done, a second letter is sent reminding the resident of their responsibility, setting a shorter time line, and stating that if not done, it will be removed by the City. About 75% of the complaints are taken care of by property owners within the allotted time. Goal G6 identifies treatments for reducing obstructions on sidewalks.

Waste and recycling containers are another common sidewalk obstruction. When specific blocking problems are reported, letters are sent by the City to the offending property owners. Mail boxes and parked cars can also be obstructions. The Public Works Department can often work with neighbors to change parking restrictions to eliminate parking blockages. Mailbox relocation can only be done with the approval of the Post Office. Relocation can be difficult because the Post Office has regulations that prohibit box relocation in some cases; for example to the other side of a street.

There are about 180 pathways and small connectors that are the maintenance responsibility of the City. These are the kind of facilities that make connections between cul-de-sacs for example. These are maintained semi annually or on a complaint basis depending on the amount of staff available.

Maintenance of in-pavement lights at crosswalks has proven problematic. Equipment from some manufacturers has not been durable and sometimes parts are not readily available. Sometimes, installations fail and cannot be put back in service without total replacement. Various substitute solutions can be put in place when this type of failure occurs, depending on the situation. These include overhead pushbutton-activated flashing lights. Figure 21 shows one such solution.

BICYCLE FACILITIES

Keeping bicycle lanes free of obstructions and free of debris is a major maintenance concern of cyclists and the City of Kirkland. On average, every street in the city is swept 11 times a year. The downtown area is swept 100 times a year. Downtown sweeping frequency increases in the summer when activity is highest and in the autumn when leaf debris can clog storm drains.

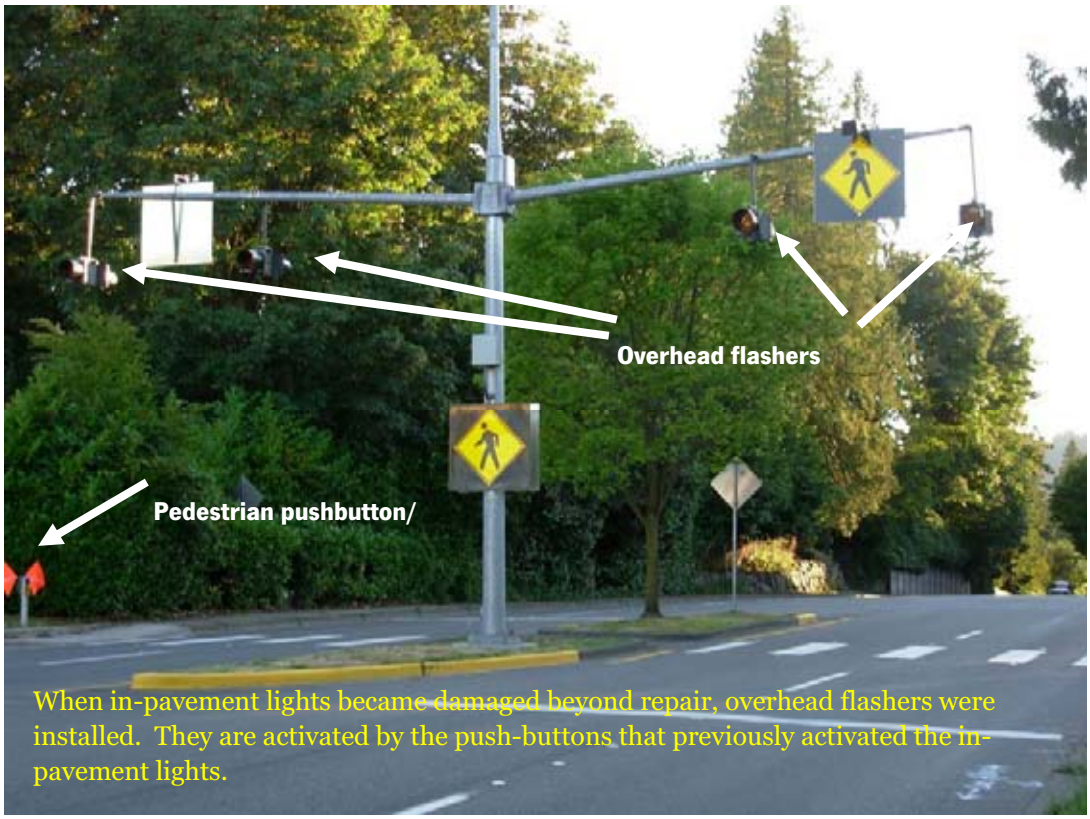
Although there is no special program to specifically sweep bicycle lanes, there is an active program that responds to specific complaints. Spot sweeping is performed on bicycle lanes whenever a focused complaint is received. Many requests of this type are handled each year.

Being detected at traffic signals is also a major concern for cyclists. Traffic signals in Kirkland should be able to detect bicycles. City technicians can respond and work with cyclists at any location where a problem is reported.

During periods of snow and ice, sand is sometimes used as a means of improving traction for cars and trucks. After the weather event, the leftover sand sometimes presents an obstruction in the area of the street where bicycles typically travel. Chemical deicers are being examined as an alternative to sand in part to help with this problem.

Small bumps and holes in the pavement that car traffic doesn't notice can still be a problem for cyclists. As with sweeping and traffic signal detection, pavement irregularities are also handled as they are reported.

Figure 19 Overhead flashers at a former site of in-pavement lights, NE 124th Street at 105th Avenue in Juanita



When in-pavement lights became damaged beyond repair, overhead flashers were installed. They are activated by the push-buttons that previously activated the in-pavement lights.

SECTION 3: EXISTING PLANS AND PROGRAMS

2001 NON-MOTORIZED TRANSPORTATION PLAN

System maps are at the heart of both the 2001 Non-Motorized Plan and its 1995 predecessor. These maps designated Priority One and Priority Two classifications for both bicycle and pedestrian facilities. In both Plans, the Priority One facilities were to be "given priority when selecting projects to construct" and the Priority Two facilities were to be "given priority during project selection, but to a lesser degree than Priority One Corridors". These priority routes were used to help rank CIP projects for funding and were used in development review to decide where bicycle facilities should be installed by new construction. Map 13 shows examples of the priority corridors.

The 1995 Plan used a measure of miles of facility per population to evaluate performance of the non-motorized system. The 2001 update replaced this with two new measures. The first was a measure of the number of miles of complete facilities within the priority system. Note that this is not a measure of all the sidewalks that have been constructed, only those on priority routes. The second was a measure of completeness, as measured by priority corridors that were complete along their entire length.

From previous Non-motorized Transportation Plans:

The 1995 Plan contained the following Mission Statement:

Mission Statement
To integrate non-motorized transportation throughout Kirkland as an essential element of our transportation system, recreation system and community.

From the 2001 Non-motorized Transportation Plan

"Priority One Corridors represent significant north-south and east west routes, both existing and potential. The spacing between Priority One Corridors is approximately 1/2-mile in the pedestrian system and approximately one mile in the bicycle system."

"Priority two corridors represent the next level of importance in non-motorized transportation connectivity. These corridors are approximately ¼ mile apart in the pedestrian system and ½ mile apart in the bicycle system."

COMPREHENSIVE PLAN

GENERAL

The Comprehensive Plan is a guiding document for the City of Kirkland because it establishes a vision, goals, policies, and implementation strategies for managing growth within the City's Planning Area over the next 20 years. All regulations pertaining to development (such as the Zoning Code, Subdivision Ordinance, and Shoreline Master Program) must be consistent with the Comprehensive Plan. There are 17 framework goals that provide the basic structure of the document. The Transportation Element of the Plan focuses on how the transportation system should be developed. Specifically, the Plan's framework goal 12 states:

> *FG-12 Provide accessibility to pedestrians, bicyclists, and alternative mode users within and between neighborhoods, public spaces, and business districts and to regional facilities.*

Map 13 Priority Pedestrian Corridors from 2001 Plan

PRIORITY CORRIDOR NETWORK FOR PEDESTRIAN PLANNING
Figure 4-1

4. PLANNING GUIDELINES

Within the Transportation Element there are several goals corresponding to the larger framework goal. The goal that most applicable to the Non-Motorized Plan is Goal T-2:

> *Goal T-2: Develop a system of pedestrian and bicycle routes that forms an interconnected network between local and regional destinations.*

Each goal has underlying policies that are designed to support meeting the goal. Goal T-2's policies are as follows:

> *Policy T-2.1: Promote pedestrian and bicycle networks that safely access commercial areas, schools, transit routes, parks, and other destinations within Kirkland and connect to adjacent communities, regional destinations, and routes.*
>
> *Policy T-2.2: Promote a comprehensive and interconnected network of pedestrian and bike routes within neighborhoods.*
>
> *Policy T-2.3: Increase the safety of the non-motorized transportation system by removing hazards and obstructions and through proper design, construction, and maintenance, including retrofitting of existing facilities where needed.*
>
> *Policy T-2.4: Design streets with features that encourage walking and bicycling.*
>
> *Policy T-2.5: Maintain a detailed Non-motorized Transportation Plan (NMTP).*

These policies have been taken into account as the existing pedestrian and bicycle networks have been developed and as this Plan was prepared. The Transportation Element of the Comprehensive Plan calls for a mode split of 65% drive alone/35% transit, carpool, walking and cycling trip, for PM peak hour trips between work and home, by 2022. This is the plan's level of service standard for transit.

NEIGHBORHOOD PLANS

The Comprehensive Plan contains a separate neighborhood plan for each neighborhood. Each neighborhood plan identifies bicycle and pedestrian routes in that neighborhood. For most neighborhoods, the majority of these routes follow the priority routes in the 2001 Non-motorized Transportation Plan. Some plans have not been updated in over 20 years, others have been updated recently. There is not a uniform understanding of what designation in the neighborhood plan means or requires.

As discussed in the previous section, earlier versions of this plan used a priority network to help prioritize construction of walking and cycling facilities. These priority networks could be updated based on information from the neighborhood plans. Up to 3% of a project's possible total points could come from presence in a neighborhood plan under the Project Evaluation process (page 64). Additional points could be awarded if a project were on a priority network. The proposed system for ranking projects for construction (see Section 5) does not directly take neighborhood plans into account. On the other hand, the proposed bicycle network and the bicycle networks in the neighborhood plans are largely coincidental, especially on higher volume streets. The other important function the neighborhood plans provide is specification of pedestrian connections (see page 67).

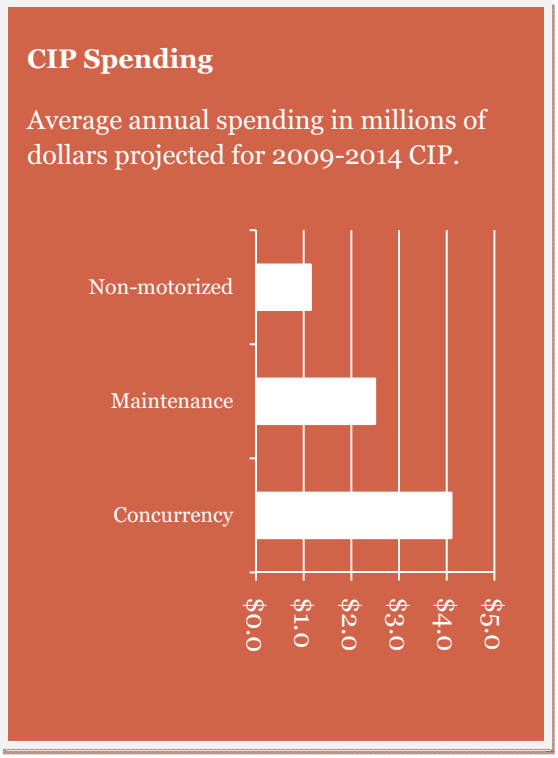
CAPITAL IMPROVEMENT PLAN

GENERAL

Kirkland's Capital Improvement Program (CIP) is updated and approved by City Council every two years. It contains a list of projects that the City plans to construct over a six year period. Bicycle and sidewalk projects that involve a construction cost of more than $50,000 are funded through the CIP (see Figure 22). For the period 1997-2007, almost $900,000 per year was spent form the Capital Improvement Program on construction of sidewalks, crosswalk improvements, sidewalk maintenance and wheelchair ramps. This doesn't include improvements that were part of larger roadway projects or routine maintenance.

PROJECT RANKING

Transportation projects can be divided into *capacity projects*; those projects that are intended to provide capacity for automobiles in order to meet specific concurrency[10] targets, *maintenance projects* such as pavement overlay and *non-motorized projects*. Non-motorized projects are prioritized for funding using the Transportation Project Evaluation (see Appendix D). In 1995, the City Council adopted a set of criteria which was developed by a citizen advisory committee for evaluating and prioritizing transportation projects. The Transportation Project Evaluation, criteria also known as the ad-hoc criteria (because the committee that formed them was nicknamed the Ad-hoc Committee) were then used in the City's Capital Improvement Program for two years to prioritize all of the proposed transportation projects. After two full CIP prioritization processes, the City Council reconvened the original committee to ascertain whether or not the resulting CIP projects reflected the desired outcome of the committee. After looking at the projects that were being funded in the CIP, the committee concluded that the projects did not provide enough recognition for school walk routes. As a result, the committee recommended, and the City Council approved, a modification to the criteria in May of 1998; the revised criteria gave additional points to sidewalk project proposals on identified school walk routes.



[10] Concurrency is a system which is intended to insure that auto capacity is built at a rate commensurate with the rate at which auto trips from new development are added.

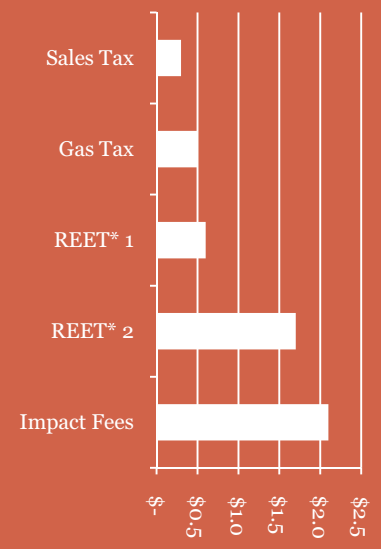
These modifications were included in the Transportation Project Evaluation process and have been used by staff to rate non-motorized projects for placement on the priority list and ultimately in the CIP. Although it was originally developed to rank all types of "non-roadway" projects, the evaluation criteria is now used exclusively for sidewalk projects.

The system uses six factors to rank projects (see Figure 23). Each project may receive up to 100 points:

- **Fiscal – (20 points possible)** What is the City's ability to leverage funding with other sources? Can grants be secured to extend the City's "purchasing" power?**Plan Consistency – (10 points possible)** How does the project compare with existing neighborhood or regional plans?**Neighborhood Integrity – (15 points possible)** What are the impacts that this project will have on the neighborhood that it is proposed for?
- **Transportation Connections – (15 points possible)** Will the proposed project fit into the network of the transportation system on a local/regional level? Are there nearby attractions that be served by this proposed project?
- **Multimodal – (20 points possible)** How does this project encourage alternate (non-single occupancy vehicle) forms of transportation?
- **Safety – (20 points possible)** What are the existing conditions as compared to the improvements proposed by the project?

CIP Revenue

Average Annual Current Revenue in millions of dollars projected for 2009-2014 CIP.



* REET is Real Estate Excise Tax.

Inputs for project scoring include whether or not the proposed project is on a Priority 1 or Priority 2 route as described in the 2001 Non-motorized Plan. This factor enters into the scoring of both the Plan Consistency and Transportation Connections categories. As discussed in Section 5, this Plan substitutes an evaluation of the pedestrian accessibility for each street and other factors for the priority network.

Figure 20 Cumulative CIP spending by transportation project type 1997-2007 (millions of dollars)

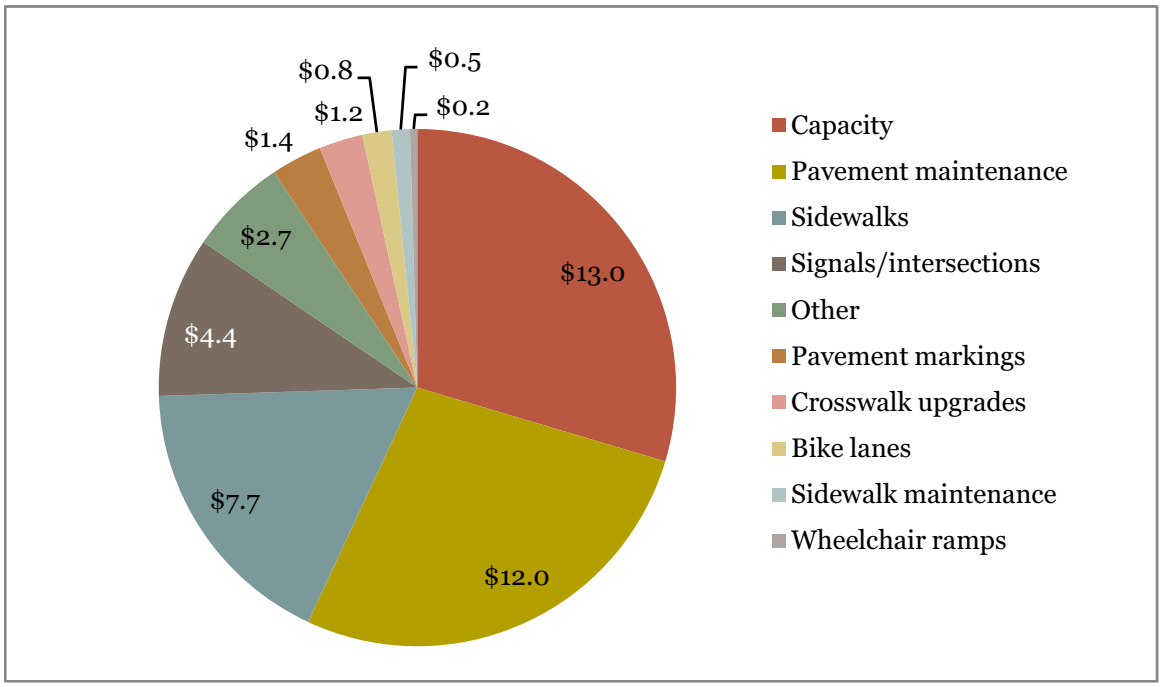
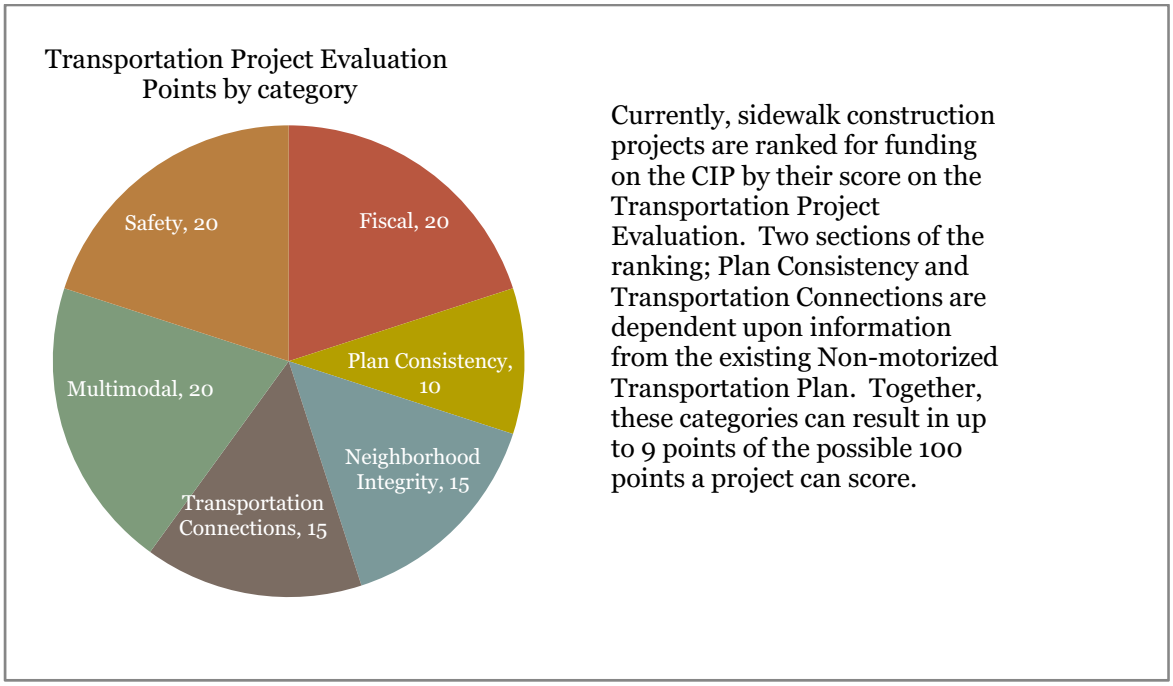


Figure 21 Relationship between previous plans and project evaluation

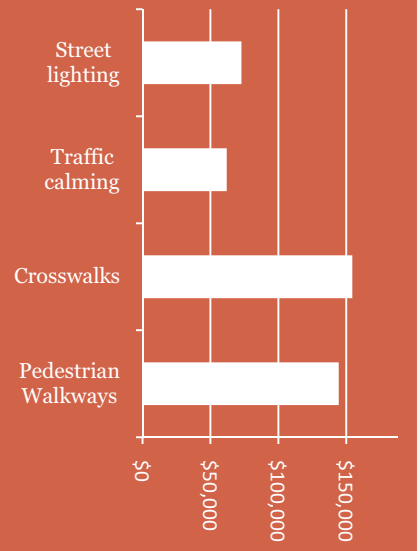


OTHER PROJECTS

In addition to projects specifically targeted for pedestrian or bicycle improvements, elements of benefit to walkers and cyclists are constructed through other roadway projects. For example, a street reconstruction project like the one that added a center turn lane on Slater Avenue north of NE 116th Street included bicycle lanes, sidewalks, planter strips, lighting and medians.

Figure 22 Crosswalk near the Casa Juanita senior housing facility. The crosswalk improvement program funded new islands, lighting and signing.

Neighborhood Connection spending for selected project types, 2000-2008



The Neighborhood Connection program enables neighborhood associations to fund projects of their choosing. Each neighborhood gets $50,000 every 3 years, to spend on projects, neighbors propose projects and vote on them. Some of the most popular projects support pedestrians.

Whenever a street is scheduled for a pavement overlay, the adjacent sidewalk is evaluated. Any sidewalk that needs replacement is replaced and accessible sidewalk ramps are installed (see Table 6). This work is funded from the pavement maintenance budget.

Table 6 Sidewalk and ramps constructed by pavement overlay program

YEAR	*Feet of 5' sidewalk*	*Number of accessible ramps*
2006	2266	47
2007	516	43
2008	461	27

If there is an in-pavement light installation at a crosswalk where pavement is being overlaid, the maintenance program removes and reinstalls the lights after the pavement is repaired.

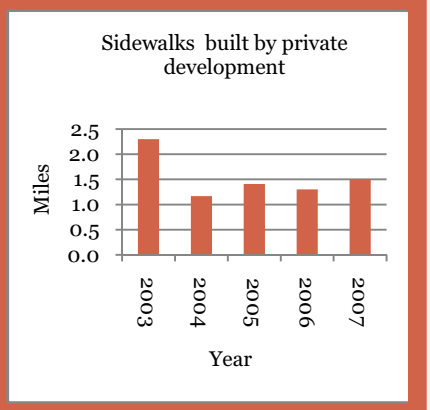
CIP funding supports a crosswalk improvement program. Recently, funding has been $70,000 every two years. This funding has been used to improve install in-pavement flashers and overhead signing at uncontrolled crosswalks (see figure 24).

DEVELOPMENT GUIDELINES

Kirkland's Zoning Code and Pre-approved Plans work together to describe when where and how non-motorized facilities are constructed in Kirkland. The Zoning Code describes *what* improvements must be made and the Pre-Approved Plans describe *how* improvements are to be made. Other sections of the Zoning Code specify other aspects of street design, for example districts where sidewalk width or planter strip width is required to be greater than usual.

Spending on sidewalks

Over the last 5 years, private development has built 7.4 miles of sidewalk



WHERE IS SIDEWALK REQUIRED?

Beginning in about 1985, builders of individual single family homes were not required to construct sidewalk along the frontage of their property. Instead, they signed a promise to fund future construction of the missing sections of sidewalk, called a concomitant agreement. This avoided construction of short "islands" of sidewalk. At the same time, the property owners were responsible for the cost of their sidewalk if the City "called" the concomitant within 15 years of its signing.

In 2000 as the concomitants began to reach their 15 year life, concomitant holders were given the choice to either build the sidewalk or sign a new 15 year agreement. The holders of concomitants felt this was unfair and the City Council agreed. While the issue was being studied, neither new concomitant agreements or new sidewalk were required.

After studying the issue, The City Council decided to do away with new concomitants and require builders of individual single family homes to build the sidewalk when the home is built. Even if an existing house is demolished and rebuilt. This new policy took effect in January of 2005.

Figure 23 A path (in green) connects the cul-de-sac on the left with the street on the right

There are currently three cases where sidewalks are not required as a part of new development. The most common case is on dead-end streets less than 300' long. Another case is on local streets in the equestrian overlay area near Bridle Trails State Park. Beginning in 2005, residents could vote to wave the sidewalk requirement on their street. This is the third case where sidewalk may not be required. City approval is required to enter into the voting process. Streets that make key pedestrian connections or that have the potential for a

substantial pedestrian trips or that are school walk routes are not eligible for the wavier process. Obtaining a waiver requires approval by 70% of the property owners on the street. This process is detailed in policy R-14 of the Pre-approved Plans.

CONNECTING PATHS

All new subdivisions are reviewed for possible pedestrian connections. Two cul-de-sacs can be connected by such a path, for example. These connections provide handy shortcuts for walkers and cyclists (see Figure 25) and sometimes allow them to avoid busy streets. Sometimes these connections are required in place of road connections. Because the need for connections depends on the context of the location and existing conditions, they are required on a case-by-case basis. Some of the neighborhood plans in the Comprehensive Plan describe connections that should be made (see page 62). The Kirkland Municipal Code authorizes the Public Works Department to require easements to be granted by developers. This same authority also allows the City to require sidewalks along private streets that connect with each other.

STREET WIDTHS

Chapter 110 of the Kirkland Zoning Code *Required Public Improvements* contains standards for how streets and sidewalks are to be developed. Chapter 110 describes street cross-sections and when facilities such as sidewalks and bicycle lanes are to be constructed within the right-of-way.

Local streets are 20', 24' or 28' wide (see Table 9). The width and cross-section elements on arterials and collectors are determined by the Public Works Director. For some streets; NE 132nd Street, NE 85th Street, 120th Avenue NE, 124th Avenue NE and 132nd Avenue NE, cross-sections are established in the Pre-Approved Plans. Other sections of the Zoning Code specify other aspects of street design, for example districts where sidewalk width or planter strip width is required to be greater than usual.

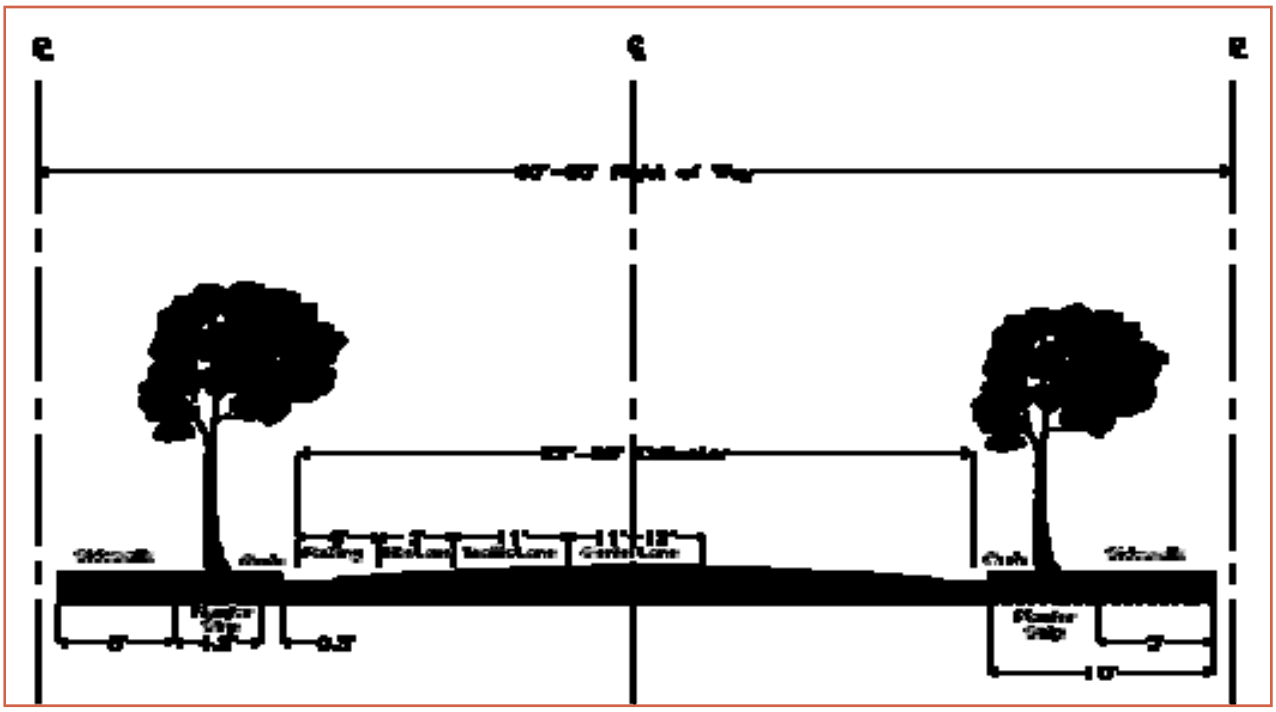
Table 7 Size and requirement for common street elements

Elements	Size	Required
Sidewalks	5' on most streets, 8' or 10' or other in business districts as identified in the zoning code, 7' on NE 85th Street.	Always except on short dead end streets and equestrian zones. Can sometimes be waived by residents on local streets.
Planter strip between curb and sidewalk	4.5' with 5' sidewalks, no planter strips on wider sidewalks.	Always, but planter strip requirement can be waived or modified if terrain is too steep.
Bicycle lanes	5' wide minimum with curb and gutter, 4' minimum with no curb.	Formerly on 2001 Non-motorized Transportation Plan priority routes, now on bicycle network when auto volume over 5000 vehicles per day.
Parking	6' wide minimum, 7' typical.	Case by case. Usually allowed both sides of street
Auto travel lanes	10' wide minimum, 11' typical.	Case by case depending on volume and street function.

Table 8 Common local street widths

Common local street widths		
Curb face to curb face width	***Parking allowed***	***Common application***
20'	Yes, one side only	Shorter, low volume
24	Yes, two sides	Standard
28	Yes, two sides	Higher volume, multi-family applications

Figure 24 Example of an illustration from Chapter 110 of the Kirkland Zoning Code



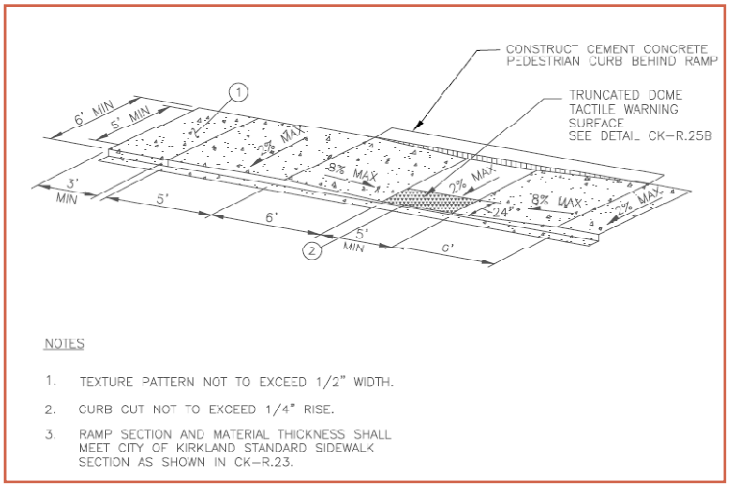
Recent research[11] shows that car lanes 10' wide do not have negative safety impacts as compared to wider lanes. Using 10' wide lanes often makes striping bicycle lanes possible on streets that would otherwise not accommodate them. Table 8 shows common sizes for various street elements.

PRE APPROVED PLANS

The City of Kirkland's Pre-Approved Plans describe common details of common construction projects. They exist to assure consistency across projects and to make plan preparation easier. The Pre-Approved Plans describe specifications for the placement and construction of items such as, driveway ramps in sidewalks, street tree wells, curbs and gutters and street lights. The Pre-Approved plans also contain policies on such items as driveway locations, signing, paving and right-of-way widths. The City's Public Works Department administers the Pre-Approved Plans.

[11] *Relationship of Lane Width to Safety for Urban and Suburban Arterials*, Potts, Harwood, and Richard. Transportation Research Record 2023, Transportation Research Board.

Figure 25 Sample drawing from Pre-approved Plans showing how to construct a mid-block sidewalk ramp



STREET DESIGN GUIDELINES

Design Guidelines for Pedestrian Oriented Business Districts sets forth a series of design guidelines, adopted by Section 3.30 of the Kirkland Municipal Code, that are used by the City in the design review process. The Design Review Board uses these guidelines in association with the Design Regulations of the Kirkland Zoning Code. Figure 28 is a page from the Design Guidelines that illustrates its contents.

CROSSWALK REVIEW

As a result of the 2003 study of crosswalk safety by the Transportation Commission, the following principles were developed for establishment of uncontrolled crosswalks in Kirkland.

1. The North Carolina ranking system is valid. Therefore, all other things being equal, crosswalks are improved in the order: N then P then C. Within a particular category, crosswalks are ranked for improvement by traffic volume, then by number of lanes and then by speed limit. No ped crossings are placed on routes with vehicular volumes of greater than 30,000 without a signal.
2. Crosswalks that have any pedestrian crashes in the past five years and three or more crashes in the past 10 years are an crash problem and rate higher for removal or for improvement.
3. All other things being equal, crosswalks that make connections to routes on the pedestrian network as described in the Non-Motorized Plan should be considered for improvement first.
4. School crosswalks are only on accepted school walk routes. SN, SP and SC crosswalks are treated as non-school N, P and C crosswalks respectively. Favor improvements on school routes.
5. Improved crosswalk spacing on arterials of 1200' or less is desirable and a general minimum is 400'.
6. Lighting at crosswalks should be analyzed and a plan for improvement should be developed independent of other improvements.
7. Basic improvements beyond lighting are applied in the order 1) islands 2) flashing crosswalks 3) overhead signs 4) signals (half, full, etc).
8. All N rated crosswalks should have at least an island. If an island is not feasible, the crosswalks should be seriously considered for removal. Only if removal is not feasible should improvements other than an island be considered first.
9. Removal is an option if technical and non-technical factors are met.
10. Warrants for pedestrian signals are driven by gaps, not necessarily by the MUTCD volume warrants.

Figure 26 Page 2 of the Design Guidelines for Pedestrian Oriented Business Districts

Kirkland Design Guidelines

The drawing below illustrates many of the design Guidelines described in this appendix

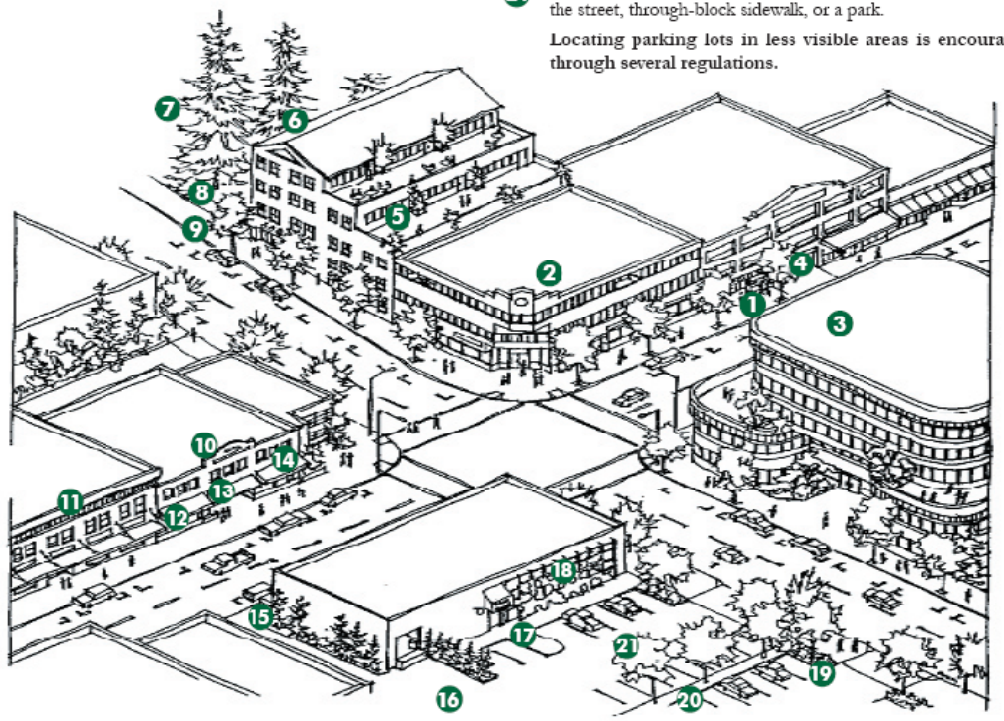
1. Pedestrian plazas and places for vendors encouraged through several regulations.
2. Buildings on corner lots may be required to incorporate an architectural or pedestrian-oriented feature at the corner. Many options are possible including plazas, artwork, turrets, curved corners, etc.

   Special architectural requirements placed on use of concrete block and metal siding.
3. "Architectural scale" requirements direct large buildings to fit more comfortably with neighboring development. This example employs building setbacks, decks, curved surfaces, and recessed entries to reduce appearance of building mass.
4. Parking garages on pedestrian-oriented streets or through-block sidewalks may incorporate pedestrian-oriented uses or pedestrian-oriented space into front facades.

   Street trees required along certain streets.
5. Human scale features such as balconies or decks, bay windows, covered entries, gable or hipped rooflines, multiple paned windows, or pedestrian-oriented space may be required.
6. More flexible method of measuring building height on slopes.
7. New policies regarding tree protection and enhancement of wooded slopes.Standards for size, quantity, quality, and maintenance of landscape plant materials are set by the Zoning Code.
8. Standards for size, quantity, quality, and maintenance of landscape plant materials are set by the Zoning Code.
9. Standards are set for pathway width, pavement, lighting, and site features on required major pathways and public properties.
10. A building cornerstone or plaque may be required.
11. Covering up existing masonry or details with synthetic materials is restricted
12. Ground story facades of buildings on pedestrian-oriented streets or adjacent to parks may be required to feature display windows, artwork, or pedestrian-oriented space.
13. Pedestrian weather protection required on pedestrian-oriented streets.
14. Architectural detail elements such as decorative or special windows, doors, railings, grillwork, lighting, trellises, pavements, materials, or artwork to add visual interest may be required.

    Size of parking lots abutting pedestrian-oriented streets may be restricted.
15. Quantity and locations of driveways are regulated.
16. Visible service areas and loading docks must be screened.
17. Provision for pedestrian circulation is required in large parking lots.
18. Blank walls near streets or adjacent to through-block sidewalks must be treated with landscaping, artwork or other treatment.
19. Screening of parking lots near streets is required.
20. Standards for curbs, signing, lighting, and equipment are set for parking lots
21. Internal landscaping is required on large parking lots visible from the street, through-block sidewalk, or a park.

    Locating parking lots in less visible areas is encouraged through several regulations.



PEDESTRIAN AND CYCLIST COUNTS

In late September and early October of 2008, the Washington State Department of Transportation contracted with the Cascade Bicycle Club to count the number of pedestrians and cyclists throughout Washington. The Washington Department of Transportation (WSDOT) Bicycle and Pedestrian Documentation Project is a statewide effort sponsored by WSDOT, conducted in conjunction with the National Bicycle and Pedestrian Documentation Project. Six locations in Kirkland were included in the survey, which was performed by volunteers (see Table 10). This data should be replicated and improved upon in future years as noted in Goal G2.

Table 9 Cyclist and Pedestrian counts, fall 2008

Site	*date*	*Cyclists heading*					*Pedestrians heading*				
		North	South	East	West	**Total**	North	South	East	West	**Total**
						AM					
1	9/30	5	12	8	0	**25**	6	20	33	33	**92**
2	No Data										
3	9/30	2	7	0	0	**9**	0	1	0	0	**1**
4	10/1	0	0	10	8	**18**	0	0	17	14	**31**
5	9/30	0	0	11	7	**18**	0	0	20	4	**24**
6	10/2	0	0	8	4	**12**	0	0	5	17	**22**
						PM					
1	10/2	7	4	0	2	**13**	26	14	9	21	**70**
2	10/2	36	21	0	0	**57**	58	55	0	0	**113**
3	No Data										
4	10/1	0	0	5	5	**10**	0	0	16	6	**22**
5	No Data										
6	10/2	1	5	3	5	**14**	6	3	5	9	**23**

Site 1 -100th Avenue NE South of NE 132nd Street
Site 2 -Market Street north of Central Way
Site 3 -116th Avenue NE north of Kirkland/Bellevue city limit (south of NE 41st street)
Site 4 -NE 70th Street west of 122nd Avenue NE
Site 5 -NE 100th Street on pedestrian/bicycle bridge over I-405
Site 6 -NE 116th Street west of 124th Avenue NE

AM count periods 7:00-9:00, PM count period 4:00-6:00. PM at Site 6, 5:30-6:30

WASHINGTON STATE DEPARTMENT OF TRANSPORTATION PLAN

The Washington State Department of Transportation recently completed an update to the *State Bicycle Facilities and Pedestrian Walkways Plan*[12]. State law (RCW 47.06.100) calls for the Washington State Bicycle Facilities and Pedestrian Walkways Plan to include strategies for improving connections, increasing coordination, and reducing traffic congestion. It also calls for an assessment of statewide bicycle and pedestrian transportation needs.

Because I-405 is the only route in Kirkland which is maintained by the State, the major impact of State projects in Kirkland is at interchanges with I-405. These interchanges are important because they are some of the most difficult locations for biking and walking in Kirkland. Funding for these projects is not driven by needs for pedestrian and bicycle facilities, but updated bicycle and pedestrian facilities are included when they are built. There is currently a funded plan to complete the reconstruction of the NE 116th interchange and to add a new interchange at NE 132nd Street. Both of these projects will improve facilities for walking and biking in the vicinity of those interchanges. Because of their physical proximity, reconstruction and modernization of the NE 85th and NE 70th Street interchanges is envisioned in the I-405 Master Plan[13] as a single project. It is not currently funded.

TRAFFIC CONTROL DURING CONSTRUCTION

Provision of safe passage for pedestrians and cyclists is an important part of traffic control through construction work zones. The necessary level of the control depends on several factors. One is the functional classification of the road on which work is being performed. Arterials require the highest level of planning and control. Higher volume collectors require more control than do low volume collectors and local streets. The level of pedestrian and cyclist use on the facility under construction is also a factor that determines the sophistication necessary in a traffic control plan. Finally, the duration of the construction is also factored into work zone planning; short duration work does not require as much as longer term projects do. The *Manual on Uniform Traffic Control Devices*[14] serves as a guide for designing work zone traffic control. Construction zones can be barriers to pedestrians and this is addressed in Objective G6.1.

OTHER PROGRAMS

POLICE DEPARTMENT PEDESTRIAN STINGS

Police crosswalk stings are targeted at drivers that violate crosswalk laws. A police officer dressed in plain clothes enters the crosswalk when drivers are far enough from the crosswalk to have adequate stopping distance and notice. If drivers do not stop for the crossing officer, other officers on motorcycles are positioned so that they can easily stop and cite the offending motorist. The Kirkland Police Department runs stings several times a year.

7 HILLS OF KIRKLAND

[12] The plan is available at www.wsdot.wa.gov/BIKE/PDF/BikePedPlan.pdf

[13] The Washington State Department of Transportation has more information on the I-405 projects and plans at www.wsdot.wa.gov/Projects/I405/

[14] A full version of the Manual is available at www.mutcd.fhwa.dot.gov

Seven Hills of Kirkland[15] is a cycling event which raises funds for Kirkland Interfaith Transitions in Housing. It begins and ends in Marina Park and draws over 1000 cyclists to Kirkland each Memorial Day. The route includes portions of Market Street, Lake Washington Boulevard, NE 70th Street and 116th Avenue NE.

WALK YOUR CHILD TO SCHOOL WEEK

Figure 27 Walk your child to school week at AG Bell School

Each fall, the Kirkland Public Works Department sponsors Walk Your Child to School Week. Kirkland is part of the nationwide event[16] aimed at encouraging children to try walking to school and to recognize those who walk throughout the school year. Each elementary school organizes their own events and one day during the week, hosts City elected officials and staff to help celebrate walking to school.

BIKE TO WORK MONTH

The Cascade Bicycle Club sponsors Bike to Work Month each May. One Friday of the month is designated as Bike to Work Day, and commuter stations are set up all over the region, including at Marina Park in Kirkland. The Kirkland station is manned by City of Kirkland staff, at least one interested citizen and a technician from a local bicycle shop. Snacks and prizes furnished by Cascade are distributed to riders who choose to stop. In 2008, over 200 cyclists visited the Kirkland station.

ACTIVE LIVING TASK FORCE

The Active Living Task Force (ALTF), created in 2007, is comprised of residents, representatives from community agencies and local businesses, along with City staff. The vision for ALTF is community design, services and programs to enhance our quality of life by making it safe, enjoyable and easy for everyone to be physically active in their daily lives. The mission of the ALTF is to advise Kirkland policy makers, advocate and provide support for local strategies aimed at promoting community-enriched physical activity as an integral part of everyone's daily life.

SENIOR STEPPERS

Figure 28 Senior Steppers

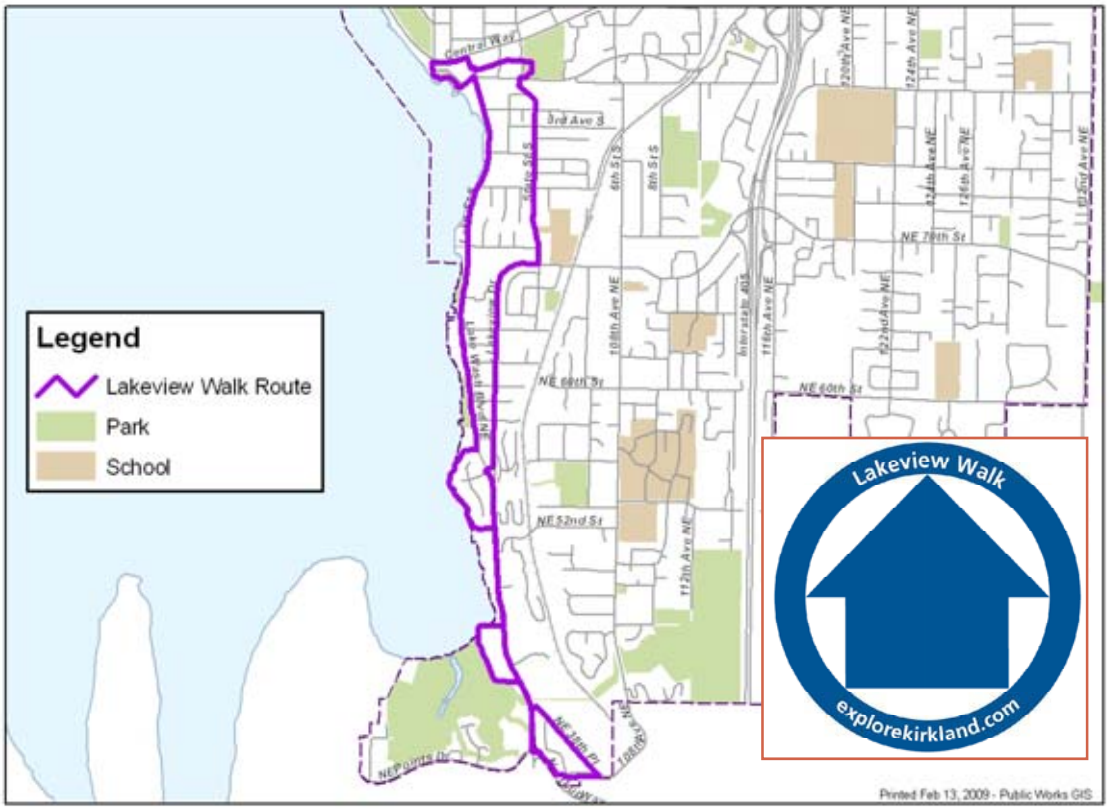
The Kirkland Parks and Community Services Department manages the Senior Steppers program. The program was developed to encourage otherwise sedentary adults age 50+ to walk regularly for fun and fitness. Each year 170-200 participants, ranging in age from 48 to 96 register to walk with the "Kirkland Steppers". They range in ability from long-time walkers to those who are just beginning to seek regular. Walkers are given a bright fluorescent program t-shirt and on any given Tuesday and Thursday throughout the summer, a sea of brightly-clad walkers roam the streets of downtown Kirkland and neighborhood parks. Many of the walkers continue to walk together throughout the year, rain or shine.

[15] More information about the 7 Hills event can be found at www.7hillskirkland.org/
[16] More information about the national walk your child to school program can be found at www.walktoschool.org/

SIGNED WALKS

The Lakeview walk is a signed route that forms a loop in the southwest area of Kirkland (see Map 14). It passes along the lakeshore and in through the Lakeview and Moss Bay neighborhoods, from the city's southern boundary to downtown. Wayfinding arrows direct pedestrians along the route. The route was designed by the Interlaken Trailblazers Volkssport Club[17] and is also a Volksmarch walk. Additional walks with coordinated wayfinding are planned for other parts of the city.

Map 14 The Lakeview walk route. Special signs (lower right) guide walkers along the route



COMMUTE TRIP REDUCTION PROGRAMS

The State of Washington's CTR law requires large employers to institute programs to encourage employees to walk, bicycle carpool and use the bus to get to work. At any given time, there are between 10 and 20 such employers in Kirkland including Evergreen Healthcare, Kenworth Truck and City of Kirkland. Some employers offer cash payments to those who walk or bicycle and some have less generous benefits. The City of Kirkland contracts with King County Metro Transit to support CTR employers in Kirkland. Metro fills this role with other cities as well, and has access to a wide range of resources to draw upon to help employers meet their goals.

[17] More information about the Interlaken Club can be found at http://www.ava.org/clubs/interlaken/

TRAFFIC CALMING

Severity of pedestrian injuries is closely linked to the speed of the vehicles involved, with the potential for death rising steeply as vehicle speeds pass 30 mph. Research shows that it is not possible to significantly change travel speeds by changing the posted speed limit. In 1993, Kirkland started a formal program for neighborhood traffic control in an attempt to reduce speeds on local streets. In response to citizen requests and with the support of neighbors, traffic control devices such as speed cushions, chokers and small traffic circles have been built in almost every neighborhood. Traffic calming on arterials usually takes the form of radar signs that provide information to drivers about their speed in real time. Although pedestrians have widely supported traffic calming, some cyclists have reported difficulty with certain types of traffic control devices. The main complaint is that the devices force cars into space normally occupied by cyclists. Traffic calming devices are located on low volume streets and the reduced speed of cars is helpful to cyclists.

Figure 29 Traffic calming devices in neighborhoods slow traffic but sometimes require cyclists and drivers compete for the same space.

COMPLETE STREETS ORDINANCE

At the prompting of the Cascade Bicycle Club, the City of Kirkland enacted Washington's first Complete Streets ordinance in September 2006. The City Council asked the Transportation Commission to develop an ordinance for Council's consideration. After a brief period of working with the bicycle club, an ordinance satisfactory to all was proposed by the Commission and passed enthusiastically by City Council. Passage of the ordinance did not result in major changes in the way projects were designed and constructed because the City of Kirkland has been using a Complete Streets approach for a number of years. However, codification of this commitment is helpful to further institutionalize consideration of all users.

Complete Streets

Section 19.08.055 of the Kirkland Municipal Code is Kirkland's "complete streets" ordinance.

(1) Bicycle and pedestrian ways shall be accommodated in the planning, development and construction of transportation facilities, including the incorporation of such ways into transportation plans and programs.

(2) Notwithstanding that provision of subsection (1) of this section, bicycle and pedestrian ways are not required to be established:

(a) Where their establishment would be contrary to public safety;

(b) When the cost would be excessively disproportionate to the need or probable use;

(c) Where there is no identified need;

(d) Where the establishment would violate comprehensive plan policies; or

(e) In instances where a documented exception is granted by the Public Works Director. (Ord. 4061 § 1, 2006)

STAFFING

TRANSPORTATION COMMISSION

The Transportation Commission is one of the several Boards and Commissions that is appointed by the City Council. The Transportation Commission is unique because its bylaws specifically call for appointment of

transportation experts to some of the board positions. Seven commissioners serve four year terms. The Commission also has a youth member that serves a 2 year term. The Commission usually meets once a month and deals mostly with transportation policy issues. Information about the Commission and its upcoming meetings is posted on the City website (Boards and Commissions>Transportation Commission)

PUBLIC WORKS DEPARTMENT

Staffing for walking and cycling programs is a responsibility shared in part by every City Department. Most programs are coordinated by the Public Works Department including planning, design, construction, operation and maintenance of walking and cycling facilities.

KIRKLAND WALKS TEAM

The Kirkland Walks team was formed in 2007 and is made up of representatives from the Police, Parks, Public Works, Information Technology and City Manager's Departments. The purpose of the team is to develop programs to increase pedestrian safety. Members of the group have worked together to produce several videos that run on Kirkland's community television channel. Each of the videos has won one or more awards.

INTERAGENCY PARTNERSHIPS

The City of Kirkland has good communications with its neighboring jurisdictions on matters of cycling and pedestrian planning. Representatives from Kirkland, Redmond and Bellevue held joint meetings to coordinate development of their non-motorized transportation plans. The three cities regularly confer on regional transportation issues such as reconstruction and operation of I-405 and SR 520.

SECTION 4: ONLINE SURVEY RESULTS

In the summer of 2007, online surveys were conducted as a part of the development of this Plan. The survey was not intended to be a statistically valid. Instead, it was to take the place of the normal open house where only a small number of participants might be able to take part. Two surveys were available, one for pedestrians and one for cyclists. Respondents indicated their top three attributes for prioritizing construction of new facilities. They were also asked how often they cycled and walked by purpose. By asking questions about the best and worst places to walk and cycle, information about preferences and needs for improvement were obtained. This information is described below. More details about the survey are located in Appendix A.

PEDESTRIAN SURVEY

In the pedestrian survey respondents were asked:

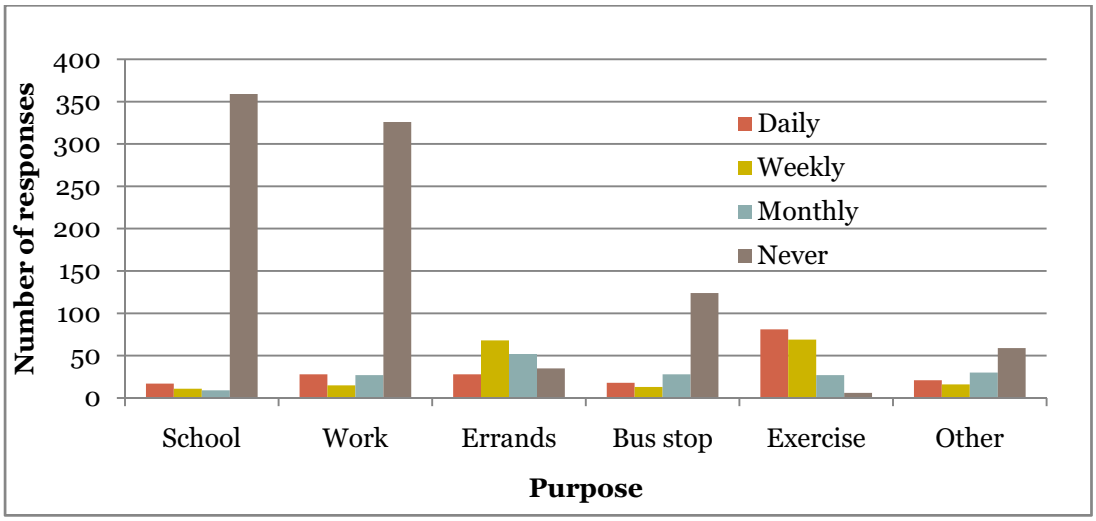
> *How often do you walk/run in Kirkland? For each purpose below indicate the frequency that BEST describes how often you walk. Here are some examples: if you do an activity on weekdays only, choose daily. If you do an activity 3 times a month, choose monthly. If you do an activity once or twice a week, choose weekly.*

Respondents were asked to select *daily, weekly*, *monthly* or *never* for each of the following walking trip types:

- all the way to school
- all the way to work
- to run errands like shopping, etc.
- to the bus stop for work or school
- for exercise/fitness/pleasure
- other

Results for this question are shown in Figure 32. Among those who responded to the survey, Exercise/fitness/pleasure is by far the most common trip type. Note that walking to perform errands is also an important trip type for survey respondents.

Figure 30 Frequency of walking trip by purpose as reported by survey respondents



Those responding to the walking survey were also asked:

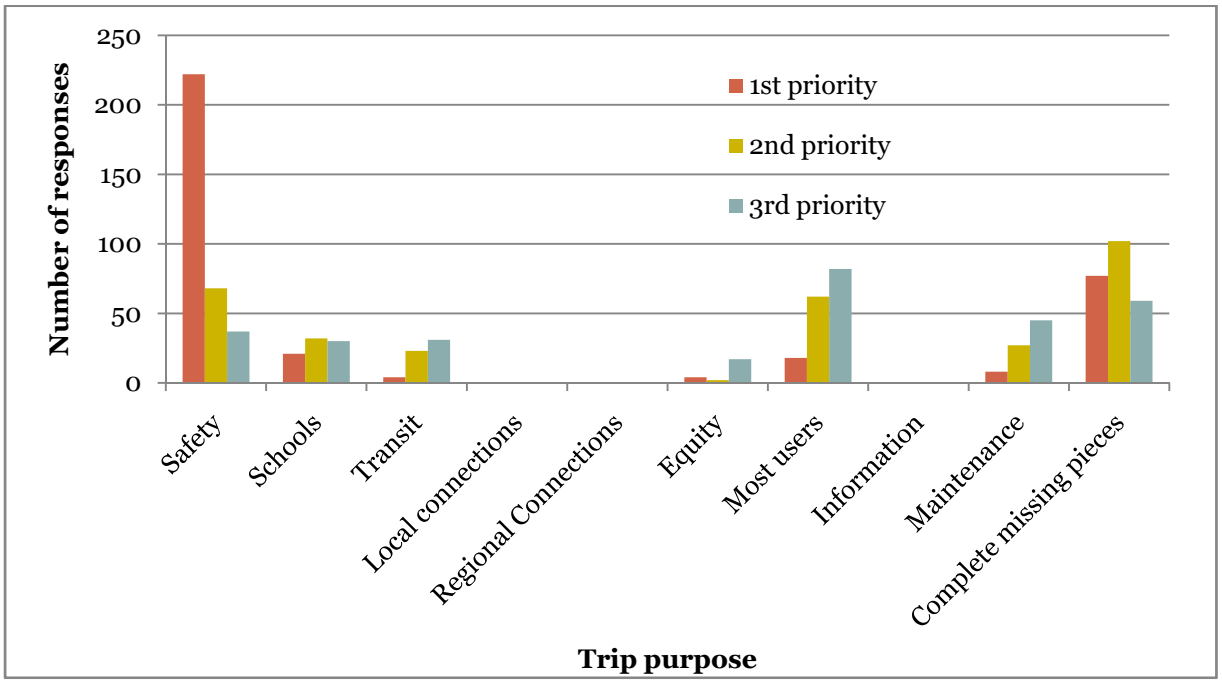
> *What factors should be used to prioritize construction of pedestrian improvement projects? Indicate how highly each factor should rank when determining funding priorities*

A list of possible choices was shown in a drop down menu for each of the first, second and third highest priorities. The choices for priorities were explained in the survey as:

- **Safety -** Address locations where crashes have occurred. This includes street lighting improvements.
- **Complete missing pieces** - Create longer continuous walkways
- **Most users** - Build facilities that will serve the most users
- **Connections** - Facilitate pedestrian travel to shopping, restaurants and other services
- **Equity** - Spend similarly in various neighborhoods
- **Transit** - Increase easy walking access to Metro bus stops
- **Schools** - Build projects near schools and that access school bus stops
- **Maintenance** - Maintain existing pedestrian facilities

Figure 33 shows that by far safety is the most important criteria by which projects should be ranked. Respondents also felt strongly about constructing projects that fill in gaps in the sidewalk, and the criteria with the highest number of votes for the third priority was projects that serve the most users.

Figure 31 Priorities for selecting criteria by which pedestrian improvement construction projects should be evaluated



For the optional question:

> *Where are the most problematic locations for walking in Kirkland? Be as specific as possible.*

Figure 34 shows the major categories respondents chose to answer this question. These responses when looked at in combination with responses in Figure 35 to the question:

> *Tell us more about anything that would make walking in Kirkland easier for you. Subjects could include:*
> *• Any walking/running issues you've always wanted to comment about. • Questions or comments about walking facilities or programs. • Things that you've seen elsewhere that you would like to see in Kirkland.*

show that general concerns about sidewalks and crosswalks in a variety of areas are of most concern to pedestrians. In general, there was a strong desire for more sidewalks in all areas of the City. Other areas where there were a group of similar concerns included:

- The intersection of NE 116th Street/Juanita Drive and 98th Avenue NE
- Crossings of I-405 on NE 85th Street and NE 124th Street.
- Clearing of obstructions such as trees and leaves on sidewalks
- Policy for requiring construction of sidewalk along street frontages of new homes.

Figure 32 Responses to the question: Where are the most problematic locations for walking in Kirkland? Sorted by major category

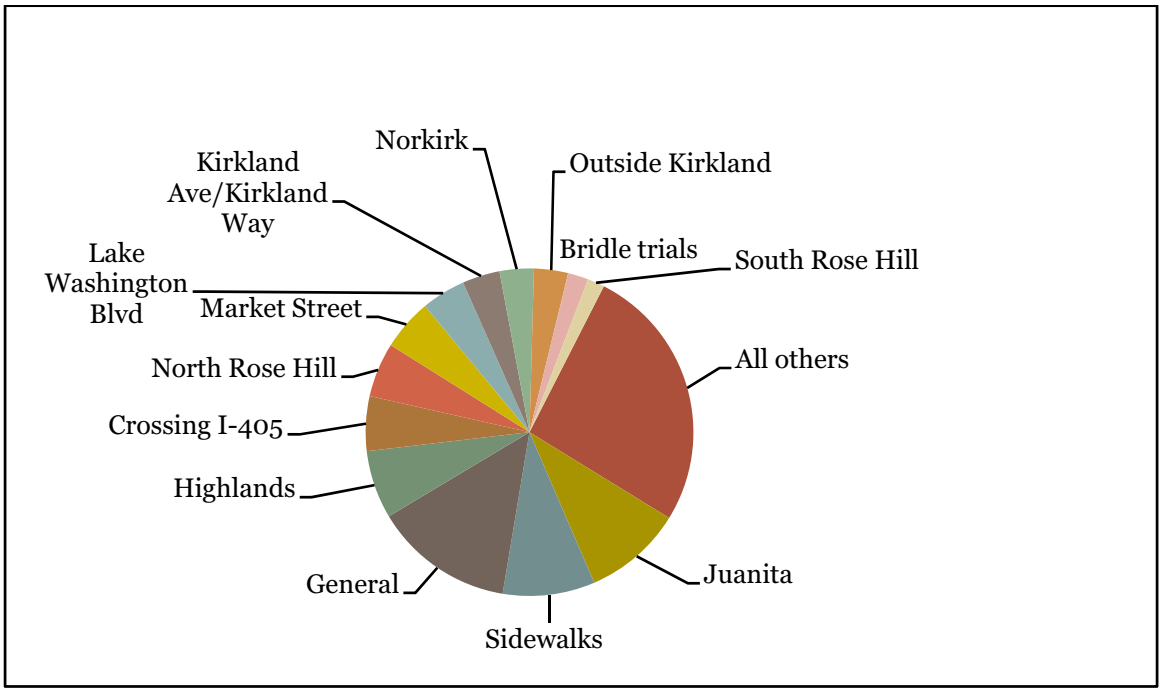
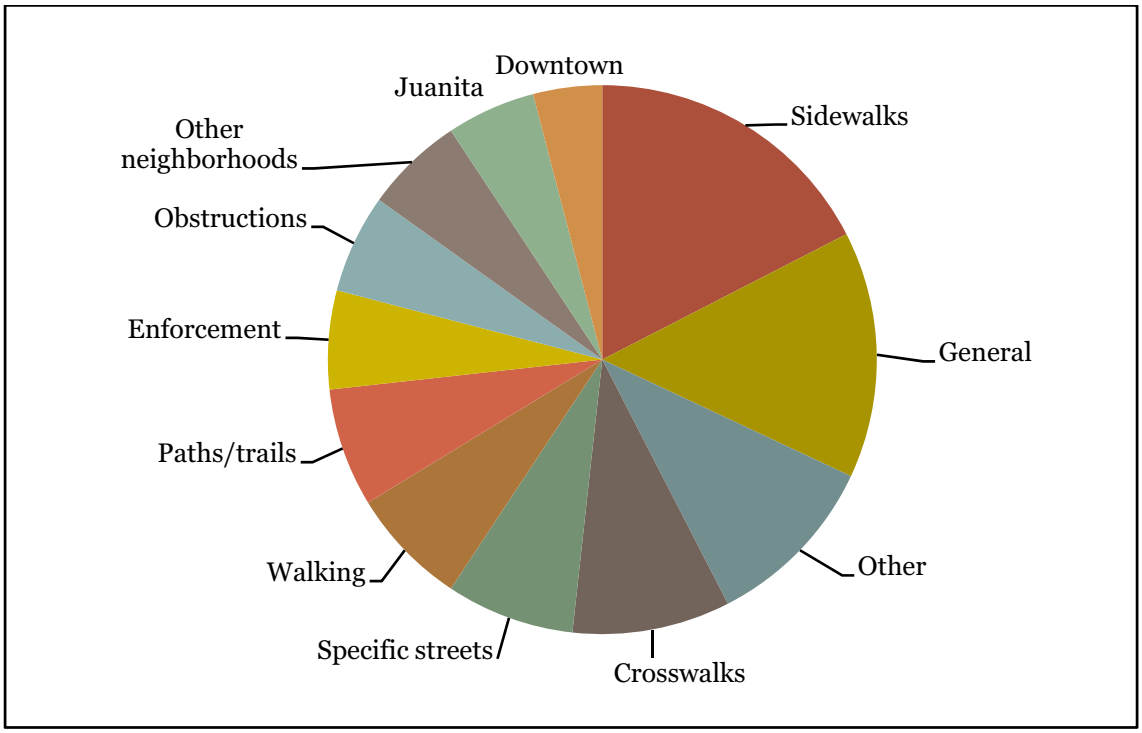


Figure 33 Responses to the question: Tell us more about anything that would make walking in Kirkland easier?



Responses to the question:

Where is an excellent location for walking in Kirkland? Be as specific as possible.

were the clearest of any of the questions asked. Combining the number of responses choosing the Lakefront, downtown and Parks accounts for over 60% of the total responses as shown in Figure 36.

As mentioned above, the on-line survey was not intended to be statistically valid but to serve as option to an open house with the hope that access would be greater. As can be seen in Figure 37, about twice as many woman responded to the pedestrian survey as did men. Statistically valid surveys show that nationally, woman and men make walking trips at about the same rate. Relative to national statistics[18], respondents to the survey fall disproportionately in the 30-49 year old age group. Nationally, about the same amount of walking takes place among all ages from 16 to 64.

The results of the survey shaped the prioritization system for sidewalk construction projects as well as the programmatic elements of the Plan. Prioritization is discussed further in Section 5.

[18] National survey of Bicyclist and Pedestrian Attitudes and Behavior, Volume 1 Summary Report, August 2008, National Highway Traffic Safety Administration.

Figure 34 Responses to the question: Where is an excellent location for walking in Kirkland? Grouped by location.

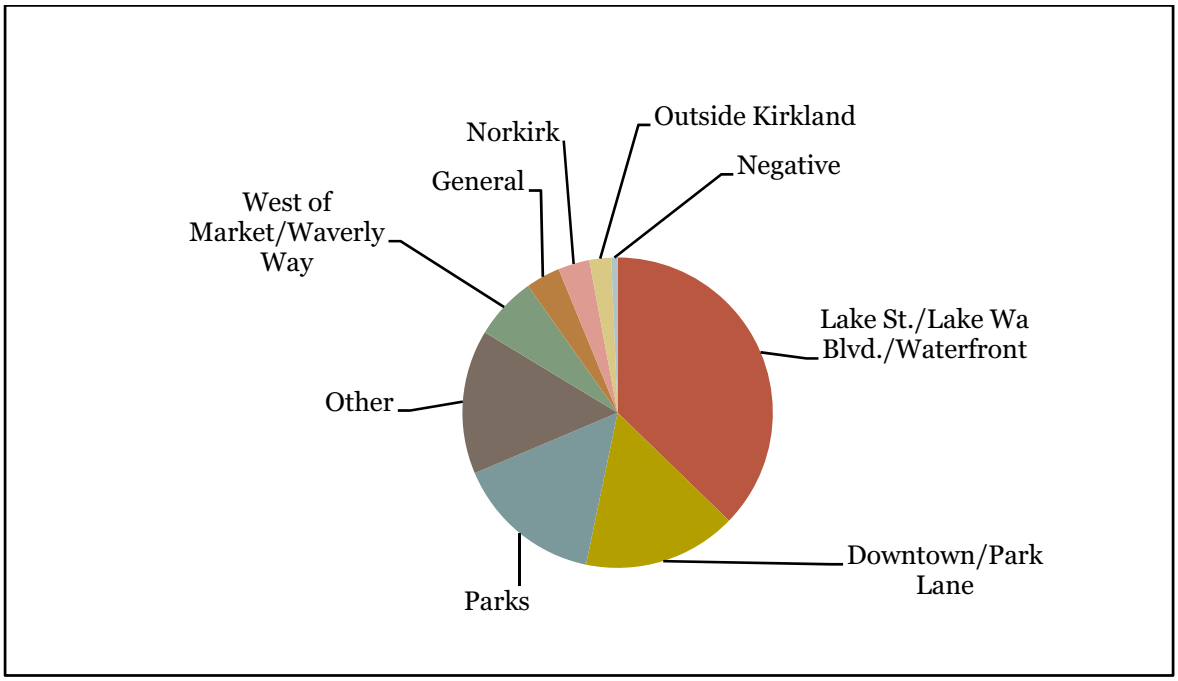
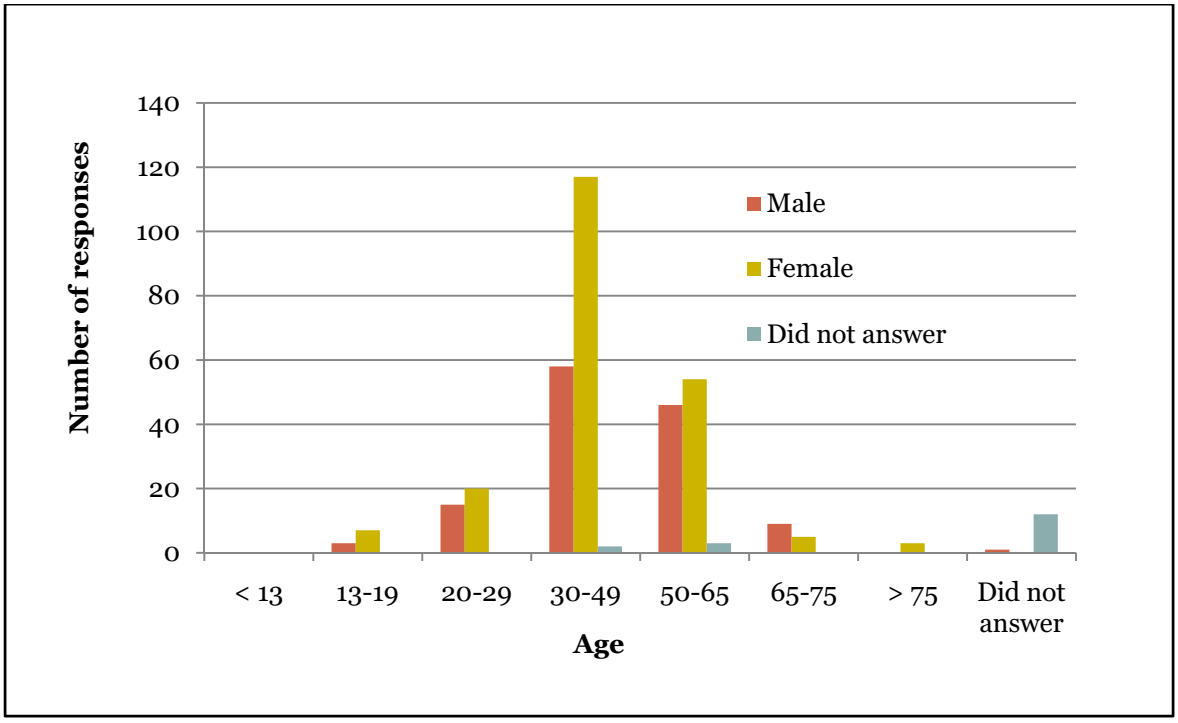


Figure 35 Age and gender of respondents to the pedestrian survey



CYCLIST SURVEY RESULTS

In the bicycle survey respondents were asked:

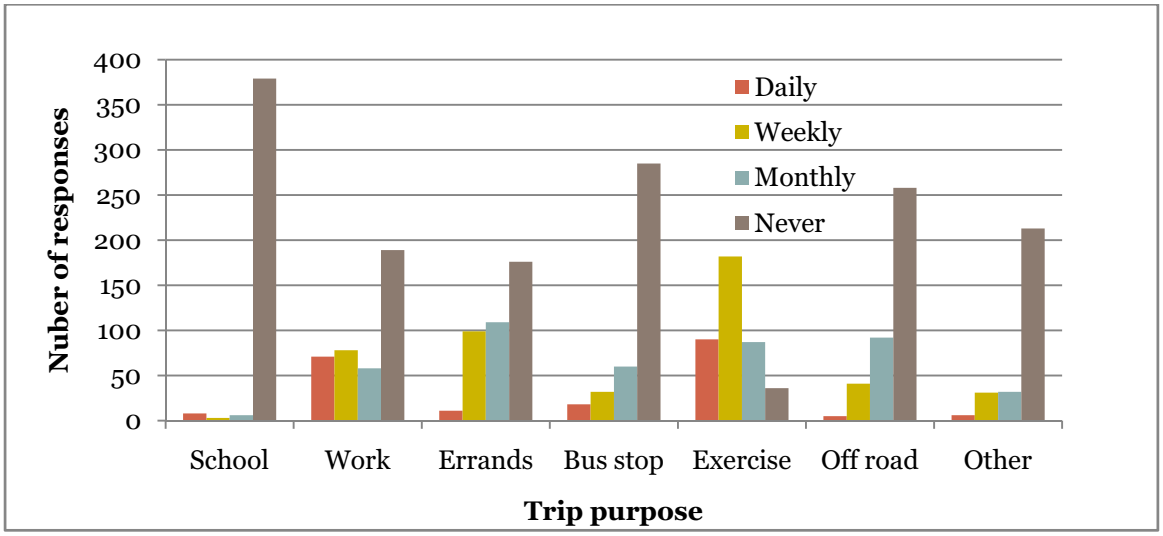
> *How often do you bicycle in Kirkland? For each purpose below indicate the frequency that BEST describes how often you bicycle. Here are some examples: if you do an activity on weekdays only, choose daily. If you do an activity 3 times a month, choose monthly. If you do an activity once or twice a week, choose weekly.*

Respondents were asked to select *daily, weekly, monthly* or *never* for each of the following walking trip types:

- all the way to school
- all the way to work
- to run errands like shopping, etc.
- to the bus stop for work or school
- for exercise/fitness/pleasure
- Mountain bike/off road
- other

Results for this question are shown in Figure 38. Respondents indicated that exercise, errands and work are the most important trip types. This suggests a need for both local access for errands and regional access for longer work and exercise trips.

Figure 36 Frequency of bicycling trip by purpose as reported by survey respondents



Those responding to the bicycle survey were also asked:

> *What factors should be used to prioritize construction of bicycle improvement projects? Indicate how highly each factor should rank when determining funding priorities*

A list of possible choices was shown in a drop down menu for each of the first, second and third highest priorities. The choices for priorities were explained in the survey as:

- **Safety -** Address locations where crashes have occurred. This includes projects that improve lighting.
- **Regional Connections** - Projects that connect to regional trails/other cities
- **Most Users** - Build facilities that will serve the most users
- **Local Connections** - Connect to shopping, restaurants, other services
- **Equity** - Spend similarly in various neighborhoods
- **Transit** - Increase easy bicycle access to Metro bus stops
- **Schools** - Build projects near schools and that access school bus stops
- **Information** - Mark bicycle routes and add other information like distances to key destinations
- **Maintenance** - Maintain existing bicycle facilities

Figure 39 shows that, by far, safety is the most important criteria by which projects should be ranked. Respondents also felt strongly about completing connections, with regional connections more important than local connections. Judging from the responses to the question about things that can be done to make biking easier (Figure 41) maintenance concerns center on sweeping bicycle lanes and making sure that bicycles can activate traffic signals.

Figure 37 Priorities for selecting criteria by which bicycle improvement construction projects should be evaluated

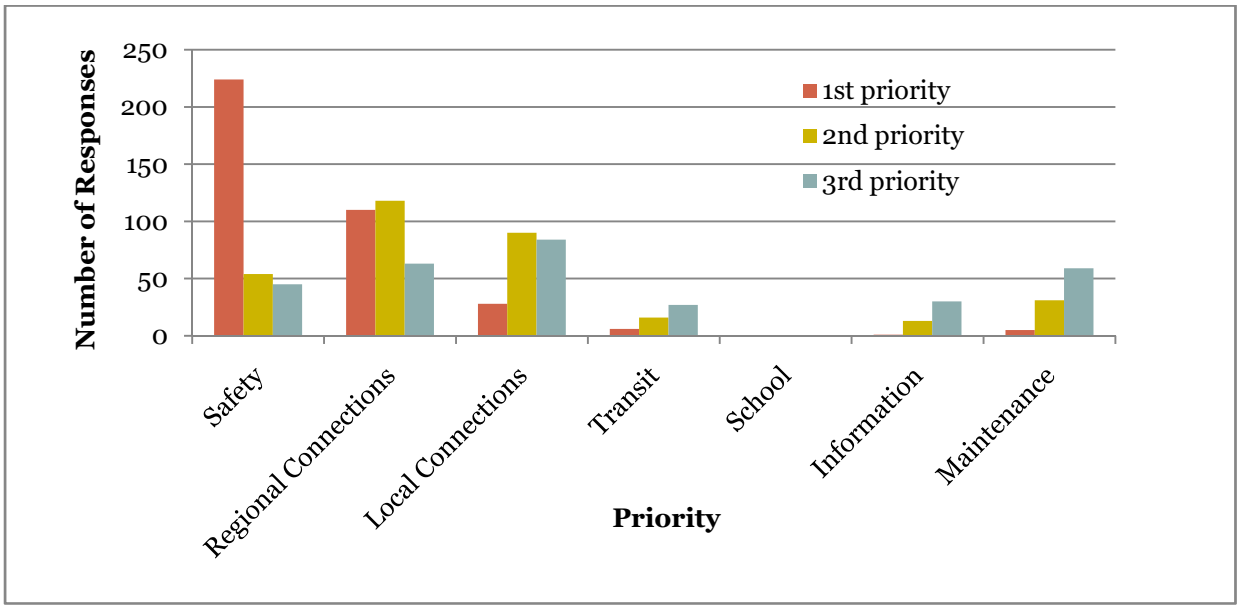


Figure 40 shows the major categories respondents chose to answer the optional question:

> *Where are the most problematic locations for biking in Kirkland? Be as specific as possible.*

The high volume, higher speed, multilane streets NE 85th Street, NE 124th Street (along with their crossings of I-405) and the section of 100th Avenue NE north of NE 124th Street were, not surprisingly, all cited as locations where cycling is difficult. Lake Street between downtown and NE 60th Street was also mentioned fairly frequently, but bike lanes were striped on this section in the fall of 2008.

As illustrated in Figure 41, when cyclists responded to the question:

> *Tell us more about anything that would make biking in Kirkland easier for you. Subjects could include:*
> *• Any bicycling issues you've always wanted to comment about.*
> *• Questions or comments about bicycle facilities or programs.*
> *• Things that you've seen elsewhere that you would like to see in Kirkland.*

The single largest response was for additional bike parking, particularly in downtown Kirkland. There was also support for more bike lanes and for paths that are separated from traffic. The two main maintenance items were additional sweeping of bike lanes and marking traffic signals to be more easily activated by cyclists. Traffic speed and volume represents a small fraction of the problem areas, but when combined with the responses to problem locations, its clearer that traffic speed and volume are major contributors to cyclist dissatisfaction.

Figure 38 Responses to the question: Where are the most problematic locations for biking in Kirkland? Sorted by major category

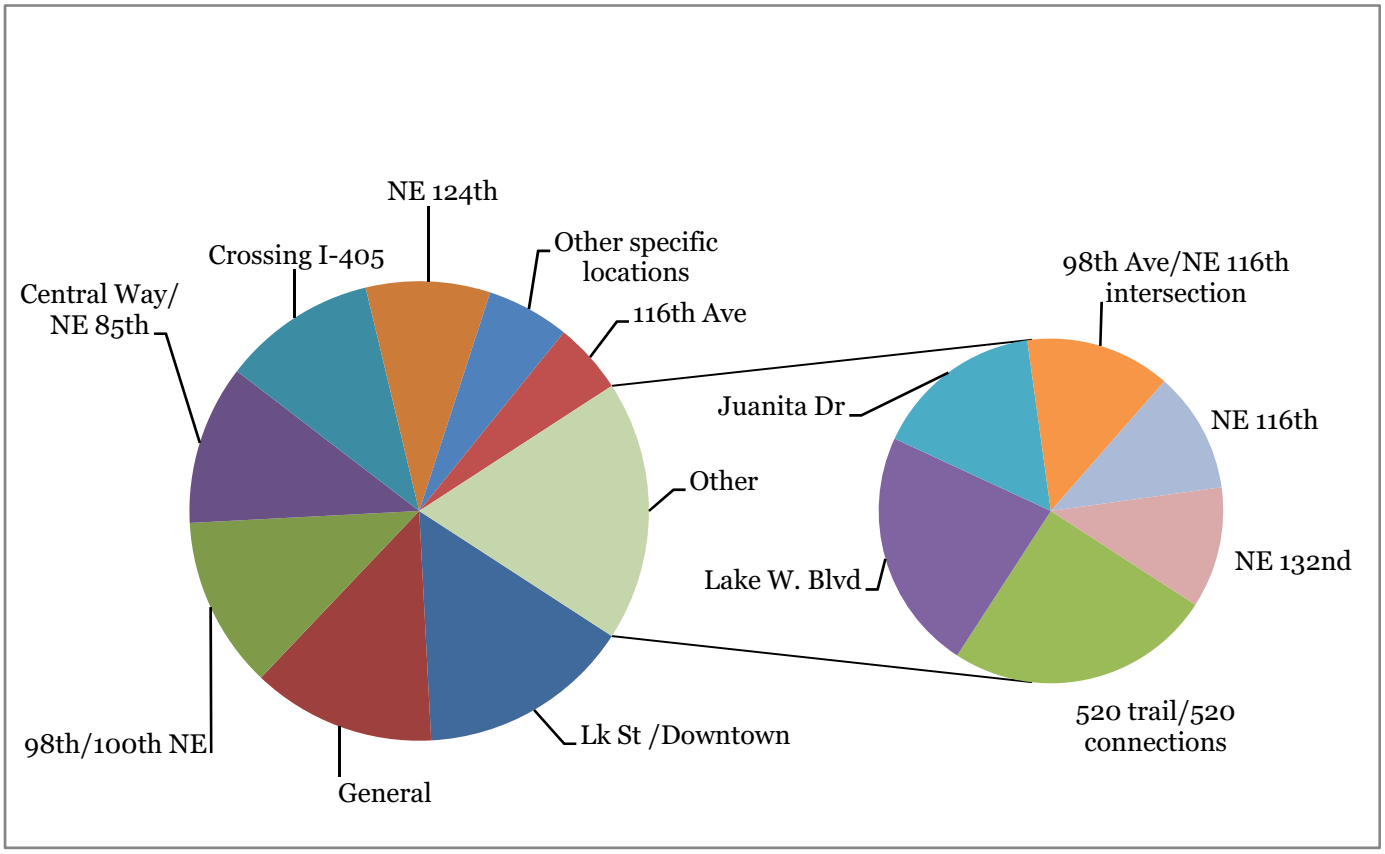


Figure 39 Responses to the question: Tell us more about anything that would make biking in Kirkland easier? sorted by group

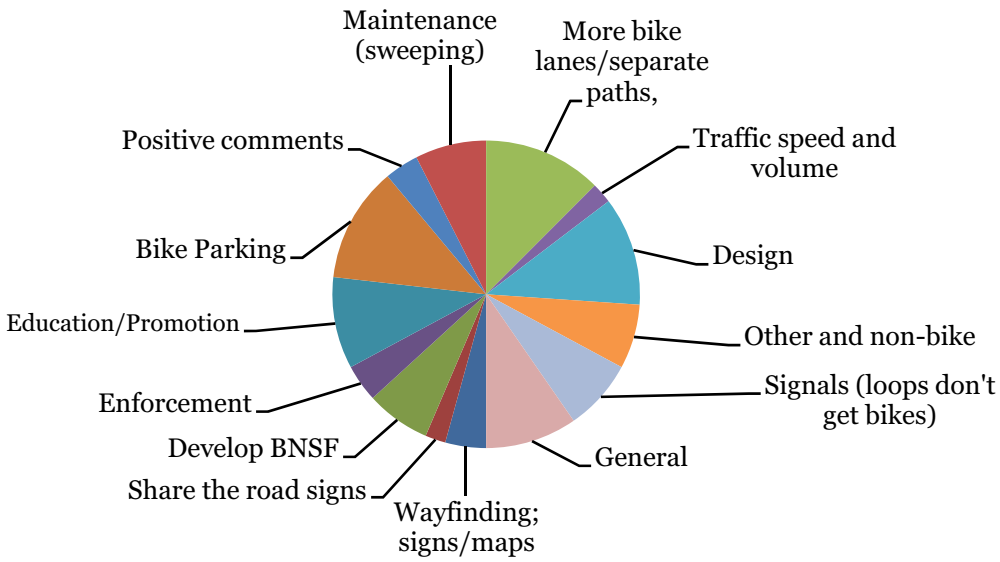


Figure 42 shows that responses to the question:

Where is an excellent location for cycling in Kirkland? Be as specific as possible

Confirmed the popularity of the Lake Washington Blvd./Market Street/Juanita Drive portion of the Lake Washington Loop Route. Other responses were divided among a number of locations.

According to one statistically valid national survey, males make about 68% of all bicycle trips and females make about 32% of all trips. Figure 43 shows a similar difference between male and female respondents to the bicycle survey.

The prioritization of bicycle improvements is discussed further in Section 6. It reflects the information gathered from the survey for both network improvements and programmatic elements.

Figure 40 Responses to the question: Where is an excellent location for biking in Kirkland? Grouped by location.

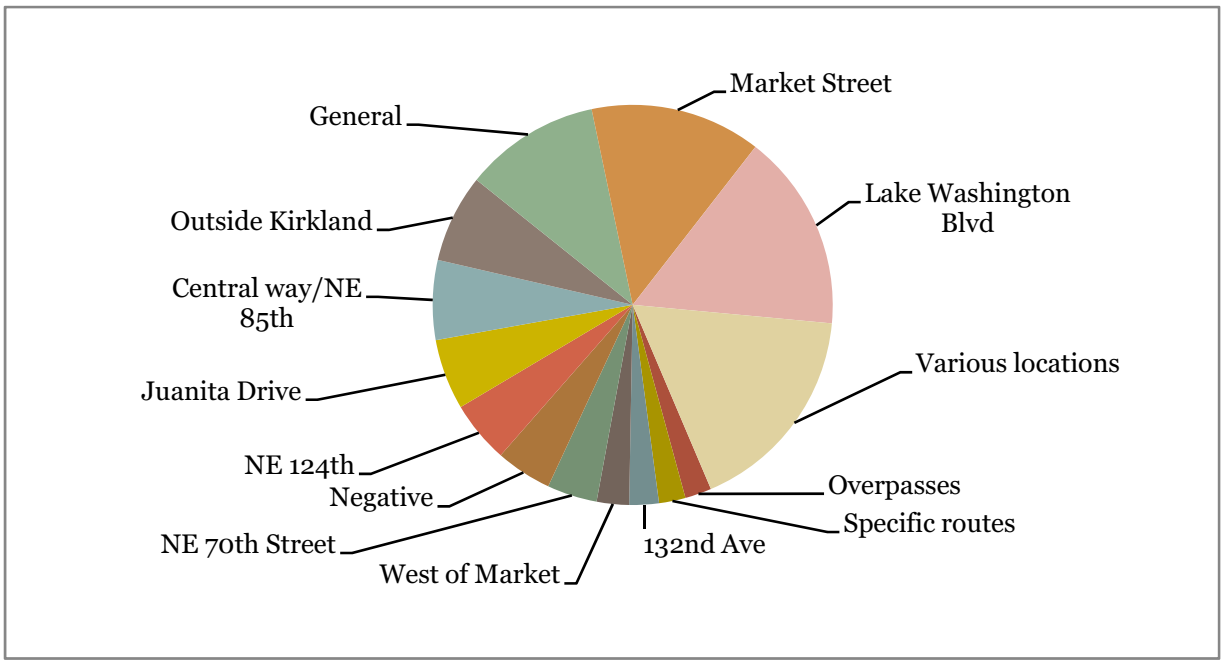
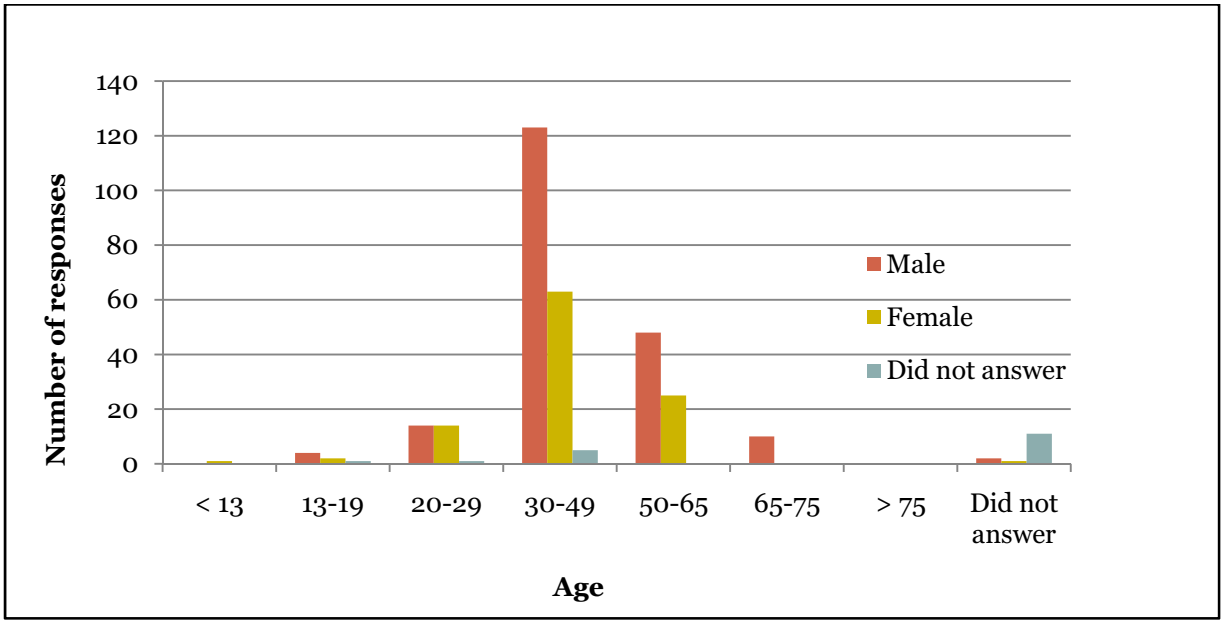


Figure 41 Age and gender of respondents to the bicycle survey



SECTION 5: PRIORITIZING CONSTRUCTION OF SIDEWALKS

INTRODUCTION

The purpose of this section is to describe a system for selecting among potential construction projects. Such a system is needed to prioritize projects for the CIP. Like the two previous non-motorized plans, this Plan does not propose specific pedestrian projects. Instead, it proposes a ranking system for evaluating sidewalk construction projects that can be used as part of a prioritization process see Figure 44. This replaces the Priority 1 and Priority 2 route networks contained in earlier plans. As described on Page 60, the priority networks from previous plans fed information to the Project Ranking System. This Plan revises that ranking system, originally developed to evaluate all kinds of projects, with a system tailored to sidewalk ranking. In general, the ranking system gives first priority to construction of facilities on higher volume streets, close to schools, parks, commercial areas and bus routes. It favors construction on school walk routes. And, it favors locations where existing walkways are narrow and not constructed from concrete (See Goal G3).

The system is based on data such as presence of sidewalk, sidewalk conditions and proximity to various features like parks and schools. Much of this information changes with time. For example, new sidewalks are constructed, existing sidewalks are repaired and transit routes are altered. It is important to note that all of the maps and data shown here **illustrate how the system works**, **they do not provide definitive results.** The first step in using the system will be to update and carefully field check the underlying data before beginning to rank projects. Four sections make up the ranking system as shown in Figure 45.

Figure 42 Project sidewalk prioritization process

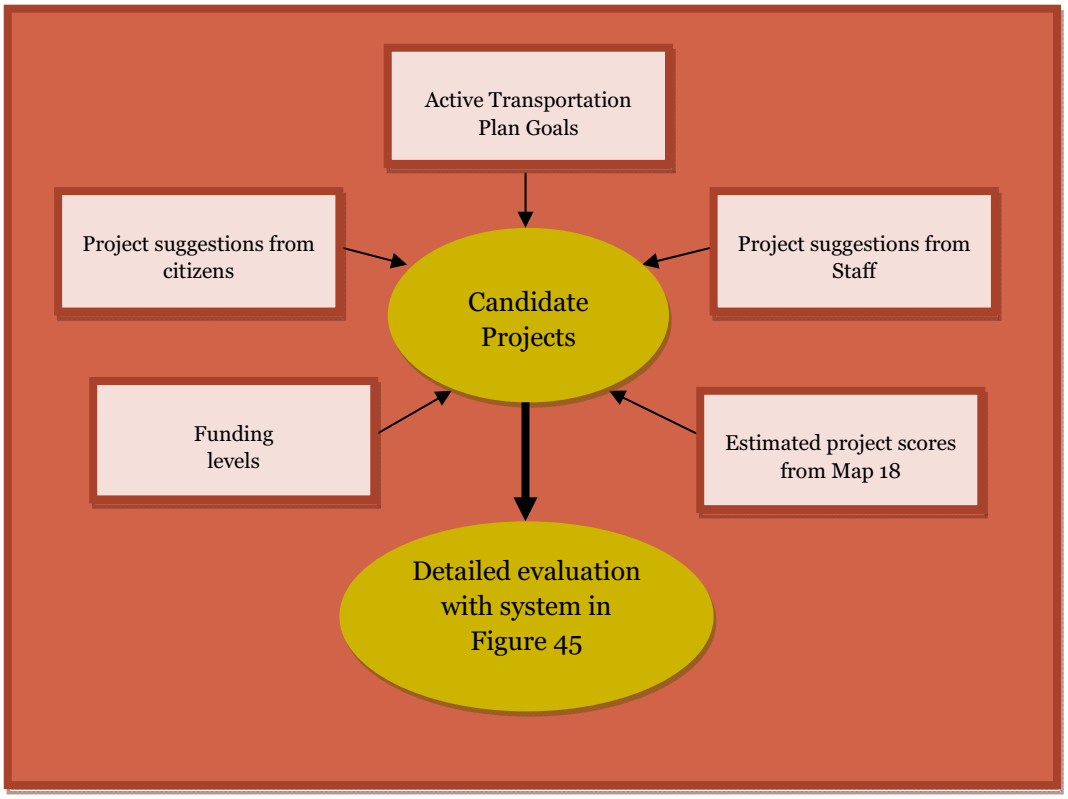
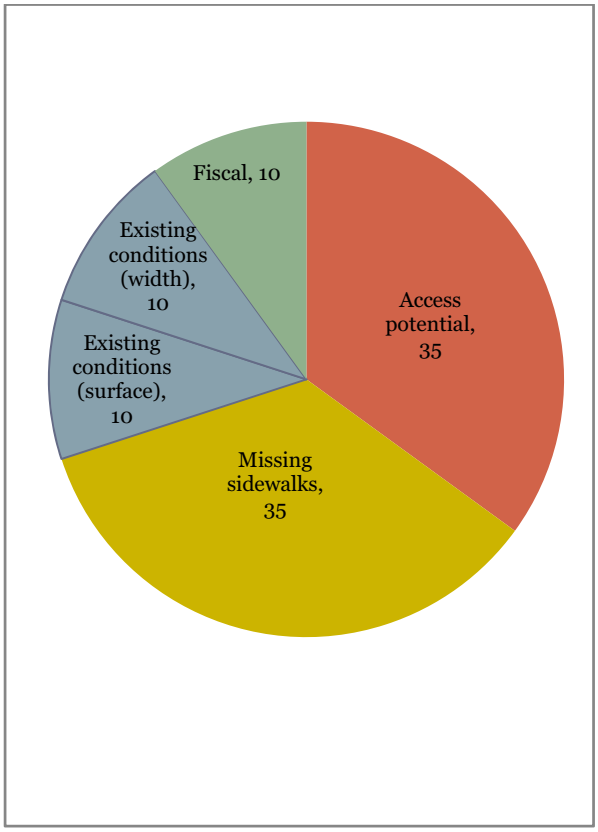


Figure 43 Proposed prioritization system for sidewalk construction projects



Access potential *35 % of total score*
Access potential measures the proximity of a given street segment to uses that pedestrians walk to. It reflects the responses to the pedestrian survey; errands, exercise and transit are typical uses for those who answered the survey.

Missing sidewalks *35% of total score*
This category evaluates the amount of sidewalk already constructed, favoring locations that have no sidewalk over those that have sidewalk on one side. This is also one of the places where school walk routes are taken into account and given extra points.

Existing Conditions *20% of total score*
Existing walkway surface type and walkway width are examined in this category. More points are given for projects that build where concrete sidewalk is not already present on the segment and where walkways are less than 4' wide.

Fiscal *10% of total score*
This category is based on the existing project scoring criteria; it evaluates the anticipated cost of the project relative to typical projects of the same type.

ACCESS POTENTIAL

Proximity to parks, commercial areas, bus routes and schools are the factors used to develop the access potential score. Each of the four destinations is ranked relative to each other; Schools and Parks at 30% and Transit and Commercial areas at 20% for a total of 100%. Using a GIS system, the City was divided into a grid of 25' squares then, each square was scored based on distance to Parks, Transit, Schools and Commercial areas. Values were adjusted to reflect the desired weightings as shown in Table 10 (see Appendix C).

Table 10 Relative weighting between and within destination types.

Destination	*Relative weighting within destination by type*				*Total % weighting for destination*
Schools	One school		Shared campus		30%
	⅛ mile or closer	between ¼ and ⅛mile	⅛ mile or closer	between ¼ and ⅛mile	
	1.25	1.00	1.30	1.10	
Transit	Peak hour		All-day		20%
	⅛ mile or closer	Between ¼ and ⅛mile	⅛ mile or closer	Between ¼ and ⅛mile	
	0.95	0.75	1.25	1.00	
Parks and Commercial areas (counted separately)	⅛ mile or closer	Between ¼ and ⅛mile	Not used, only one type		Parks 30%
	1.25	1.00			Commercial areas 20%

Higher weights were given to parks and schools than to transit and commercial areas to reflect their higher importance as expressed by the community. For simplicity, each park and each commercial area is considered to draw the same amount of pedestrian traffic (hence equal weighting among parks and among commercial areas) even though different parks have different features as do different commercial areas. Different weightings were given within the school and transit categories. Campuses with more than one school get higher weighting than campuses with only one school. Transit that runs all day gets higher weighting than transit that only runs in the peak period. Proximity to each feature is measured separately. For example, if a particular location is within ¼ mile of three different parks, it will receive three times the value of a site within ¼ mile of only one park. The only exception to this is transit. Scores for transit are capped at five routes; in other words a location that is close to more than five routes scores the same as one that is close to only five routes. This helps to prevent locations where many transit routes meet from having too high an influence on the overall score.

Distances of ¼ and ⅛ miles were used because they are conservative in that only a few people would consider distances of ¼ mile or less to be inconvenient.

Distances were measured from the edges of parks because this is less likely to exclude any possible access. Some parks have only one or two discrete entrances, others have many entrances.

Adjacent commercial areas were combined to avoid double counting. For example, the nine separate zones in and around the Totem Lake neighborhood are considered one, not nine separate areas each with its own influence.

Schools are included here because they can generate walking trips that are outside the school day or made by non-students. These might include trips to use play fields, to attend athletic events or for evening activities. Northwest University, Lake Washington Technical College, and the Boys & Girls Club were all included for these reasons. The Seventh Day Adventist School and the Holy Family School were also included because they are the only private school campuses with K-8 students and because they are located in residential areas.

Comparing the existing and proposed project ranking systems.

The existing project ranking system is described beginning on page 63. Most of the factors that have been used in the existing system are also used in the new system. These factors include:

- Proximity to pedestrian generators like parks, schools, commercial areas
- Width of existing shoulder, presence of existing walkway
- Type of existing walkway
- School walk route

The system described here gives about twice as much weight to the project's proximity to pedestrian traffic "generators" like parks, commercial areas and schools.

The revised ranking system also weights school walk routes more heavily – about 8% to 17% of the total score compared to about 9% in the existing method.

School walk routes which are intended for use by elementary school students, are accounted for elsewhere. Distances to schools are measured from the edges of the school buildings to compensate for the large and irregular boundaries of some school properties. This also helps to account for the fact that some campuses have multiple schools on their campus.

For simplicity, it's assumed that transit stops are uniformly spread along the routes and distances can be measured from the routes. Portions of routes along freeways are not considered, although stops at freeways are. Peak hour transit routes typically run in one direction, for example to Seattle in the morning and the other direction – to Kirkland for example – in the evening. There are typically eight or less runs on these peak hour routes in each direction as opposed to the 40 or so in each direction on an all day route with evening coverage. Therefore, peak hour routes get fewer points.

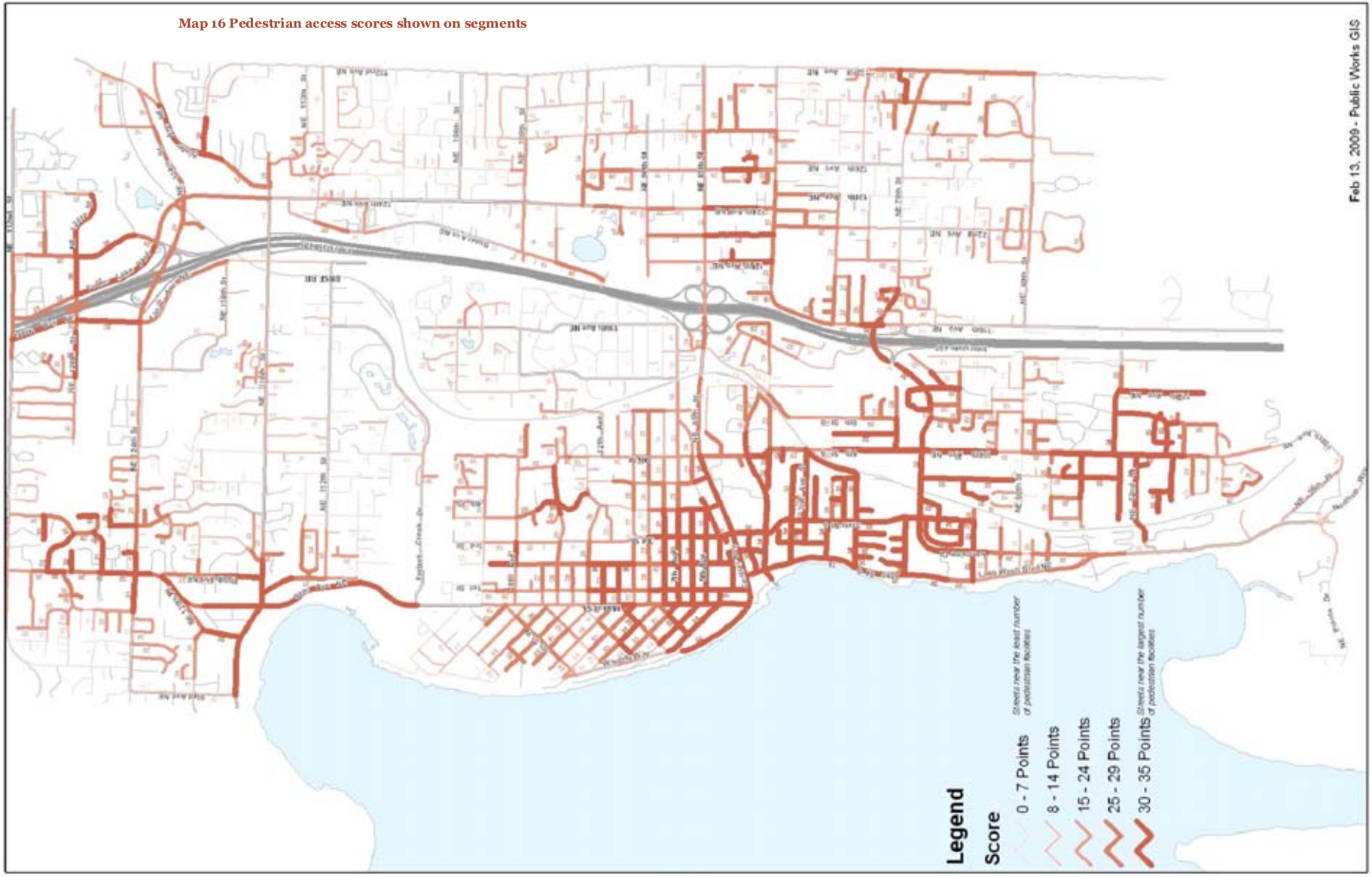
Map 15 shows the results of the pedestrian access analysis. Darker areas show more potential for needing pedestrian access, based on the methods described above.

Each segment in the roadway system was given a score based on the pedestrian access ranking described above[19]. These scores were translated into a 1-35 range because this section of the ranking accounts for 35% of the project score (see Page 74). Map 16 shows access scores on road segments. More details on this process are in Appendix C.

[19] Each segment passes through multiple 25' grid squares. The value of the highest scoring grid square was assigned to the segment.

Map 15 Pedestrian access scores

Map 16 Pedestrian access scores shown on segments



MISSING SIDEWALKS

Along with pedestrian access – features that are important because of where the segment is – there are other important characteristics that are associated with existing conditions on the segment itself. Scoring based on these factors; the roadway[20] classification, the presence of existing sidewalk and whether or not the segment is on a school walk route is incorporated in the Missing Sidewalk category. Table 11 summarizes how these factors are ranked relative to each other in order to develop link scores. Unlike the pedestrian access component, the missing sidewalk component is computed directly by road segment.

Table 11 Segment scores based on street classification, school walk routes and walkway completion.

MISSING SIDEWALK 35 point maximum *segments where walkways are not complete on both sides*				
Street Class	**School walk route points**	**Existing walkway**		
		Neither side complete		**One side complete**
Principal	+10	35		20
Minor		18		16
Collector	+7	14		10
Local	+3	**No walkway**	**Some walkway on one or both sides**	3
		5	9	

[20] The types of roadways are based on functional classification: Principal arterials, minor arterials, collectors and local streets. Functional classification is closely associated with the street's auto volume.

The type of road – its functional classification – is a surrogate measure for the auto volume on a segment. It is also a predictor of crash history. For the five year period 2003-2007 only 5% of all crashes took place on local streets the rest occurred on arterials or collectors. However, very few (2 out of 165, about 1%, during the period 1996-2007) crashes involved vehicles striking pedestrians that were not crossing the street. Constructing sidewalks has a direct effect on pedestrian comfort and that effect is proportionate to the volume of the adjacent street. When pedestrian comfort is improved, the number of pedestrians who walk regularly will increase, supporting the principles of this plan.

Constructing sidewalks along school walk routes is an important value to the community. Therefore a higher priority is given to segments that are on school walk routes.

The extent of the walkway that is currently available is also a consideration when determining the priority of a segment for additional sidewalk. More points are given when there is not a walkway complete on at least one side. For arterials and collectors, there are two categories of completion; either sidewalks are complete on one side or it is not. There are various subcategories, within each of these larger categories. However, Figure 8 on page 40 shows that very few segments that fall within any of these subcategories. Therefore, they can be collapsed into the two major groups described above. For local streets, the picture is a little different. There are many more miles of local streets and two subcategories have more than 10 centerline miles of segments. For local street segments where sidewalks are not complete, a distinction is made between those segments where there is no sidewalk at all and those where there are some sidewalks on one or both sides.

Scoring projects

The purpose of the prioritization system is to be able to evaluate different projects against each other and decide which should be built first.

Projects are often proposed by the public for consideration in the CIP. The goals of this plan to complete sidewalks on major streets and school walk routes would also be considered when proposing candidate projects. Map 19 can also be used as a guide to selecting projects with high potential to score well

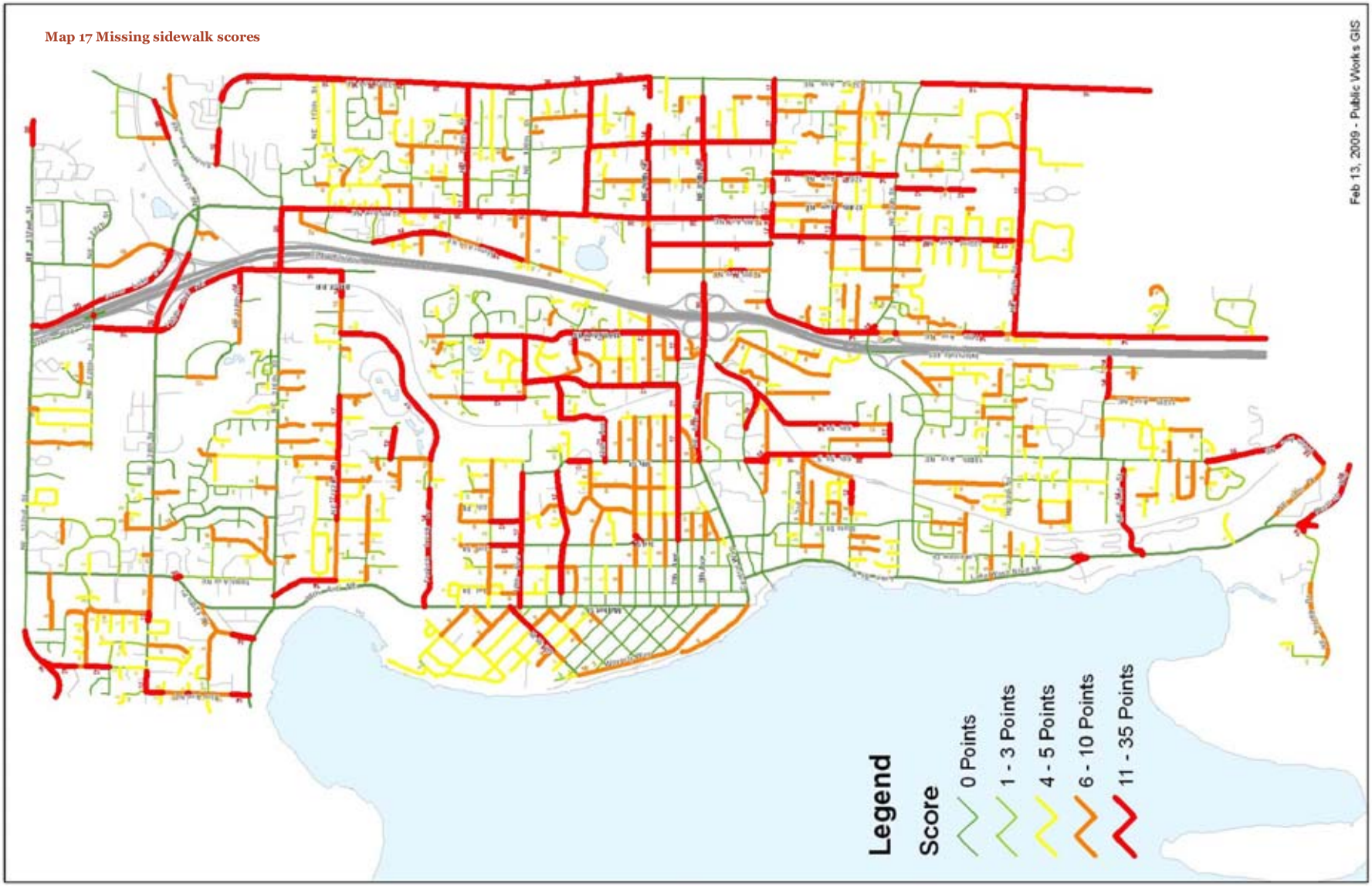
The first step in ranking projects would be to document the data necessary to calculate scores for the various ranking components. Essentially, this would mean updating maps 15 through 19 and computing the appropriate values from Tables 11-14. For each segment included in a candidate project.

When projects include more than one segment, the score for the total project is based on the scores of the component segments, with each segment being weighted in proportion to its length.

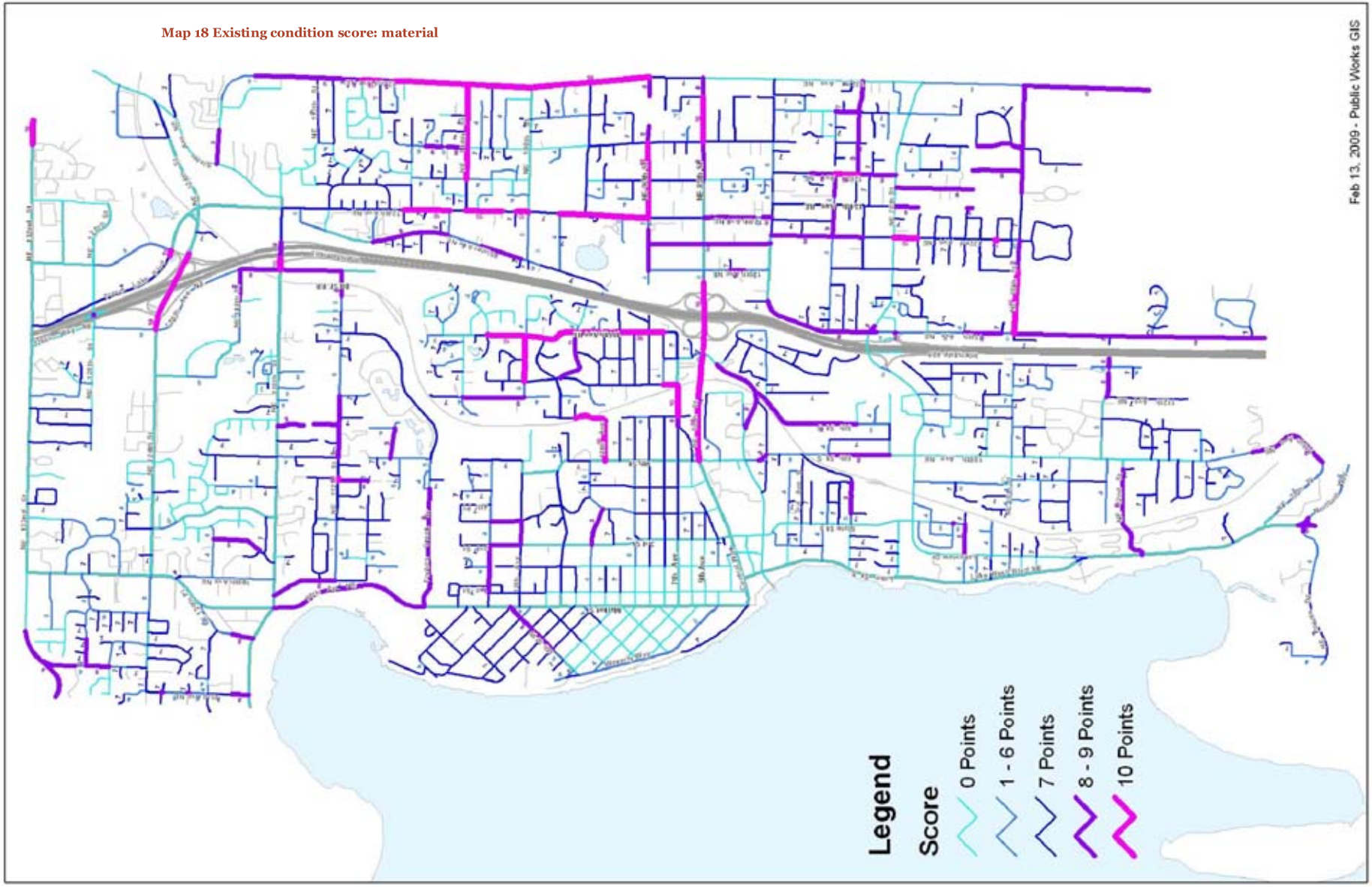
For a given sidewalk completion status, the highest priority for sidewalk improvements is assigned to principal arterials. Minor arterials and collectors receive the next most points and local streets receive the fewest points. Similarly, within a given street classification, the most points are given to segments where a sidewalk is not already complete on one side. For local streets, more points are given to segments where there is some sidewalk but it is not complete on one side. This supports Goal G3 and the desire to build upon sidewalk that is already in place and fill in gaps, first on busy streets.

Map 17 shows the segment scores based on the missing sidewalk analysis. Like the pedestrian analysis scores, the missing sidewalk scores were translated into a 1-35 range because this section of the ranking accounts for 35% (see Page 89) of the project score.

Map 17 Missing sidewalk scores



Map 18 Existing condition score: material



EXISTING CONDITIONS

Along with location and segment specific features, determining the priority of projects also depends on characteristics that are measured on a project by project basis. As points are assigned for location and segment elements, points are also assigned for project specific features. More points represent a higher priority for construction.

SURFACE

For walkways adjacent to streets, most people feel that asphalt and gravel are preferable to no walkway, but not preferable to concrete sidewalks with curb and gutter. Asphalt and gravel are acceptable surfaces for trails and sometimes gravel is used for equestrian paths.

Points are assigned based on the amount of non-concrete walkway on a segment. If there are no complete walkways of any type, the maximum points are assigned. No points are assigned if there is concrete sidewalk on both sides. Points are assigned even if there is a complete sidewalk on one side, but it is not concrete.

For a given set of existing conditions more points are assigned to street classifications with higher volumes. Extra points are given for school walk routes. A maximum of 10 points is assigned (see Table 12).

WIDTH

When determining where sidewalk should be built, priority is given to locations where there is the least area to walk. Segments where at least one side has areas at least 4' wide to walk on get higher priority than segments where both sides have areas 4' or wider. For a given set of existing conditions more points are assigned to street classifications with higher volumes. Extra points are given for school walk routes. A maximum of 10 points is assigned (see Table 13).

Sidewalk inventory

In 2004 a survey was made of all of Kirkland's walkways. Presence or absence and length of walkway along with the walkway material was noted on each side of every roadway segment. The information was tied to the City's GIS system for mapping.

Both the missing sidewalk and existing condition (surface) score depend on information from the sidewalk survey. This means that 45% of a project's score depends on information from the sidewalk inventory.

When the walkway is a wide shoulder, it can be difficult to decide whether or not there is a walkway present. Therefore, the inventory can sometimes be subject to correction. Sometimes, the inventory defines a wide shoulder as a walkway but sometimes it does not. This can make an important difference in the missing sidewalk portion of the project score. As noted several places in the plan, evaluating projects can't rely solely on the maps in this plan. Their primary purpose is to illustrate how the system works and serve as an estimate of the project scores.

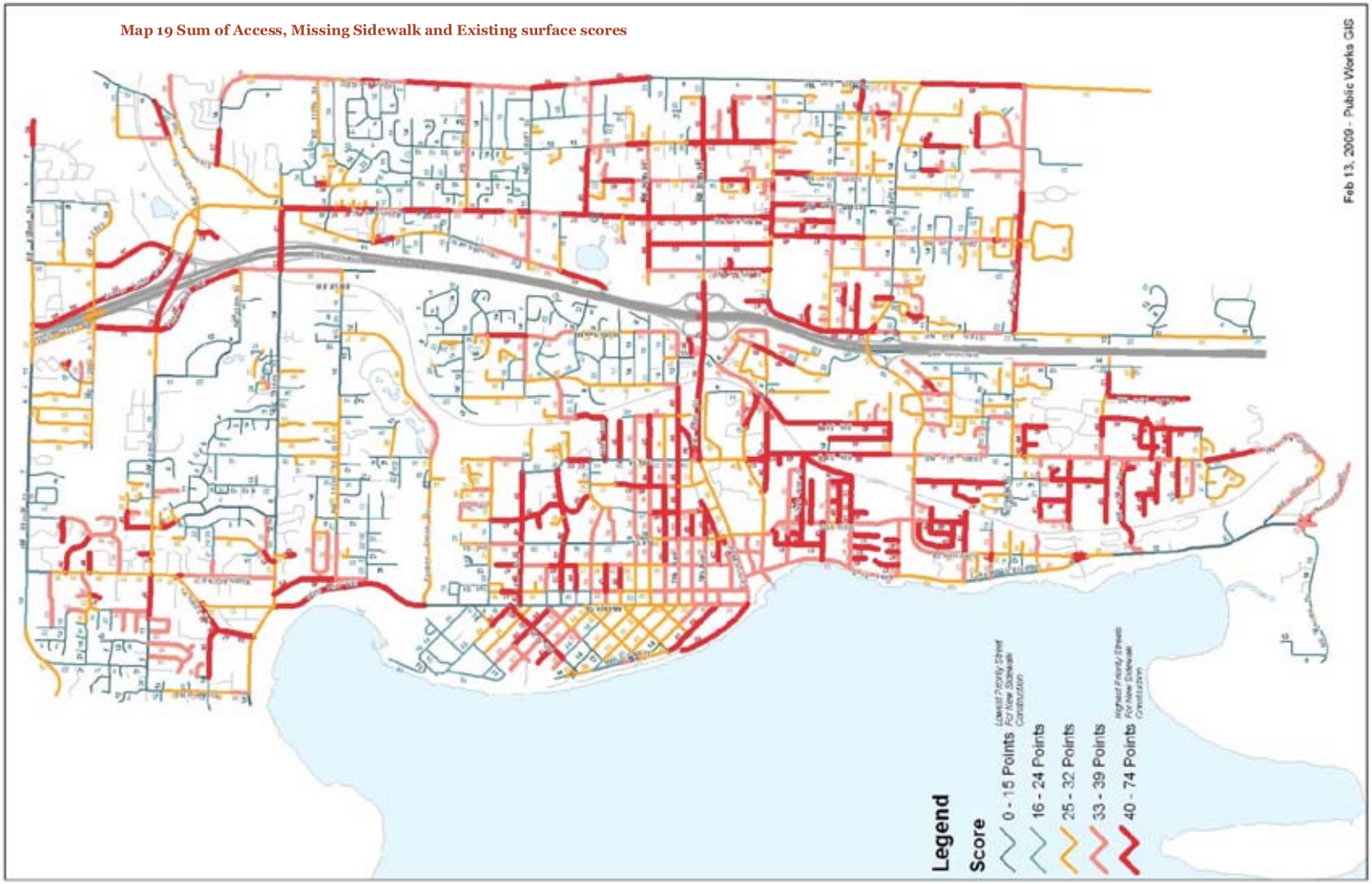
Table 12 Points for projects based on existing surface conditions

Walkway completion and Surface *by side of adjacent street, for locations where concrete sidewalk is not complete on both sides.* *10 POINT MAXIMUM*	*Functional class*				*School Walk routes*
	Principal	Minor	Collector	Local	
Neither side is complete and neither side is concrete	10	9	8	7	***Add 2 points for school walk route***
Only one side is complete, and it is not concrete	9	8	7	6	
Both sides are complete, but neither is concrete	8	7	6	5	
Only one side is complete and it is concrete	7	6	5	4	
Both sides are complete and only one is concrete	6	5	4	3	

Table 13 Points for projects based on existing walkway width

Width (area reserved for pedestrians) *10 POINT MAXIMUM*	*Functional class*				*School Walk routes*
	Principal	Minor	Collector	Local	
Both sides are less than 4' wide	10	10	8	6	***Add 2 points for school walk route***
One side is less than 4' wide	7	6	5	4	
Neither side is less than 4' wide	0	0	0	0	0

Map 19 Sum of Access, Missing Sidewalk and Existing surface scores



FISCAL

As mentioned above, the fiscal component of project evaluation is taken from the existing project evaluation criteria. It is made up of three subparts; the project's basic construction cost its maintenance cost and its affect on the cost of existing maintenance operations. A maximum of 10 points can be assigned to a project that has lower than average construction and maintenance costs (see Table 14).

Table 14 Points for projects based on fiscal factors

Fiscal factors 10 POINTS MAXIMUM		
Difference between forecast project unit construction costs and the standard unit construction costs for a similar project		
More than 25% greater than standard unit costs	***0-25% greater than standard unit costs***	***Less than standard unit costs***
0 points	3 points	6 points
Difference between forecast maintenance costs of project and the standard maintenance costs for a similar project		
Greater costs	Similar costs	Lower costs
0 points	1 point	2 points
Project affect on existing maintenance needs		
Greater than existing	Same as existing	Less than existing
0 points	1 point	2 points

COMBINING FACTORS

Map 19 shows scores for segments when all the components the can be mapped through existing GIS data are combined. Note that it only represents 80% of the overall possible project score because sidewalk width is not currently available in the GIS database and fiscal factors depend on a number of project specific factors. Note that while Map 19 gives overall picture of where the highest scoring segments are located, the scores on that map cannot be used directly to select or score projects. For example, some short dead-end streets score well --the scoring system does not exclude dead-end streets-- but short dead-end streets are not where sidewalk is needed.

SECTION 6: CYCLING NETWORK AND PROJECTS

DEFINING A NETWORK

This Plan is formulated on the idea that a basic bicycle network will be established followed by an evaluation of places that need improvement and prioritization of the projects that are necessary to make those improvements.

The first step is to determine a bicycle facility network that will guide where investments are made in the medium term (0-10 years). All streets must have appropriate accommodation for cyclists, but not necessarily bicycle lanes. Most of the street miles in Kirkland are low volume and do not need special facilities to safely carry cyclists. Striped bicycle lanes are generally limited to collectors and arterials that have volumes over 3000 ADT.

Bicycle network and bicycle lanes

Bicycle lanes are generally suggested when auto volume exceeds 5,000 vehicles per day. Therefore, some segments of the bicycle network do not need bicycle lanes to adequately support bicycle travel.

Portions of the bicycle network that don't need bicycle lanes will still be signed for wayfinding.

Respondents to the bicycle survey indicated that cyclists are interested in regional destinations/relatively longer routes. Therefore, a starting point for developing a bicycle network is to examine the endpoints of Kirkland roads and identify the places they lead to. These are shown in the table below. The routes in the left hand side of the table should be on the bicycle network.

Table 15 Regional destinations that connect to streets in Kirkland

Connecting Route leaving Kirkland	*Route destinations*
Juanita Drive	Kenmore/Burke-Gillman Trail
124th Ave NE, BNSF row	Woodinville
Lake Washington Blvd	Bellevue
100th Ave NE	Bothell/Sammamish River Trail
NE 132nd St, NE 124th St.	Sammamish River Trail
116th Ave. NE	Bellevue SR 520 Trail
108th Ave NE,	Bellevue
132nd Ave NE Sbnd	Overlake/Bellevue/520 Trail
132nd Ave NE Nbnd	Woodinville
NE 100th Ave (via Willows Rd), NE 80th St. (via 140th Ave NE) NE 70th St.	Redmond
Eastside rail corridor (BNSF) right of way	Woodinville/Bellevue

Some streets were specifically described as important by the survey respondents. These routes should also be on the bicycle network.

- LW Blvd/Lake St/Central Way/Market Street/Juanita Drive from S. city limits to west city limits.
- 100th Ave NE between NE 124th and NE 132nd St.

- NE 68th St/NE 70th St between west of the BNSF and 132nd Ave. This suggests adding Lakeview Dr. between NE 68th St. and Lake Washington Blvd. along with State Street between NE 68th St. and Central Way. Adding these last two pieces connects 68th/70th to something on the west end.
- 116th Avenue NE between S. Kirkland City limit and NE 80th St. This suggests adding another connection all the way to Totem Lake via 124th Ave. NE/Totem Lake Blvd./120th Ave NE. Adding 122nd NE between NE 80th and NE 60th Streets completes that N/S corridor.
- 108th Avenue/6th Street between S. city limits and Central Way

Kirkland has existing bicycle facilities on an number of streets and those streets must also be on the network

- 132nd Ave NE/NE 120th St. between south city limits and Slater Ave.
- NE 132nd Street between east city limits and west city limits
- NE 80th St./I-405 overpass and portions of Kirkland Ave/Kirkland Way between 132nd Ave NE and Downtown
- NE 116th Street between 100th Ave NE and Slater Ave.
- NE 100th Street NE/18th Ave between 132nd Ave NE and Market St.
- 108th Avenue NE/6th Street from south city limits to Kirkland Way

NE 85th and NE 124th Streets

From a connectivity perspective, it would be ideal for both NE 85th and NE 124th Street to be part of the bicycle network. Although both were carefully considered for inclusion, neither NE 124 nor NE 85th Streets are part of the bicycle network. Reasons for this include:

- Auto volume of 30,000-40,000 vehicles per day with speed limits of 35 MPH combine to make both streets uncomfortable for most cyclists.
- Bicycle lanes cannot be placed through restriping, and given the speed and volume of auto traffic such lanes alone would be unlikely to make either street feel comfortable for cyclists.
- Interchanges at I-405 are barriers on both routes.
- There are no plans to develop NE 85th as a bicycle route in Redmond.
- NE 80th Street provides a reasonably close parallel route to NE 85th Street.

As a part of the 2008 resurfacing program, 10' wide inside travel lanes were striped on a section of NE 124th Street between NE 116th Avenue and about 108th Avenue. If this restriping is successful as judged by comments from the public and crash experience, other sections of both streets may be restriped to allow wider outside lanes. Wider outside lanes will provide some support to the experienced riders that tend to use both facilities.

The Eastside Rail Corridor (ERC) will eventually form the centerpiece of the off-street bicycle and pedestrian network in Kirkland.

- ERC right-of-way
- NE 60th St between 132nd Ave NE and Lake Washington Blvd
- 7th Ave, 6th St., between ERC and Central Way
- NE 112th St/Forbes Creek Dr. between ERC and Market St.
- 120th Ave NE/116th Ave NE between NE 112th St. and NE 132nd St. This suggests including NE 128th St between 116th Ave NE and 120th Ave NE.

Combining all the segments noted above result in the network shown on Map 20.

CROSS KIRKLAND TRAIL

A multi-use trail on the former Burlington Northern Santa Fe Railroad right-of-way is one of Kirkland's highest priority non-motorized transportation projects (see Goal G1). The right-of-way provides unprecedented opportunities for a number of reasons. Because it is designed for rail traffic it is practically flat. It cuts through the center of Kirkland on a diagonal, connecting Totem Lake, downtown and Houghton. Grade separation is already in place at I-405 and other key arterials but there is still adequate opportunity to connect to the street system through at-grade crossings. The trail can provide excellent regional connections to the north and south.

Map 20 Bicycle network

Efforts to develop the trail began in the mid 1990's but were stalled by the fact that the railroad was not willing to provide access to the right-of-way. As this Plan is being prepared, the Port of Seattle is poised to obtain the right-of-way and sell a trail easement to King County. There are still questions about the future of passenger rail in the corridor and how some bridges will support a trail, but the promise of an outstanding trail is closer than ever to being realized (see Goal G1).

LOCATIONS THAT NEED IMPROVEMENT

Once the network is identified, the next step is to identify areas on the network that need improvements. In large part, this was done using information from the bicycle survey and public comment along with staff and Transportation Commission comments. In some cases the same segment has multiple projects. Usually this is the case when there is a simple project such as restriping that can provide an interim improvement and a more complicated and comprehensive project such as widening to provide bicycle lanes.

- Cross-Kirkland Trail on the Eastside Rail Corridor right-of-way.
- 98th Ave NE /100th Ave NE between NE 116th and NE 132nd Sts.
- 116th Ave NE between NE 124th and NE 132nd Sts. No bicycle facilities on street.
- Connection across Cross-Kirkland Trail between 18th Ave and NE 100th St.
- Kirkland Way between Railroad Avenue and 6th Street.
- NE 60th St. across Cross-Kirkland Trail.
- 116th Ave NE between south city limits and NE 60th St.
- NE 70th St at I-405 interchange.
- Lake St. between 2nd Street S. and Central Way.
- 6th St. S. between Kirkland Way and Central Way.
- Central Way between Market St. and 6th Street.
- Various signalized intersections where bicycle lanes are dropped such as: 98th Ave./NE 116th St, State St/NE 68th, Central/3rd, Central/6th.

POTENTIAL PROJECTS

After defining the bicycle network and areas where improvements are needed, treatments for those areas were developed. These improvements are shown in Tables 16, 17 and 18, and on Map 21. In some cases, a segment has multiple treatments. For example, one project might simply restripe wider outside lanes on a segment of

Sharrows

Sharrow is a nickname for shared lane markings which are also known as SLM. Their purpose is to indicate to motorists and cyclists that an area of the roadway is to be shared by both users. The City of San Francisco did research* to develop the sharrow marking finding it the most effective of several they tried.

The City of Seattle has begun to install sharrows and they are included in the Seattle Bicycle Master Plan.

A bicyclist pedals toward a sharrow along Stone Way N. in Seattle. Grant M. Haller/Seattle P-I.

Sharrows are not a direct substitute for bicycle lanes, so they should not be used where bicycle lanes are feasible.

*San Francisco's Shared Lane Pavement Markings: Improving Bicycle Safety FINAL REPORT February 2004 San Francisco Department of Parking & Traffic

roadway while another reconstructs that same section to provide enough width for full width bicycle lanes.

Projects are broken into three groups: those that require restriping alone or restriping and minor construction; those that require construction; and those that involve the Eastside Rail Corridor. The restriping projects tend to be lower cost, but in some cases do not provide the level of improvement that the far more expensive widening projects provide. The Cross-Kirkland Trail projects will be most valuable as connections once the trail is completed.

Because there are relatively few projects in each category further project prioritization is not necessary. Therefore, work should continue within the restriping program to complete the restriping projects. Projects that are associated with the Cross-Kirkland Trail should be pursued as a part of trail development. The construction projects should be evaluated for funding from the CIP non-motorized construction budget.

Map 21 Bicycle network and improvements

Table 16 Bicycle network projects that require construction

PROJECTS THAT REQUIRE CONSTRUCTION				
Number	Street	From	to	project
C1.	120th Avenue NE	NE 128th Street	NE 132nd Street	Add bicycle lanes. Not in initial scope of CIP project, but can be added.
C2.	120th Avenue NE	Totem Lake Blvd	NE 128th Street	Add bicycle lanes Not in initial scope of CIP project, but can be added.
C3.	6th Street	Kirkland Avenue	Central Way	Add bicycle lanes. Parkplace redevelopment would add lanes on west side.
C4.	98th Avenue NE	Juanita Bay bridge	NE 116th Street	Widening/rebuilding Possibly include a bicycle lane for NB left turn.
C5.	Kirkland Way	Railroad Avenue	NE 85th Street	Widen for bicycle lanes
C6.	Kirkland Way	6th Street	Railroad Avenue	RR bridge/overpass is a major obstruction. From 6th to about 4th could be restriped for bicycle lanes if parking was removed on one side.
C7.	98th Avenue NE	NE 116th Street	NE 124th Street	Widening to include bicycle lanes. Expensive and difficult. Probably done in connection with redevelopment.
C8.	116th Avenue NE	City limits	NE 60th Street	Add bicycle lanes. Design funded as CIP project NM-0001.
C9.	NE 116th Street	120th Avenue NE	124th Avenue NE	Complete bicycle lanes. Funded by WSDOT nickel project. Scheduled for construction in 2010.
C10.	NE 120th Street	124th Ave NE	Slater Ave NE	Construct new road connection. Funded CIP project ST 0057 construction in 2012. Project includes bicycle lanes.
C11.	NE 70th Street	I-405 west ramps	116th Avenue NE	Rebuild interchange . Unfunded WSDOT responsibility. NE 70th and NE 85th Street interchanges would be rebuilt together.
C12.	Totem Lake Blvd	NE 124th Street	NE 132nd Street	Add bicycle lanes
C13.	Totem Lake Way	east end	NE 126th Place	Construct trail to connect Totem Lake with 132nd Avenue. Unfunded CIP project NM 0043 estimated cost $4.3m.
C14.	122nd Avenue NE	NE 70th Street	NE 80th Street	Add bicycle lanes. Part of Lake Washington High School remodel and CIP project NM 0055.
C15.	NE 90th Street	West end at I-405	East end at I-405	Overpass at I-405. Would likely have to wait for rebuild of NE 85th Street/I-405 interchange.

Table 17 Bicycle system improvements that require striping

PROJECTS THAT CAN BE COMPLETED THROUGH RESTRIPING AND/OR MINOR CONSTRUCTION				
Number	Street	From	To	Project/Notes
S1.	100th Avenue NE	NE 124th Street	NE 132nd Street	Restripe to 5 car lanes@ 10 + 2 bicycle lanes @5'. Requires narrowing medians, coordinate with King County to extend north to connect to existing bicycle lanes.
S2.	116th Ave/Way	NE 124th Street	NE 132nd Street	Restripe for NB climbing lane. Perhaps add shared lane markings on downhill side.
S3.	Lake Street	2nd Street S	Central Way	Shared lane marking (sharrow). May also be able to extend bicycle lanes north of 2nd Street S.
S4.	116th Avenue NE	Houghton P&R S. entrance	NE 70th Street	Restripe for bicycle lanes in both directions. Need WSDOT approval, to narrow lanes, since area is in the limited access area of I-405.
S5.	120th Avenue NE	NE 116th Street	N. of BNSF	Restripe to complete Sbnd lane
S6.	98th Avenue NE	Juanita Bay bridge	NE 116th Street	Restripe for wider outside lanes can add some width, but need to be careful to keep left turn lane of adequate width.
S7.	Central Way	4th Street	6th Street	Stripe wider outside lane Parkplace could provide extra width for eastbound lane.
S8.	Central Way	Lake Street	4th Street	Eastbound; stripe bicycle lane Westbound; stripe wider outside lane
S9.	Central Way	Market Street	Lake Street	Shared lane marking (sharrow), may be able to fit a bicycle lane in westbound
S10.	98th Avenue NE	NE 116th Street	NE 124th Street	Restripe for slightly wider outside lanes If project S1 completed, this could be sharrows especially Sbnd between NE 124 and existing bicycle lanes at 120th PL.
S11.	NE 132nd Street	100th Avenue NE	132nd Avenue NE	Restripe for uniform width. Requires coordination/agreement with King County.
S12.	Totem Lake Blvd	NE 124th Street	NE 132nd Street	Restripe. Not enough width for standard bicycle lanes. May result in wide outside lanes or climbing lane/shared lane combination.
S13.	116th Avenue NE	City Limits	NE 60th Street	Narrow car lanes, more evenly balance shoulder widths to provide additional space for bicycles.
S14.	Various	At intersections		Look for locations where bicycle lanes can/should be continued through intersections. Consider sharrows.

Table 18 Bicycle projects that involve the Eastside Rail Corridor

PROJECTS THAT INVOLVE THE CROSS-KIRKLAND TRAIL/EASTSIDE RAIL CORRIDOR				
Number	Street	From	to	project
ER 1.	Eastside rail corridor	Southwest city limits	Northeast city limits	Complete a multipurpose trail on the eastside rail corridor. Waiting for BNSF/Port of Seattle/King County agreement.
ER 2.	116th Avenue NE Highlands	North end of 116th Avenue	Forbes Creek Drive	Connect to and across BNSF right-of-way. This could connect at other locations, purpose is to connect Highlands neighborhood to right-of-way.
ER 3.	NE 100th Street	6th Street	111th Avenue NE	Construct trail to connect through park and across BNSF
ER 4.	NE 60th Street	BNSF	BNSF	Construct trail to connect across railroad, approaches very steep.

SECTION 7: PROGRAMMATIC ELEMENTS

PEDESTRIANS

AMERICANS WITH DISABILITIES ACT TRANSITION PLAN

Kirkland is steadily making walkways more accessible. Substandard facilities were identified in the 2004 sidewalk inventory and are gradually being replaced, while new construction complies with current standards. Most cities have adopted ADA transition plans as required by Title II of the Americans with Disabilities Act. Title II mandates that public agencies such as the City of Kirkland operate each service with accessibility to those with disabilities.

Title II also dictates that a public entity must evaluate its facilities and public areas to determine whether or not they are in compliance with the nondiscrimination requirements of the ADA. The regulations detailing compliance requirements were issued in July 1991. The requirements include completing a self-evaluation to identify any areas not within compliance of the ADA standards. Next, a transition plan is to be prepared describing any necessary structural or physical changes needed to make all required areas accessible and compliant with ADA.

Although the City of Kirkland has conducted most of the steps necessary to complete a transition plan, a formal plan has not been completed. In order to comply with regulations such a plan should be prepared and adopted. Goal G6 relates to this work.

WAYFINDING FOR PATHS AND TRAILS

As described in Sections 2 and 3, there are about 180 pathways and small connectors in Kirkland that are intended for use by pedestrians and cyclists. Many of these connections allow pedestrians to avoid sections of busy streets, shorten their trips, or go places that are accessible by streets. Sometimes these connections are unknown, particularly by those who live outside the vicinity of the connection. Wayfinding for these paths would remedy this situation. Objective G3.2 describes pedestrian wayfinding. A public process would be undertaken to determine the style and location of the signs.

OBSTRUCTIONS

Despite the programs described in Section 2, walkway obstructions due to brush, debris and recycling or waste containers are a common complaint among Kirkland's pedestrians. This Project would include some measure of the magnitude of the problem, i.e. what fraction of sidewalks are blocked at any given time, review the processes that are in place to assure clear sidewalks and develop strategies to increase the amount of clear walkways. Goal G6 with its associated objectives and strategies describes this work.

SAFETY AT INTERSECTIONS

Data show that most pedestrian crashes happen at intersections (see Figures 11, and 12 on Pages 32 and 33). At signalized intersections, slightly more than half of the crashes involve turning vehicles. Many of these crashes could be avoided if pedestrians looked more carefully for turning vehicles and if drivers were more aware of the presence of pedestrians. Increasing the prevalence

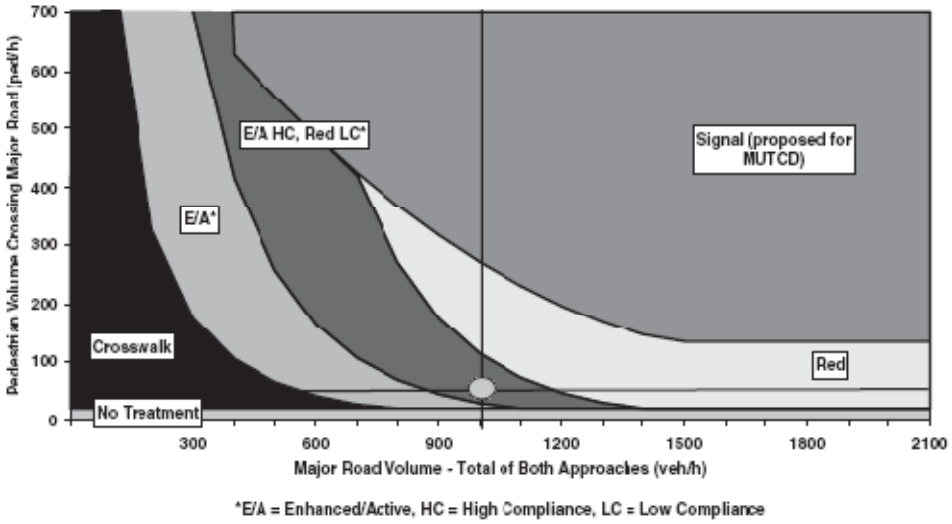
of these behaviors is not likely to be accomplished through traditional engineering measures. Instead, campaigns directed at changing behavior are more appropriate. An example of this type of effort is the "Take It to Make It" campaign that focused on getting pedestrians to use pedestrian flags. A similar program should be conducted to increase the number of pedestrians that look for turning vehicles. Emphasis should be placed on understanding why pedestrians don't look for turning vehicles and developing strategies to overcome those barriers. The Take it to Make it effort was grant funded and it is likely that a program of this type would also require grant funding.

CROSSWALK SAFETY REVIEW

All uncontrolled crosswalks were reviewed in 2003. This review is discussed in Section 3. A ranking system that was new at the time was used to evaluate the risk of crashes at uncontrolled crosswalks. This evaluation was combined with actual crash data to develop a list of candidate improvements. Since 2003 two other evaluation criteria have been developed, the Pedestrian Intersection Safety Index[21] and Guidelines for Pedestrian Crossing Treatments[22]

The intersection safety index is a method that allows a specific number reflecting the safety potential of any crossing at an intersection. The Guidelines for Pedestrian Crossing Treatments goes beyond the 2003 analysis to identify the type of treatment that is best suited for a particular crosswalk. Potential Treatments may range from a marked crosswalk only to a traffic signal. Goal G5 supports crosswalk safety.

Figure 44 A sample chart from Guidelines for Pedestrian Crossing Treatments showing the relationship between street volume, pedestrian volume and treatment type.



BICYCLES

[21] Pedestrian and Bicyclist Intersection Safety Indices: User Guide, Publication No. FHWA-HRT-06-130, Federal Highway Administration, April 2007

[22] National Cooperative Highway Research Project Report 562 Improving Pedestrian Safety at Unsignalized Crossings Transportation Research Board, 2006

The programs in the following sections support Goal G8.

WAYFINDING SIGNS

Bicycle wayfinding signs are being installed by cities throughout the region. Wayfinding signs in Kirkland should be of the same style that is used by the City of Seattle, Bellevue and Redmond. There are two types of signs that will make up the signing system as shown in Figure 47. On streets that are part of the bicycle network and on other streets that intersect with streets on the bicycle network, signs will be placed that show the distance and direction to key destinations. On regional routes or trails with designated names (like the Lake Washington Loop or the future Cross-Kirkland Trail) a second type of route specific sign will be used to identify the trail and on other streets that intersect with the trail. On the order of 150 signs would be needed to sign the existing network.

Figure 45 Two types of bicycle wayfinding signs used communities surrounding Kirkland. The sign on the left is used at junctions on the bicycle network. The sign on the right is used on named routes, such as the Lake Washington Loop.

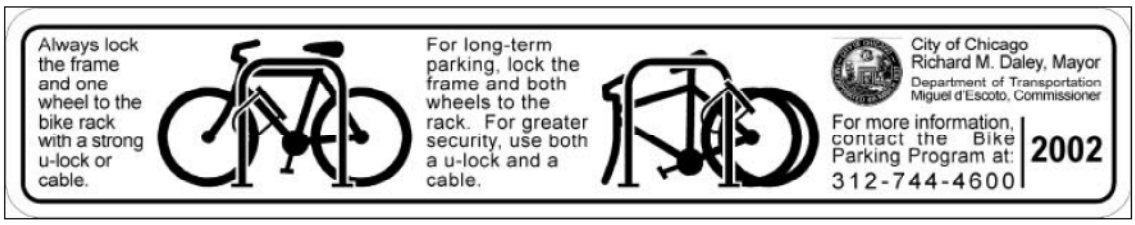
BICYCLE PARKING

Existing requirements for bicycle parking are discussed in Section 2. Based on the number of comments obtained in the bicycle survey and based on comments received prior to the survey, there is strong support for additional bicycle parking. Experts on bicycle parking agree that simple," inverted U" shaped racks best meet the goals of effective bicycle parking; namely that the bicycle is supported in two places and that the racks are both secure and easy to use. In Kirkland, these racks could be incorporated on wide sidewalks between street trees and street lights. Another option is to convert street space into areas for storing multiple racks. The following tasks should be completed to improve bicycle parking in Kirkland. (See Goal G8).

- Indentify where bicycle parking should be added. Candidates include Downtown, Juanita, Totem Lake , and/or other commercial areas. Special attention should be given to locating racks where they can be used by transit riders.
- Identify the amount of additional parking needed. This could be based on having parking available within a certain distance, on increasing the existing supply by a certain amount, on developing locations where parking can be easily located or on other factors
- Revise the zoning code to require bicycle parking as a part of right-of-way improvements
- Review existing zoning code requirements for
- Add specifications for bicycle rack design and installation to the Pre-Approved plans

- Create additional bicycle parking
- Explore requiring special events in Downtown to provide bicycle parking.

Figure 46 This information is printed on stickers and placed on bicycle racks in Chicago

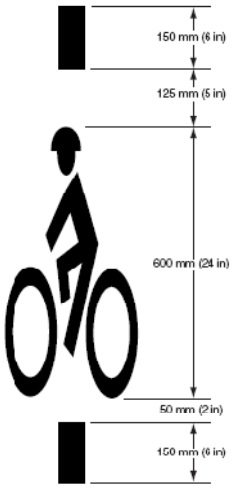


TRAFFIC SIGNALS

In Kirkland, most traffic signals are activated by loops buried in the pavement. The loops have an electric current passing through them making a circuit. When a vehicle passes over a loop the properties of the circuit change, the traffic signal equipment detects the change and the signal turns green for the direction where the vehicle is. Loops are most sensitive at their edges Cars and trucks are large enough that they easily cover the loop and are therefore easy for the traffic signal equipment to detect them. Sometimes it's hard for cyclists to get a signal to respond because they don't know where to stop in order to activate the loop.

In order to make it easier for cyclists to activate the signals, markings like the one shown in Figure 47 will be placed to give cyclists a clear location of where to stop. About 275 markings will be needed. This work could likely be accomplished through the City's pavement marking program.

Figure 47 Marking that could be used at traffic signals to indicate where cyclists should stop



STREET SWEEPING

Kirkland's existing sweeping program is described in Section 2. A number of respondents to the survey cited increased sweeping of bicycle lanes as a measure that would improve their bicycling experience. A main purpose of street sweeping is to keep debris from clogging the stormwater system. Therefore, it's important to sweep both minor and major streets frequently. Increasing the sweeping of bicycle lanes by decreasing sweeping of other streets is not realistic. In order to sweep bicycle lanes more often, more person-hours would have to be added to the sweeping program. Given budget constrains this is probably not realistic. The spot sweeping of bicycle lanes is relatively inexpensive because the sweeper is out almost every day and can make a pass on the way to or from another job.

Two ideas should be considered to reduce debris in the bicycle lanes. One is the wider promotion of the fact that cyclists can call to get spot sweeping done and the other is the reconsideration of spreading sand for snow and ice control.

NE 116TH STREET/JUANITA DRIVE/98TH AVENUE NE INTERSECTION

This intersection was one that was viewed as difficult by both pedestrians and cyclists who responded to the survey. It is heavily traveled by cyclists connecting between Juanita Drive and downtown Kirkland on the popular Lake Washington Loop route, it's in the center of the Juanita Business district and used to connect to both Juanita Bay Park and Juanita Beach Park. It is also heavily traveled by motorists. There was one pedestrian crash and no bicycle crashes in the period 2003 to 2007.

In support of Goal G5, it is proposed that a Road Safety Audit (RSA) be conducted at this intersection. An RSA is a formal safety examination of an existing or future roadway that is conducted by a multidisciplinary (for example, traffic signal engineer, police officer, roadway designer, expert in disabled access, pedestrian safety expert, etc) team of people who don't work for the City and who were not involved with the development of the current configuration. The main objective of an RSA is to address the safe operation of roadways and crossings to ensure a high level of safety for all road users. RSAs are not intended to be a review of design standards or policies, but rather a review of site elements that, alone or combined, could contribute to safety concerns.[23]

[23] Pedestrian Road Safety Audit Guidelines and Prompt lists. FHWA SA-07-007, USDOT FHWA July, 2007.

SECTION 8: EQUESTRIAN SYSTEM

INTRODUCTION

Urban equestrians face unique challenges in their use of the City's transportation system. Paved surfaces are not ideal for equestrians because they provide poor traction for horses and can be hard on their joints. In addition, horses can be frightened by other users of the transportation system such as motorists and bicyclists.

Figure 48 Bridle Trails State Park is an important resource for equestrians.

To accommodate the needs of the equestrian community, it is important that care be given to the design and construction of equestrian facilities. These should incorporate the following considerations:

Shared equestrian and pedestrian use of a path can generally be safely managed. Where possible, some separation of equestrians from bicyclists and motorists is desirable.

Equestrian paths should not be paved. Rather, paths should be constructed with a specially designed, stabilized granolithic mix to provide appropriate footing and to retain their integrity in Puget Sound's wet climate.

Clearances should be designed with the use by horse and rider in mind. Paths should be wide enough to support two-way equestrian travel and have enough vertical clearance for a horse and rider.

EXISTING FACILITIES

Bridle Trails State Park is a regional hub for equestrian activities and the key equestrian facility available to Kirkland residents. It has been owned by the State since the 1880's and has been a popular riding area for equestrians since the 1930's. In the 1960's, citizens successfully petitioned the State to make it a State Park.

The park encompasses 481 acres of forested land and includes 28 miles of equestrian/pedestrian trails as well as horse show arenas and spectator stands. It is a mark of how significant this facility is that, in 2002, users established the Bridle Trails Park Foundation. This 501(c) 3 non-profit organization acts in partnership with the State to fund operating costs for the park.

Kirkland's Land Use Code establishes most of the area around the park as Low Density Residential. Much of it is zoned to allow one unit per acre, while some zoning allows 1 -3 units per acre. This reduced density helps preserve the option for owning horses in the areas surrounding the park.

To take advantage of the equestrian opportunities presented by the park, a series of equestrian trails and access routes exist in the surrounding neighborhoods. These generally use easements

or street rights-of-way to provide access to the park trail system. They also allow access to the Bridlecrest trail which goes east through Redmond, connecting Bridle Trails State Park with Marymoor Park.

PROPOSED FACILITIES

Additional multi-use trails are proposed for the streets on the west and north boundaries of the park. These trails need to be designed and constructed to accommodate the special needs of equestrians as described earlier in this section.

Map 20 shows the system of existing and proposed equestrian routes in the areas surrounding Bridle Trails State Park. Table

Map 22 Existing and proposed equestrian routes

Table 19 Equestrian projects

Number	Street	From	To	Project
EQ1	116th Avenue NE (east side)	NE 60th St	South City Limit	Project is under design
EQ2	NE 60th St (south side)	116th Avenue NE	132 Avenue NE	Future Project

ACTION ITEMS

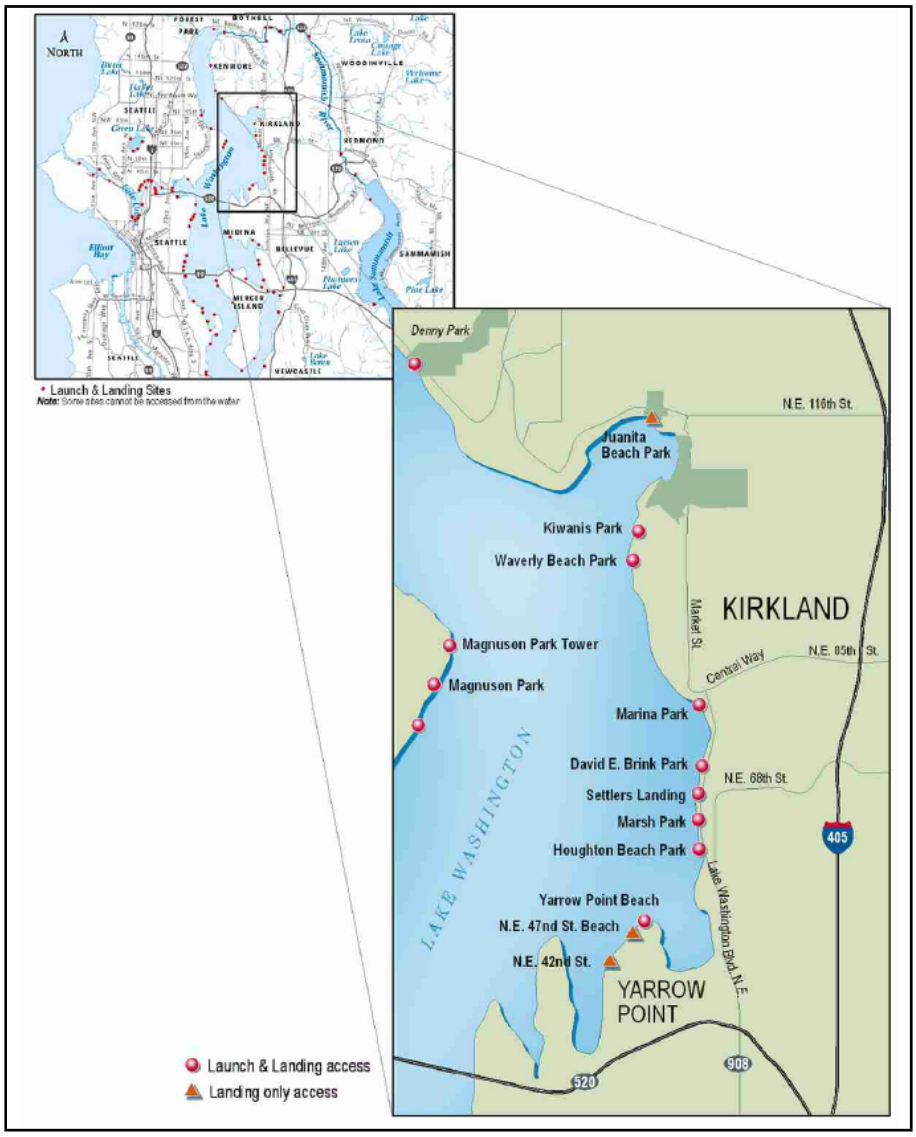
The following Action Items are necessary to implement and manage the equestrian element facilities described above:

- Complete design of the 116th Avenue NE facility (2009).
- Finalize equestrian path design standards for inclusion in City's Pre-Approved Plans (2010).
- Secure funding for the construction of the 116th Avenue NE facility (ongoing).
- Seek funding for the design and construction of the NE 60th Street facility (ongoing).
- Preserve and maintain access through the existing equestrian easements around Bridle Trails State Park (ongoing).

SECTION 9: WATER TRAILS

The Washington Water Trails Association (WWTA) is a volunteer, non-profit organization that promotes the use of small, human- and wind-powered, beachable watercraft. The WWTA has established what is referred to as the Washington State Water Trails Recreation Program. This program includes a number of marine and inland water trails, or blueways, in western Washington. The water trails consist of secure access points and rest stops and also often include natural and cultural waterside attractions. The Lakes-to-Locks Water Trail, shown in Map , is a series of lakes and rivers extending from Issaquah to Elliot Bay with nearly a dozen launch, landing, and rest sites along Kirkland's shoreline. Kirkland's Parks and Community Services Department was one of many public agencies that cooperated with the WWTA in creating the Lakes-to-Locks Water Trail. This partnership should be continued so that this unique non-motorized transportation facility is preserved.

Map 23 The Lakes-to-Locks Water Trail



APPENDIX A ON-LINE SURVEY

Paper versions of the on-line survey instrument are shown on the following pages. About 800 responses were received about 400 each to the pedestrian and the bicycle surveys. Surveys were available beginning on July 19, 2007 and although there was no hard ending date, very few surveys were received after August 31, 2007. More information about the survey including all the comments is available on the City website www.ci.kirkland.wa.us click through to: departments>Public Works>non-motorized plan.

BICYCLING SURVEY

The City of Kirkland is revising its non-motorized plan. The Kirkland Transportation Commission is responsible for this effort. Our new plan has 3 goals:

1. **Network and project priority**. Describe a future network for bicycle and pedestrian facilities and identify a clear subset of first priority projects.

2. **Evaluation**. Prepare a "to do" list of things to work on to improve bike/pedestrian environment.

3. **Handbook.** Serve as a source of information to answer commonly asked pedestrian/bike questions and document policies/procedures.

You can improve the plan by completing this survey about bicycle facilities. Everyone in your household is welcome to complete their own survey, and we encourage you tell others about the survey. Also, check out the walking survey. You can fill these surveys out on line too. Visit www.ci.kirkland.wa.us

The first part of the survey has **3 required questions**, there are **10 more optional questions** that we invite you to answer as well.

REQUIRED QUESTIONS:

1. **Home Zip Code:** _____

2. **How often do you bicycle in Kirkland? For each purpose below, check the frequency that BEST describes how often you bicycle. Here are some examples: if you do an activity on weekdays only, choose *daily*. If you do an activity 3 times a month, choose *monthly*. If you do an activity once or twice a week, choose *weekly*.**

Purpose	Frequency			
	Daily	Weekly	Monthly	Never
All the way to school:				
All the way to work:				
To run errands like shopping, etc.:				
In combination with a bus trip for work or school:				
For exercise/fitness/pleasure:				
Mountain bike/off road:				
Other:				

3. **What factors should be used to prioritize construction of bicycle improvement projects? From the list of possible factors, choose your top three priorities:**

Factors	Priority		
Check one factor ↓ for each priority →	1st	2nd	3rd
Safety - Address locations where accidents have occurred. This includes projects that improve lighting.			
Regional Connections - Projects that connect to regional trails/other cities			
Most users - Build facilities that will serve the most users			
Local Connections - Connect to shopping, restaurants, other services			
Equity - Spend similarly in various neighborhoods			
Transit - Increase easy bike access to Metro bus stops			
Schools - Build projects near schools and that access school bus stops			
Information - Mark bike routes and add other information like distances to key destinations			
Maintenance - Maintain existing bicycle facilities			
Other factors you would like to see considered:			

OPTIONAL QUESTIONS

4. Where are the most problematic locations for biking in Kirkland? Be as specific as possible.

_____

_____

_____

_____

_____

_____

_____

_____

5. Where is an excellent location for biking in Kirkland? Be as specific as possible.

_____

_____

_____

6. Tell us more about anything that would make biking in Kirkland easier for you. Subjects could include:

- Any bicycling issues you've always wanted to comment about.
- Questions or comments about bicycle facilities or programs.
- Things that you've seen elsewhere that you would like to see in Kirkland.

_____

_____

_____

_____

_____

_____

_____

_____

7. Your age *(circle 1)* <13 13-19 20-29 30-49 50-65 65-75 >75

8. Your gender (circle 1) Male Female

9. Your email address *(please print clearly)* _____

10. Your work zip code _____

11. Your home address

_____

Street address City

12. Would you be willing to participate in groups working on the equestrian or waterborne parts of the plan?

Circle One: NO YES *(if yes, please include your email address in question 9.)*

PEDESTRIAN SURVEY

The City of Kirkland is revising its non-motorized plan. The Kirkland Transportation Commission is responsible for this effort. Our new plan has 3 goals:

1. **Network and project priority**. Describe a future network for bicycle and pedestrian facilities and identify a clear subset of first priority projects.

2. **Evaluation**. Prepare a "to do" list of things to work on to improve bike/pedestrian environment.

3. **Handbook** Serve as a source of information to answer commonly asked pedestrian/bike questions and document policies/procedures.

You can improve the plan by completing this survey about pedestrian facilities. Everyone in your household is welcome to complete their own survey, and we encourage you tell others about the survey. Also, check out the bicycling survey. You can fill these surveys out on line too. Visit www.ci.kirkland.wa.us

The first part of the survey has **3 required questions**, there are **10 more optional questions** that we invite you to answer as well.

REQUIRED QUESTIONS:

1. **Home Zip Code:** _____

2. **How often do you walk/run in Kirkland? For each purpose below indicate the frequency that BEST describes how often you walk. Here are some examples: if you do an activity on weekdays only, choose *daily*. If you do an activity 3 times a month, choose *monthly*. If you do an activity once or twice a week, choose *weekly*.**

Purpose	Frequency			
	Daily	Weekly	Monthly	Never
All the way to school:				
All the way to work:				
To run errands like shopping, etc.:				
To the bus stop for work or school:				
For exercise/fitness/pleasure:				
Other:				

3. **What factors should be used to prioritize construction of pedestrian improvement projects? Indicate how highly each factor should rank when determining funding priorities.**

Factors	Priority		
Check one factor ↓ for each priority →	1st	2nd	3rd
Safety - Address locations where accidents have occurred. This includes street lighting improvements.			
Complete missing pieces - Create longer continuous walkways			
Most users - Build facilities that will serve the most users			
Connections - Facilitate pedestrian travel to shopping, restaurants and other services			
Equity - Spend similarly in various neighborhoods			
Transit - Increase easy walking access to Metro bus stops			
Schools - Build projects near schools and that access school bus stops			
Maintenance - Maintain existing pedestrian facilities			
Other factors you would like to see considered:			

OPTIONAL QUESTIONS

4. Where are the most problematic locations for walking in Kirkland? Be as specific as possible.

_____
_____
_____
_____
_____
_____
_____
_____

5. Where is an excellent location for walking in Kirkland? Be as specific as possible.

_____
_____
_____

6. Tell us more about anything that would make walking in Kirkland easier for you. Subjects could include:

- Any walking/running issues you've always wanted to comment about.
- Questions or comments about walking facilities or programs.
- Things that you've seen elsewhere that you would like to see in Kirkland.

_____
_____
_____
_____
_____
_____
_____
_____

7. Your age *(circle 1)* <13 13-19 20-29 30-49 50-65 65-75 >75

8. Your gender (circle 1) Male Female

9. Your email address *(please print clearly)* _____

10. Your work zip code _____

11. Your home address

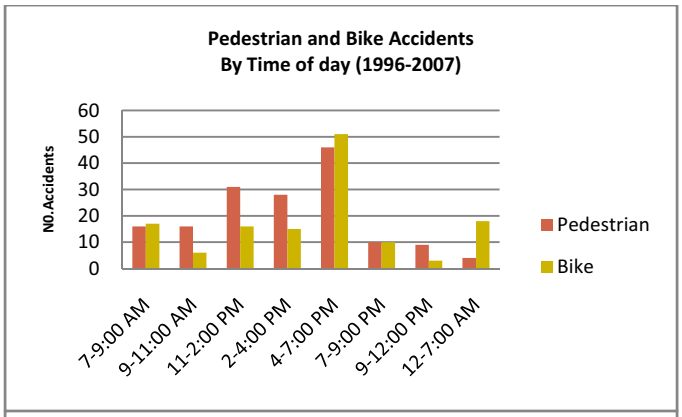
_____
Street address City

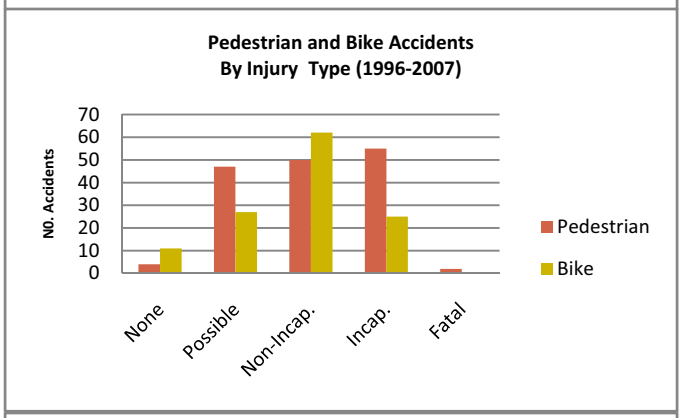
12. Would you be willing to participate in groups working on the equestrian or waterborne parts of the plan?

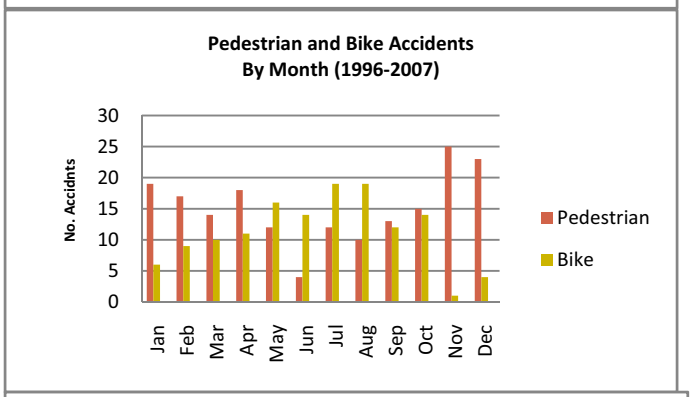
Circle One: NO YES *(if yes, please include your email address in question 9.)*

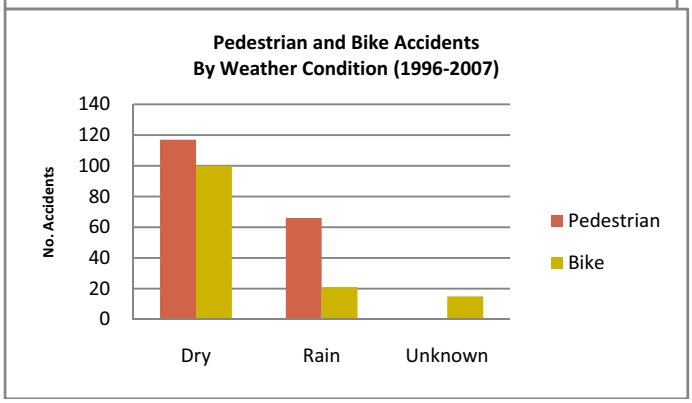
APPENDIX B CRASH DATA

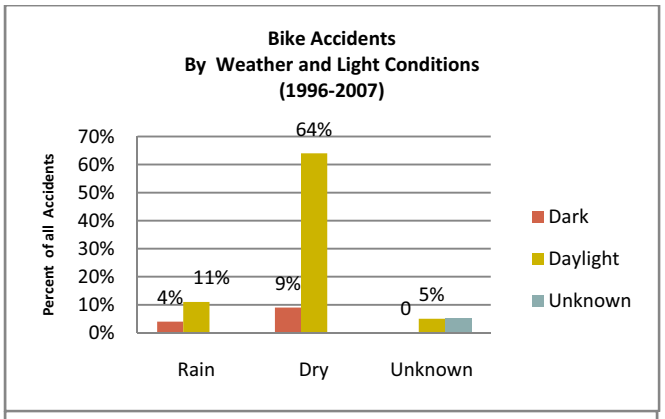
This appendix is a gallery of selected crash data based on information from the City of Kirkland's pedestrian and bicycle crash database.

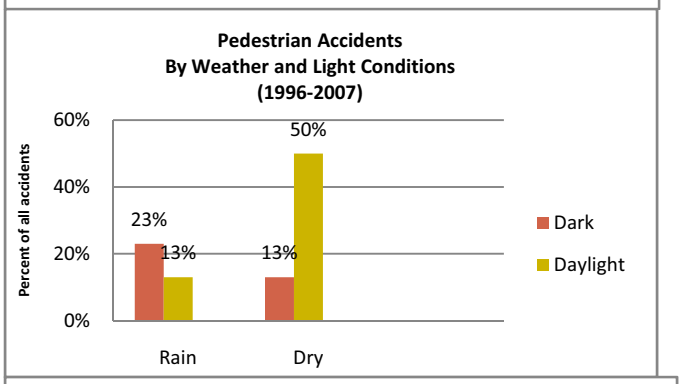

Pedestrian and Bike Accidents
By Time of day (1996-2007)
NO. Accidents
60
50
40
30
20
10
0
7-9:00 AM
9-11:00 AM
11-2:00 PM
2-4:00 PM
4-7:00 PM
7-9:00 PM
9-12:00 PM
12-7:00 AM
Pedestrian
Bike

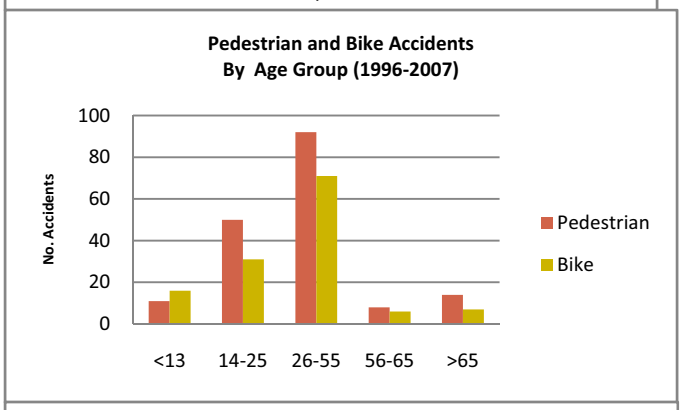

Pedestrian and Bike Accidents
By Injury Type (1996-2007)
NO. Accidents
70
60
50
40
30
20
10
0
None
Possible
Non-Incap.
Incap.
Fatal
Pedestrian
Bike

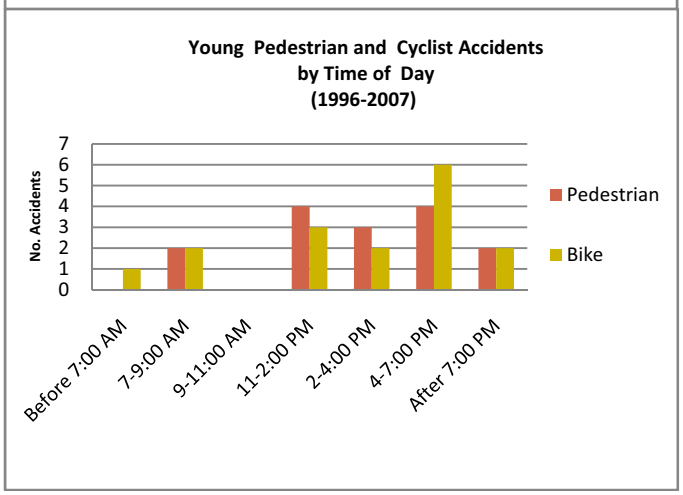

Pedestrian and Bike Accidents
By Month (1996-2007)
No. Accidnts
30
25
20
15
10
5
0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Pedestrian
Bike

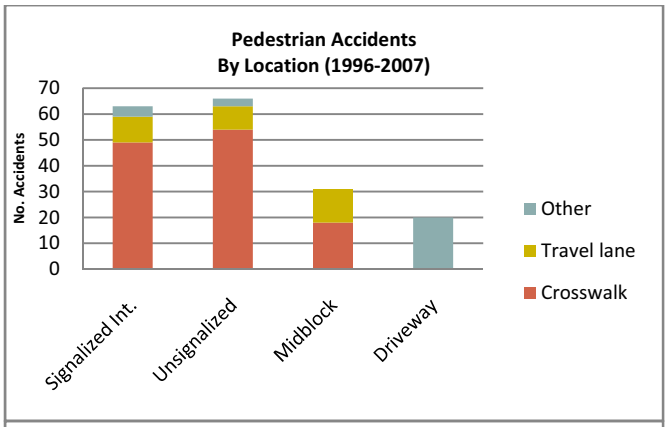

Pedestrian and Bike Accidents
By Weather Condition (1996-2007)
No. Accidents
140
120
100
80
60
40
20
0
Dry
Rain
Unknown
Pedestrian
Bike

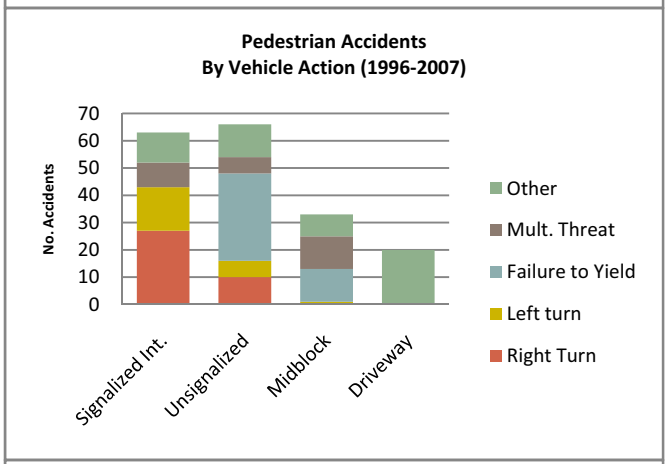

Bike Accidents
By Weather and Light Conditions
(1996-2007)
Percent of all Accidents
70%
60%
50%
40%
30%
20%
10%
0%
4%
11%
9%
64%
0
5%
Rain
Dry
Unknown
Dark
Daylight
Unknown

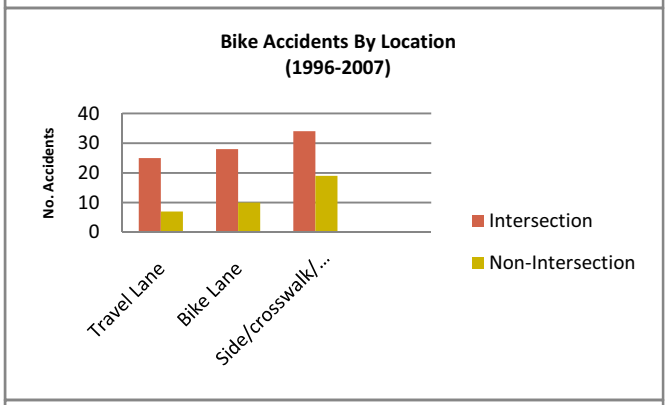

Pedestrian Accidents
By Weather and Light Conditions
(1996-2007)
Percent of all accidents
60%
40%
20%
0%
23%
13%
13%
50%
Rain
Dry
Dark
Daylight

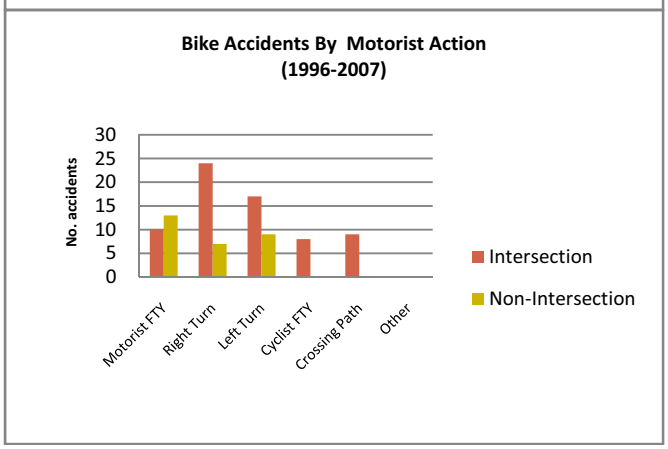

Pedestrian and Bike Accidents
By Age Group (1996-2007)
No. Accidents
100
80
60
40
20
0
<13
14-25
26-55
56-65
>65
Pedestrian
Bike

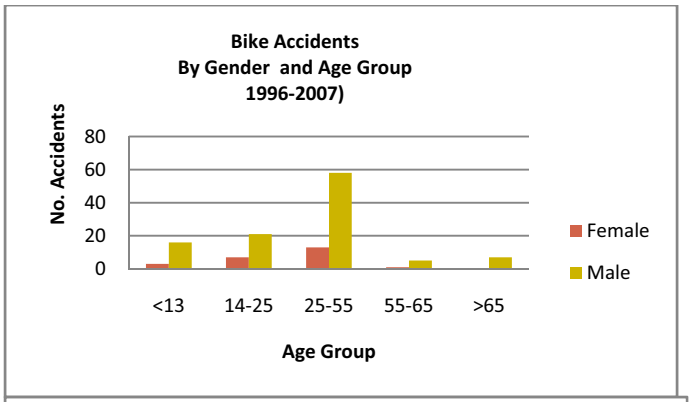

Young Pedestrian and Cyclist Accidents
by Time of Day
(1996-2007)
No. Accidents
7
6
5
4
3
2
1
0
Before 7:00 AM
7-9:00 AM
9-11:00 AM
11-2:00 PM
2-4:00 PM
4-7:00 PM
After 7:00 PM
Pedestrian
Bike

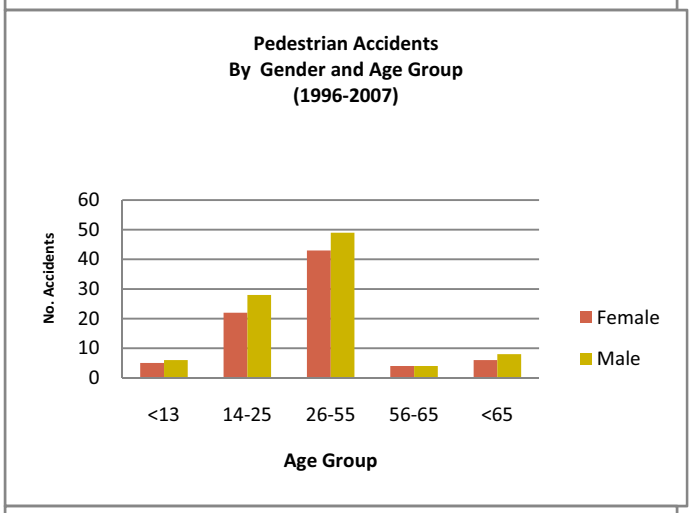

Pedestrian Accidents
By Location (1996-2007)
No. Accidents
70
60
50
40
30
20
10
0
Signalized Int.
Unsignalized
Midblock
Driveway
Other
Travel lane
Crosswalk

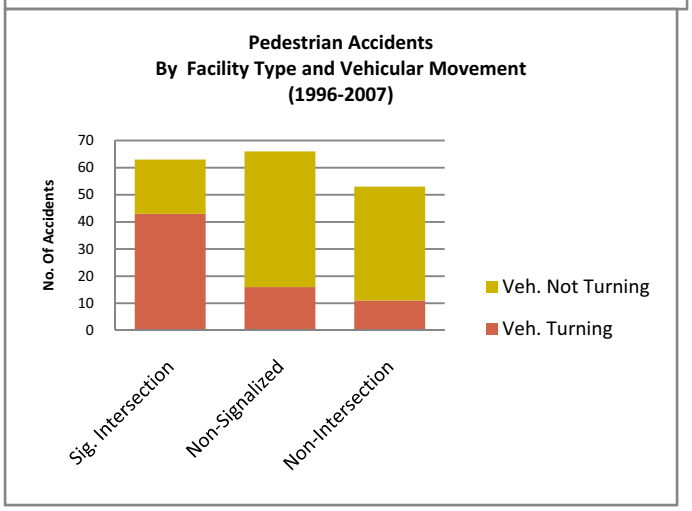

Pedestrian Accidents
By Vehicle Action (1996-2007)
No. Accidents
70
60
50
40
30
20
10
0
Signalized Int.
Unsignalized
Midblock
Driveway
Other
Mult. Threat
Failure to Yield
Left turn
Right Turn


Bike Accidents By Location
(1996-2007)
No. Accidents
40
30
20
10
0
Travel Lane
Bike Lane
Side/crosswalk/...
Intersection
Non-Intersection


Bike Accidents By Motorist Action
(1996-2007)
No. accidents
30
25
20
15
10
5
0
Motorist FTY
Right Turn
Left Turn
Cyclist FTY
Crossing Path
Other
Intersection
Non-Intersection


Bike Accidents
By Gender and Age Group
1996-2007)
No. Accidents
80
60
40
20
0
<13
14-25
25-55
55-65
>65
Age Group
Female
Male


Pedestrian Accidents
By Gender and Age Group
(1996-2007)
No. Accidents
60
50
40
30
20
10
0
<13
14-25
26-55
56-65
<65
Age Group
Female
Male


Pedestrian Accidents
By Facility Type and Vehicular Movement
(1996-2007)
No. Of Accidents
70
60
50
40
30
20
10
0
Sig. Intersection
Non-Signalized
Non-Intersection
Veh. Not Turning
Veh. Turning

APPENDIX C PRIORITIZATION OF SIDEWALK PROJECTS

As described in Section 5, proximity to parks, bus routes, schools and commercial areas were used to calculate the access portion of the sidewalk construction project ranking system.

Table 20 shows the schools, parks, transit routes and commercial areas that were used in the calculation.

Table 20 Data used for computing access score

PARKS	SCHOOLS	COMMERCIAL AREAS	TRANSIT		
			Route	Peak hour only	Freeway in Kirkland
1. 132nd Square Park	**Lake Washington School District**	1. Bridle Trails: BCX, BN1	230		
2. Bridle Trails State Park	*Elementary (k-6)*	2. Carillion Point: PLA 15A	234		
3. Brookhaven Park	1. AG Bell	3. Downtown: CBD 1-8	236		
4. Carillon Woods	2. Juanita	4. Houghton: BC	238		
5. Cedar View Park	3. Peter Kirk	5. Juanita: JBD 1-2, 4-6	244	x	
6. Crestwoods Park	4. Mark Twain	6. Lake Washington Blvd.: BN	245		
7. David E. Brink Park	5. Rose Hill	7. Market Street south: MSC 3	248		
8. Everest Park	6. Lakeview	8. Market Street north: MSC 2	252	X	Between Totem Lake freeway station and Seattle
9. Forbes Creek Park	7. Ben Franklin	9. NE 85th Street: RH1 A-B, 2 A-C, 3, 4, 5 A-C, 7	255		
10. Forbes Lake Park	*Jr. High (7-9)*	10. Totem Lake: TL 2, 4 A-C, 5, 6 A,B, 8, NRH 1A, 1B, 4	257	X	Between Totem Lake freeway station and Seattle
11. Heritage Park	8. Kirkland		260	X	Between NE 116th St. and Seattle. Stops at Houghton Freeway Stop
12. Highlands Park	9. Rose Hill Shares campus with Stella Schola		265	X	Between Houghton P&R and Seattle
13. Houghton Beach Park	*High Schools (10-12)*		277	X	Between Houghton P&R and Seattle
14. Juanita Bay Park	10. Juanita Shares campus with Futures School		291	X	
15. Juanita Beach Park	11. Lake Washington Shares campus with Northstar Jr. High		342		Serves only Totem Lake Freeway Station and Houghton Freeway stop
16. Kiwanis Park	**Choice Schools**		532	X	Serves only Totem Lake Freeway Station

PARKS	SCHOOLS	COMMERCIAL AREAS	TRANSIT		
			Route	Peak hour only	Freeway in Kirkland
17. Marina Park	12. Community Elementary (1-6) Shares campus with International School		535		Serves only Totem Lake Freeway Station
18. Mark Twain Park	13. Stella Schola (6-9) Shares campus with Rose Hill Jr. High		540		
19. Marsh Park	14. Northstar Jr. High (7-9) Shares campus with Lake Washington High		935		
20. McAuliffe Park	15. International School (7-12) Shares campus with Community Elementary				
21. North Kirkland Community Center and Park	16. BEST High School (9-12) Shares campus with Family Learning Center				
22. North Rose Hill Woodlands Park	17. Futures School (10-12) Shares campus with Juanita High School				
23. Ohde Avenue Pea Patch	18. Family Learning Center (k-12) Shares campus with BEST High School				
24. Peter Kirk Park	**Other Schools and facilities**				
25. Phyllis A. Needy Park	19. Holy Family (k-8)				
26. Reservoir Park	20. Seventh Day Adventist (k-8)				
27. Rose Hill Meadows	21. Lake Washington Technical College				
28. Settler's Landing	22. Northwest University				
29. Snyder's Corner	23. Boys & Girls Club				
30. South Rose Hill Park					
31. Spinney Homestead Park					
32. Street End Park					
33. Taylor Fields at Houghton Landfill					
34. Terrace Park					
35. Tot Lot Park					
36. Totem Lake Park					
37. Van Alst Park					

PARKS	SCHOOLS	COMMERCIAL AREAS	TRANSIT		
			Route	Peak hour only	Freeway in Kirkland
38. Watershed Park					
39. Waverly Beach Park					
40. Yarrow Bay Wetlands					

As described in Section 5, buffers of ⅛ and ¼ mile were mapped around each of the features in Table 20. (See Maps 24-27) The city was divided into an imaginary grid of almost 619,000 25' x 25' cells and the presence of various buffers was tabulated by cell. For example, Table 21 shows that there were 42 cells that were within 1/8 mile of 3 parks, 17 cells that were within ¼ mile of 5 parks and 184,369 cells within ¼ mile of 1 park. Similar tables were prepared for commercial areas, transit (separate tables for both peak only and all day) and schools (separate tables for shared and non-shared campuses).

Table 21 Example of proximity to parks calculation

Parks			
Within 1/8 Mile		More than 1/8, less than 1/4 Mile	
Number of Parks	Number of cells	Number of Parks	Number of cells
0	382,173	0	383,843
1	220,372	1	184,369
2	16,240	2	41,978
3	42	3	7,314
		4	1,306
		5	17
Sum	618,827	Sum	618,827
non zero sum	236,654	non zero sum	234,984

By summing the non-zero cells the "volume" of each feature can be calculated. Summing these volumes gives the overall impact of all the features. The total impact of each major category was adjusted to the proportions shown in Table 10 on page 81. An adjustment factor was calculated for each major category, Parks, Transit, Commercial areas and Schools; schools and parks should each account for 30% of the total impact and transit and commercial areas should account for 20% each. Adjustments are then made within each major category, as called for in Table 10, for example being within 1/8 of a mile of park counts 1.25 more than being within ¼ mile of a park. This second adjustment essentially reallocates the major category adjustment across the sub categories. Tables 22 and 23 show the values of the various factors.

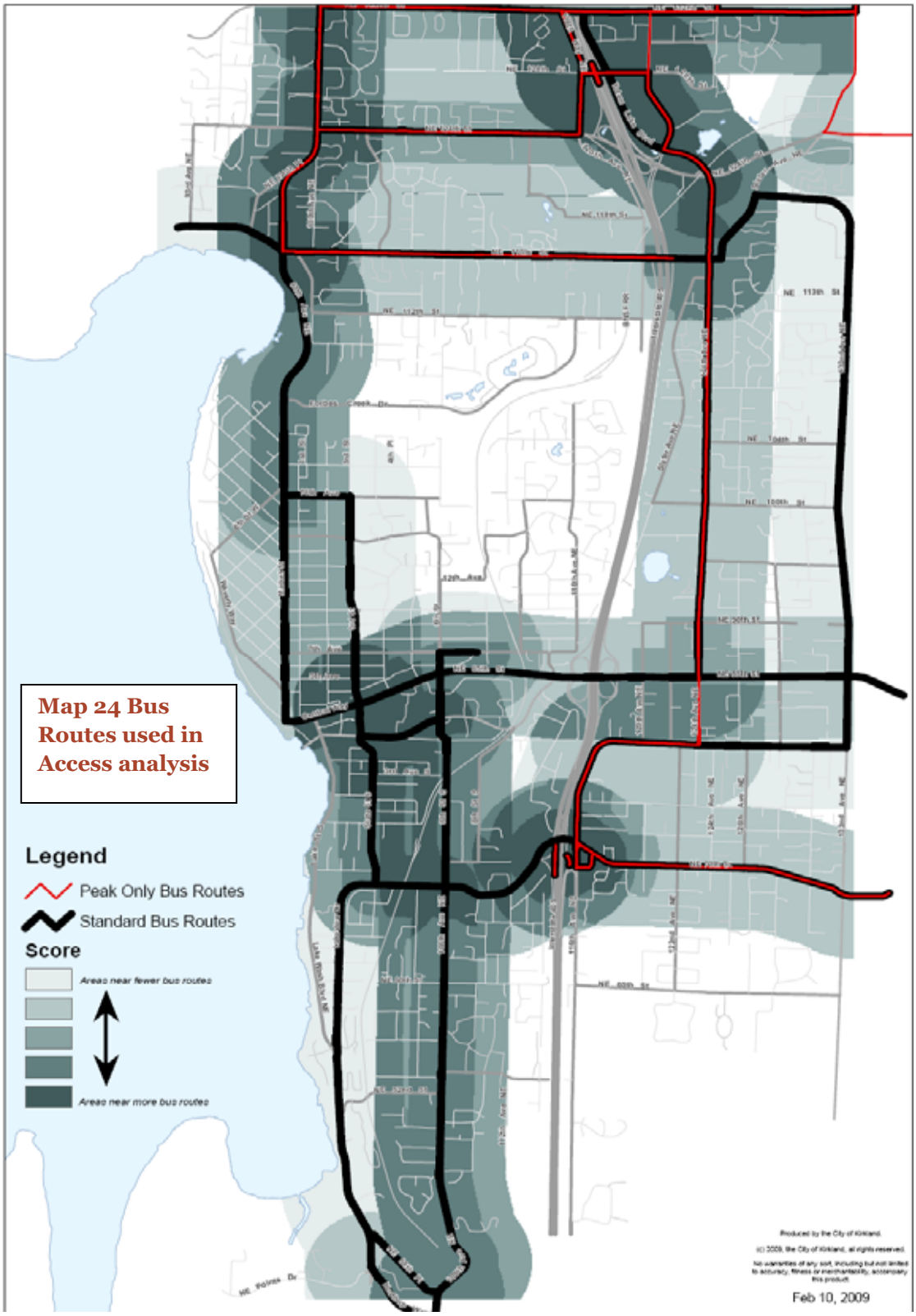
These factors are multiplied by the sum of the scores for each feature in each cell. Scores for segments are developed by assigning the segment the score of the highest cell it passes through. Segment scores were converted to a 1-35 scale by computing the cumulative distribution of all the segment scores an assigning them to a 1-35 range. For example the 20th percentile segment score was converted to a score of 7 (20th percentile of 1-35 range) 40th percentile 14 and so on.

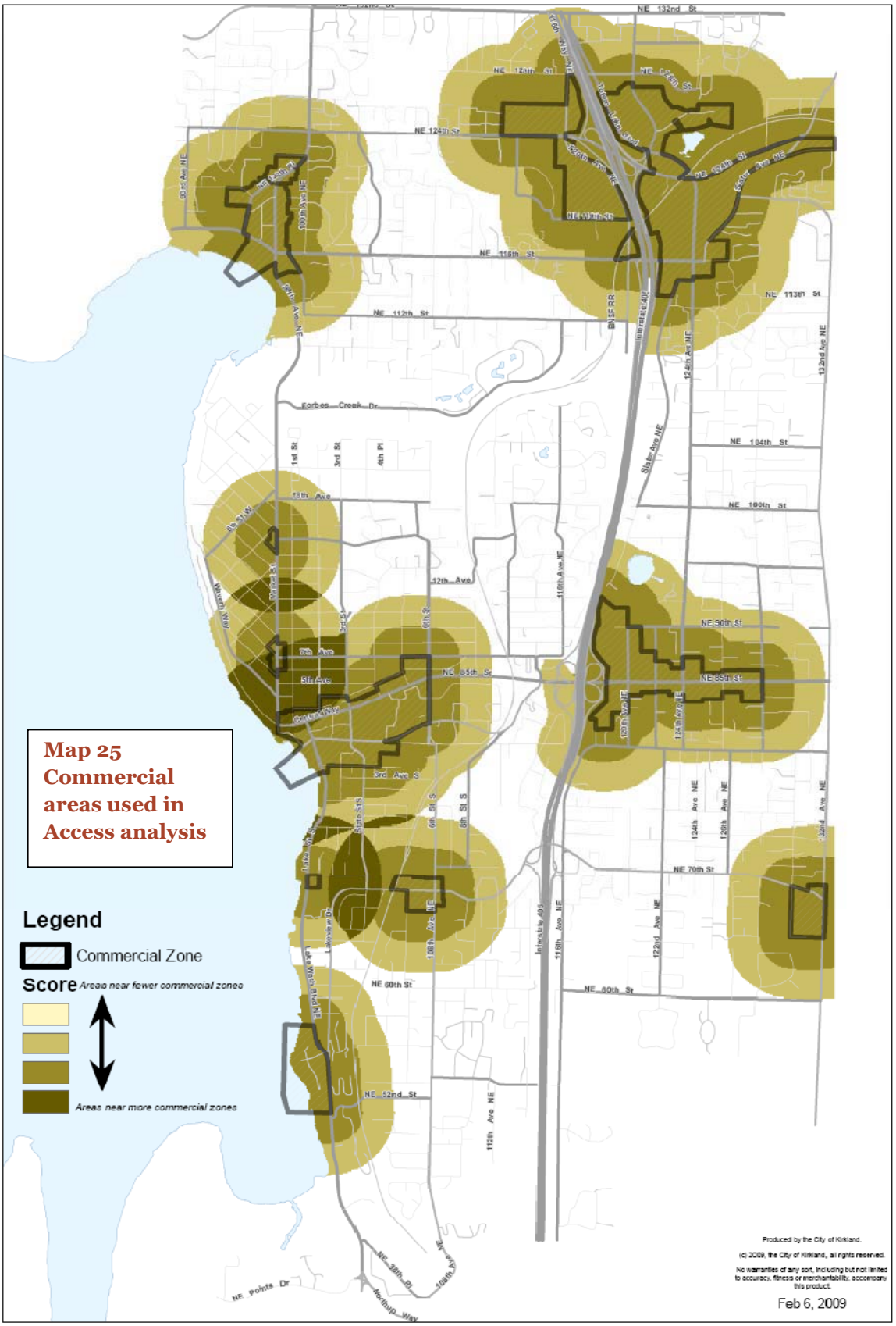
Table 22 Major category factors

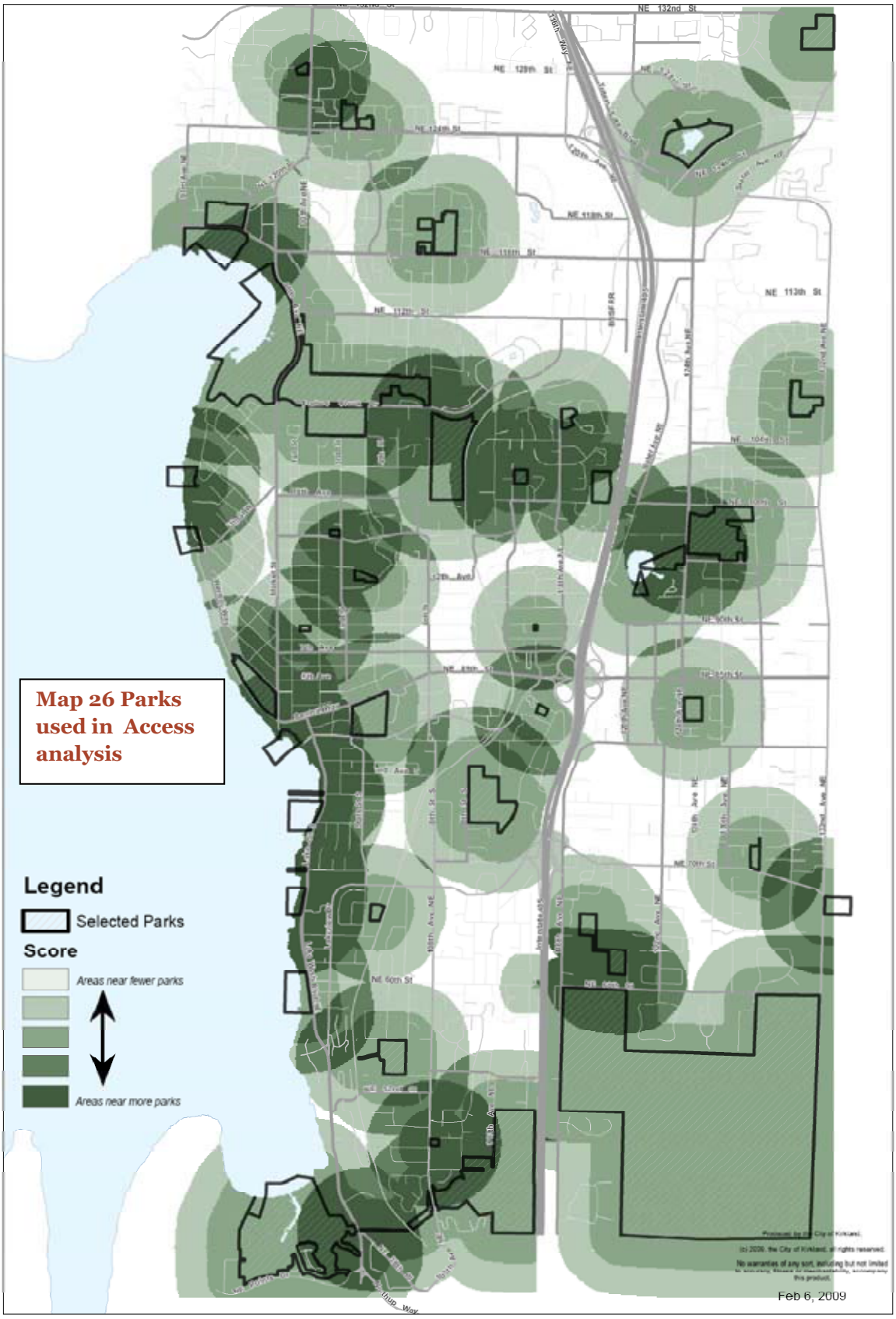
Major Category	Number of non zero cells	Fraction of non zero cells in category		Major Category factor (Desired/Unadjusted)
		Un adjusted (non zero cells/Total)	**Desired** from Table 10	
Parks	471,638	0.303	0.3	0.989
Commercial	213,006	0.136	0.2	1.46
School	183,465	0.118	0.3	2.54
Bus	686,910	0.442	0.2	0.453
TOTAL	**1,555,019**	1.000	1.0	

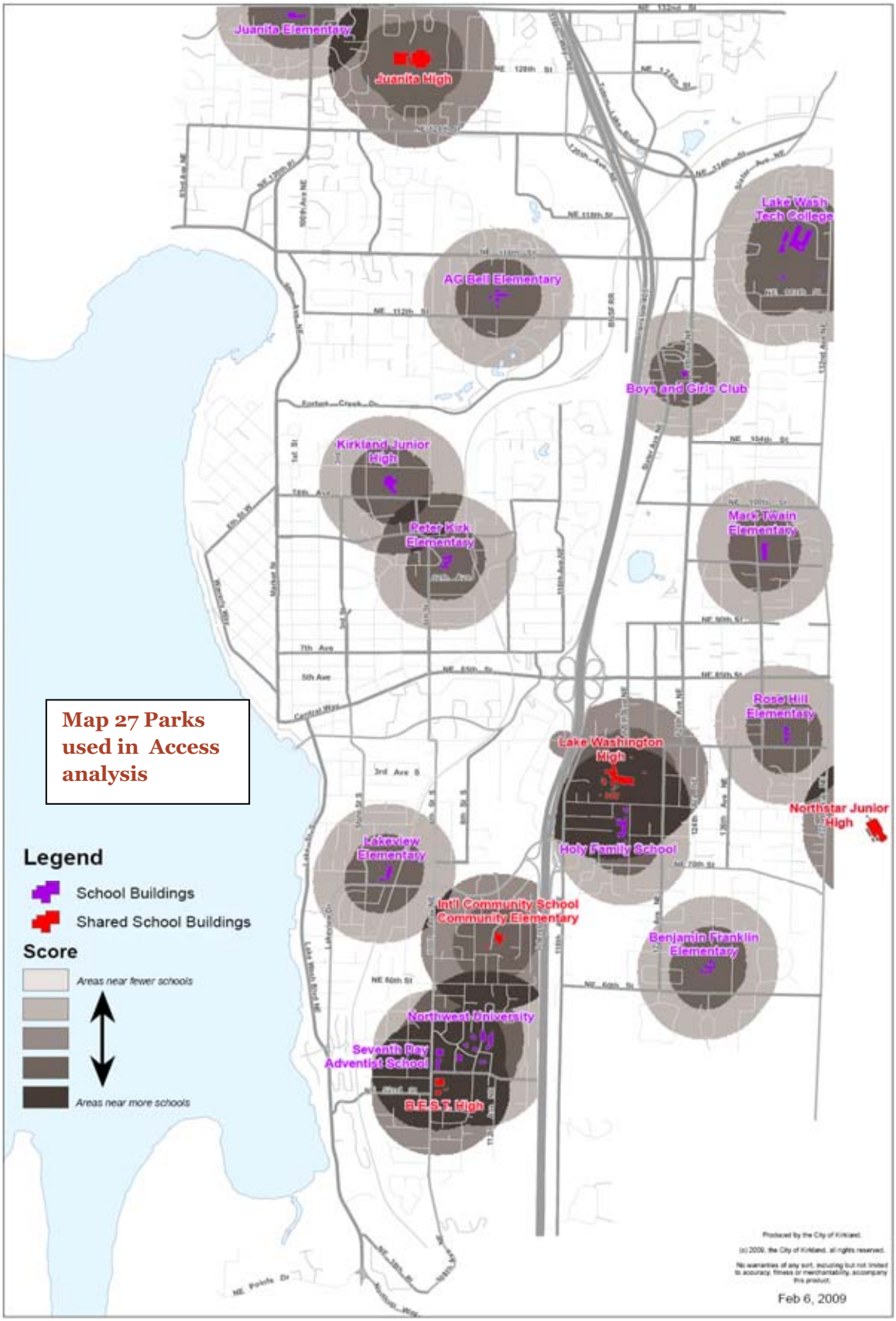
Table 23 Final adjustment factors

Category	Distance	Internal weight from Table 10	Internal factor (weight/weight sum)	Final factor (internal factor x Major category factor)
Parks	1/8 mile	1.25	0.556	0.55
	1/4 mile	1.00	0.444	0.44
	weight sum	**2.25**	**1.00**	**0.99**
Commercial area	1/8 mile	1.25	0.556	0.81
	1/4 mile	1.00	0.444	0.65
	weight sum	**2.25**	**1.00**	**1.46**
School	1/8 mile	1.25	0.269	0.68
	1/4 mile	1.00	0.215	0.55
Shared campus school	1/8 mile	1.30	0.279	0.71
	1/4 mile	1.10	0.236	0.60
	weight sum	**4.65**	**1.00**	**2.54**
All day bus	1/8 mile	1.25	0.316	0.14
	1/4 mile	1.00	0.253	0.11
Peak hour only bus	1/8 mile	0.95	0.241	0.11
	1/4 mile	0.75	0.190	0.09
	weight sum	3.95	1.00	0.45


Map 24 Bus Routes used in Access analysis
Legend
Peak Only Bus Routes
Standard Bus Routes
Score
Areas near fewer bus routes
Areas near more bus routes
Feb 10, 2009


Map 25
Commercial areas used in Access analysis
Legend
Commercial Zone
Score
Areas near fewer commercial zones
Areas near more commercial zones
Produced by the City of Kirkland.
(c) 2009, the City of Kirkland, all rights reserved.
No warranties of any sort, including but not limited to accuracy, fitness or merchantability, accompany this product.
Feb 6, 2009


Map 26 Parks used in Access analysis
Legend
Selected Parks
Score
Areas near fewer parks
Areas near more parks
NE 132nd St
NE 128th St
NE 124th St
NE 120th St
NE 116th St
NE 112th St
NE 113th St
NE 108th St
NE 104th St
NE 100th St
NE 95th St
NE 90th St
NE 85th St
NE 80th St
NE 70th St
NE 60th St
NE 53rd St
Interstate 405
Lake Washington
Feb 6, 2009



Map 27 Parks used in Access analysis

APPENDIX D TRANSPORTATION PROJECT EVALUATION FORM

CITY OF KIRKLAND

TRANSPORTATION PROJECT EVALUATION FORM

PROJECT INFORMATION

Project:_____

Limits:_____

Description:_____

_____

Proposed By:_____Date:_____

Rated By:_____Date:_____

INITIAL PROJECT SCREENING

Does the project conflict with any specific policy provisions of the Comprehensive Plan?

Yes: project eliminated from consideration

No: project ranked using following criteria

PROJECT VALUES

	POSSIBLE	THIS PROJECT
• FISCAL	20	
• PLAN CONSISTENCY	10	
• NEIGHBORHOOD INTEGRITY	15	
• TRANSPORTATION CONNECTIONS	15	
• MULTIMODAL (NON-SOV)	20	
• SAFETY	20	
TOTAL	100	

(Note to Rater: Please address all of the following questions recording any assumptions or comments in the margin adjacent to the question. Record scores for each question and transfer each value total to this cover sheet.)

FISCAL

_____ (50) 1. What is the City's ability to leverage funds from all non-City sources (i.e. grants, private funds)?

(a) Chance to leverage		x	(b) Amount leveraged	
0%	0		0-25%	1
1-25%	1		26-49%	2
26-50%	2		50-74%	3
51-75%	3		75-100%	4
76-100%	4			

(Rater: Multiply (a) x (b) = leverage factor (LF))

LF	SCORE
0-1	0
2-3	15
4-6	25
7-11	35
12-16	50

_____ (30) 2. How does the project unit construction cost deviate from standard unit construction cost? (Compare like projects: i.e. paths to paths, and not paths to sidewalks.)

>25% Greater than standard unit costs	0
0-25% Greater than standard unit costs	15
Less than standard unit costs	30

_____ (10) 3. How will the maintenance costs for conceptual design of project compare with the maintenance costs for a standard project design? (Standard project design is defined as the current requirements as set forth in the street standards.)

Greater than standard maintenance cost	0
Standard maintenance cost	5
Reduce costs of existing infrastructure or less than standard maintenance cost	10

FISCAL VALUES (Continued)

_____ (10) 4. How will the conceptual design of the project affect existing maintenance needs?

Greater than existing	0
Same	5
Less than existing	10

_____ VALUE SCORE
(100 max)

x .20 VALUE WEIGHT

_____ VALUE TOTAL

PLAN CONSISTENCY

_____ (50) 1. Is the project generally consistent with or generated from adopted regional plans, such as Eastside Transportation Plan, King County Transit Six-Year Plan?

No	0
Project is not inconsistent	25
Project is generated from a regional plan	50

_____ (50) 2. Is the project identified by the 20 year project list in the Capital Facilities Element of Kirkland's Comprehensive Plan or the Non-Motorized Transportation Plan (NMTP)?

Project is not in either plan	0
Project is identified as a priority 2 route in the NMTP	25
Project is in the Comprehensive Plan, listed as a priority 1 route in the NMTP or is an approved school safe walk route.	50

_____ VALUE SCORE
(100 max)

x .10 VALUE WEIGHT

VALUE TOTAL

_____

NEIGHBORHOOD INTEGRITY

_____ (40) 1. Does the project have public support?

Clearly opposed by the public	0
Support/opposition of the public unknown or balanced	20
Clearly supported by the public (i.e. Neighborhood Association, PTA letter)	40

_____ (20) 2. Is the project generally consistent with the neighborhood in regards to street widths, landscaping, and appropriate buffers?

No	0
Neutral	5
Yes	15
Yes & superior design	20

_____ (20) 3. How will the project impact through traffic on neighborhood access/collector streets?

Will significantly divert traffic onto neighborhood access/collector streets	0
Will have minimal impact on neighborhood access/ collector streets	10
Will divert traffic away from neighborhood access/ collector streets	20

_____ (20) 4. Is the project identified in a neighborhood plan or does the project support the goals of the neighborhood plan?

Does not support goals or conflicts	0
No impact on goals of the Plan	10
Identified in the Plan or supports the goals of the Plan	20

_____ VALUE SCORE
(100 max)

x .15 VALUE WEIGHT

_____ VALUE TOTAL

TRANSPORTATION CONNECTIONS

_____ (28) 1. Does the project provide a missing segment of an existing incomplete transportation network which is specifically identified in the Comprehensive Plan, the Non-Motorized Transportation Plan or is an approved school safe walk route?

No	0
Pedestrian Network	
Yes for a priority 2 network or a school safe walk route on a local street	14
Yes for a priority 1 network or a school safe walk route on a collector or arterial	28
Bicycle Network	
Yes for a priority 2 network	14
Yes for a priority 1 network	28
Transit/HOV Network	
Yes for a moderate improvement	14
Yes for a substantial improvement	28
Road Network	
Yes for a moderate improvement	14
Yes for a substantial improvement	28

_____ (72) 2. Does the project improve pedestrian, bicycle, transit/HOV or road connections near activity centers?

(72) Pedestrian:

Activity Centers	**Project Within 1/4 Mile of a Center**		**Project Within 1/2 Mile of a Center**	
School	18 points		12 points	
Community Facility[1]	12 points		6 points	
Business District[2]	12 points		6 points	
Transit/HOV Facility	Facility 12	Route 6	Facility 6	Route 3
Regional Center[3]	6 points		3 points	
Improves a Connection within a Business District			12 points	

TRANSPORTATION CONNECTIONS (Continued)

(72) Bicycle:

Activity Centers	Project Within 1/2 Mile of a Center		Project Within 1 Mile of a Center	
School	18 points		12 points	
Community Facility[1]	12 points		6 points	
Business District[2]	12 points		6 points	
Transit/HOV Facility	Facility 12	Route 6	Facility 6	Route 3
Regional Center[3]	6 points		3 points	
Improves a Connection within a Business District			12 points	

(72) Transit/ HOV:

Activity Centers	Project Within 1/4 Mile of a Center		Project Within 1/2 Mile of a Center	
School	18 points		12 points	
Community Facility[1]	12 points		6 points	
Business District[2]	12 points		6 points	
Transit/HOV Facility	Facility 12	Route 6	Facility 6	Route 3
Regional Center[3]	6 points		3 points	
Improves a Connection within a Business District			12 points	

Footnotes:
(1) Community Facility includes parks, libraries, hospitals, fire stations, city hall,
community centers, the Boys and Girls club and similar facilities.
(2) Business District includes commercial or employment centers.
(3) Regional Center includes Totem Lake area and Downtown Kirkland.

(72) Roads:

Connects To	Connects From		
	Arterial Street	**Collector Street**	**Local Access Street**
Arterial Street	72 points	72 points	0 points
Collector Street	72 points	72 points	36 points
Local Access Street	0 points	36 points	72 points

For multi-modal projects, the project will receive the same number of points as the highest rated mode.

TRANSPORTATION CONNECTIONS (Continued)

(72) Signals:

Warrants	<75%	>75%	Meets
1. Minimum Volume	0	6	12
2. Interruption	0	6	12
3. Ped Volume	0	6	12
9. Four Hour Volume	0	6	12
10. Peak Hour Delay	0	6	12
11. Peak Hour Volume	0	6	12

_____ VALUE SCORE
(100 max)

x .15 VALUE WEIGHT

VALUE TOTAL

_____

MULTIMODAL (NON-SOV)

_____ (45) 1. Does the project provide non-SOV modes to the existing facility that currently do not exist?

Adds transit/HOV mode	15
Adds bicycle mode	15
Adds pedestrian mode	15

_____ (30) 2. Will the project impact the effectiveness of any existing non-SOV modes (minimum standard)?

Denigrates existing non-SOV mode(s)	0
No impact	15
Improves existing non-SOV mode(s)	30

_____ (25) 3. Does the project add one or more non-SOV modes to an existing regional corridor/facility or provide a new regional corridor/facility?

Pedestrian	5
Bike - one way	5
Bike - two way	10
Transit	10

_____ VALUE SCORE
(100 max)

x .20 VALUE WEIGHT

_____ VALUE TOTAL

SAFETY

_____ (10) 1. Does the conceptualized design of the project meet generally accepted practices?

No	0
Yes	10

_____ (25) 2. What are the existing conditions for each mode of the project?

_____ (25) Bicycle:

Traffic volume is low, wide vehicular lanes	0
Traffic volume is moderate, wide vehicular lanes which will allow cars to pass	5
Traffic volume is high, wide vehicular lanes which will allow cars to pass	10
Pavement is narrow, moderate volume of traffic	15
Pavement is narrow, high volume of traffic	20
Pavement is too narrow, to provide bicycle lane, traffic and parking demand are heavy	25

_____ (25) Pedestrian

_____ (25) **Pathway**:

High parking demand on shoulder, low traffic volume, sidewalk/pathway currently available on one side	0
High parking demand on shoulder, high traffic volume, sidewalk pathway available on one side	5
Moderate parking demand on shoulder, low traffic volume, no existing sidewalk/pathway available	10
Low parking demand on shoulder, high traffic volume, low turning movements, no existing sidewalk/pathway	15
Low parking demand on shoulder, high traffic volume, high turning movements, no existing facilities	20
Ability to prohibit or no parking demand on shoulder, high traffic volume/turning movements, no existing facilities	25

_____ (25) **Sidewalk**:

Sidewalk separated pathway available, low traffic volume	0
Wide paved shoulder or pathway both sides, low traffic volume	5
Wide gravel/dirt shoulder four to eight feet wide one side, moderate traffic volume	10

SAFETY (Continued)

Sidewalk: (Continued)

Paved shoulder one to four feet wide present both sides, moderate traffic volume 15
No shoulder present on one side (must walk in vehicle lane), one to four feet other side, high traffic volume 20
No shoulder either side (must walk in vehicle lane), high traffic volume 25

_____ (25) **Crosswalk**:
Low pedestrian/traffic volume 0
Moderate pedestrian/traffic volume 10
Vulnerable population in proximity, moderate pedestrian/traffic volume 20
Vulnerable population in proximity, high pedestrian/ traffic volume; high number of ped. accidents 25

_____ (25) Roadway: *(Note: Rater can substitute documented accidents along proposed project for relative ranking in this category).*

Roadway meets design standards (site distance, curves, travel lane widths, shoulders, etc.); saturated development (95 to 100% developed) feeding roadway 0
Roadway meets design standards; surrounding property mostly developed (50 to 95% developed) 5
Certain areas of the roadway below design standards, surrounding property mostly developed 10
Overall roadway is below design standards; surrounding property has significant undeveloped parcels with developable property (25 to 50% developed) 15
Certain areas of the roadway are potentially hazardous and substandard; surrounding property has significant undeveloped parcels 20
Overall roadway is potentially hazardous and substandard; high current or anticipated development (0 to 25% developed) will feed roadway 25

SAFETY (Continued)

_____ (25) Traffic Signal:

Accident Rate for Intersection

Not rated	0
0.25 accidents - 0.75 accidents/MEV	5
0.75-1.0 accidents/MEV	10
1.0 - 1.5 accidents/MEV	15
1.5 - 2.0 accidents/MEV	20
Greater than 2 accidents/MEV	25

_____ (25) Transit/HOV:

Not on an existing transit route, low need	0
Identified Transit route, high pedestrian/traffic volumes	25

_____ (15) 3. What is the degree of improvement proposed by the project compared to the existing condition(s). To determine, *After condition - Before condition = Number of points*; calculate total for all proposed project modes.

_____ (15) Bicycle:

No bike facilities available	0
Class III - no dedicated lane, but widened shoulder	5
Class II - on street, striped bike lane (5 feet wide)	10
Class I - separated trail	15

_____ (15) Pedestrian:

No pedestrian facilities available	0
Gravel shoulder (4 foot minimum)	5
Paved shoulder (4 foot minimum)	10
Sidewalk	12
Separated Trail	15

_____ (15) Crosswalk:

Unmarked crossing	0
Illuminated crossing/median island and warning signs	5
Traffic signal	10
Grade separation (under/overpass)	15

_____ (15) Roadway:

No existing roadway	0
Gravel/dirt roadway; no storm drainage	5
Existing paved roadway	10
Minimum roadway per zoning code	15

SAFETY (Continued)

_____ (15) Traffic Signal:

Stop sign controlled	0
No separate turn phases	5
Protected/permissive turns	10
Protected turns only	15

_____ (15) Transit/HOV:

No transit facilities available	0
Increases safety for transit	15

_____ (10) 4. Does the proposed project maintain or enhance the safety of the following modes?

	Positive impact enhances (2.5)	No impact neutral (1)	Negative Impact inhibits/reduces (0)	Total
Bicycle	_____	_____	_____	_____
Pedestrian	_____	_____	_____	_____
Vehicular	_____	_____	_____	_____
Transit/HOV	_____	_____	_____	_____

_____ (25) 5. Does the proposed project provide access for a vulnerable population (i.e. park, elementary school, mobility challenged, wheelchairs, retirement homes, hospital, Boys & Girls Club, Senior Center)?

No surrounding facilities will access	0
Facility within 8 to 15 blocks (½ to 1 mile)	5
Facility within 4 to 8 blocks (¼ to ½ mile)	10
Facility within 4 blocks (¼ mile)	15
One facility accessed directly	20
More than one facility accessed directly	25

_____ (15) 6. Does the proposed project maintain or enhance the emergency vehicle network?

Inhibits/reduces	0
Maintains or neutral	8
Enhances	15

SAFETY (Continued)

_____ VALUE SCORE
(100 max)

x .20 VALUE WEIGHT

_____ VALUE TOTAL

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