City of Kent
Transportation Master Plan

Non-Motorized Transportation Study
August 2007

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Chapter 1—Executive Summary

INTRODUCTION

Two of the City Council's strategic goals are to *improve transpor*tation *connectedness* and to *enhance the sense of community*. Community outreach has repeatedly confirmed that the non-motorized transportation systems have a strong relationship to people's sense of quality life in Kent. The Kent Non-Motorized Transportation Study (NMTS) was undertaken to help identify critical gaps in the City's pedestrian and bicycle transportation system. Through the identification of better pedestrian and bicycle access to transit and community centers, and filling in the missing links along existing routes, the NMTS helps the City reach some of its strategic goals.

The Kent NMTS provides a comprehensive strategy to enhance the urban area pedestrian and bicycle system. This effort was initiated by the City as part of a multi-modal Transportation Master Plan effort.

The Kent NMTS was completed in several steps. First, an inventory of the existing pedestrian and bicycle system within the City was completed and integrated into the City's Geographic Information System (GIS). The GIS data were used help identify priority pedestrian and bicycle improvements. Planning-level cost estimates were integrated and used to help draft priority improvement projects while considering accessibility to public transit, schools, parks, civic centers and other critical factors. A Draft NMTS was coordinated with the other modal elements and financial planning efforts in the larger Transportation Master Plan effort. The Final NMTS reflects this coordination and includes policy and design guidelines for effective implementation.

Missing Sidewalks on 116th Ave

A major policy objective of the Kent NMTS included a pedestrian planning process to address the guidelines and regulatory requirements of the Americans with Disabilities Act (ADA). The ADA was enacted on July 26, 1990, and provides comprehensive civil rights protections to persons with disabilities in the areas of employment, state and local government services, and access to public accommodations, transportation, and telecommunications. There are five titles or parts to the ADA; Title II is of the

most concern to the NMTS. Kent's NMTS is intended to address the most recent ADA policies and rules.

Title II of the ADA prohibits state and local governments from discriminating against persons with disabilities by requiring them to make all programs, services, and activities accessible to persons with disabilities. Title II requires that a public entity must evaluate its services, programs, policies, and practices to determine whether they are in compliance with the nondiscrimination requirements of the ADA. The ADA requires that a Transition Plan be prepared, to describe any structural or physical changes required to make programs accessible. The Transition Plan is intended to outline the methods by which physical or structural changes will be made to effect the non-discrimination policies described in Title II. The Kent NMTS serves as its Transition Plan to meet ADA Title II requirements.

Commensurate with the ADA requirements for inventory and self-evaluation, the City targeted a significant portion of the overall NMTS planning effort to complete a walking inventory of the major street-side pedestrian system within the Kent urban area. More than 450 miles of existing and missing sidewalks and 1,950 street corners (curb ramps) were inventoried and assessed as part of Kent's Self-Evaluation. Documenting the location, type and condition of sidewalks and curb ramps is an important step in the pedestrian planning effort. A full inventory of missing sidewalks helps identify the critical "gaps" to fill. Kent has successfully completed a thorough inventory of the pedestrian system as the basis of the NMTS.

The NMTS also includes a thorough inventory of the bicycle system, including bicycle lanes, shared-use paths and shared travel lane facilities. The inventory was completed to help identify candidate corridors for bicycle lane and route enhancements, and helped expand the City's bicycle planning database. The NMTS provides Kent with the added background inventory, assessment and general recommendations for bicycle corridor enhancements to fill in critical bicycle system gaps. Through recommended implementation, Kent can effectively expand the bicycle system along critical corridors to better link major areas of the city, especially between downtown and east and west Kent neighborhoods. Through continued coordination and implementation of the NMTS, Kent and its neighboring cities and King County can effectively expand and enhance the regional pedestrian and bicycle network.

Bridge to Green River Trail

Kent's NMTS contains a summary evaluation of the existing pedestrian and bicycle facilities; and provides comprehensive recommendations for future facilities. Key components of the NMTS include:

- An inventory and condition assessment of existing sidewalks & curb ramps along major streets in the Kent urban area
- A methodology for prioritizing pedestrian projects
- An inventory of the bikeway system
- A non-motorized Policy Guide and Local Design Guide for pedestrian and bicycle facilities, including recommended changes to existing City design standards
- A prioritized summary of pedestrian and bicycle study projects and their costs
- Recommended measures to implement the NMTS

A brief summary of each chapter in the Kent NMTS is provided here.

CHAPTER 2 – PEDESTRIAN SYSTEM INVENTORY AND SELF-EVALUATION

In early 2005, data collection using hand-held Global Positioning System (GPS) units was conducted to fully inventory the pedestrian facilities along Kent's major streets within the urban area. Given the limited resources in the planning effort, GPS data collection was focused on arterial and collector streets. Local, or residential, streets were inventoried using the most current aerial photograph and the City's GIS database. As shown in **Figure 1-1**, the result of the inventory is a map and database of existing and missing sidewalks and curb ramps. The inventory database was formatted specifically for GIS analysis and was added to the City's other GIS-based mapping themes for interim analysis and evaluation.

Slightly more than 47 percent of Kent's streets are missing sidewalks. There are over 240 miles of sidewalks within the Kent urban area. Only about 18 percent of the sidewalks have some form of a buffer that separates sidewalks from the street and curb section.

Local street sidewalks constitute about 40 percent the total sidewalk mileage within the Kent urban area. For non-local street sidewalks, most of the existing sidewalks are located along principal arterials, minor arterials and residential collector streets.

Figure 1-1
Existing & Missing Sidewalks & Curb Ramps

Legend

GPS Data Collection
- Curb Ramp
- Missing Curb Ramp
- Sidewalk
- No Sidewalks

Aerial Photograph Sidewalk Data
- Missing Sidewalks
- Sidewalk on one side of Street
- Sidewalks on both sides of Street
- Water
- Parks
- City Limits
- Comp Plan

0 0.25 0.5 1 1.5 2 Miles

0

As shown in Figure 1-1, there are only a few miles of sidewalks on non-local streets that may need to be replaced due to poor surface conditions. It was found that the older developed areas have a larger portion of older sidewalks needing repair or new sidewalks where they are currently missing. In some cases these areas were developed prior to the current sidewalk design standards and/or site development standards that required sidewalks to be built on both sides of the street. Older Kent neighborhoods are the subject area with a larger number of missing sidewalks and sidewalks in poor condition.

CHAPTER 3 – METHODOLOGY FOR PRIORITIZING PEDESTRIAN PROJECTS

Future pedestrian improvements in the city will be prioritized so the City can effectively implement the NMTS recommendations. The prioritization method must consider the relative cost of needed pedestrian improvements to maximize the public's investment within Kent areas that require higher levels of pedestrian accessibility. The City's Pedestrian Priority Index (PPI) was based on separate index measures for "attributes" and "accessibility."

Attributes

The summary and evaluation of existing sidewalks and curb ramps identified for each pedestrian attribute is given a condition rating, ranging from very poor to good or excellent (see Chapter 2 – Pedestrian System Inventory and Self-Evaluation). The current pedestrian system attributes in the poorest condition (or missing) were scored highest in the Attribute Index as the segments in greatest need for improvement.

Accessibility

The closer that needed pedestrian improvements projects are located to various important trip generators and transportation facilities, the higher their priority. A series of critical accessibility indices are grouped into a composite Accessibility Index to help prioritize improvements. Point scoring was established for each index. Accessibility indices were established by measuring and scoring the proximity of existing and missing sidewalk segments near:

- Schools (by school type, crossings and walk-to-school routes)
- Civic/ Commercial Centers
- Parks
- Transit (routes and bus stops)
- Traffic signals (street crossing access)

- Street Functional Classification (type and level of auto/truck traffic conflict)
- Lower Income Residence
- Mobility-Impaired Residence
- Population/Employment Density
- Senior/Adult Housing
- Walk-To-Work (US Census of areas with high walk-to-work mode split)

The accessibility measures were coordinated and ranked by the Kent TMP Task Force. To reflect the community's priority, slightly higher emphasis was placed on accessibility improvements near schools or along walk-to-school routes, and near transit facilities.

The Composite accessibility index map is illustrated in **Figure 1-2**. As shown, areas in darker shading reflect higher pedestrian accessibility index values. Also illustrated in **Figure 1-2** are streets with missing sidewalks (automatically mapped and graded as "very poor") or existing sidewalks in poor condition. As example, those poor or missing sidewalks within the darkest shaded areas are ranked the highest in priority for future improvements. These values and scoring system form the basic input into the prioritization of pedestrian system improvements.

Planning-Level Cost Estimates

A set of planning-level unit cost measures were prepared within the City GIS database to help estimate the cost of future pedestrian improvements. These costs are not necessarily reflective of actual costs, but provide a comparative basis for establishing priorities and evaluating future programs. All possible pedestrian system improvements were assigned a planning-level cost estimate.

Those potential sidewalk or curb ramp improvements with the highest Composite PPI score should have the highest priority for future project completion. The Composite PPI was applied to all sidewalk segments and curb ramp locations, including missing sidewalk segments and missing curb ramps. Four priority levels were assigned to all possible pedestrian improvements.

The cost to build new and improved sidewalks and curb ramps fully compliant with the ADA is estimated at about $174 million. **Table 1-1** summarizes these pedestrian improvement cost estimates by priority and improvement type. Not all pedestrian improvements are essential for system pedestrian mobility and access.

Table 1-1. Pedestrian Improvement Costs (2006 dollars, in millions)

	Priority				
Pedestrian Improvements	**Highest**	**High**	**Medium**	**Low**	**TOTAL**
New Sidewalk	$1.3	$32.1	$67.9	$62.7	$164.0
Sidewalk Repairs		$0.2	$3.2	$0.9	$4.3
New Curb Ramps	$0.2	$0.4	$2.2		$2.8
Curb Ramp Repairs	$0.5	$0.7	$0.5	$1.2	$2.9
Total	$2.0	$33.4	$73.8	$64.8	$174.0

The cost of constructing new sidewalks is the largest of all improvement costs, and the greatest portion of these costs is amongst the "medium" and "low" priorities. Low priority, new sidewalk improvement needs are essentially in areas outside many or all of the accessibility measures calculated as part of the study. The Highest ($2.0 million) and High ($33.4 million) priority pedestrian improvements are the focus of the study. These improvements are located in areas where pedestrian activity is highest (e.g. near schools and transit stops, or near dense population and employment centers) and needed accessibility improvements are greatest (e.g. along or across busy arterials or near civic buildings).

As illustrated in **Figure 1-3**, the Highest and High priority pedestrian improvement projects (estimated to cost about $35.4 million) are either new sidewalks or new curb ramps and curb ramp replacements. High-priority, new sidewalk improvement costs are largely located along various collector streets and within the downtown area.

Figure 1-2
Composite Pedestrian Accessibility Index

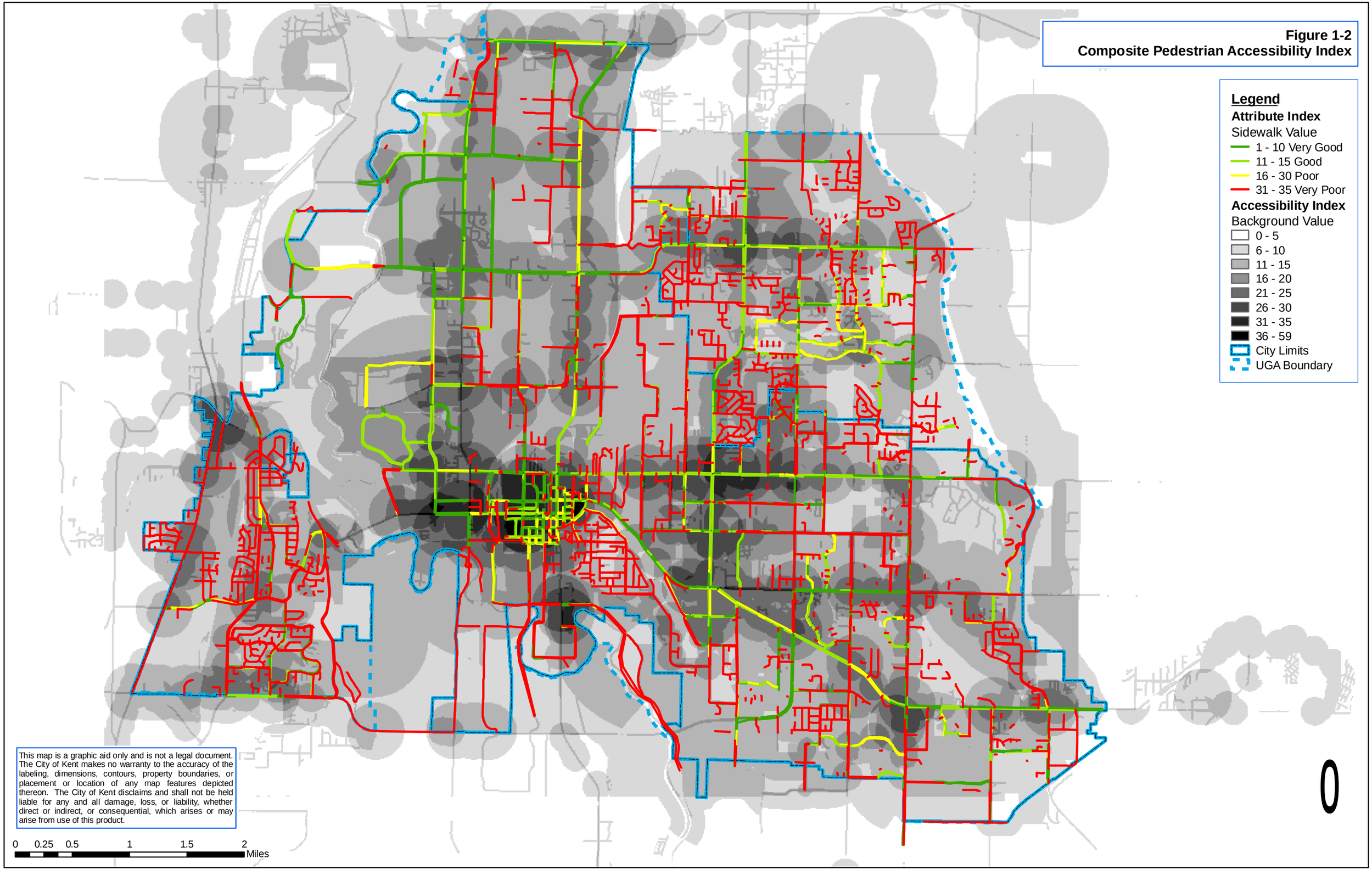


Figure 1-3
Highest & High Priority Pedestrian Projects

Legend

New Sidewalk Priorites

Highest
- All Classifications

High
- Principal Arterial
- Minor Arterial
- Residential Collector Arterial
- Industrial Collector Arterial
- Residential Collector
- Collector
- Local

Transportation Master Plan
- Roadway Projects
- Railroad
- Water
- Parks
- City Limits
- Comp Plan

0 0.25 0.5 1 1.5 2 Miles

CHAPTER 4 – EXISTING BICYCLE SYSTEM

Two fundamental building blocks are needed in understanding the study of Kent's bicycle system: (1) a baseline definition of the various terms and language used in describing bicycle facilities, and (2) acknowledging the physical constraints which have limited Kent's bicycle system development.

Historical plan documentation has concluded in text and mapping a "Bikeway" or "Bikeway Route" network, some of which may be implied to mean on-street bicycle lanes. What are bikeway routes? Are they separate lanes for cyclists or a series of signs and painted symbols that indicate for both motorists and cyclists the need to share the outside travel lane? There is need for further clarity in these definitions, otherwise planners, engineers, policy officials and the general public might be unclear what the NMTS full intentions are. **Figure 1-4** illustrates the basic forms of bikeways that best define the various bicycle facilities within the City.

Cyclist and Pedestrian on Interurban Trail

The Kent urban area spans both the west and east plateaus on either side of the valley floor, home of the city center.

Overcoming the steep terrain has been a major engineering and design issue, for both streets and bicycle system features. Other transportation constraints that have limited bicycle system connectivity in the Kent urban area include SR-167 and the two major railroads. The Green River is both a barrier to east-west bicycle travel but also a partial asset with the development of the Green River Trail facilities. As a result, Kent's bicycle system has many excellent features but is lacking a cohesive and connected system. **Figure 1-5** illustrates the existing bicycle system in Kent.

Figure 1-4. Bikeway Facility Definitions

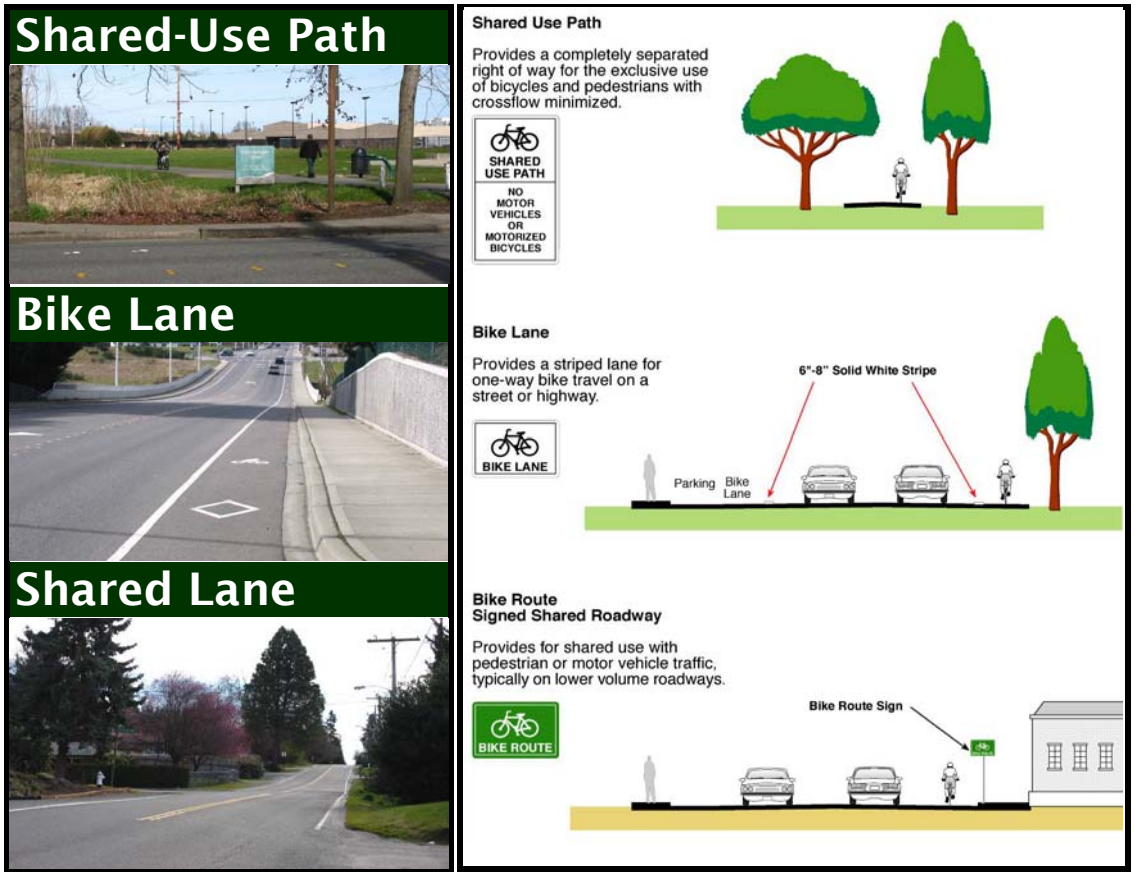


Figure 1-5
Existing Bicycle System

Legend

Existing System

- Bike Lanes
- Shoulder Lane
- Shared Use Path

ANGLE LAKE

LAKE YOUNGS

SR 99

SR 181

SR 167

SR 5

SR 516

SR 18

S 180 St

SE CARR RD

SE PETROVITSKY RD

140 Av SE

116 Av SE

SE 192 St

S 200 St

S 199 P

ORILLIA RD S

S 208 St

SE 208 St

S 212 St

S 212 Wy

92 Av S

148 Av SE

MARINE VIEW DR S

MILITARY RD S

S 228 St

53 Pl S

54 Av S

S 231 St

56 Av S

S 236 St

JAMES ST

E JAMES ST

S 240 St

SE 240 St

94 Av S

100 Av SE

CANYON DR

E CANYON DR

CANYON DR

SE 256 ST

SE 256 St

104 Av SE

132 Av SE

149 Av SE

16 Av S

PACIFIC Hwy S

40 Av S

LAKE FENWICK RD

S 259 St

S 262 St

S 272 St

S 277 St

68 Av S

78 Av S

CENTRAL AV S

AUBURN WY N

SE KENT KANGLEY RD

150 Wy SE

152 Av SE

156 Av SE

144 Av SE

118 Av SE

SE 284 St

0 0.25 0.5 1 1.5 2 Miles

CHAPTER 5 – NON-MOTORIZED POLICY GUIDE

There are several federal and state policies which affect the City regarding the planning and development of its non-motorized transportation system. This chapter provides an overview of those policies, and summarizes a policy framework for both the pedestrian and bicycle element of the NMTS. The policy framework outlines the pedestrian and bicycle goals, and then a series of objectives, policies and implementation strategies by which the City can coordinate and guide the implementation of NMTS as an integral component of the Kent Comprehensive Plan. The policy guide concludes with a summary of state funding sources for non-motorized projects.

The U.S. Department of Transportation (USDOT) has issued policy guidelines for local agencies to better integrate bicycling and walking into comprehensive transportation plans. Much of Washington State policy regarding transportation planning is guided by the Growth Management Act (GMA). In 2005 the State amended the GMA to encourage local governments to complete their non-motorized transportation plans (NMTPs) with comprehensive networks for pedestrian and bicycle travel. Specifically, the GMA amendments require communities to consider urban planning approaches that promote physical activity, and require that a bicycle and pedestrian component be included in the Transportation Element of a comprehensive plan. Fundamental to state policy is support for local plans which help ensure that high quality bicycle and pedestrian facilities are available, as well as ensuring that people feel safe using them. "High quality" plans have several characteristics:

- A complete street network with multiple connections, accommodating of multiple transportation modes.
- Connectivity between trails, pathways, neighborhoods, schools, and sidewalks that enhances the ability for users to be physically active.
- Trails and linear parks that link activity centers, and serve as recreation facilities and as transportation routes.
- Safety enhancements such as lighting, signage, more safe crossing opportunities, reduced vehicle speeds, and separated paths and trails.

By addressing these federal and state policies the City will be competitive for statewide and federal funding, and consistent with the revised GMA.

CHAPTER 6 – LOCAL NON-MOTORIZED DESIGN GUIDE

There are many opportunities to improve pedestrian and bicycle conditions and in doing so making Kent more livable. The purpose of the Local Non-Motorized Design Guide is to highlight significant local design features relative to federal and state requirements and design guides on the premise that accessible design is the foundation for all good pedestrian and bicycle design.

The Local Non-Motorized Design Guide directly references **Designing Sidewalks and Trails for Access**[5] for the full range of pedestrian design elements, rather than develop a fully independent and comprehensive guide. Detailed sidewalk, curb ramp, driveway crossing and trail design elements are provided in Designing Sidewalks and Trails for Access. The Local Non-Motorized Design Guide summarizes only those elements of the pedestrian system crucial to current planning, design and construction of critical pedestrian facilities in Kent.

Curb Ramp with Missing Top Landing

Similar design guidance is important for the consistent development of Kent's system of bicycle lanes and share-lane facilities. Significant guidance is provided at the federal and state level in assisting the City in revisions for design guides to bicycle facilities, including:

- Guide for the Development of Bicycle Facilities, 1999, AASHTO.
- Manual on Uniform Traffic Control Devices (MUTCD), Federal Highway Division (including the Washington State Modifications to the MUTCD, M 24-01).
- WSDOT Design Manual**,** Bicycle Facilities—Section 1020, 2001.

The cities of Chicago and San Francisco have also pioneered bicycle design work from which to borrow important elements, particularly with regards to bicycle lane and shared travel lane facilities.

Significant areas where design guideline recommendations are made include:

- Curb ramps
- Sidewalk widths and buffers

- Shared-use path widths
- Bicycle lanes, and
- Shared-use lane bicycle facilities

CHAPTER 7 – PEDESTRIAN AND BICYCLE SYSTEM STUDY

The Transportation Master Plan Task Force was essential in helping establish pedestrian priorities and in the review and general consensus of draft pedestrian and bicycle study recommendations—mainly the respective pedestrian and bicycle system maps. These maps indicate the priority pedestrian and bicycle projects identified in the Kent urban area, generally to be constructed over the next 20 years.

The Kent Bicycle Advisory Board (KBAB) provided a CD containing a report and a series of maps illustrating the group's issues and ideas for system improvements. In addition, KBAB was well represented on the Task Force, and provided review and comment on the draft bicycle system map, initial comments which were considered by the Task Force and reflected in the final bicycle system study map.

Pedestrian System Study

Chapter 2 summarized the process establishing the priority sidewalk and curb ramp improvement needs and their costs. The pedestrian system study is categorized in two major priority groups:

Highest/High - projects that can likely be funded within the next 20 years (generally based on traditional funding sources and levels), and

Medium - projects that are constructed as additional funding becomes available, likely beyond the 20-year planning period.

New Sidewalks at Kent Transit Center

Figure 1-6 and **Figure 1-7** map and illustrate the High/Highest and Medium priorities. **Figure 1-8** maps those existing sidewalks that should be reconstructed due to poor conditions. Together, these maps reflect the pedestrian system study for the Kent urban area.

Funding these improvements will require a policy commitment by the City. As summarized in **Table 1-2**, the costs of the combined Highest/High priorities, when averaged over 20 years, results in an annual cost of about $1.7 million to add or repair over 100 miles sidewalks and curb ramps in Kent's critical corridors.

Table 1-2. Priority Pedestrian Improvement Costs

	Priority		
	Highest	**High**	**Medium**
New Sidewalks	$1,291,100	$32,050,900	$67,916,700
Sidewalk Repairs		$191,400	$3,237,400
New Curb Ramps	$148,500	$424,500	$2,155,500
Curb Ramp Replacements	$534,000	$715,500	$523,500
Total	$1,974,600	$33,382,300	$73,833,100
Annual Cost (20-yr period)	$98,700	$1,669,100	

Bicycle System Study

Priority was placed in the study process to identify opportunities to build new (as part of street projects identified in the Transportation Master Plan) or re-stripe existing arterial and collector streets with bicycle lanes to close critical gaps in the existing system. As an alternative, along existing streets where space is limited (existing travel lanes and curb/sidewalks) or there are underlying design constraints (often topography is the culprit) bicycle lane re-striping was found to be impractical. As an alternative to bike lanes the study recommends striping and posting these routes as shared lanes. Finally, a series of new shared-use path connections are identified in the study along Green River and Soos Creek.

Figure 1-9 maps the existing and planned bicycle system for the Kent urban area. The bicycle system study includes re-striping about 27 miles of bicycle lanes, 19 miles of shared-use lane routes, and over 9 miles of new shared-use paths to fill critical gaps in Kent's bicycle system.

As seen in Figure 1-9, the arterial street improvements identified in the Transportation Master add significant mileage to the bike lane network. Planning-level costs were estimated for stand-alone bike lane and shared lane re-striping, and the extension of the shared-use path network. The total cost of the bicycle system improvements is estimated at $2.2 million over the next 20 years.

Funding the bicycle improvements will also require a policy commitment by the City. As summarized in Table 1-3, the total costs of bicycle system priorities when averaged over 20 years, results in an annual cost of slightly more than $111,000.

Figure 1-6
Pedestrian System Map - Highest & High Priorities

Legend

New Sidewalk Priorites

Highest
- All Classifications

High
- Principal Arterial
- Minor Arterial
- Residential Collector Arterial
- Industrial Collector Arterial
- Residential Collector
- Collector
- Local

Transportation Master Plan
- Roadway Projects
- Railroad
- Water
- Parks
- City Limits
- Comp Plan

0 0.25 0.5 1 1.5 2 Miles

0

Figure 1-7
Pedestrian System Map - Medium Priorities

Legend

New Sidewalk Priorities

Medium

- Principal Arterial
- Minor Arterial
- Residential Collector Arterial
- Industrial Collector Arterial
- Residential Collector
- Collector
- Local

Transportation Master Plan

- Roadway Projects

- Railroad
- Water
- Parks
- City Limits
- Comp Plan

0 0.25 0.5 1 1.5 2 Miles

Figure 1-8
Pedestrian System Map - Sidewalk Repairs

Legend

Existing Sidewalk Priorities

- High
- Medium
- Low
- Railroad
- Water
- Parks
- City Limits
- Comp Plan

ANGLE LAKE

LAKE YC

SR 99

SR 181

SR 167

SR 5

SR 516

SR 18

S 180 St

SE CARR RD

SE PETR

140 Av SE

SE 192 St

116 Av SE

S 200 St

ORILLIA RD S

S 199 P

S 208 St

92 Av S

S 212 St

SE 208 St

148 Av SE

MARINE VIEW DR S

MILITARY RD S

S 228 St

S 231 St

64 Av S

56 Av S

53 Pl S

S 236 St

JAMES ST

E JAMES ST

S 240 St

SE 240 St

88 Av S

94 Av S

100 Av SE

104 Av SE

132 Av SE

144 Av SE

152 Av SE

156 Av SE

16 Av S

E CANYON DR

CANYON DR

S 256 ST

SE 256 St

S 259 St

S 262 St

LAKE FENWICK RD

PACIFIC Hwy S

40 Av S

S 272 St

78 Av S

CENTRAL AV S

AUBURN WY N

68 Av S

S 277 St

SE KENT KANGLEY RD

118 Av SE

SE 284 St

0 0.25 0.5 1 1.5 2 Miles

0

Figure 1-9 (a)
Bicycle System Map

Legend

Existing System
- Bike Lanes
- Shoulder Lane
- Shared Use Path
- Shared Use Path Junctions

NMTP Options
- Shared Use Path Extension
- Shared Travel Lane
- Routes for Further Study

New Bike Lanes
- Possible Re-Striping
- Part of Future Street Improvement
- Alternate Route Studies

- School
- Railroad
- Kent Transit Center

0 0.25 0.5 1 1.5 2 Miles

ANGLE LAKE
SR 99
SR 181
SR 167
SR 516
SR 18
SR 5
S 180 St
SE CARR RD
SE PETROVITSKY RD
S 200 St
S 199 P
ORILLIA RD S
S 208 St
SE 208 St
S 212 St
S 212 Wy
S 228 St
S 231 St
S 238 St
JAMES ST
E JAMES ST
S 240 St
SE 240 St
E CANYON DR
CANYON DR
SE 256 ST
SE 256 St
S 259 St
S 262 St
SE KENT KANGLEY RD
SE 284 St
MARINE VIEW DR S
PACIFIC HWY S
LAKE FENWICK RD
CENTRAL AV S
AUBURN WAY N
16 Av S
40 Av S
53 Pl S
53rd Pl S
54 Av S
64 Av S
68 Av S
78 Av S
88 Av S
94 Av S
104 Av SE
116 Av SE
132 Av SE
144 Av SE
148 Av SE
152 Av SE
156 Av SE
SE 142nd Pl
140Th Av SE

Figure 1-9 (b)
Bicycle System Map

Legend

Existing System
- Bike Lanes
- Shoulder Lane
- Shared Use Path
- Shared Use Path Junctions

NMTP Options
- Shared Use Path Extension
- Shared Travel Lane
- Routes for Further Study

New Bike Lanes
- Possible Re-Striping
- Part of Future Street Improvement
- Alternate Route Studies

- n School
- Railroad
- a Kent Transit Center

Coordinate with SR 167 Widening to Upgrade Meeker Undercrossing:
(1) relocate sidewalks
(2) add bicycle lanes
(3) add pedestrian-scale street lighting for safety

0 0.05 0.1 0.2 0.3 0.4 Miles

68 AV S
SR 167
W SMITH ST
4th Av N
4th Av S
JAMES ST
CENTRAL AV N
CENTRAL AV S
JASON AV N
88 AV S
88 Av S
E SMITH ST
REITEN RD
E CANYON DR
CANYON DR
E TITUS ST
S KENT DES MOINES RD
W WILLIS ST
E WILLIS ST
94 Av S
S 248 St
WASHINGTON

Table 1-3. Priority Bicycle Improvement Costs

	Miles	Cost	Annual Cost
Bike Lane Signing and Marking	16	$405,000	$20,300
Shared-Lane Signing and Marking	27	$903,750	$45,200
New Shared-Use Path Construction	6	$924,000	$46,200
Total	49	$2,232,750	$111,700

Non-Motorized Funding Policy

The combined non-motorized system improvement costs total about $37.6 million, including the Highest/ High pedestrian priorities and the bicycle system study projects. A preliminary funding analysis was conducted on the various pedestrian and bicycle improvement needs as input into the larger transportation funding analysis of the Transportation Master Plan. This analysis is reflected in the cost summaries for both the pedestrian and bicycle system studies and is generally predicated on the City's recent history of funding unique non-motorized programs and projects as part of their Transportation Improvement Program. It is generally anticipated that the 20-year plan needs can be met if the following programs are confirmed for sustained funding:

Sidewalk Construction Program—totaling more than $33 million. Sources include General Fund, New Development and state & federal grants.

Sidewalk Repair Program—a proposed 50%-50% cost share between the City and adjacent private property owners (total—$191,000). City source is General Fund.

Curb Ramp Replacement Program—totaling $1.8 million as a continuance of the City's ADA Compliance program. City source is General Fund and available grants.

Bicycle System Expansion Program—totaling $2.2 million. City source is General Fund and available grants.

Increased funding levels from existing sources or new funding sources will be necessary should the City pursue more aggressive funding of the Medium priority pedestrian improvements or additional bicycle system facilities.

CHAPTER 8 – RECOMMENDED MEASURES TO IMPLEMENT THE NMTS

The City serves a critical role in the planning, development and construction of needed pedestrian and bicycle improvements. That role will likely be expanded to meet the needs identified in the NMTS.

The NMTS recommends on-going refinement to project priorities, short- and long-range planning coordination, bus stop planning and design, refinement to design standards, and better site-plan review processes. Follow-up planning efforts to focus on critical walk-to-school routes and a comprehensive neighborhood traffic management program are all important measures that help implement the findings and recommendations of the NMTS.

Missing Sidewalks on Cambridge

Recent public input indicates that Kent residents are seeking greater public investment in non-motorized facilities. Neighborhoods and interest groups are also focusing on street, bicycle and pedestrian traffic safety issues. As continued growth occurs in Kent, so too will traffic congestion. The public's interest in neighborhood traffic management issues will likely expand, and residents will likely be calling on the City for even greater assistance to help improve pedestrian, bicycle and neighborhood traffic conditions. It is also very likely that more detailed federal policies and ADA rules are forthcoming in the near future. These policies may require the City to expand its efforts to develop and refine internal policies and standards to guide pedestrian and bicycle studies and projects.

To address these issues in the future, the City will consider revising its staffing position responsibilities and identify a new role as Non-Motorized Transportation Study Coordinator. The Coordinator's general responsibilities will include:

- Monitoring of ADA federal policy refinements and local policy compliance
- TIP project and TMP coordination
- NMTS GIS database management
- Site Plan review to help ensure NMTS findings are implemented and revised pedestrian and bicycle design standards
- WSDOT project development and plan coordination

- Transit stop development
- Walk-to-School Route planning and bicycle education

How Should Kent Proceed?

In accordance with current ADA requirements, the City is to have designated an ADA Coordinator to facilitate the ADA rules and coordinate with local stakeholders. To best administer the NMTS findings, the City will consider revising staffing position responsibilities that couple the ADA and NMTS Coordinator functions, serving to guide and facilitate the implementation measures as outlined.

In this manner the City will help meet the public's growing expectations for pedestrian and bicycle system enhancements and investments in the future.

Chapter 2—Pedestrian System Inventory & Self-Evaluation

PROCESS

The City conducted extensive pre-planning as part of the Non-Motorized Transportation Study to ensure the inventory of existing sidewalk and curb ramp facilities was both cost-effective and yielded highly accurate and reliable data for further analysis.

Title II of the American's with Disabilities Act (ADA) requires that the City evaluate its services, programs, policies, and practices to determine whether they are in compliance with the nondiscrimination requirements of the ADA. This section describes the data collection process and resulting inventory of sidewalk and curb ramp facilities within the Kent urban area, all critical elements as part of the City's Self-Evaluation. The inventory and self-evaluation is described in these sections.

Given the limited resources in the planning effort, GPS data collection was focused on arterial and collector streets. Local, or residential, streets were inventoried using the most current aerial photograph and the City's GIS database.

GPS-Based Data Collection

Techniques and Technology

Rather than manually record the sidewalk and curb ramp system with laptop computers or hard-copy tablets, the City and The Transpo Group evaluated and confirmed the use of hand-held Global Positioning System (GPS) units to electronically record the necessary system inventory. The GPS data collection method enabled the City to eliminate the steps of hard data transcription, formatting and re-entry for later GIS analysis.

GPS Unit

Data Dictionary Development

The Transpo Group developed and tested the Data Dictionary file for use with the Trimble GeoXT's to record the necessary sidewalk and curb ramp information. The Data Dictionary was developed to collect pertinent information to identify the location and characteristics of sidewalk and curb ramp features, focusing on ADA-compliance based on characteristics fully defined and summarized in Designing Sidewalks and Trails for Access. GPS data line features were developed to record the location of missing

sidewalks and the characteristics of existing sidewalks. GPS point features were developed to record the location of missing curb ramps and the characteristics of existing curb ramps. The Data Dictionary was also developed with pre-set scoring values for all sidewalk and curb ramp attributes. These pre-set values helped expedite the GIS evaluation in later steps of the study. **Table 2-1** summarizes the characteristics targeted in the inventory. **Appendix A** includes a full summary of the sidewalk and curb ramp features and attributes that were defined in the Data Dictionary for GPS data collection.

Data Collection

The temporary staff was equipped with the GeoXT unit, tape measure (to measure sidewalk and curb ramp dimensions), and a Smart Level to efficiently and accurately measure sidewalk and curb ramp slopes. The staff was also equipped with an orange reflector vest and hat for safety.

For block sections, the predominant sidewalk characteristic was recorded for the entire block length (although the width and length of severely damaged sidewalks sections were recorded to more accurately estimate replacement costs). For curb ramps, unique and specific curb ramp (or missing curb ramp) characteristics were recorded for each public street corner.

Over 240 miles of existing sidewalks were inventoried, and 212 miles of missing sidewalks were logged.

Slightly more than 1,950 street corners were inventoried for the presence and characteristics of existing curb ramps.

Table 2-1. GPS Data Inventory

Feature	Characteristics
Sidewalks	Location, width, cross-slope, material, surface condition, presence of heaving/cracking, type and number of fixed obstacles within sidewalk, type and number of movable obstacles located on sidewalk, presence of vertical obstructions, type of street lighting, type and number of driveway crossings, presence and type of buffer between street and sidewalk, presence and type of foliage (trees, shrubs, grasses, etc.), type of street curb
Missing Sidewalks	Location, type and number of fixed obstacles in immediate area of future sidewalk, type of street curb (if any)
Curb Ramps	Location, type, surface condition, material, top landing width and slope, number of ramps at corner, ramp width, ramp slope, ramp cross-slope, slip-resistant surface, sidewalk approach, ramp flare slope, gutter slope, crosswalk connection and alignment, bottom landing width and slope
Missing Curb Ramps	Location, sidewalk surface condition, material, type and number of fixed obstacles in immediate area of future curb ramp, location of nearby street drain
School Crossings	Location and type of designated school crossings, including advanced signing, striping and traffic control applications

Quality Control

Pre-planning for the inventory effort included the identification of regular quality control and evaluation of the GPS raw data. Weekly review of the raw GPS data was provided by The Transpo Group. The Transpo Group also conducted weekly GPS data conversion, differential corrections, GIS data conversion and database assembly. Any data discrepancies or errors, including missing data, were identified and coordinated with staffing to re-inventory problem areas. Only a few streets or areas required secondary data collection efforts to replace questionable or missing data.

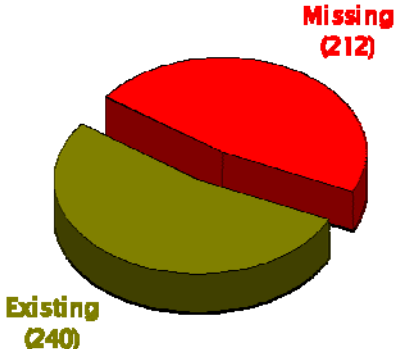
Data Summary

Sidewalks

EXISTING VS. MISSING SIDEWALKS

As shown in **Figure 2-1**, slightly more than 47 percent of the study area streets are missing sidewalks. There are over 240 miles of sidewalks within the Kent urban area. Only about 18 percent of the sidewalks have some form of a buffer that separates sidewalks from the street and curb section.

Figure 2-1. Kent Sidewalks



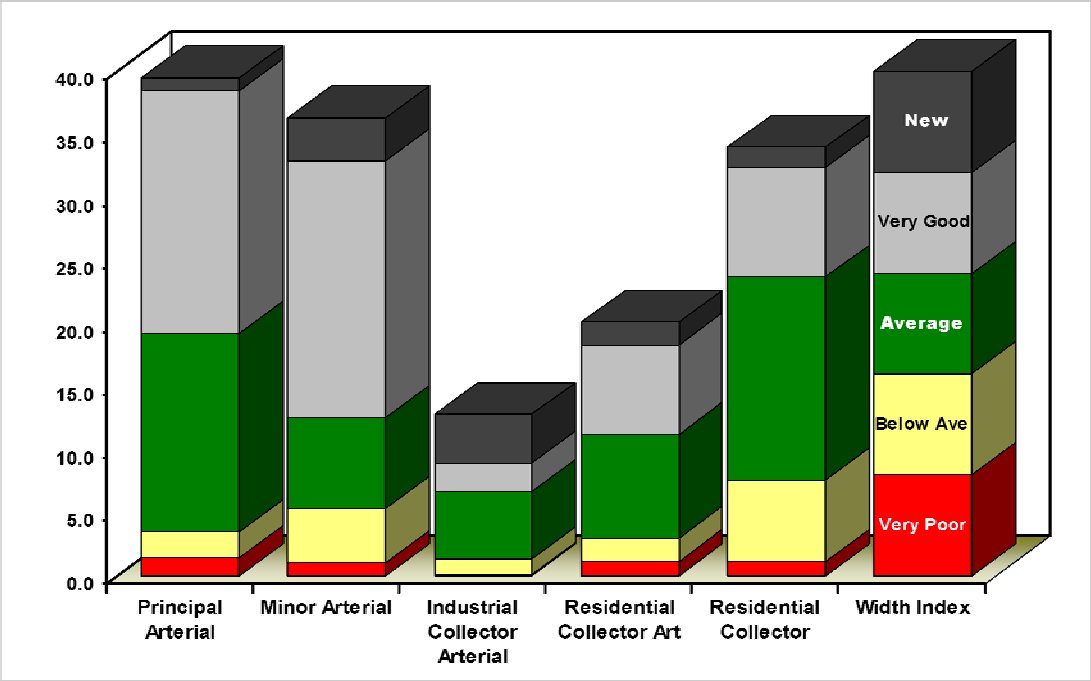
SIDEWALK BY STREET CLASS

Local street sidewalks constitute about 40 percent of the total sidewalk mileage within the study area. For non-local street sidewalks, most of the existing sidewalks are located along principal arterials, minor arterials and residential collector streets.

SIDEWALK CONDITION

As shown in **Figure 2-2**, there are only a few miles of sidewalks on non-local streets that may need to be replaced due to poor surface conditions. It was found that the older developed areas have a larger portion of older sidewalks needing repair or new sidewalks where they are currently missing. In some cases these areas were developed prior to the current sidewalk design standards and/or site development standards that required sidewalks to be built on both sides of the street. Older Kent neighborhoods are the subject area with a larger number of missing sidewalks and sidewalks in poor condition.

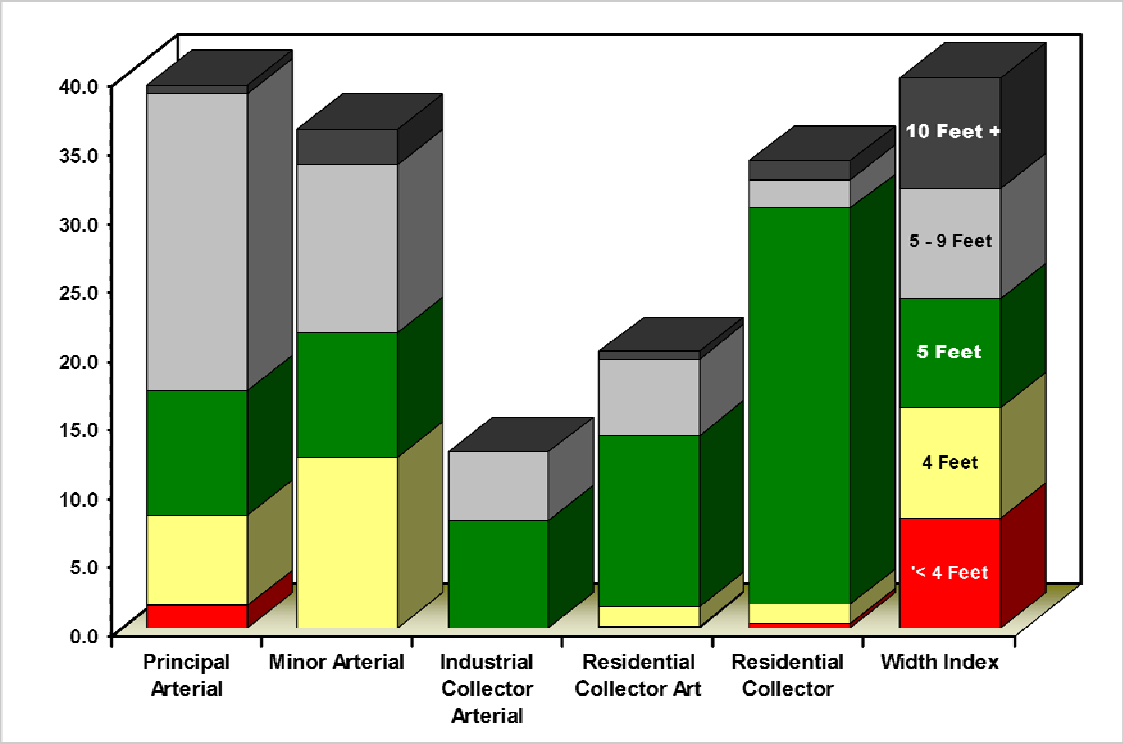
Figure 2-2. Sidewalk Condition (miles) by Street Classification



SIDEWALK WIDTH

Most of the study area existing sidewalks are at least four feet wide. Many sidewalks are five feet or wider, as shown in **Figure 2-3**. Only a small percentage of existing sidewalks are less than four feet wide, mostly along some Principal Arterials. Not all of the existing sidewalks are free of obstacles that reduce the effective clear width (minimum of four feet), but the fact that the majority of existing sidewalks are at least four feet or wider is an excellent starting point of the Kent NMTS.

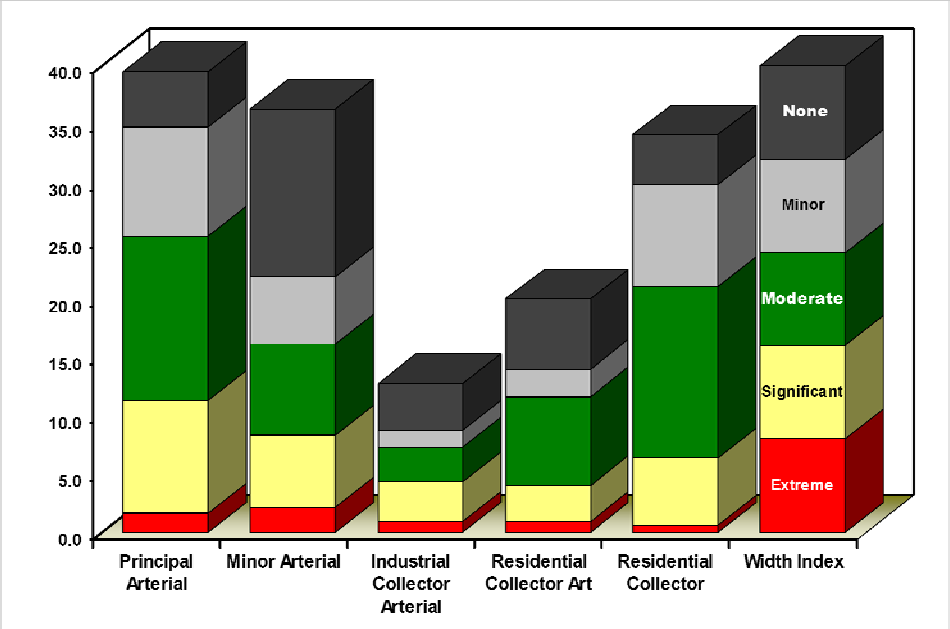
Figure 2-3. Sidewalk Width (miles) by Street Classification



HEAVING AND CRACKING

Sidewalks with significant heaving and cracking can be problematic for pedestrians with limited mobility. Only a small portion of the study area sidewalks have significant or extreme heaving and cracking conditions, as shown in **Figure 2-4**. Many of these sidewalks are located next to buffer strips where older trees are causing significant heaving, especially along principal and minor arterials.

Figure 2-4. Sidewalk Heave & Cracking (miles)



OBSTACLES

The inventory program was developed specifically to identify the location, type and density of fixed and removable obstacles found along existing sidewalks. The majority (97%) of existing sidewalks do not have fixed obstacles that reduce the pedestrian clear width of four feet. Of course the type of fixed obstacle is important. Some obstacles may be relatively easy and inexpensive to move or remove. Review of the data indicates that mailboxes are the predominant type of fixed obstacle that reduces the sidewalk clear width below four feet. Street trees are also a common occurrence. While utility pole obstacles are less frequent, they are likely the most difficult and expensive fixed obstacle to remove from the sidewalk area.

The presence of movable obstacles along arterial streets can also hinder pedestrian travel, particularly in commercial areas. A variety of moveable obstacles were noted in the inventory, including advertising message boards, sometimes referred to as "sandwich" boards. Along residential collector streets, in particular, the presence of parked cars was noted as a significant movable obstacle that hinders pedestrian travel. Along residential streets a variety of movable obstacles were identified in the inventory. Over 4 miles of existing sidewalks were noted as having some type of movable obstacles that hindered pedestrian mobility. Removal of these kinds of obstacles is often corrected by enforcement.

DRIVEWAY CROSSINGS

Figure 2-5 illustrates a number of different driveway crossing examples. The type of driveway crossing design can also be a factor in pedestrian mobility. As shown in **Figure 2-6**, a large number of older sidewalks were constructed without level landings, especially along principal and minor arterials. The City has revised its sidewalk standards to require level sidewalks as they cross driveway access points.

Figure 2-5. Examples of Driveway Crossing Treatments

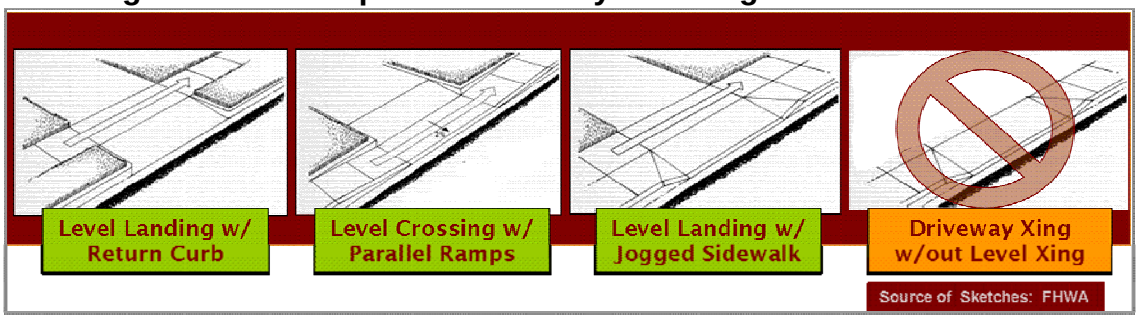
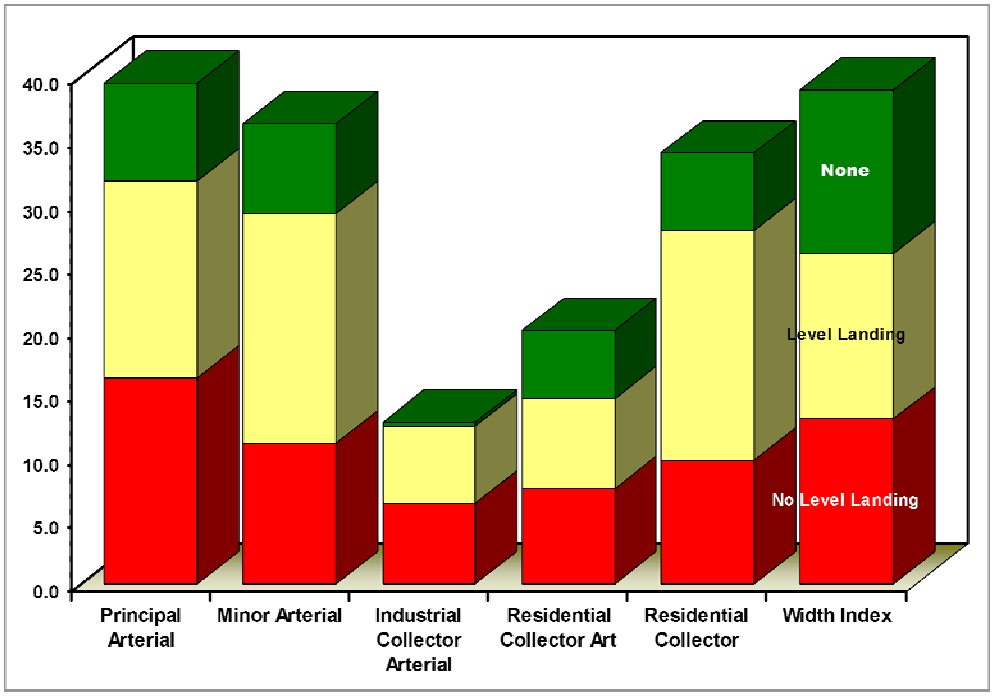


Figure 2-6. Driveway Crossing of Sidewalks (miles) by Street Class



Missing Sidewalks

In general, and over the past 10-20 years, the City has been ensuring that sidewalks are constructed on both sides of new streets. As a result, newer subdivisions have few missing sidewalks. A greater number of streets with missing sidewalks are located within older neighborhoods.

Figure 2-7 illustrates the location of existing and missing sidewalks throughout the City.

Curb Ramps

Of the more than 1,950 street corners inventoried along existing sidewalk corridors, only about 8 percent are missing curb ramps. All other corners have some type of curb ramp to assist the mobility-impaired pedestrian when crossing the street.

However, a number of the existing curb ramps are essentially ADA non-compliant. ADA non-compliance can generally mean that: (a) the ramp width is too narrow; (b) the top landing is either missing or too narrow; or, (c) the ramp slope is too steep. The construction of many of the non-compliant ramps preceded enact ion of the ADA.

Ramp Type

The majority of curb ramps constructed in the City study area are diagonal by design, with a single ramp oriented to the center of the street intersection. As shown in **Figure 2-8**, perpendicular curb ramps are more often found in downtown Kent along the grid street network where sidewalks were constructed with sidewalk buffer strips. In recent growth areas, most new curb ramps have been constructed to standards with diagonal ramp designs, to align with curb-side sidewalks.

Figure 2-7
Inventory of Existing & Missing Sidewalks & Curb Ramps

Legend

GPS Data Collection
- Curb Ramp
- Missing Curb Ramp
- Sidewalk
- No Sidewalks

Aerial Photograph Sidewalk Data
- Missing Sidewalks
- Sidewalk on one side of Street
- Sidewalks on both sides of Street
- Water
- Parks
- City Limits
- Comp Plan

ANGLE LAKE

SR 99

S 180 St

108 Av SE

SE PETRO

S 196 St

ORILLIA RD S

SR 167

SE 200 St

S 208 St

SE 208 St

124 Av SE

S 212 St

148 Av SE

68 Av S

88 Av S

94 Av S

94 Pl S

MARINE VIEW DR S

S KENT DES MOINES RD

JAMES ST

E JAMES ST

S 240 St

SE 240 St

30 Av S

4th Av N

CENTRAL AV N

E SMITH ST

104 Av SE

132 Av SE

SR 516

SR 5

SE 248 St

S 260 St

SE 256 St

SE 267 St

CENTRAL AV S

SE KENT KANGLEY RD

16 Av S

S 277 St

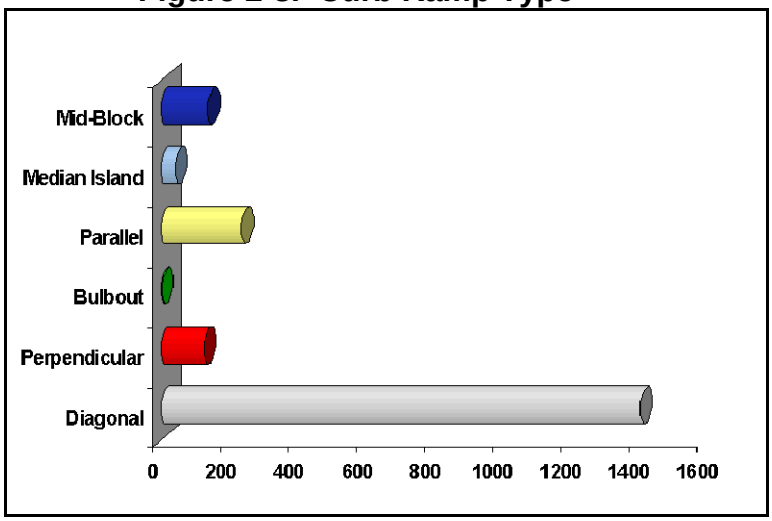
SE 277 St

SR 18

0 0.25 0.5 1 1.5 2 Miles

0

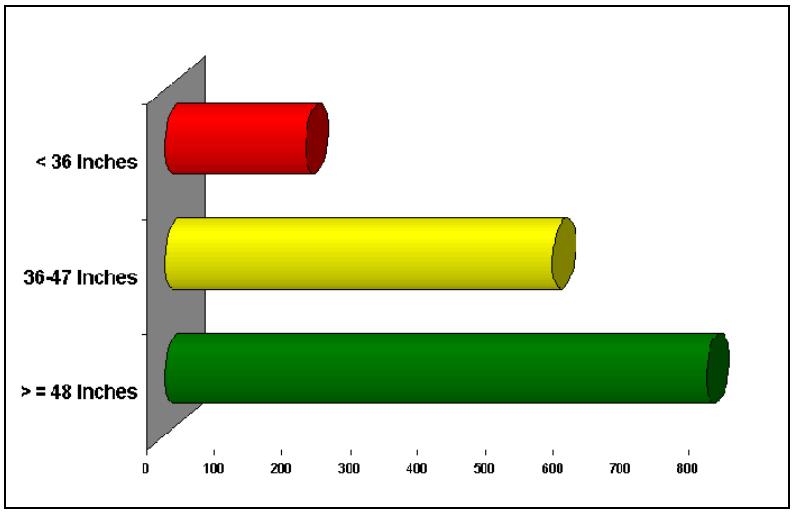
Figure 2-8. Curb Ramp Type



Ramp Width

ADA requires that curb ramps be constructed with a minimum width of 3 feet and desired width of 4 feet. Many of the older curb ramps throughout the study area were built with widths well below 4 and sometimes 3 feet – see **Figure 2-9**. Most of these ramps were constructed to design standards that preceded the ADA. However, they do meet the minimum design width as prescribed by ADA.

Figure 2-9. Curb Ramp Width

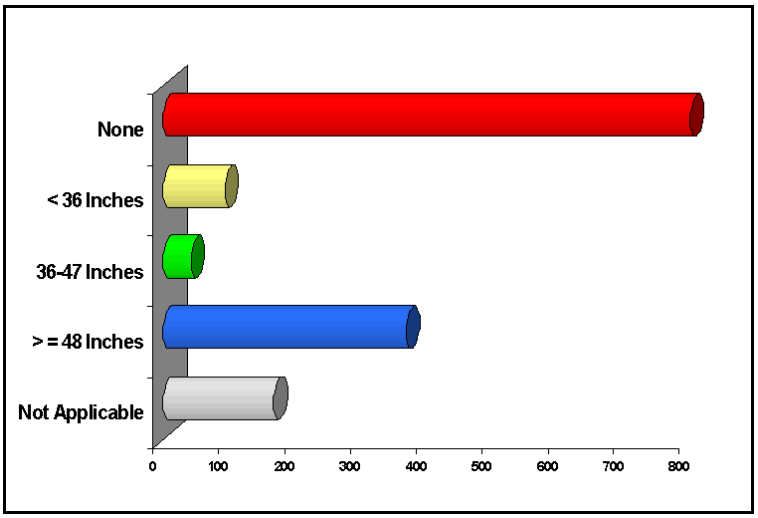


Top Landing

ADA requires that a top landing be placed at all curb ramps, four feet wide and a slope not to exceed 2 percent. Even new ramps, recently constructed to existing standards, include top landings, but with slopes that exceed the maximum of 2 percent (see Local Design Guide). Many of the system's

ramps (predominantly diagonal curb ramps, as shown in Figure 2-8) are either missing the top landing, the ramp widths are too narrow, or the landing slope exceeds 2 percent. **Figure 2-10** illustrates the top landing condition for Kent's curb ramps.

Figure 2-10. Curb Ramp—Top Landing



Attribute Index

To complete the self-evaluation of existing sidewalks and curb ramps a scoring assessment was calculated. Each sidewalk segment and curb ramp in the GIS database was assigned an attribute index value for further evaluation in the prioritization of pedestrian improvements (see Methodology for Prioritizing Pedestrian Projects). The attribute index enables The City to consistently measure and quantify problematic sidewalks and curb ramps that may pose as obstacles to the mobility-impaired. **Table 2-2** summarizes the Attribute Index scoring values for sidewalks, missing sidewalks, curb ramps and missing curb ramps.

A higher attribute index value reflects a poorer condition of the existing sidewalk or curb ramp. For example, a curb ramp that scores 35 points (out of a possible 35 points maximum for prioritized need) would reflect the following conditions:

Top Landing—Missing
Ramp Width—Less than 3 Feet
Ramp Slope—Exceeds 8.3 Percent
Surface Condition—Very Poor
Alignment—At Angle with Curb Line
Cross-Slope—Exceeds 2 Percent
Gutter Slope—Exceeds 2 Percent

Table 2-2. Attribute Index

		Possible Points
Sidewalks		
	Surface Condition	5
	Heave & Cracking	5
	Width	5
	Fixed Obstacles (density)	5
	Driveways	5
	Curb Type	5
	Cross-Slope	5
	Total	35
Missing Sidewalk		35
Curb Ramps		
	Top Landing Width	5
	Ramp Width	5
	Ramp Slope	5
	Surface Condition	5
	Alignment	5
	Cross Slope	5
	Gutter Slope	5
	Total	35
Missing Curb Ramp		35

Summary

By successfully deploying the GPS-based data collection effort, the City was able to inventory the critical pedestrian facilities within the urban area. The inventory effort was completed within the pre-planning estimates for staffing and schedule, and was successfully formatted and assimilated in the City's GIS database. The Self-Evaluation and scoring, summarized in the Pedestrian Attribute Index, provides one of the essential measures from which the City analyzes, identifies and prioritizes pedestrian improvements.

Chapter 3—Methodology for Prioritizing Pedestrian Projects

PEDESTRIAN PRIORITY INDEX

Future pedestrian improvements in the city should be prioritized so the City can effectively implement the NMTS recommendations. The prioritization method must consider the relative cost of needed pedestrian improvements to maximize the public's investment within Kent areas that require higher levels of pedestrian accessibility. The City's Pedestrian Priority Index (PPI) was based on separate index measures for *attributes* and *accessibility*.

Attributes

The summary and evaluation of existing sidewalks and curb ramps identified for each pedestrian attribute is given a condition rating, ranging from very poor to good or excellent (see Chapter 2 – Inventory and Self-Evaluation). The current pedestrian system attributes in the poorest condition (or missing) were scored highest in the Attribute Index as the segments in greatest need for improvement.

Accessibility

The closer that needed pedestrian improvements projects are located to various important trip generators and transportation facilities, the higher their priority. A series of critical accessibility indices are grouped into a composite Accessibility Index to help prioritize improvements.

Point scoring was established for each index. **Table 3-1** summarizes the component index ratings, point values and scoring values of the composite PPI. A total of 35 points is possible within the Attribute Index. Those sidewalks or curb ramps whose attributes are all very poor condition (or missing sidewalks and curb ramps) could be scored as high as 35 points. A total of 59 points is possible within the Accessibility Index. Candidate projects (repair, replace or install new pedestrian facilities) located within all of the critical pedestrian access areas could score as high as another 59 points. The total possible score for the PPI is 94.

Table 3-1. Pedestrian Priority Index Ratings, Point Values and Numeric Scores

Index Criteria	Location Rating	Point Value					Possible Score
Attribute Index	**Calculation of all scores summarizing Rating of Existing Conditions**						**35**
Accessibility Indices		**Total**	**Elem**	**Jr Hi**	**Sr Hi**	**Other**	
Schools		**16**					**16**
Proximity to Schools	Within ⅛-mile radius of school	10	4	2	2	2	
	Within ¼-mile radius of school	6	3	1	1	1	
	Within ½-mile radius of school	2	2	0	0	0	
	Within 1-mile radius of school	1	1	0	0	0	
School Crossings	Within 1/16-mile radius of school crossing	1					
Walk-to-School Route	Within 50 feet on either side of route	5					
Civic/Commercial Centers	Within ¼-mile radius of civic/commercial center	5					5
Parks	Within ⅛-mile radius of park	5					5
	Within ¼-mile radius of park	4					
	Within ½-mile radius of park	3					
	Within 1 mile radius of park	1					
Transit		5					5
Transit Route	Within 50 feet on either side of route	1					
Transit Bus Stops	Within ⅛-mile of transit stop	4					
Traffic Signal/Roundabout	Within ⅛-mile of signal or roundabout	5					5
Street Functional Class	(route continuity – accessibility)	5					5
Principal	Within 50 feet on either side of street	5					
Minor Arterial	Within 50 feet on either side of street	4					
Collector	Within 50 feet on either side of street	3					
Local	(all other)	1					
Lower Income Residence	Within Census Tract – below poverty line	3					3
Mobility-Impaired Residents	Top Third = 3; Middle = 2; Bottom = 1	3	(US Census Density*)				3
Population Density	For Both Variables	6					6
Employment Density	Top Qtr = 3; Second = 2; Third = 1; Fourth=0	3					
Senior Adult Housing	Within 1/16-mile radius of adult home	3					3
Walk-to-Work	Top Third = 3; Middle = 2; Bottom = 1	3	(US Census Density*)				3
COMPOSITE ACCESSIBILITY INDEX							59
COMPOSITE PEDESTRIAN PRIORITY INDEX							94

Defining the Accessibility Indices

A range of spatial index measures were developed to identify and quantify critical pedestrian access issues in Kent. Access at the pedestrian trip ends (origins and destinations) and pedestrian access to critical transportation system features (bus transit and arterial streets) were developed based on currently available technology (the City GIS data) and relevant data information (2000 US Census).

Schools

Many students walk or ride bicycles on the sidewalks to school. Students, particularly younger children, are among the most vulnerable pedestrians. Areas around schools, where student pedestrians congregate, require special attention in the form of pedestrian facilities and safety measures. As such, areas within certain distances from schools with students of different ages were assigned different accessibility index values areas.

As it's possible for an area to be within an eighth of a mile between different types of schools, different values were assigned to the four defined types: elementary, junior high, senior high, and other. The highest value of 4 was assigned to areas within an eighth of a mile from an elementary school. The proximity then decreased by a quarter-mile, a half-mile, and a full mile. The total possible accessibility index value is 10, which would indicate that an area is within an eighth of a mile from all four types of schools.

School Crossings

Similar to schools, school crossings are places where student pedestrians can congregate, in this case when waiting to cross a busy street. Again, they require special attention in the form of pedestrian facilities and safety measures. Areas within one-sixteenth of a mile from a school crossing were assigned an accessibility index value of one.

Walk to School Routes

Along the same lines as schools and school crossings, walk to school routes also service student pedestrians and require special attention due to safety issues. Areas within fifty feet on either side of a designated walk to school route were assigned an accessibility index value of five. The designated walk to school routes were identified by the Kent School District. When combined, the three accessibility measures related to school sites and crossings can total 16 possible points.

Civic Buildings

Access to public buildings is a critical component of Title II of the ADA. Libraries, court houses and other public buildings provide a wide-range of services to children, senior adults, and mobility-impaired residents. Areas within a quarter-mile of these facilities have been an accessibility index value of five was given.

Parks

Parks attract recreational users of all ages. Pedestrian access and safety facilities are essential to park accessibility. Some linear parks and greenways also include multi-use trails that provide critical transportation connections for pedestrians and cyclists. Accordingly, areas within distances from Kent's parks and greenways were assigned varying accessibility index values. The highest value assigned was five for areas within one-eighth of a mile, then a value of four for areas within one-quarter mile, a value of 3 for areas within one-half mile, and a value of one for areas within 1 mile.

Public Transit

King County Metro Transit and Sound Transit both provide public bus and rail transit service to the City. Some of the Metro and Sound Transit riders begin and end their trips as pedestrians and almost all will access the bus at stops requiring pedestrian facilities. Similarly, areas along bus routes will most likely be used by bus riders to get to the bus stops. Safe and continuous pedestrian facilities that link the bus stops to the surrounding area are an integral component of the public transit system. Areas within 1/8-mile of the bus stops in Kent have been assigned an accessibility index value of four and areas within 50 feet on either side of a bus route have been assigned a value of one, making a total value of five for areas associated with public transit.

Traffic Signals/Roundabouts

Crosswalks at traffic signals and roundabouts provide a means for pedestrians to safely cross busy roadways. Areas to the sides of the intersections serve as a gathering point for pedestrians to congregate while waiting to cross the street. Due to the importance of facilities where pedestrians gather, areas within one-eighth of a mile of a signal or roundabout have been given an accessibility index value of five.

Street Functional Classification

Streets function as ways for people and goods to move in and around the city. Different classifications of roadways demonstrate the purpose of each

type. Principal arterial streets are usually used to move traffic through local jurisdictions and are often state highways. High vehicle volumes at higher speeds intensify the need for separate pedestrian access and safety facilities. Without them, principal arterials become significant barriers to pedestrians of all kinds, but especially to the mobility-impaired. Areas within fifty feet on either side of a principal arterial were given an accessibility index value of five. As the speeds and volumes decrease on other classified streets (minor arterials, collectors, and local streets), the barrier the street presents to pedestrians starts to diminish. For this reason, the accessibility index value also decreases. Minor arterials were assigned a value of four, collectors were assigned a value of three and local streets were assigned a value of one.

Lower Income Residents

Residents with lower income are more likely to travel by walking, biking, or riding public transit than residents with higher incomes. In all cases, pedestrian facilities would be used to some degree, making pedestrian connections and safety a concern. For this reason, areas (block groups) in Kent below the poverty line (according to 2000 US Census Data) were given an accessibility index score of three.

Mobility-Impaired Residents

Mobility-impaired residents are those with a sensory and/or a physical disability. For this analysis, pedestrian access and safety facilities were determined more essential to those who are mobility-impaired than those with other impairments. These residents depend on pedestrian facilities operating at a satisfactory level in order to get about. As such, areas in Kent (US Census block groups) were broken out into three sets by naturally defined breaks in the percentage of residents with mobility impairment. The highest set – those with a high percentage of mobility-impaired residents – were given a value of three. The middle set was assigned a value of two and the bottom set a value of one.

Population & Employment Density (Year 2030)

Future (year 2030) residential population and employment in Kent was used as a measurable surrogate for land use intensity, in turn an indicator of pedestrian travel demand. Transportation analysis zones (K-zones) with high residential population and high employment utilize pedestrian facilities more than other areas because of the higher land use density. These land use attributes were measured by (a) dwelling unit per acre (for population) and (b) jobs per acre (for employment); and broken into approximate quarters at natural breaking points among the data. The resulting accessibility index values were highest for k-zones with very high densities both in population

and employment, which were given a value of six. Values decrease down to zero for those k-zones in the two bottom quarters with little to no residential population and employment.

Walk to Work Residents

People who walk to work in Kent use pedestrian facilities and often cross higher speed streets. For those areas of Kent (block groups) where there are a relative higher percentage of residents walking to work there is a higher need for attention to pedestrian facilities and pedestrian safety. The Kent urban area was roughly segregated into thirds based on natural breaking points among the data (US 2000 Census, Journey to Work). The highest third, containing the highest percentage of residents who walk to work, was assigned an accessibility index value of three, the middle third was assigned a value of two, and the bottom third a value of one.

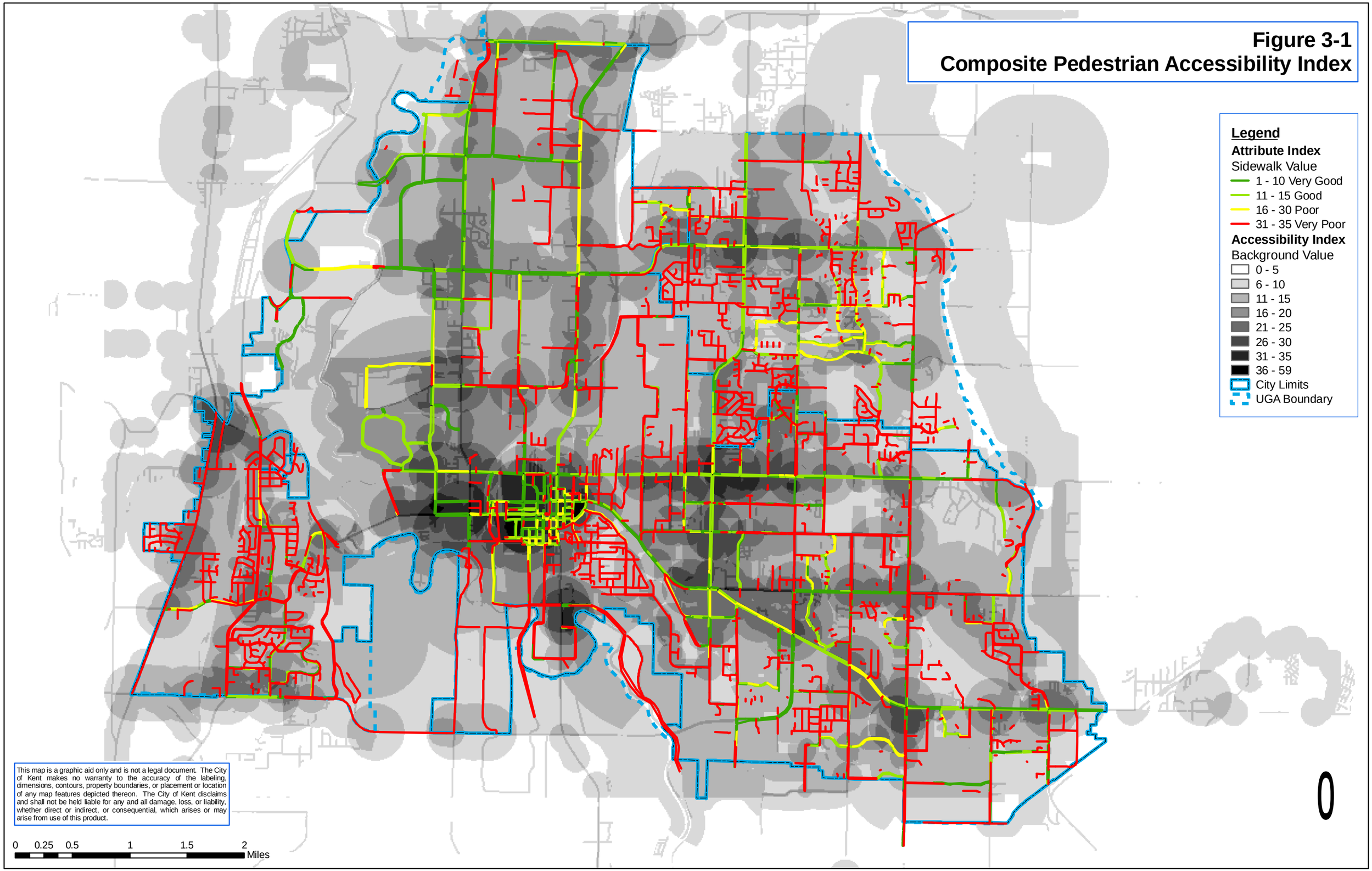
Senior Adult Housing

Senior adults are typically thought to utilize alternate means of transportation (walking and public transit) more than younger adults. Senior and adult housing facilities in Kent tend to generate significant pedestrian activity. Nearby pedestrian facilities and their condition is a safety concern. Due to this, an area within one-sixteenth of a mile from an adult home was given a value of three.

Composite Map

Appendix B contains individual maps for each of the accessibility indices. The Composite accessibility index map is illustrated in **Figure 3-1**. As shown, areas in darker shading reflect higher pedestrian accessibility index values. Also illustrated in Figure 3-1 are streets with missing sidewalks or sidewalks in poor condition. As example, those poor or missing sidewalks within the darkest shaded areas are ranked the highest in priority for future improvements. These values and scoring, form the basic input into the prioritization of pedestrian system improvements.

Figure 3-1
Composite Pedestrian Accessibility Index



PLANNING-LEVEL COSTS ESTIMATES

A set of planning-level unit cost measures were prepared within the City GIS database to help estimate the cost of future pedestrian improvements. These costs are not necessarily reflective of actual costs, but provide a comparative basis for establishing priorities and evaluating future programs. All possible pedestrian system improvements were assigned a planning-level cost estimate. The unit costs were based on recent roadway and sidewalk improvement projects completed within the city. **Table 3-2** includes a summary of the unit costs estimates used to develop the planning-level costs of possible pedestrian improvements. All costs were based on 2006 dollars and do not include right-of-way costs, assuming that most improvements are within existing right-of-way.

Table 3-2. Planning-Level Unit Costs

Improvement	Unit Cost
Curb Ramps	$1,500 (per ramp)
Sidewalks	Per Lineal Foot
Sidewalk, Curb, Gutter & Drain	$260
Sidewalk Only	$20

IDENTIFYING PEDESTRIAN IMPROVEMENT PROJECTS AND THEIR PRIORITIES

Those potential sidewalk or curb ramp improvements with the highest Composite PPI score should have the highest priority for future project completion. The Composite PPI was applied to all sidewalk segments and curb ramp locations, including missing sidewalk segments and missing curb ramps.

GIS Database Applications

A series of interim queries of the City GIS database were made to ensure that the definition and selection of pedestrian improvement project priorities do not duplicate or double-count projects already identified in the City's 2006 TIP. All possible project priorities along WSDOT facilities were also flagged and removed from the study summary, even though in some cases the pedestrian system GPS inventory covered several WSDOT routes.

Pedestrian Improvement Needs for Full ADA Compliance

The cost to build new and improved sidewalks and curb ramps fully compliant with the ADA is estimated at about $174 million. **Table 3-3**

summarizes these pedestrian improvement cost estimates by priority and improvement type. Not all pedestrian improvements are essential for system pedestrian mobility and access. As listed in **Table 3-4**, four priority groups were established based on the composite accessibility index score for various missing and existing sidewalks and curb ramps. Slightly higher emphasis was placed on new curb ramps and curb ramp repairs in scoring the accessibility index for candidate projects.

Table 3-3. Pedestrian Improvement Costs *(2006 dollars, in millions)*

Pedestrian Improvements	Priority				
	Highest	High	Medium	Low	TOTAL
New Sidewalks	$1.3	$32.1	$67.9	$62.7	$164.1
Sidewalk Repairs		$0.2	$3.2	$0.9	$4.3
New Curb Ramps	$0.2	$0.4	$2.2		$2.8
Curb Ramp Repairs	$0.5	$0.7	$0.5	$1.2	$2.9
TOTAL	$2.0	$33.4	$73.8	$64.8	$174.0

Table 3-4. Accessibility Index Thresholds (Project Prioritization)

	Priority—Accessibility Index Values			
	Highest	High	Medium	Low
New Sidewalks	> 30	25-30	20-24	< 20
Sidewalk Repairs		> 30	16-30	< 16
New Curb Ramps	> 30	16-30	< 16	
Curb Ramp Repairs	> 24	20-24	15-19	< 15

The cost of constructing new sidewalks is the largest of all improvement costs, and the greatest portions of these costs are amongst the "medium" and "low" priorities. Low priority, new sidewalk improvement needs are essentially in areas outside many or all of the accessibility measures calculated as part of the study. The *Highest* ($ 2.0 million) and *High* ($ 33.4 million) priority pedestrian improvements are the focus of the study. These improvements are located in areas where pedestrian activity is highest (e.g. near schools and transit stops, or near dense population and employment centers) and needed accessibility improvements are greatest (e.g. along or across busy arterials or near civic buildings).

High Priority Pedestrian Improvement Projects

As listed in **Table 3-5** and illustrated in **Figure 3-2**, the *Highest* and *High* priority pedestrian improvement projects are estimated to cost about $35.3 million, all of which are either new sidewalks or new curb ramps and curb ramp replacements. High-priority, new sidewalk improvement costs are largely located along various collector streets and within the downtown area.

Table 3-5. Highest/High Priority Pedestrian Improvements *(2006 dollars, in millions)*

Pedestrian Improvements	Priority by Street Class				
	Principal Arterial	Minor Arterial	Collector	Downtown Local	TOTAL
New Sidewalks	$1.6	$2.0	$17.6	$12.2	$33.4
Sidewalk Repairs				$0.1	$0.1
New Curb Ramps					$0.6
Curb Ramp Repairs					$1.2
TOTAL	$1.6	$2.0	$17.6	$12.3	$35.3

New Sidewalks

Installing new sidewalks along critical street corridors helps remove significant obstacles to pedestrians of all types. Those streets that currently do not have sidewalks on one or both sides of the street were identified in the Study for the installation of new sidewalks.

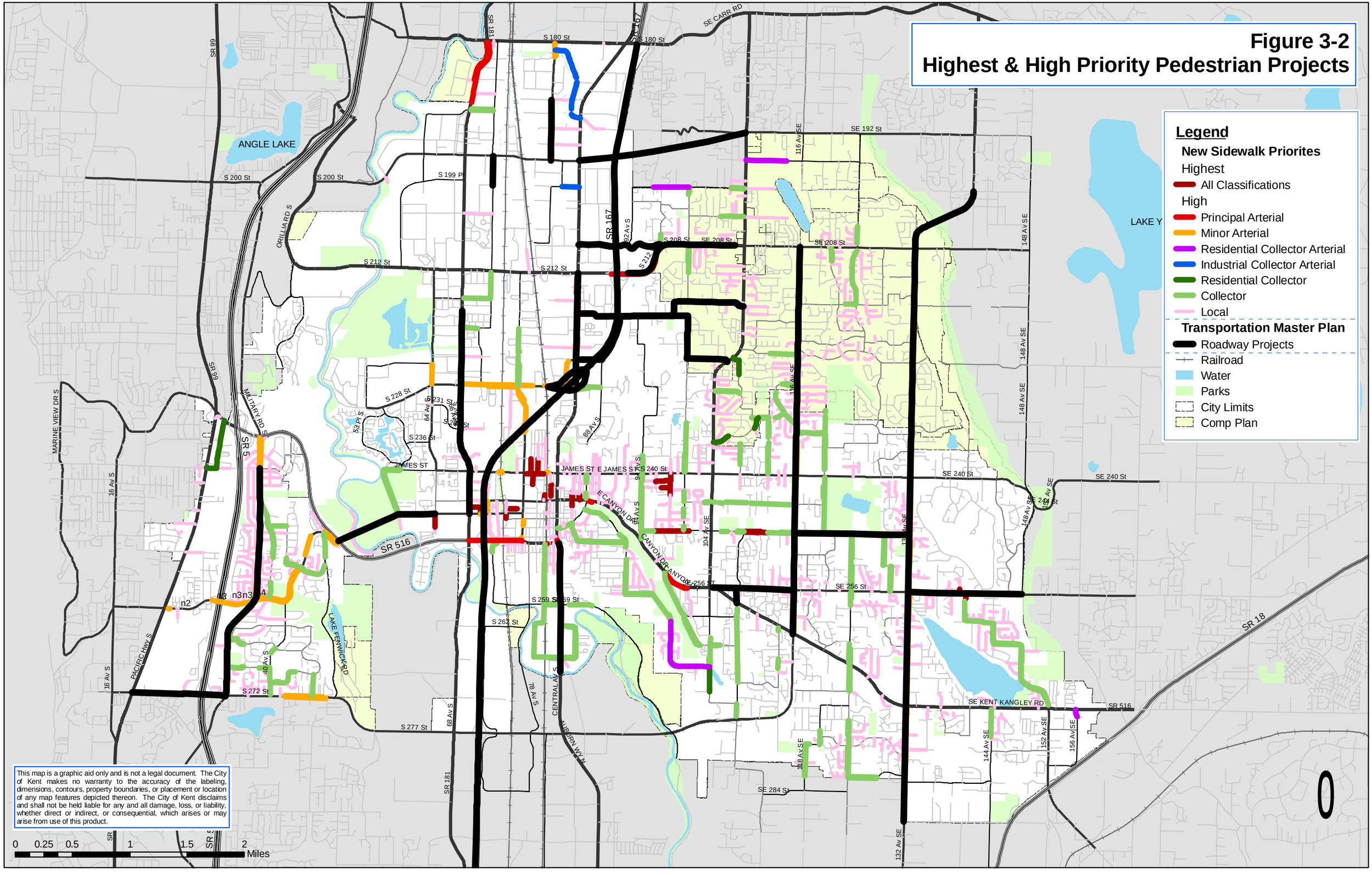
Sidewalk Repairs

Reconstructing existing sidewalks with significant structural problems can greatly improve pedestrian safety and access, particularly for the young, elderly and mobility-impaired pedestrians. Existing sidewalks were identified for reconstruction if they are currently rated with either (a) significant-extreme heaving and cracking, (b) substandard width (less than four feet in width), or (c) below average or very poor surface condition.

New Curb Ramps

Installing new curb ramps in critical locations will significantly remove obstacles for the mobility-impaired pedestrian. Those street corners that currently do not have curb ramps were identified in the Study for the installation of new curb ramps.

Figure 3-2
Highest & High Priority Pedestrian Projects



This map is a graphic aid only and is not a legal document. The City of Kent makes no warranty to the accuracy of the labeling, dimensions, contours, property boundaries, or placement or location of any map features depicted thereon. The City of Kent disclaims and shall not be held liable for any and all damage, loss, or liability, whether direct or indirect, or consequential, which arises or may arise from use of this product.

Curb Ramp Repairs

Some of Kent's older curb ramps are in such poor condition that they are more a hindrance and barrier to pedestrians than they are helpful. Through reconstruction these curb ramps can provide the needed safety and access improvements for the mobility-impaired and others. Existing curb ramps were identified for reconstruction if they are currently rated with either (a) very poor surface condition, (b) non-compliant ramp width (less than three feet wide), (c) non-compliant top landing (missing or less than 3 feet wide), or (d) non-compliant ramp slope (8.4% or greater).

USING THE PEDESTRIAN PRIORITY INDEX

The PPI provides the City with an objective methodology for selecting and prioritizing pedestrian system improvements. This methodology provides an initial basis for project identification as input into the City's Transportation Improvement Program (TIP). However, professional judgment will always be required to select appropriate projects. Other factors will likely need to be evaluated by the City, including relationship to:

- Other TIP projects
- Special grant application projects
- Pending development projects, and
- Prevailing site conditions.

See Chapter 8 - Recommended Measures to Implement the NMTS for further recommendations regarding pedestrian project funding and the TIP.

It is recommended that the PPI calculation be reviewed and updated every three years, concurrently with regular updates of the City's TIP. In this manner The City can incorporate the completion of pedestrian improvements that are installed with roadway widening or new street projects identified in the TIP. Doing so will ensure that pedestrian priorities reflect pedestrian and street project completion, new development, and other land use changes.

It should also be noted that new developments that have been constructed since the NMTS data inventory may not be compliant with the ADA, since the City's current policies may not have required ADA compliant installation.

Chapter 4—Existing Bicycle System

INTRODUCTION

Two fundamental building blocks are needed in understanding the study of Kent's bicycle system: (1) a baseline definition of the various terms and language used in describing bicycle facilities, and (2) acknowledging the physical constraints which have limited Kent's bicycle system development. Each of the building blocks is described here.

REVISING THE BICYCLE PLANNING LANGUAGE

The City can begin more proactive planning for bicycle facilities by first expanding upon and clarifying the definitions of the various bicycle facilities, especially for the on-street bicycle system. Historical plan documentation in Kent has concluded in text and mapping a "Bikeway" or "Bikeway Route" network, some of which may be implied to mean on-street bicycle lanes. What are bikeway routes? Are they separate lanes for cyclists or a series of signs and painted symbols that indicate for both motorists and cyclists the need to share the outside travel lane? There is need for further clarity in these definitions, otherwise planners, engineers, policy officials and the general public might be unclear what the NMTS full intentions are. **Figure 4-1** illustrates the basic forms of bikeway facilities as defined by AASHTO.[1] Pavement markings and signing guidance is provided by the Manual of Uniform Traffic Control Devices (MUTCD)[2]. Consistent with the MUTCD, the City will adhere to the following definition of terms concerning bicycle facilities:

Bicycle Facilities

A general term denoting improvements and provisions that accommodate or encourage bicycling, including parking and storage facilities, and shared roadways not specifically defined for bicycle use.

Bikeway

A generic term for any road, street, path that in some manner is specifically designated for bicycle travel, regardless of whether such facilities are designated for the exclusive bicycle use or are to be shared with other travel modes.

Bicycle Lane

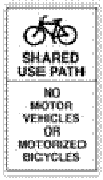
A portion of a roadway that has been designated by signs and pavement markings for preferential or exclusive use by bicyclists. Bicycle lanes are way- facilities that are placed on

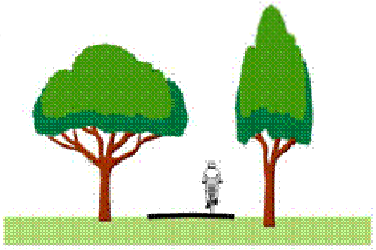
both sides of a street, and they carry bicyclists in the same direction as adjacent vehicle traffic. In addition to lane striping, pavement and signage identify lanes.

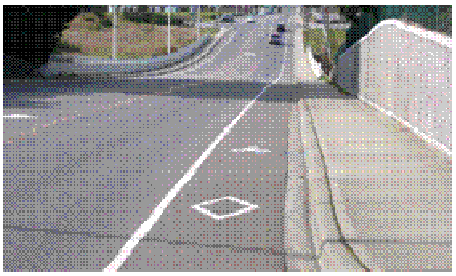
Figure 4-1. Bikeway Facility Definitions

Shared Use Path

Provides a completely separated right of way for the exclusive use of bicycles and pedestrians with crossflow minimized.

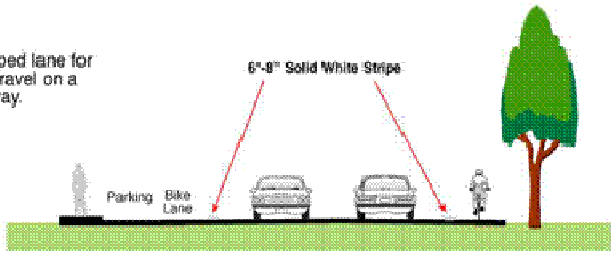






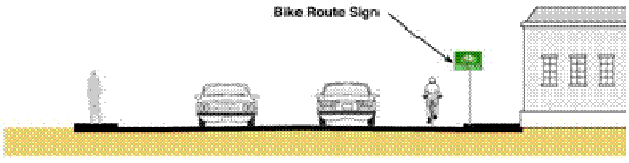
Bike Lane

Provides a striped lane for one-way bike travel on a street or highway.



Bike Route
Signed Shared Roadway

Provides for shared use with pedestrian or motor vehicle traffic, typically on lower volume roadways.



Another type of bicycle lane is a bikeway. Shoulders are paved, are at least four feet in width, and are separated from travel lanes with a lane stripe. This facility is typically applied to a rural cross-section that does not have curb and gutter.

Designated Bicycle Routes

A system of bikeways designated by the jurisdiction having authority with appropriate directional and informational route signs, with or without specific bicycle route numbers. Bicycle routes, which might be a combination of various types of bikeways, should establish a continuous routing.

Designated bicycle routes can be divided into ***shared roadway*** and ***shared-use path*** facilities.

Shared Roadway

On a shared roadway, bicyclists and motorists use the same travel lane. Shared roadways bicycle routes can be placed on streets with wide outside travel lanes, along streets with bicycle route signing, or along local streets where motorists have to weave into the lane in order to safely pass a bicyclist.

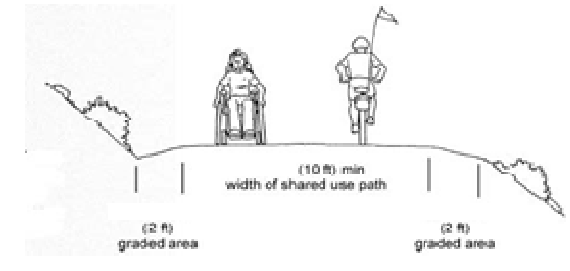
Shared-Use Path

A bikeway outside the traveled way and physically separated from motorized vehicular traffic by an open space or barrier and either within the highway right-of-way or within an independent alignment. Shared-use paths are also used by pedestrians (including skaters, users of manual and motorized wheelchairs, and joggers) and other authorized motorized and non-motorized users.

Shared-use paths primarily attract recreational users, because they typically wind through and connect destinations, they also are an excellent opportunity to function as motorized transportation routes.

For any cyclist uncomfortable with sharing the roads with vehicles, shared-use paths may be the preferred facility.

Implementation of these specific terms will help advance consistent dialogue between the City and the community regarding bicycle facility planning and design, within the context of multi-modal systems development.



Shared-use paths should be constructed to minimum widths of 10 feet (Source: *FWHA Designing Trails and Sidewalks for Access)*

DEFINING BICYCLE USERS

There are a variety of bicyclists traveling within the study area, depending on their skills, confidence and preferences. According to AASHTO,

> *"some riders are confident riding anywhere they are legally allowed to operate and can negotiate busy and high speed roads that have few, if any, special accommodations for bicyclists. Most adult riders are less confident and prefer to use roadways with a more comfortable amount of operating space, perhaps with designated space for bicyclists, or shared*

use paths that are away from motor vehicle traffic. Children may be confident riders and have excellent bike handling skills, but have yet to develop the traffic sense and experience of an everyday adult rider."

For the purpose of this study the following categories of bicycle user types are applied as the impact of different bicycle facility types are determined:

Source: www.canada.com/ottawacitizen/news

Advanced or experienced riders are generally using their bicycles as they would a motor vehicle. They are riding for convenience and speed and want direct access to destinations with a minimum of detour or delay. They are typically comfortable riding with motor vehicle traffic; however, they need sufficient operating space on the traveled way or shoulder to eliminate the need for either themselves or a passing motor vehicle to shift position.

Basic or less confident adult riders may also be using their bicycles for transportation purposes, e.g., to get to the store or to visit friends, but prefer to avoid roads with fast and busy motor vehicle traffic unless there is ample roadway width to allow easy overtaking by faster motor vehicles. Thus, basic riders are comfortable riding on neighborhood streets and shared use paths and prefer designated facilities such as bike lanes or wide shoulder lanes on busier streets.

Source: www.contextsenstitivesolutions.org

Source: www.indygreenways.org

Children, riding on their own or with their parents, may not travel as fast as their adult counterparts but still require access to key destinations in their community, such as schools, convenience stores and recreational facilities. Residential streets with low motor vehicle speeds, linked with shared use paths and busier streets with well-defined

pavement markings between bicycles and motor vehicles can accommodate children without encouraging them to ride in the travel lane of major arterials.

LOCAL GEOGRAPHY

The Kent urban area spans both the west and east plateaus on either side of the valley floor, home of the city center. As illustrated in **Figure 4-2**, overcoming the steep terrain has been a major engineering and design issue, for both streets and bicycle system features. Other transportation constraints that have limited bicycle system connectivity in the Kent urban area include SR-167 and the two major railroads. Green River is both a barrier to east-west bicycle travel but also a partial asset with the development of the Green River Trail facilities.

As a result, Kent's bicycle system has many excellent features but is lacking a cohesive and connected system. **Figure 4-3** maps the current bicycle system within the Kent urban area.

END NOTES

[1] Association of American State Highway Transportation Officials. Guide for the Development of Bicycle Facilities, Washington, D.C. 1999.

[2] Manual of Uniform Traffic Control Devices, U.S. Department of Transportation - Federal Highways Administration, 2004.

Chapter 5—Non-Motorized Policy Guide

INTRODUCTION

There are several federal and state policies which affect the City regarding the planning and development of its non-motorized transportation system. This chapter provides an overview of those policies, and summarizes a policy framework for both the pedestrian and bicycle element of the NMTS. The policy framework outlines the pedestrian and bicycle goals, and then a series of objectives, policies and implementation strategies by which the City can coordinate and guide the implementation of NMTS as an integral component of the Kent Comprehensive Plan. The policy guide concludes with a summary of state funding sources for non-motorized projects.

FEDERAL POLICY

The U.S. Department of Transportation (USDOT) has issued policy guidelines[1] for public agencies, professional associations, advocacy groups, and others to better integrate bicycling and walking into comprehensive transportation plans. More specifically, USDOT has emphasized that bicycling and walking facilities will be incorporated into all transportation projects unless exceptional circumstances exist. There is a certain amount of flexibility for the type of facility, and the design elements that are required to ensure accessibility.

This federal approach is intended to provide guidance for the accommodation of bicyclists and pedestrians, and can be adopted by State and local agencies and other groups as a commitment to developing a transportation infrastructure that is safe, convenient, accessible, and attractive to motorized and non-motorized users alike.

After adopting the policy that bicyclists and pedestrians (including people with disabilities) will be fully integrated into the transportation system, State and local governments should encourage engineering judgment in the application of the range of available treatments. An example of the federal policy regarding bicycle facilities states: collector and arterial streets shall typically have a minimum of a four foot wide striped bicycle lane; however, wider lanes are often necessary in locations with parking, curb and gutter, heavier and/or faster traffic. For more design guidance, see **Chapter 6, NMTS Design Guidelines**.

The fully integrated transportation infrastructure will improve conditions for all users because of State and local agencies' efforts to plan projects for the long term; address the need for bicyclists and pedestrians to cross

corridors as well as travel along them; obtain approval for exceptions at the highest senior level; and design facilities to the best currently available standards and guidelines.

Local Agency Actions

Some actions that agencies can take to demonstrate their commitment to the multifaceted USDOT approach include:

- Adopt new manuals, or amend existing manuals, covering the geometric design of streets, the development of roadside safety facilities, and design of bridges and their approaches so that they comprehensively address the development of bicycle and pedestrian facilities as an integral element of the design of all new and reconstructed roadways;
- Define the exceptional circumstances in which facilities for bicyclists and pedestrians will not be required in all transportation projects;
- Adopt stand-alone bicycle and pedestrian facility design manuals as an interim step towards the adoption of new typical sections or manuals covering the design of streets and highways;
- Initiate an intensive re-tooling and re-education of transportation planners and engineers to make them conversant with the new information required to accommodate bicyclists and pedestrians. Training should be made available for, if not required of, agency traffic engineers and consultants who perform work in this field.

Agencies should take steps to identify and evaluate risks, and develop an effective risk management program. One risk that local government agencies can avoid is signing sidewalks as bicycle paths. Such signage indicates that it is safe for bicyclists to ride there, but these facilities are not usually designed for pedestrians and bicyclists. In addition to steering clear of potential bicycle-pedestrian collisions, separate bicycle facilities are "operationally superior" to wide outside lanes.

In policy and in practice, USDOT has committed itself to supporting a completely mobile transportation infrastructure. Bicycles are increasingly used for everyday travel needs as well as for recreation and health benefits. As more federal funding is devoted to research and planning for bicycles, the judicial system is now less likely to rule in favor of local jurisdictions that do not prepare and implement truly multi-modal plans. By paralleling USDOT's commitment to planning for pedestrian and bicycle transportation, the City can help to build a transportation network that is more fully mobile for all travelers.

WASHINGTON STATE POLICY

Much of Washington State policy regarding transportation planning is guided by the Growth Management Act (GMA). In 2005 the State amended the GMA[2] to encourage local governments to complete their non-motorized transportation plans (NMTPs) with comprehensive networks for pedestrian and bicycle travel. Specifically, the GMA amendments require communities to consider urban planning approaches that promote physical activity, and require that a bicycle and pedestrian component be included in the Transportation Element of a comprehensive plan.

Examples of planning approaches to promoting physical activity are: encouraging infill development, designating mixed-use community centers, and designating transit-oriented development (TOD) zones, among other things. Most relevant to transportation planners, the State suggests that agencies review local regulations to ensure that bicyclists and pedestrians are adequately planned for in street and subdivision development standards, parking standards, and parking lot design. Also, local governments should comply with the Americans with Disabilities Act not only to provide access for the disabled, but also for people with strollers and walkers. Ensuring that high quality bicycle and pedestrian facilities are available is important, as well as ensuring that people feel safe using them. "High quality" denotes several characteristics:

- A complete street network with multiple connections, accommodating of multiple transportation modes, and a grid street pattern. Block sizes between 200-800 feet and maximum distances for intersections between 500 feet (local streets) and 1000 feet (arterial streets) are elements of such a complete street network. Links between dead-end streets are also essential.
- Connectivity between trails, pathways, neighborhoods, schools, and sidewalks that enhances the ability for users to be physically active.
- Trails and linear parks that link activity centers, and serve as recreation facilities and as transportation routes.
- Safety enhancements such as lighting, signage, more safe crossing opportunities, reduced vehicle speeds, and separated paths and trails.
- A consistent use of strategies such as crime prevention through environmental design (CPTED) in order to address users' fears and perceptions of danger about walking and bicycling in the community. The use of CPTED includes a clear division between public and private space, and passive surveillance of public areas can improve safety. The cities of SeaTac, Everett, and Spokane have adopted CPTED principles.

Washington cities have been including bicycle and pedestrian components as parts of their Transportation Elements in their comprehensive plans. By employing consistent non-motorized policies with new federal and state directives, the City will be more competitive for statewide and federal funding, and consistent with the revised GMA. Some strategies that can be used in NMTS components are:

- Retrofit existing streets with pedestrian and bicycle facilities.
- Designate and improve safe routes to school.
- Improve walking and bicycling conditions by improving connections from residential areas to health care facilities, community centers, shopping, transit, and other services. The improved connections would be enhanced by adding amenities such as shade trees, benches, and water fountains. It is also important to eliminate hazards to bicycle travel such as parallel bar drainage grates, traffic-actuated signals unresponsive to bicycles, and roadside debris along non-motorized routes of travel.
- Use traffic calming measures such as narrower road widths, traffic circles, speed humps, and other devices to slow traffic for safer pedestrian and bicycle use, and create safer and more attractive streets.
- Enforce traffic laws and provide traffic safety education programs for drivers, pedestrians, and bicyclists.
- Use innovative, low-cost transportation demand management (TDM) strategies (e.g., employer provided bus passes, facilities, and incentives) to help make bicycling, walking, transit, carpooling, and vanpooling more attractive commuting options. Washington's Commute Trip Reduction (CTR) Act requires certain jurisdictions to develop, adopt by ordinance, and implement a commute trip reduction plan for all major employers.

In addition to the GMA, the State of Washington has emphasized multi-modal planning[3] in order to be more consistent with Federal policy. WSDOT has been instrumental in this effort, particularly by laying out the Livable Communities Policy[4]. Transportation agencies have many options at their disposal to support and encourage livable communities. Some of these options are:

- Foster multimodal transportation systems that enhance communities to
- Encourage multimodal access to transportation facilities; i.e., design and placement of facilities to provide for safety and access to services or jobs.
- Consider community and neighborhood connectivity when improving transportation corridors by providing bicycle and pedestrian networks.
- Ensure new or expanding transportation facilities are consistent with

local land use and regional policies, plans and agreements.

- Develop collaborative transportation actions sensitive to community values.
- Allow flexibility in design standards/procedures to adjust to local plans.
- Promote tools for livable communities such as model ordinances, codes, and regulations.
- Enhance community aesthetics with transportation facilities, incorporating unique local features (i.e., scenic views, community neighborhoods, historic districts, etc.) and providing focal points for communities through those facilities such as multimodal stations, pedestrian plazas, and parkways.
- Coordinate access to funding.
- Support local planning efforts.
- Fund (support) projects and efforts that enhance local livability.
- Support projects consistent with local plans.
- Encourage the use of funding resources like Transportation Enhancements and the National Scenic Byways program to support livable communities.
- Provide innovative financing tools which provide positive incentives to promote livable communities.
- Include livability criteria in funding of projects.
- Encourage funding partnerships by simplifying transportation and community infrastructure funding programs.

KENT PEDESTRIAN STUDY POLICY FRAMEWORK

In developing the Pedestrian System Goal for the City, an emphasis was placed on the importance of providing connecting facilities. This can only be accomplished by building sidewalks where they are not currently in place. To provide this comprehensive network of well-maintained pedestrian facilities, the Non-Motorized Transportation Study element of the Kent Comprehensive Plan contains a goal, objectives, and policies section. This policy framework reflects the intent and requirement of the State Growth Management Act, but also addresses the requirements of Title II of the ADA.

In order to achieve the pedestrian goal, three objectives have been outlined that deal with the role of creating pedestrian facilities:

- Create a comprehensive system of pedestrian facilities;
- Increase the percentage of all trips made by pedestrians; and
- Reduce the number of pedestrians injured in traffic accidents.

Each objective is to be met through the implementation of policies that pursue particular strategies, develop specified programs, or engage in defined courses of action to ensure the achievement of the goal and objectives established in the NMTS.

Goal, Objectives, and Policies

The City has the following goal, objectives, and policies for the planning, development, and operation of its pedestrian system:

GOAL: To provide a comprehensive system of connecting sidewalks and walkways that will encourage and increase safe pedestrian travel.

Objective No. 1

The City shall create a comprehensive system of pedestrian facilities.

POLICY 1.1 FOCUS ATTENTION ON INTER-MODAL CONNECTIONS

Sidewalks and walkways will complement access to transit stations/stops, train stations, and multiuse paths. The City will encourage development of or enhancements to activity centers and business districts with site plans and designs that encourage pedestrian travel within their proximity.

POLICY 1.2 ENSURING FUTURE SIDEWALK CONNECTIONS

All future development must include sidewalk and walkway construction as required by the Kent City Code and adopted Design Standards. All road construction or renovation projects shall include sidewalks. As resources are available the City will support projects that address identified barriers to pedestrian travel or safety.

POLICY 1.3 COMPLETE CONNECTIONS WITH CROSSWALKS

All signalized intersections must have marked crosswalks. School crosswalks will be marked where crossing guards are provided. Marked crosswalks, along with safety enhancements (medians and curb extensions), shall be provided, as resources are available, at unsignalized intersections and uncontrolled traffic locations in order to provide greater mobility in areas frequently traveled by persons with limited pedestrian capabilities. Marked crosswalks may also be installed at other high volume pedestrian locations without medians or curb extensions if a traffic study shows there would be a benefit to those pedestrians.

POLICY 1.4 COMPLIANCE WITH ADA STANDARDS

The City shall comply with the requirements set forth in the Americans with Disabilities Act regarding the location and design of sidewalks.

POLICY 1.5 CONNECTING TRAIL NETWORK

The City will encourage the development of a connecting, multiuse trail network, using the Interurban Trail, Green River Trail and Soos Creek Trail, and other corridors such as rivers, creeks, utility easements, and abandoned rail lines. This network can be further established using programs such as rail-banking, which complement and connect to the sidewalk and park systems.

Objective No. 2

The City will seek to double the 2000 percentage of work-trips made by pedestrians by the Year 2025 (increase from 6.2% to 12%).

POLICY 2.1 MAINTAINING AND ASSURING THE QUALITY OF FACILITIES

The City will establish standards for the maintenance and safety of pedestrian facilities. These standards should include the removal of hazards and obstacles to pedestrian travel, as well as maintenance of benches and landscaping.

POLICY 2.2 PROMOTION OF WALKING FOR HEALTH AND COMMUNITY LIVABILITY

Consistent with the GMA, the City will encourage efforts that inform the public and promote the health, economic, and environmental benefits of walking for the individual and the community. Walking for travel and recreation should be encouraged to achieve a more healthful environment that reduces pollution and noise to foster a more livable community.

Objective No. 3

The City will encourage education services and promote safe pedestrian travel in order to reduce the accident rates involving pedestrians.

POLICY 3.1 EDUCATION OF PEDESTRIAN SAFETY NEEDS

The City shall encourage schools, safety organizations, and law enforcement agencies to provide information and instruction on pedestrian safety issues that focus on prevention of the most important accident problems. The programs will educate all roadway users of their privileges and responsibilities when driving, bicycling, and walking.

POLICY 3.2 TAKING ACTION TO IMPROVE SAFETY

The City will enforce pedestrian safety laws and regulations to help increase safety as measured by a reduction in accidents. Attention should be focused on areas where high volumes of automobile and pedestrian travel occur. Warnings and citations given to drivers and pedestrians should serve to impress the importance of safety issues.

POLICY 3.3 COMPLETION OF STREET LIGHTING FACILITIES

The City will work toward the completion of the street lighting system, designed to City illumination standards, on all Arterial and Collector streets within the urban area. Through the use of neighborhood street lighting districts, property owners should be encouraged to provide street lighting, designed to City illumination standards, on all public local streets within the urban area.

POLICY 3.4 SAFE ACCESS TO SCHOOLS

The City will work with the Kent School District, the Highline School District and the Federal Way School District and neighborhood associations to maintain and improve its programs to evaluate the existing pedestrian access to local schools, estimate the current and potential use of walking as a travel mode, evaluate safety needs, and propose changes to increase the percentage of children and young adults safely using this mode.

Pedestrian Implementation Strategies

Sidewalk Construction

In implementing the NMTS pedestrian element, several methods of providing sidewalks are currently available to the City:

- Private Development of Properties and Subdivisions. All new streets are required to have sidewalks. Most developing properties are required to construct sidewalks on abutting street frontages as part of the building permit process. The majority of new sidewalks are constructed in this manner.
- City-funded Street Improvement Projects. The City will typically construct sidewalks as part of a street improvement project that brings a street up to urban standards.
- Assessed Projects. An assessed project involves the direct financial participation of abutting or nearby property owners to fund the construction of public improvements. This is implemented through the creation of an assessment district called a Local Improvement District. Individual properties can also be assessed for the improvements required along their own frontage.
- Inclusion in TIP. The current Six-Year Transportation Improvement Plan should be updated with transportation system projects (sidewalk, multi-use path, bicycle lane and shared travel lane improvements) as prioritized in the NMTS. Kent's TIP includes specific pedestrian and bicycle improvements in on-going programs: Bicycle and Pedestrian Improvements and ADA Compliance Sidewalk Repair and Rehabilitation.

- State Coordination. Coordination with WSDOT is essential to assure that adequate pedestrian facilities are included in all WSDOT improvements to SR-516 and SR-167, particularly at freeway/expressway interchanges and crossings (underpasses and overpasses) of state highways, including sufficient street lighting for non-motorized safety.

All five of these methods will be used by the City in differing situations to complete construction of the sidewalk system.

Safety and Maintenance

Safety is a primary concern for pedestrians who travel throughout their neighborhoods. In addition to providing sidewalks for pedestrians to walk on, the sidewalks need to be appropriately illuminated and adequately maintained. Property owners are required to maintain and repair the public sidewalks that abut their property.

Safe Pedestrian Crossings

By law, every intersection is a legal crosswalk, whether marked or not. Drivers are required to stop for pedestrians in any crosswalk, again, whether or not it is marked.

Over the years Kent has received many requests for marked crosswalks to improve safety. There are many studies that show marked crosswalks do not improve safety for a pedestrian. In many instances, the markings actually decrease safety. Marked crosswalks are very visible to the pedestrian, but in most circumstances drivers do not see them very clearly. Pedestrians get a false sense of security, expecting the driver to react to the crosswalk when the driver is not even paying attention to it. Studies have shown that this is particularly true for the elderly and youth. Physical structures, such as curb extensions and medians, improve safety because they draw drivers' attention to that structure and to the pedestrian standing within the structure trying to cross the street.

The City's policy for marking crosswalks follows nationally recognized standards on installing traffic devices. The MUTCD, 2003 edition, controls how traffic control devices (including marked crosswalks) are used throughout the United States. Under Section 7C.03 Crosswalk Markings, it states that, “Crosswalk lines should not be used indiscriminately. An engineering study should be performed before they are installed at locations away from traffic control signals or stop signs.”

Street Lighting

Currently, all new public streets constructed in Kent require the installation of street lighting. Several options currently exist for property owners to have street lighting in place. Individual owners can pay to have a light in front of their property or, more frequently, a group of property owners form a street lighting district.

Pedestrian Action Items

The following lists a series of specific action items for the City to effectively execute some of the respective pedestrian implementation strategies.

- *System Inventory Updates*. Pedestrian facility inventory updates will be performed every five years to help determine the success or failure of meeting the Study's pedestrian goal, objectives, and policies.
- *New Sidewalk Construction Program*. To complete the pedestrian facility network, the City will formalize a New Sidewalk Construction Program that reflects the City's funding resources. This program will give priority to the construction of missing sidewalks in already developed areas of the city that would provide improved access to schools, parks, shopping, and transit services.
- *Crosswalks.* The City will continue to review other jurisdictions and studies to determine the best way to apply crosswalks and other improvements for pedestrian safety.

KENT BICYCLE STUDY POLICY FRAMEWORK

In developing the Bicycle System Goal for the City, an emphasis was placed on the importance of providing a completed system of direct on-street bicycle facilities and paths, and on increasing the percentage of trips made by bicycle.

Three objectives have been developed to help the City achieve its bicycle system goal:

- Creating a comprehensive system of bicycle facilities;
- Doubling the percentage of trips made by bicycle; and
- Reducing the number of bicyclists killed or injured in traffic crashes.

Each objective is to be met through the implementation of policies that pursue particular strategies, develop specified programs, or engage in defined courses of action to ensure the achievement of the goal and objectives established in the NMTS.

To increase the role of the bicycle as a viable mode of transportation, we must provide connected and well-maintained facilities.

Goal, Objectives, and Policies

The City has the following goal, objectives, and policies for the planning, development, and operation of its bicycle system:

GOAL: To provide a comprehensive system of connecting on-street bicycle facilities and shared-use paths that will encourage increased ridership and safe bicycle travel.

Objective No. 1

The City will create a comprehensive system of bicycle facilities.

POLICY 1.1 PROVIDE BICYCLE FACILITIES ON ARTERIAL AND COLLECTOR STREETS

Bicycle lanes will be provided on newly constructed Arterial and Collector streets. Arterial and Collector streets undergoing overlays or reconstruction will either be re-striped with bicycle lanes or shared-lane routes as designated on the Bicycle System Map. Every effort will be made to retrofit existing Arterials and Collectors with bicycle lanes, as designated on the Map (see **Chapter 7**).

POLICY 1.2 MITIGATION OF ON-STREET PARKING LOSS FROM BICYCLE PROJECTS

Where the City identifies the need for new bicycle facilities which require the removal of on-street parking spaces on existing roadways, parking facilities should be provided that mitigate, at a minimum, the existing on-street parking demand lost to the bike project. This policy does not apply to street widening or major reconstruction projects.

POLICY 1.3 CONNECTING TRAIL NETWORK

The City will encourage the development of a connecting, multiuse trail network, using the Interurban Trail, Green River Trail and Soos Creek Trail, and other corridors such as rivers, creeks, utility easements, and abandoned rail lines. This network can be further established using programs such as rail-banking, which complements the on-street bicycle system.

POLICY 1.4 ELIMINATE BARRIERS TO BICYCLE TRAVEL

The City will actively pursue a comprehensive system of bicycle facilities through designing and constructing projects, as resources are available, and implementing standards and regulations designed to eliminate barriers to bicycle travel. As a result of this policy, new developments or major transportation projects will neither create new, nor maintain existing barriers to bicycle travel. Through the implementation of development Codes and

standards, the City will require the creation of pathways and connections for bicyclists to schools, neighborhood shopping, and other activity centers.

POLICY 1.5 BICYCLE ROUTES AND SIGNAGE

As resources are available, the City will, in consultation with local bicyclists, review existing and proposed bicycle lanes and other streets, identify preferred routes, and make improvements as necessary to make these routes function better for bicyclists. These routes shall be identified by signage on the routes and shown on updates of the bicycle route map.

Objective No. 2

The City will seek a two-fold increase in the percent modal share for commuter trips made by cyclists by the Year 2025 (from 1.4% to 2.8%) by fostering an environment that eliminates deterrents to bicycling and encourages bicycle use city-wide for all types of trips.

POLICY 2.1 COMPLETE THE MAJOR BICYCLE SYSTEM

Recognizing that a completed system of major bicycle facilities is one of the most important factors in encouraging bicycle travel, the City will work toward annually completing a minimum 5 percent addition to the bicycle system, as designated on the Bicycle Route and Facility System Map, with priority given to projects that fill critical missing links in the bicycle system or address an identified safety hazard.

POLICY 2.2 REQUIRE RELEVANT BICYCLE ACCOMMODATIONS DURING ALL TRANSPORTATION CONSTRUCTION PROJECTS

The City will require each urban street construction project within the city to include consideration of bicyclists in the traffic control plan, including: placement of signs, routing, and lane width. High standards for resurfacing and sweeping will be required of all construction projects in the roadway right-of-way.

POLICY 2.3 CITY CODE REQUIREMENTS FOR BICYCLE PARKING

The Kent City Code will contain bicycle parking supply requirements and standards that require new developments to provide a minimum amount of bicycle parking, based on the needs of the specific zone or land use type.

POLICY 2.4 BICYCLE PARKING AT TRANSIT AND INTER-MODAL FACILITIES

The City will encourage the installation of public bicycle parking facilities at park and ride facilities, transit stations, bus terminals, and other inter-modal facilities, and continuation of bicycle racks on all public transit vehicles.

POLICY 2.5 PROMOTION OF WALKING FOR HEALTH AND COMMUNITY LIVABILITY

Consistent with the GMA, the City will encourage efforts that inform the public and promote the health, economic, and environmental benefits of cycling for the individual and the community. Cycling for travel and recreation should be encouraged to achieve a more healthful environment that reduces pollution and noise to foster a more livable community.

Objective No. 3

The City will promote bicycle safety and seek to reduce the accident rate involving bicyclists.

POLICY 3.1 TAKING ACTION TO IMPROVE SAFETY

The City will enforce bicycle safety laws and regulations to help increase safety as measured by a reduction in accidents. Attention should be focused on areas where high volumes of automobile and bicycle travel occur. Warnings and citations given to drivers and cyclists should serve to impress the importance of safety issues.

POLICY 3.2 BICYCLE SAFETY AWARENESS PROGRAMS

The City will develop training and awareness programs that encourage the public to ride safely and use bicycle safety equipment when bicycling. These programs should encourage all roadway users to courteously share the road and be aware of their privileges and responsibilities when driving, bicycling, and walking.

POLICY 3.3 SAFE ACCESS TO SCHOOLS

The City will work with the Kent School District, the Federal Way School District and Highline School District, and neighborhood associations to maintain and improve its programs to evaluate the existing bicycle access to local schools and supporting infrastructure at schools (bicycle racks, lockers, etc.), estimate the current and potential use of bicycling as a travel mode, evaluate safety needs, and propose changes to increase the percentage of children and young adults safely using this mode.

Bicycle Implementation Strategies

In implementing the NMTS element, several methods of providing bicycle facilities are currently available to the City:

- Inclusion in TIP. The Six-Year Transportation Improvement Plan should be updated with transportation system projects (sidewalk, multi-use path, bicycle lane and shared travel lane improvements) as prioritized in the NMTS. Kent's TIP includes specific bicycle improvements in the Bicycle and Pedestrian Improvements Program.

- Feasibility of necessary improvements. Conduct further operational study of Meeker Street to determine feasibility of re-striping those streets to include on-street bicycle lanes.
- State Coordination. Coordination with WSDOT is essential to assure that adequate pedestrian facilities are included in all WSDOT improvements to SR-99, SR-516, SR-167, SR-181 and SR-515, particularly at freeway/expressway interchanges and crossings (underpasses and overpasses) of state highways, including sufficient street lighting for non-motorized safety.
- Bicycle Storage. Establish a downtown commuter bike facility (secure parking, showers, and changing rooms) and other bicycle amenities in the downtown area.

Bicycle Action Items

The following lists a series of specific action items for the City to effectively execute some of the respective bicycle implementation strategies.

- *Baseline Measure of Bicycle Use.* Upon adoption of the Study, the City will conduct the necessary research to establish a baseline of bicycle use for all trips. Necessary facility inventories and usage surveys will be performed every five years to determine the success or failure of the study's bicycle goal, objectives, and policies.
- *Minimum Standards for Bicycle Facility Maintenance.* The City will develop minimum standards that will keep bicycle facilities clean of debris, properly striped, and clearly marked and signed.
- *Maintenance Reporting Program.* To assist the City in achieving a high standard of maintenance on existing bicycle facilities, a program will be developed that allows the public to identify repair, sweeping, and other maintenance needs.
- *Bicycle Parking Program for Businesses.* To assist businesses desiring to install bicycle parking, standards and placement criteria will be developed for acceptable bicycle parking facilities. Annually, the City will provide a limited number of installed bicycle racks to existing businesses and agencies in commercial districts, by request, on a first come, first served basis.
- *Target and Eliminate Key Behaviors that Lead to Bicycle Accidents.* The City will encourage schools, safety organizations, and law enforcement agencies to provide information and instruction on bicycle safety issues that focus on the most important accident problems.
- *Removing Barriers.* The City will adopt, include, and use bicycle supportive design and signage standards as part of roadway design standards, zoning and subdivision regulations, parking code requirements, railroad crossing standards, and other appropriate

documents. As resources are available, the City will support projects designed to eliminate identified barriers relating to bicycle travel, either as stand-alone projects or as part of a major capital improvement project.

BICYCLE AND PEDESTRIAN FACILITIES FUNDING OPPORTUNITIES

As the City implements the NMTS it will be best served by strategically pursuing state funding in support of priority pedestrian and bicycle projects. The State of Washington offers several grant programs for local governments to complete their transportation systems by making bicycle and pedestrian facility improvements. For current deadlines, see "Funding for Bicycle and Pedestrian Facilities" at

http://www.wsdot.wa.gov/bike/Funding.htm.

General Bicycle and Pedestrian Related Grants

Washington Wildlife and Recreation Program: The Interagency Committee for Outdoor Recreation provides state funds for acquisition and development of local and state parks, water access sites, trails, critical wildlife habitat, natural areas, and urban wildlife habitat.

Small City Sidewalk Program: The Transportation Improvement Board provides state gas tax funds for pedestrian projects. These projects improve safety, provide access, and address system continuity and connectivity. The program is on an annual cycle.

Non-Highway and Off-Road Vehicle Program: WSDOT provides state funding to develop and manage recreation opportunities for those who use off-road vehicles (motorcycles, four-wheel drives, all-terrain vehicles). The program also supports facilities for those who pursue non-motorized trail activities, such as bicyclists, cross country skiers, equestrians, and hikers.

Transportation Enhancement Grants: WSDOT provides federal funding to transportation-related activities designed to strengthen the cultural, aesthetic and environmental aspects of the inter-modal transportation system. The program provides for the implementation of a variety of non-traditional projects, with examples ranging from the restoration of historic transportation facilities, to bike and pedestrian facilities, to landscaping and scenic beautification, and to the mitigation of water pollution from highway runoff.

National Recreational Trails Program: The Interagency Committee for Outdoor Recreation provides federal funding to rehabilitate and maintain recreational trails and facilities that provide a backcountry experience. Eligible projects include maintenance of recreational trails, development of

trail-side and trail-head facilities, construction of new trails, operation of environmental education and trail safety programs.

Surface Transportation Program - Regional Funds: Metropolitan Planning Organizations provide federal funding for projects on any Federal-aid highway, bridge projects on any public road, transit capital projects, and intracity and intercity bus terminals and facilities. A portion of funds reserved for rural areas may be spent on rural minor collectors. Eligible projects include modifications of existing public sidewalks to comply with the requirements of the Americans with Disabilities Act.

Congestion Mitigation Air Quality Improvement Program: Metropolitan Planning Organizations provide federal funds to projects and programs that reduce transportation related emissions in four air quality non-attainment and maintenance areas in the state.

Safety Related Grants

Safe Routes to Schools: WSDOT provides state and federal funding for the Safe Routes to School Program. The purpose of this program is to provide children a safe, healthy alternative to riding the bus or being driven to school.

Pedestrian and Bicycle Safety Program: The purpose of the Pedestrian and Bicycle Safety program is to aid public agencies in funding cost-effective projects that improve bicycle and pedestrian improvements.

Traffic Safety Grants: Washington Traffic Safety Commission provides state funding for programs, projects, services and strategies to reduce the number of deaths and serious injuries that result from traffic crashes. Funds may be used for pedestrian and bicycle improvements.

Hazard Elimination Safety Grants: Intersection and Corridor Safety Program: WSDOT provides federal funding to safety improvement projects that eliminate or reduce fatal or injury accidents by identifying and correcting hazardous locations, sections and/or elements. These include activities for resolving safety problems at hazardous locations and sections, and roadway elements that constitute a danger to motorists, pedestrians, and/or bicyclists.

End Notes

[1] Design Guidance - Accommodating Bicycle and Pedestrian Travel" A Recommended Approach / A US DOT Policy statement Integrating Bicycle and Walking into Transportation Infrastructure, U.S. Department of Transportation – Federal Highways Administration, February 2000.
[2] Planning for Bicycling and Walking: 2005 Amendments to the Growth management Act, August, 2005. Washington State Departments of (1) Transportation, (2) Health, and (3) Community, Trade and Economic Development.
[3] Washington State Bicycle Transportation and Walkways Plan, Washington state Department of Transportation, September, 2005.
[4] Livable Communities Policy, Washington state Department of Transportation, 2006.

Chapter 6—Local Non-Motorized Design Guide

INTRODUCTION

Pedestrian System

Each day, nearly everyone in Kent is a pedestrian for at least some part of every trip. Yet within the last 20-30 years pedestrian travel has sometimes received secondary attention. Historically, a much greater emphasis has been placed on the planning and design of major streets and highways, with the primary focus on mobility and access for the automobiles and trucks.

The City will consider more immediate refinements to its pedestrian design standards, to increase pedestrian accessibility and mobility needs and to comply with the Americans with Disabilities Act (ADA)[1].

There are many opportunities to improve pedestrian conditions and in doing so, making Kent more walkable and livable. The purpose of the Local Non-Motorized Design Guide is to highlight significant local design features relative to the ADA requirements based on the premise that accessible design is the foundation for all good pedestrian system design.

The Local Non-Motorized Design Guide directly references a number of federal and professional sources for the full range of pedestrian elements rather than develop a fully independent and comprehensive guide, including: FHWA's ***Designing Sidewalks and Trails for Access,***[2] AASHTO's ***Guide for Pedestrian Facilities,***[3] and, FHWA's ***Pedestrian Facility User's Guide.***[4] Detailed sidewalk, curb ramp, driveway crossing and trail design elements are provided in *Designing Sidewalks and Trails for Access.* The Local Non-Motorized Design Guide summarizes only those elements of the pedestrian system crucial to current planning, design and construction of critical pedestrian facilities in Kent.

Bicycle System

Similar design guidance is important for the consistent development of a system of bicycle lanes and share-lane facilities. Significant guidance is provided at the federal and state level in assisting the City in revisions for design guides to bicycle facilities, including: AASHTO's ***Guide for the Development of Bicycle Facilities,***[5] the ***MUTCD,***[6] and WSDOT's ***Design Manual.***[7]

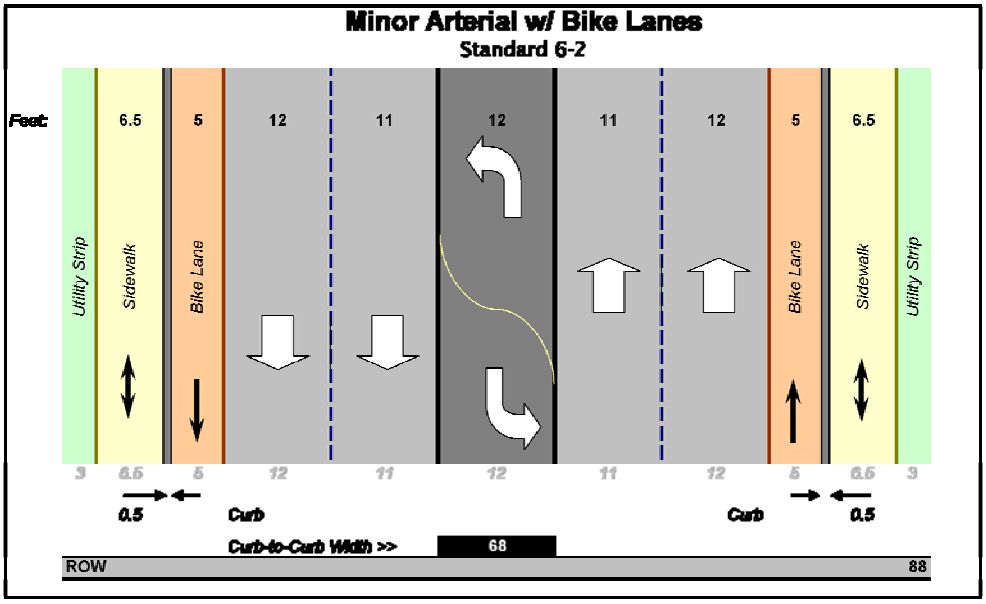
The cities of Chicago and San Francisco have also pioneered bicycle design work from which Kent can borrow important elements, particularly with regards to bicycle lane and shared travel lane facilities.

PEDESTRIAN DESIGN GUIDE

As part of the NMTS effort an examination of the City's current street, sidewalk and curb ramp design standards was conducted, including a comparison of the City's standards to the Americans with Disabilities Act Accessible Guidelines (ADAAG)[8]. The City has adopted street standards and is administering these standards throughout the city as part of new street development. The City has design standards for sidewalks, driveway crossings and curb ramps. While these standards are intended to provide mobility enhancements for pedestrians, some of them have ADA-related issues.

The City has been administering a single, predominant design for curb ramp and sidewalk construction. Along arterials the design most often constructed is a single, diagonal ramp with curbside sidewalks. With the exception of *residential collector streets* (Standard Detail 6-4(a)) and *residential streets* (Standard Detail 6-4(b)), all other City street design standards indicate curb-side sidewalks, as illustrated in **Figure 6-1** (Minor Arterial).

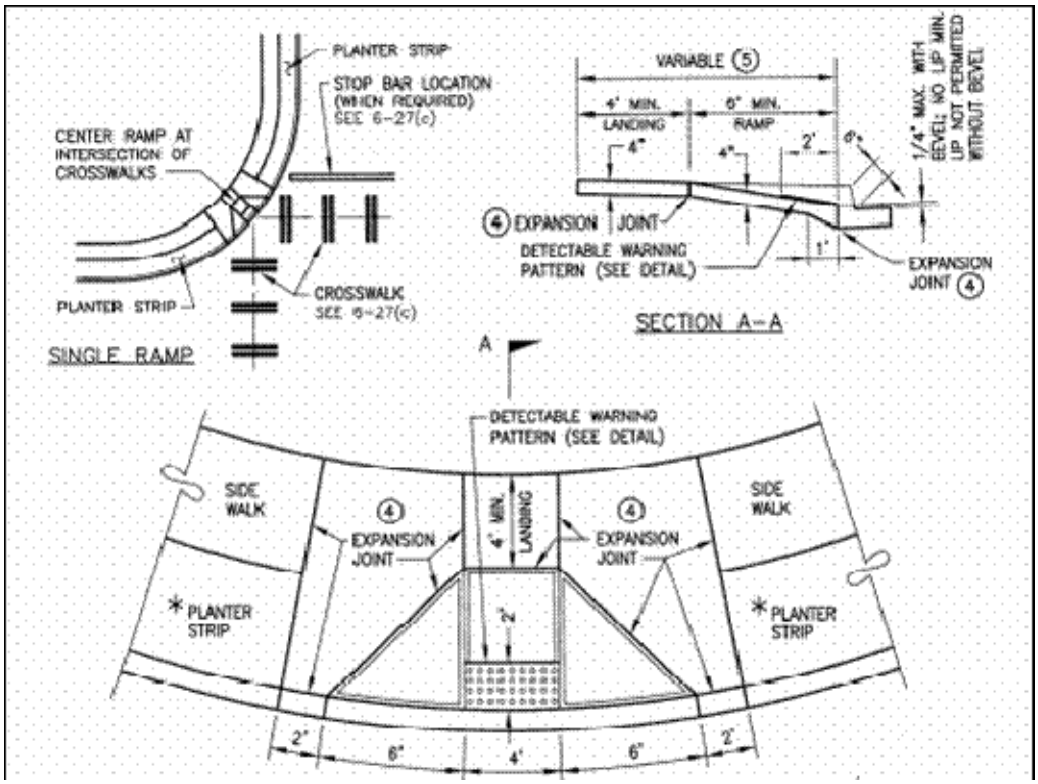
Figure 6-1. Kent Street Design Standard—Minor Arterial



The standard drawing for curb ramps however, see **Figure 6-2**, while indicating space for optional planter strips, defer to the street/sidewalk design standard width (for *arterials* and *arterial collector streets* is 6.5 feet) which is insufficient width to accommodate the full depth of the standard curb ramp and can lead to improper curb ramp design and construction.

Oftentimes what is eventually eliminated due to constrained width is the *top landing,* which is a critical design feature for wheelchair users.

Figure 6-2. Kent Curb Ramp Design Standard



While these ramps can be constructed to ADA guidelines, some vision– and mobility-impaired stakeholders from the Community Involvement effort indicated their concerns about diagonal ramps. Their primary concern is that the direction of travel is oriented by the diagonal ramp towards the center of the intersection rather than directly to the crosswalk. Placement of truncated domes (while not desired by some vision– and mobility-impaired users) only complicates the orientation. The combination of a single ramp and curbside sidewalks was also noted as a less desirable environment for pedestrians (of all kinds) crossing busy arterials.

Curb Ramps with Missing Top Landing

Curb Ramp with Top Landing

In residential areas new sidewalks are more often separated from the street, and the prevailing designs being constructed are either a set of perpendicular curb ramps or a single diagonal ramp. In several cases these older ramps are often not equipped with a level top landing of sufficient width to comply with the ADA.

The Local Non-Motorized Design Guide focuses on each of these issues with separate sections for Sidewalk Corridors, Grade and Cross Slope, Driveway Crossings, Curb Ramps, Pedestrian Crossings and Other Design Features. For each element of the pedestrian portion of the Design Guide a summary is provided, including:

- Americans with Disabilities Act Accessible Guidelines (ADAAG) regulations
- FHWA Designing Sidewalks and Trails for Access – Best Practices Design Guide (where applicable)
- ADAAG Draft Rule[9] (regulations that may be added or amended in the near future)
- Current Kent Design Standards
- Refinements to Current Design Standards

Sidewalk Corridor

As part of the Community Involvement effort several participants noted the absence of setback requirements and the impact to edge treatments along sidewalks. A prevailing problem was defined where private vegetation and fencing have been installed immediately behind sidewalks, which results in a more confined public walking space.

The city will consider re-working its street and sidewalk standards to include definitions of the sidewalk corridor. The *Sidewalk Corridor* is defined as that portion of the pedestrian system from the edge of the roadway (back

of curb) to the edge of the right-of-way, generally along the sides of streets, between street corners. For the purpose of the Kent Non-Motorized Design Guide, the width of the sidewalk corridor extends to the edge of the street or roadway, even if part of that area is not paved. Sidewalk corridors that promote access include the following characteristics:

- Wide pathways;
- Clearly defined pedestrian, furniture, and frontage zones;
- Minimal obstacles/protruding objects;
- Minimal walking distance;
- Moderate grades and cross slopes;
- Rest areas outside of pedestrian zone;
- Firm, stable, slip resistant surfaces; and
- Good lighting

The city is also not the sole public agency responsible for the development and maintenance of these sidewalk corridor characteristics. The Washington State Department of Transportation shares in some jurisdictional responsibilities. Highlighted elements of the sidewalk corridor included in the Non-Motorized Design Guide are sidewalk widths, grades and slopes. The city can directly reference Designing Sidewalks and Trails for Access as a design guide for other sidewalk corridor elements.

The Sidewalk Corridor Zone System

This section defines the sidewalk zone system which includes the design of sidewalks and the buffers between sidewalks, moving traffic and on-street vehicle parking. The definitions of the sidewalk corridor elements are taken directly from *Context Sensitive Solutions in Designing Major Urban Thoroughfares for Walkable Communities*[10]. The sidewalk corridor consists of the following four distinct functional zones:

Edge Zone—area between the face of curb and the furnishing zone, an area of required clearance between parked vehicles or traveled way and appurtenances or landscaping.

Furnishings Zone—area of the sidewalk corridor that provides a buffer between pedestrians and vehicles, which contains landscaping, public street furniture, transit stops, public signage, utilities, etc.

Throughway Zone—walking zone that must remain clear, both horizontally and vertically, for the movement of pedestrians (Note: ADA requires a minimum of 48 inches of clear width.)

Frontage Zone—distance between the throughway and the building front or private property line that is used to buffer pedestrians from window shoppers, appurtenances and doorways. It contains private street furniture, private signage, merchandise displays, etc. and can also be used for street cafes. AASHTO[11] refers to this as the "shy" zone.

The zone system is used to determine the width of the sidewalk corridor and help ensure that obstacles, such as utility poles and other street furniture, will not limit pedestrian access and mobility. **Figure 6.3** illustrates the four zones using the example of a sidewalk corridor in a commercial area. The remaining portion of this section provides design guidance for each of these zones with the width varying in relation to *street type* and *function*, and the *context zone* with specific *land use characteristics*.

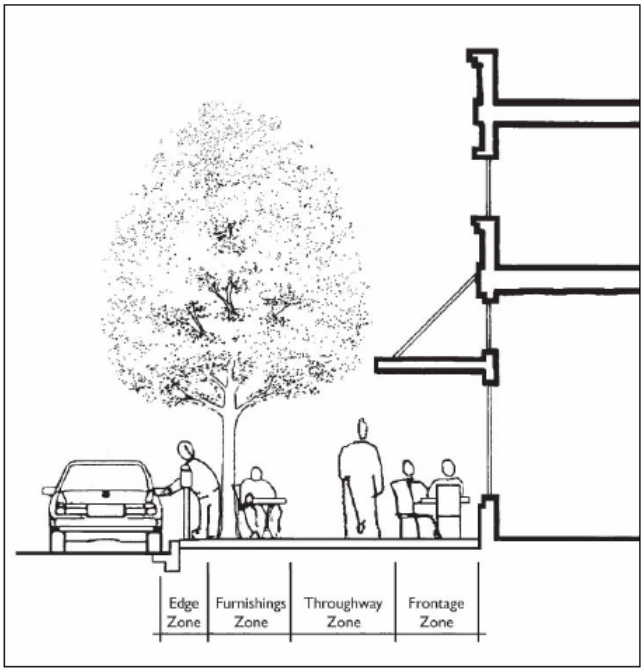


Figure 6-3. The Sidewalk Corridor System (Graphic Source: ITE)

Context Zones

Pedestrian activity and the appropriate pedestrian facility designs differ depending on the adjacent land use. The pedestrian corridor is best defined, by street class and character, when using the following general land use context zones:

Urban Center (downtown)/Core Areas

The placement of pedestrian corridor facilities should be focused in urban center or urban core context zones with predominantly retail- and entertainment-related ground floor uses with a main street level of pedestrian activity. The need for and benefits from facilities such as kiosks, restrooms, or small-scale retail stands is typically highest in the urban center/core areas.

Urban and Suburban Zones

Facilities in the general **urban** and **suburban** context zones should be limited to nodes of increased intensity of retail and entertainment uses on the ground floor that produce high levels of pedestrian activity.

The provision of facilities at public transit transfer centers is an important consideration all land use context zones.

Possible City Design Standard Refinement

The width of the sidewalk corridor is one of the most significant factors in determining the type of pedestrian experience that the sidewalk provides. Additional space is often needed to accommodate items such as pedestrian crossings, on-street parking, street cafes, and high pedestrian volumes. **Table 6-1** contains suggestions for the minimum widths of each sidewalk corridor zone, by city street functional classification and the three major land use contexts (each separated for commercial and residential types).

To better guide development, modifications to the city's current standards to include frontage and pedestrian zone dimensions will provide needed buffering and maneuverability space for pedestrians along busy arterial or industrial streets, but will require greater rights-of-way. The city has several options to achieve a wider pedestrian corridor through administration of revised standards:

- Acquire additional rights-of-way
- Placing a portion of the pedestrian corridor on private lands (possibly through easements)
- Reducing street widths (possibly by reducing the number of lanes or reducing lane widths).

Sidewalk Clear Width (ADA)

The ADA is also specific to the effective clear width of sidewalks. A minimum of 3 feet of clear width has been the operating rule. However, as shown in **Table 6-2**, revised ADA policies are tending towards four feet of clear width along pedestrian access routes. The City's street and sidewalk standards can be modified with mandatory clear zone widths to help ensure that obstacles are not constructed within the pedestrian zone.

Table 6-2. Sidewalk Width Regulations

ADAAG Regulations:

Clearances (Section 403.5) - *Clear Width* of walking surfaces shall be a minimum of 3 feet (36 inches), except as provided at turns and passing spaces.

Passing spaces - "An accessible route with a clear width less than 5 feet shall provide passing spaces at intervals of 200 feet maximum. Passing spaces shall be either: (a) a space 5 feet minimum by 5 feet minimum; or, (b) an intersection of two walking surfaces providing a t-shaped space where the base and arms of the t-shaped space extend **4 feet** minimum beyond the intersection.

FHWA Designing Sidewalks and Trails for Access:

Width - The pedestrian "zone" (sidewalk) should be at least 5 feet wide for two pedestrians to travel side by side without passing other pedestrians, or for two people going in opposite directions to pass one another.

The pedestrian zone should never be less than 3 feet. This minimum width is only acceptable when: (1) A wider width is impossible; (2) The narrow width continues for as short a distance as possible; and, (3) Passing spaces are provided at intervals of no more than 200 feet.

ADAAG Draft Rule:

Clear Width - The minimum clear width of a pedestrian access route shall be **4 feet**, exclusive of the width of the curb.

Current Kent Standard:

The *Location Grade* and *Width* to be established or approved by the Owner (KENT). Standards are absent of any language regarding specific width or clearance width.

Refinement to Current Standard:

Current standards will be modified to stipulate that a minimum clear width of **4 feet is required.**

Sidewalk Grade and Cross Slopes

Grades and cross slopes are very difficult for some people with mobility impairments to negotiate because it is harder to travel across sloped surfaces than horizontal surfaces. People with mobility impairments who are ambulatory or use manual wheelchairs (see **Figure 6-4**) must exert significantly more energy than other pedestrians to traverse sloped surfaces. Powered wheelchairs are affected by the additional work required on steep grades because more battery power is used. This reduces the travel range of a powered chair. Both powered and manual wheelchairs can become unstable and/or difficult to control on sloped surfaces. Whenever possible, slopes should not be artificially created and should be minimized (to the extent possible) to improve access for people with mobility impairments. See **Table 6-3**.

Figure 6-4. Sidewalk Grade Impact

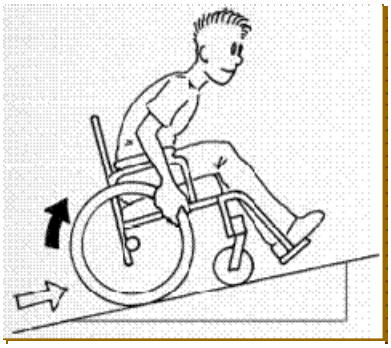


Table 6-3. Sidewalk Grade Regulations

ADAAG Regulations:
Slope - The running slope of walking surfaces shall not be steeper than 1:20 (5%). The cross slope of walking surfaces shall not be steeper than 1:48 (roughly 2%).
ADAAG Draft Rule:
Cross Slope - The cross slope of the pedestrian access route shall be 1:48 maximum.
Grade - The grade of the pedestrian access route within a sidewalk shall not exceed the grade established for the adjacent roadway. (EXCEPTION: The running slope of a pedestrian access route shall be permitted to be steeper than the grade of the adjacent roadway, provided that the pedestrian access route is less than 1:20)

Current Kent Standard:

Standards are absent of any language regarding specific grade requirements.

Refinement to Current Standard:

Current standards will be modified to specify consistent grade and cross slope as noted in ADAAG.

Driveway Crossings

Driveway crossings permit cars to cross the sidewalk and enter the street. They serve the same basic purpose for cars as curb ramps serve for pedestrians. Therefore, they consist of many of the same components found in curb ramps. It is the driver's responsibility to yield to the pedestrian at the driveway-sidewalk interface. Unfortunately, this does not always happen, and pedestrians are put at risk. Minimizing the number of driveway crossings in a sidewalk significantly improves pedestrian safety.

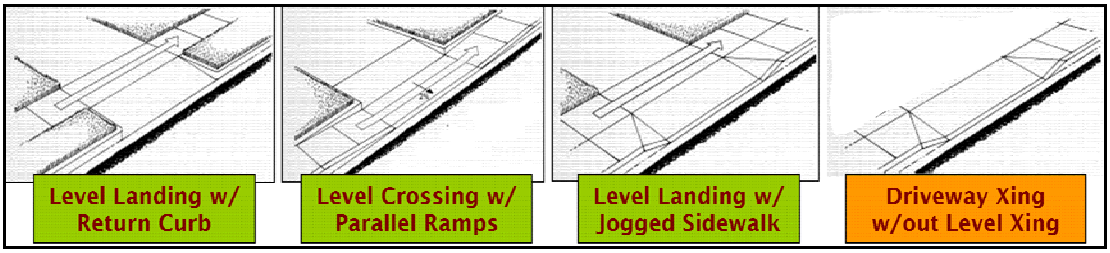
Driveway crossings should be designed so that both the pedestrians and the drivers are able to use them effectively. However, a driveway crossing must provide a way for cars to negotiate the elevation change between the street and the sidewalk. This is generally achieved by ramping all or a portion of the driveway crossing. When the ramp for the motorist crosses the pedestrian's path of travel, significant cross slopes and changes in cross slope must be negotiated by the pedestrian.

Change in Cross Slope

A change in cross slope is an abrupt difference between the cross slope of two adjacent surfaces. ADAAG does not permit cross slope to exceed 2 percent (changes in cross slope are allowed between 0-2 percent only). Changes in cross slope are commonly found at driveway crossings without level crossings. When considering the needs of pedestrians, change in cross slope is evaluated over a 2-foot interval, which represents the approximate length of a single walking pace and the base of support of assistive devices, such as wheelchairs or walkers. The design recommendations for change of cross slope specify the relationship between two adjacent surfaces, not the actual cross slope of either surface.

Figure 6-5 illustrates a number of driveway crossings, depicting those with and without level sidewalk landings. The City's current driveway crossing standard includes level pedestrian surfaces with the required minimum cross-slope.

Figure 6-5. Driveway Crossing Types



Curb Ramps

For pedestrians of all types, the curb ramp is the immediate junction between the sidewalk and street crosswalk. It is no surprise, then, that a great deal of attention is paid to the planning and design of curb ramps. In general, curb ramps are most commonly found at intersections, but they may also be located at bus stops and mid-block (street) crossings. The implementing regulations under Title II of the ADA specifically identify curb ramps as requirements for existing facilities, as well as all new construction.

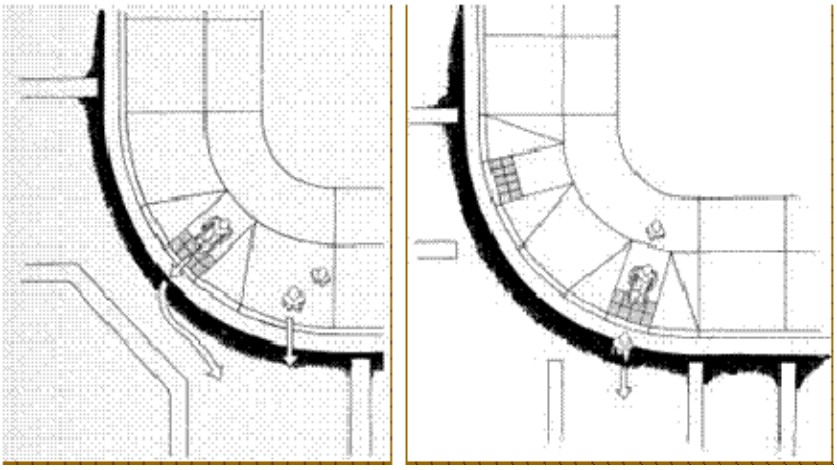
Curb ramp design issues vary from city to city and from subdivision to subdivision. As part of the Community Involvement effort a number of local issues were raised regarding curb ramps in Kent. This section provides some background information on curb ramps, user needs, and what can be done to meet ADA conformity by revisions to current curb ramp designs.

Mobility-Impaired Users

As noted by FHWA, curb ramps are designed to provide access to people who use wheeled forms of mobility. Without curb ramps, people who use wheelchairs would not be able to independently access the sidewalk and street.

Not all wheelchairs are similar in design and function, nor are all mobility-impaired pedestrians equally mobile. In fact, not all mobility-impaired pedestrians require a curb ramp. So, "a one-size fits all" curb ramp design is difficult to develop, as illustrated in **Figure 6-6.**

Figure 6-6. Types of Curb Ramp Designs



Vision-Impaired Users

For vision-impaired pedestrians, the curb is the most reliable cue to identify the transition between the sidewalk and the street. Most, if not all, curb ramps remove this cue. The physical ramp itself becomes more of a barrier to some vision-impaired walkers. Curb ramps are more difficult to detect by the range of vision-impaired. The combination of curb ramps and placement of truncated domes can, if done improperly, cause greater confusion to vision-impaired pedestrians seeking direction to cross busy streets.

Ideal Design Characteristics

FHWA's *Designing Sidewalks and Trails for Access* identifies a number of curb ramp designs that make the best accessible connection between the sidewalk and the street – for the full range of pedestrian users. To maximize accessibility and safety for all pedestrians, particularly when retrofitting existing curb ramps, curb ramp designs should attempt to meet all of the best practices for curb ramp design shown in **Table 6-4.** Depending on site constraints, it may not be possible to incorporate all of the best practices within each curb ramp.

Table 6-4. Curb Ramp Design Best Practices

Best Practice	Rationale
Provide a level maneuvering area or landing at the top of the curb ramp	Landings are critical to allow wheelchair users space to maneuver on or off of the ramp. Furthermore, people who are continuing along the sidewalk will not have to negotiate a surface with a changing grade or cross slope.
Clearly identify the boundary between the bottom of the curb ramp and the street with a detectable warning.	Without a detectable warning, people with vision impairments may not be able to identify the boundary between the sidewalk and the street.
Design ramp grades that are perpendicular to the curb.	Assistive devices for mobility are unstable if one side of the device is lower than the other or if the full base of support (e.g., all four wheels on a wheelchair) is not in contact with the surface. This commonly occurs when the bottom of a curb ramp is not perpendicular to the curb.
Place the curb ramp within the marked crosswalk area.	Pedestrians outside of the marked crosswalk are less likely to be seen by drivers because they are not in an expected location.
Avoid changes of grade that exceed 11 percent over a 610 mm (24 in) interval.	Severe or sudden grade changes may not provide sufficient clearance for the frame of the wheelchair causing the user to tip forward or backward.
Design the ramp that doesn't require turning or maneuvering on the ramp surface.	Maneuvering on a steep grade can be very hazardous for people with mobility impairments.
Provide a curb ramp grade that can be easily distinguished from surrounding terrain; otherwise, use detectable warnings.	Gradual slopes make it difficult for people with vision impairments to detect the presence of a curb ramp.
Design the ramp with a grade of 7.1 ± 1.2 percent. [Do not exceed 8.33 percent (1:12).]	Shallow grades are difficult for people with vision impairments to detect but steep grades are difficult for those using assistive devices for mobility.
Design the ramp and gutter with a cross slope of 2.0 percent.	Ramps should have minimal cross slope so users do not have to negotiate a steep grade and cross slope simultaneously.
Provide adequate drainage to prevent the accumulation of water or debris on or at the bottom of the ramp.	Water, ice, or debris accumulation will decrease the slip resistance of the curb ramp surface.
Transitions from ramps to gutter and streets should be flush and free of level changes.	Maneuvering over any vertical rise such as lips and defects can cause wheelchair users to propel forward when wheels hit this barrier.
Align the curb ramp with the crosswalk, so there is a straight path of travel from the top of the ramp to the center of the roadway to the curb ramp on the other side.	Where curb ramps can be ahead, people using wheelchairs often build up momentum in the crosswalk in order to get up the curb ramp grade (i.e., they "take a run at it"). This alignment may be useful for people with vision impairments.
Provide clearly defined and easily identified edges or transitions on both sides of the ramp to contrast with sidewalk.	Clearly defined edges assist users with vision impairments to identify the presence of the ramp when it is approached from the side.

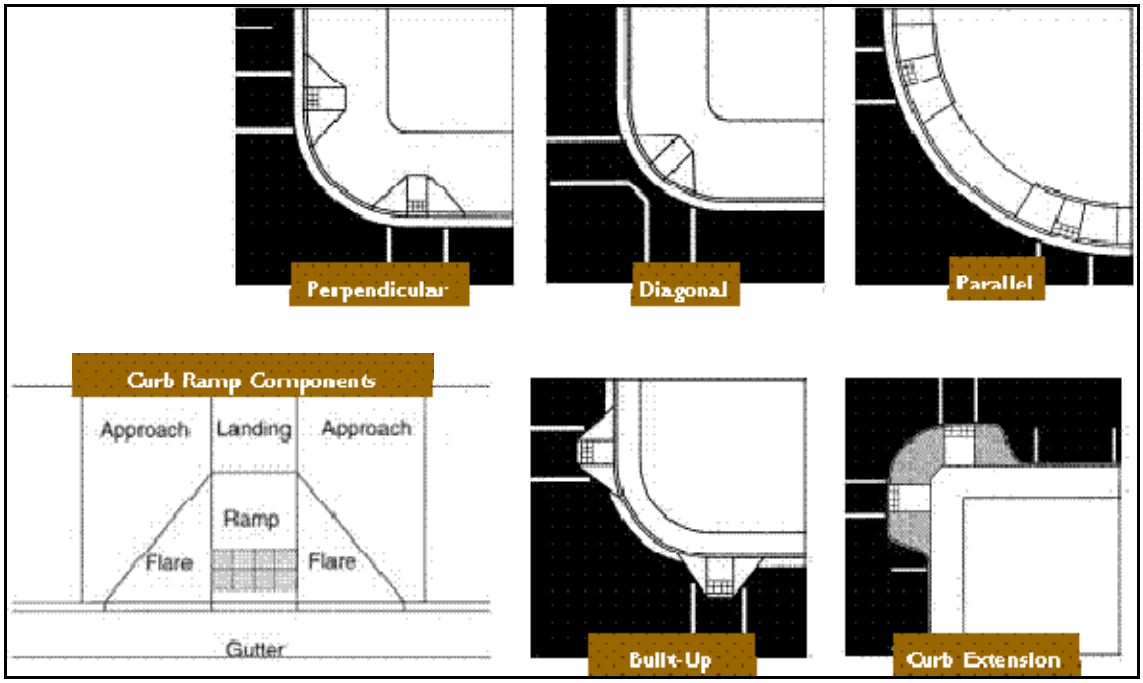
Curb Ramp Types

Curb ramps are usually categorized by their structural design and how it is positioned relative to the sidewalk or street. The structure of a curb ramp is determined by how the components, such as ramps and flares, are

assembled. The type of curb ramp and the installation site will determine its accessibility and safety for pedestrians with and without disabilities. As shown in **Figure 6-7**, the following types of curb ramps are most typical:

- Perpendicular curb ramps
- Diagonal curb ramps
- Parallel curb ramps
- Combination curb ramps
- Built-up curb ramps
- Curb extension

Figure 6-7. Curb Ramp Types and Components



ADAAG has specifically addressed minimum standards for curb ramp components. In some cases FHWA has provided greater detail on recommended curb ramp designs, as summarized in Table 6-5**.** Where there are differences between ADAAG and FHWA's *Designing Sidewalks and Trails for Access,* it is recommended that Kent follow the FHWA guidelines for ADA compliance.

For each of the various curb ramp types the City will consider revising its curb ramp standards consistent with FHWA's *Designing Sidewalks and Trails for Access* to address each of the following components:

Curb Ramp Grade – ADAAG permits curb ramp slopes of 8.33% for new construction. FHWA recommends 7.1% to allow for construction tolerances.

For retrofits where 8.3% ramp slopes cannot be attained, FHWA specifies the following ADAAG (1991) exceptions (not to be used for new construction):

- A slope between 8.33% and 10% is permitted for a maximum rise of 6 inches.
- A slope between 10% and 12.5% is permitted for a maximum rise of 3 inches.
- A slope steeper than 12.5% should be avoided regardless of length of ramp.

Ramp Cross Slope – Ramp cross slopes should not exceed 2.0%.

Ramp Length – See FHWA Designing Sidewalks and Trails for Access, (Table 7-3).

Ramp Width – Recommended width is 4 feet (48 inches), but should never be less than 3 feet (36 inches).

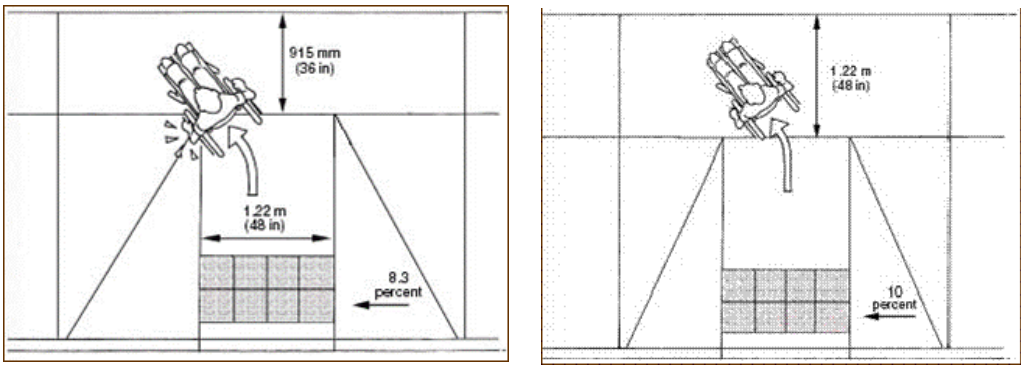
Gutter Slope – Drainage slopes should not exceed 2%. On most curb ramps, to avoid rapidly changing grades, the cross slope of the street and gutter approach should not exceed 5%.

Change of Grade – Transition areas should have a minimum grade change (less than 11%) for a gradual transition for wheelchair users.

Sidewalk Approach Width – Sidewalk approaches should have a minimum, 3-foot (36-inch) clear space, free of obstacles.

Landing Dimension and Slope – Slopes of a landing should not exceed 2%. As shown in **Figure 6-8**, landings should extend at least 4 feet (48 inches) beyond the top of the curb ramp for maneuverability. If the space is limited and a 4-foot landing cannot be provided, an absolute minimum, 3-foot (36-inch) landing is acceptable, coupled with a minimum ramp width of 4 feet (48 inches) and ramp flare slopes not to exceed 8.3%.

Figure 6-8. Curb Ramp Landings Are Critical



One of the most significant issues raised in the Community Involvement effort is the prevailing design and construction of diagonal curb ramps at major arterial intersections, combined with curb-side sidewalks. The City standard (see Figure 6-2) offers only one curb ramp design on streets:

a single-ramp design which directs the traveler to the intersection center and requires a bottom landing where the crosswalks intersect.

The relationship between curb ramps and street design is discussed further in the following section — *Pedestrian Crossings*.

Pedestrian Crossings

In *Designing Sidewalks and Trials for Access,* FHWA fully defines pedestrian crossings as *any location where the pedestrian leaves the sidewalk and enters the roadway*. At a pedestrian crossing, the pedestrian's path of travel crosses the motorist's path of travel. Pedestrian crossings include (a) mid-block crossings and (b) street intersections. At mid-block crossings, pedestrians generally encounter traffic moving in two directions. At street intersections, particularly those controlled with traffic signals, traffic is usually moving in multiple directions because of turning vehicles.

A considerable portion of *Designing Sidewalks and Trials for Access* is summarized here regarding pedestrian crossings at street intersections, because it gets at the crux of an emerging issue: *how to design arterial street intersections to balance the needs of drivers and pedestrians*.

Possible Design Solutions at Wide Intersections

The City can apply a number of techniques to improve pedestrian conditions and access at wide intersections where appropriate right-of-way exists, including:

- Install center medians to provide a refuge for slower pedestrians;
- Install accessible pedestrian signals to assist in providing people with vision impairments enough time to cross the street;
- Increase crossing times so that people who walk slowly will have sufficient time to cross before the signal indication changes;
- Increase the crossing times so that people who delay the start of their crossing to confirm the WALK interval will have sufficient time to cross before the signal indication changes;
- Restrict right turns on red;
- Enhance the visibility of the crosswalk markings or consider a raised crosswalk with detectable warnings (truncated domes) at both ends;
- Reduce crossing distances and increase visibility through the construction of curb extensions;

- Reduce traffic speed;
- Clarify the pedestrian crossing area by installing stamped or raised crosswalks with detectable warnings (truncated domes) installed at both ends;
- Provide pedestrian lead time and an accessible pedestrian signal so pedestrians, including those with vision impairments, can assert themselves in the crosswalk before motorists start making right and left turns;
- Provide mid-block signalized crossing with accessible pedestrian signal opportunities at busy intersections to encourage people to cross where there are fewer potential points of conflict between pedestrians and motorists;
- Provide a curb extension to decrease crossing distances and increase pedestrian visibility; and
- Add traffic and pedestrian signal indications if they do not already exist.

Turning Radius

Designing intersections with smaller turning radii slows traffic speeds and allows perpendicular curb ramps to be positioned parallel to the crosswalk path of travel, as well as perpendicular to the curb. In addition, smaller turning radii significantly decrease crossing distances for pedestrians. Smaller radii also enhance detection of the crosswalk and improve crossing conditions for people with vision impairments because there is a greater distinction between the perpendicular and parallel traffic flows.

The City's current street and sidewalk design standards, which are reflected at many major intersections in the developing portions of Kent, include larger turning radii at intersections *in order to accommodate larger vehicles and more continuous traffic flow*. The City has essentially deployed roadway design standards much like other U.S. cities in the past. With respect to turning radii, the City's designs have been determined *by the types of vehicles that travel on the road and the intended speeds for drivers to make right turns.* Who benefits from these designs? Larger trucks, buses, and passenger vehicles all benefit.

Pedestrian access, however, is significantly compromised at intersections with larger turning radii, for the following reasons:

- Cars can make right turns at higher speeds;
- Curb ramp designs are often compromised;
- Pedestrian crossing distances are increased (this also results in increased vehicle signal phasing delays and reduced roadway capacity from the delays);

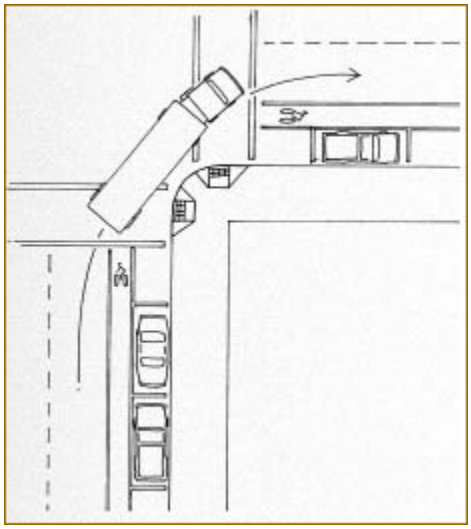
- Less space is available on the corner for pedestrians to collect;
- Less space is available on the corner for utilities;
- It is more difficult for pedestrians, especially those with vision impairments, to claim the right of way when crossing;
- Greater numbers of conflicts arise between pedestrians and motorists; and
- Pedestrians are located outside of a driver's line of vision.

Appropriate driver sight lines at street intersections are important for pedestrian safety. Street design and surrounding land use patterns vary significantly within the City and can greatly affect the prevailing sight lines.

Intersection Design Issues for Further Consideration

The design speed of arterial streets greatly affects the design requirements of intersection corner radii. The City's current standards are essentially oriented to auto and truck mobility. These designs also affect the type of sidewalk approaches and curb ramps to accommodate intersecting pedestrians. As illustrated in **Figure 6-9**, by reducing the intersection corner radii for some arterials (arterial design speed), the City may better accommodate pedestrians of all types by including sidewalk buffers and approaches at corners, and perpendicular curb ramps or parallel curb ramps) rather than diagonal curb ramps. Further, the addition of on-street bicycle lanes adds turning space for larger vehicles in lieu of wider curb radii.

Figure 6-9. Design Speed and Corner Radii Affect Pedestrian Features



Other Design Features

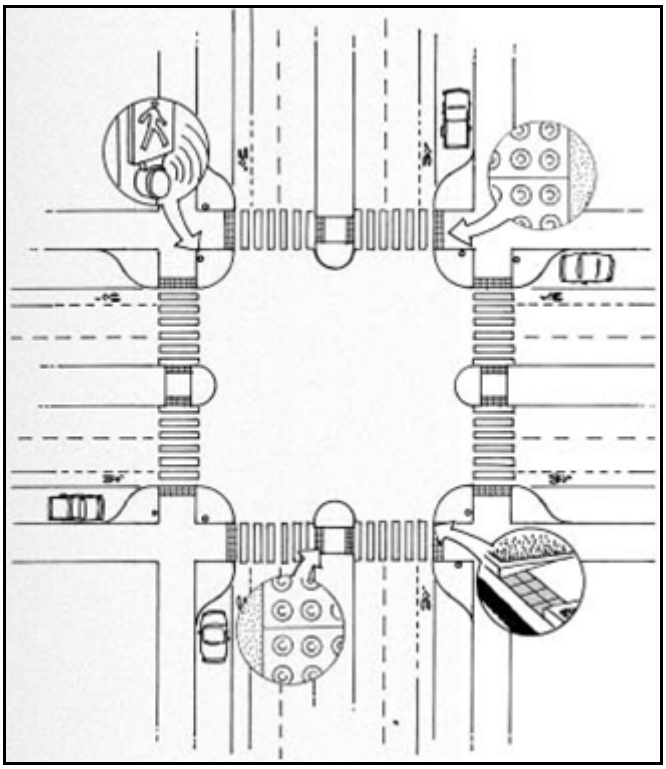
The City will continue to conduct research into the application of other design features that assist pedestrians. Some of these design features include truncated domes as detectable warnings and audible signals to assist blind walkers at major, signalized street intersections—particularly those with complex crossings and configuration.

Detectable Warnings – Truncated Domes

Detectable warnings are an ADA requirement in the current ADAAG for use by the vision-impaired to detect the boundary between the sidewalk and the street. Examples of detectable warnings are illustrated in **Figure 6-10**. The original requirement in ADAAG was suspended for a time to conduct further research. Research was conducted and the suspension of the requirement was lifted on July 26, 2001. At the time FHWA's *Designing Sidewalks and Trails for Access* went to print, the suspension had not been lifted, so its text did not mention that detectable warnings are required.

Truncated Dome Detectable Warnings

Figure 6-10. Example of Detectable Warnings



Detectable warnings are now required when constructing and altering curb ramps. Truncated domes are the only detectable warnings allowed by ADAAG. The City has already initiated the important testing and installation of truncated dome applications for current ADA compliance in the local area.

Audible Signals

Pedestrian signal indications are special types of traffic signals that are used to control pedestrian traffic patterns and movements. They consist of a series of signals to indicate:

WALK interval - the interval designated for pedestrians to cross;

Clearance interval - the interval designated for pedestrians who are already crossing to complete their crossing. Pedestrians at corners should not start a new crossing; and

DON'T WALK interval - the interval when pedestrians are not permitted to cross.

At many signalized intersections, the vision-impaired pedestrian relies on sounds of nearby, parallel traffic to indicate when the traffic signal WALK interval is indicated. At low volume intersections this method can be unreliable. Unreliable auditory cues, proportionately higher turn–volumes and complex pedestrian crossings can, by themselves or all together, cause the vision-impaired pedestrian to misjudge the signal WALK interval, leading to potentially unsafe conditions.

The implementing regulation under Title II of the Americans with Disabilities Act requires that all facilities constructed or altered after January 26, 1992 be designed and constructed to be accessible to people with disabilities (U.S. Department of Justice, 1991a). The City will continue to study, design and install pedestrian signals with accessible design features.

In addition to including accessible pedestrian signals in all new construction, the City will also consider replacing signal devices that are not fully accessible. The priorities for determining where existing pedestrian signals would be improved include:

- Complex or irregularly shaped intersections;
- Intersections experiencing high volumes of turning traffic;
- Signalized intersections where traffic sounds are sporadic or masked by ambient noise;
- Intersections that have vehicular actuation of the traffic signals;
- Intersections with complex signal phasing;
- Major corridors leading to areas of fundamental importance such as post offices, courthouses, and hospitals;
- Exclusive pedestrian phase areas, such as motorists stopped in all directions; and
- Locations requested by people with vision impairments.

Notably, there has been discussion and some disagreement over the use of audible pedestrian signals by the two main consumer groups, both nationally and locally in Kent:

- American Council of the Blind (ACB) supported use of audible pedestrian signals; and,
- National Federation of the Blind (NFB) opposed all use of them.

Other Pedestrian Information Techniques

In addition to truncated domes and audible signals there are several pedestrian information techniques the City is considering for the mobility- and vision-impaired. These include:

- Vibro-tactile signal devises,
- Intersection (crosswalk) guide strips,
- Wayfinding directional tiles, and
- Informational signing

The City will coordinate with the vision-impaired community (see Chapter 9), consider on-going research[12] of audible signal design and implementation and other pedestrian information techniques.

The City will then establish priorities consistent with *Designing Sidewalks and Trails for Access*, and prepare specific project plans for the installation of pedestrian information and audible signals at critical locations in Kent, with the support of both the ACB and NFB local chapters. The City will then revise its traffic signal designs to accommodate the necessary audible signal equipment and application as part of new traffic signal construction.

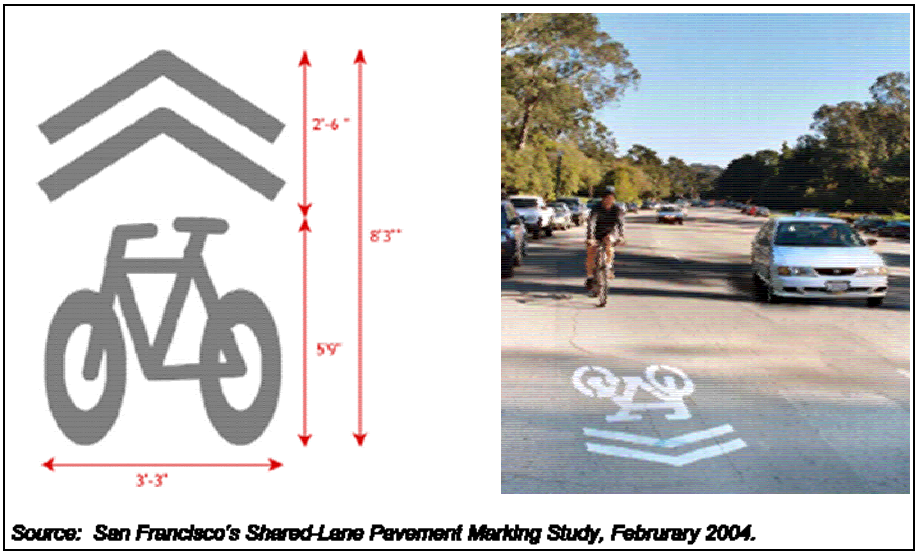
BICYCLE DESIGN GUIDE

A few comments and recommendations regarding bicycle system facilities are included as part of the NMTS.

Shared-Lane Symbols and Markings

In the absence of sufficient space to include on-street bicycle lanes on several major streets, it is important to provide greater route designation for shared travel lanes. These shared lanes, if posted and marked appropriately, indicate significant bicycle traffic to both the motorists and cyclists. The use of "sharrow" pavement markings has been adopted by the state of California for these conditions. Example "sharrow" pavement markings are illustrated in **Figure 6-11**. WSDOT has not yet considered and approved use of "sharrow" pavement markings for shared-lane designation.

Figure 6-11. "Sharrow" Shared-Lane Symbol and Pavement Marking



Source: San Francisco's Shared-Lane Pavement Marking Study, February 2004.

Further statewide policy consideration may be required before application and appropriate designation of sharrow pavement markings within the City. The City will exercise caution in "sharrow" pavement marking placement, particularly along streets with on-street parking. See San Francisco's research and findings in report titled "San Francisco's Shared-Lane Pavement Marking Study[13]."

Bike Lane Symbols and Markings

The City's current design standards for bike lane symbols and markings require some minor refinement for consistency with the MUTCD **Figure 6-12** summarizes the City's current standard, and **Figure 6-13** summarizes the recommendations of the MUTCD.

Figure 6-12. Kent Bike Lane Marking Standard

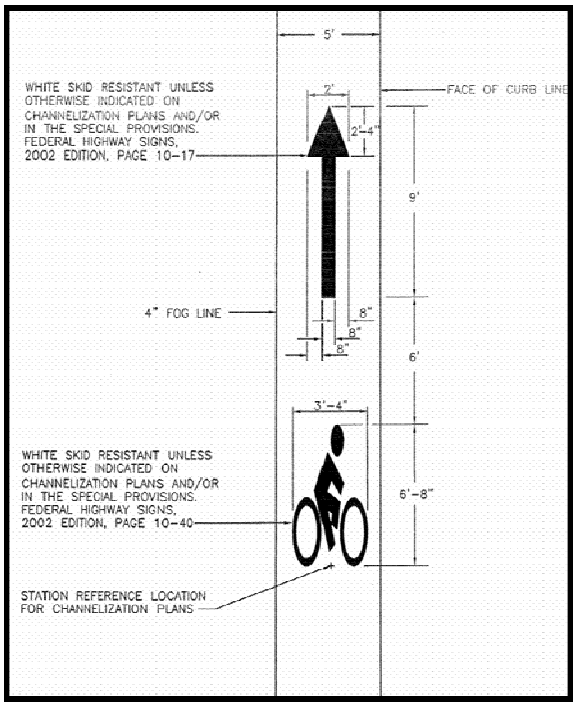
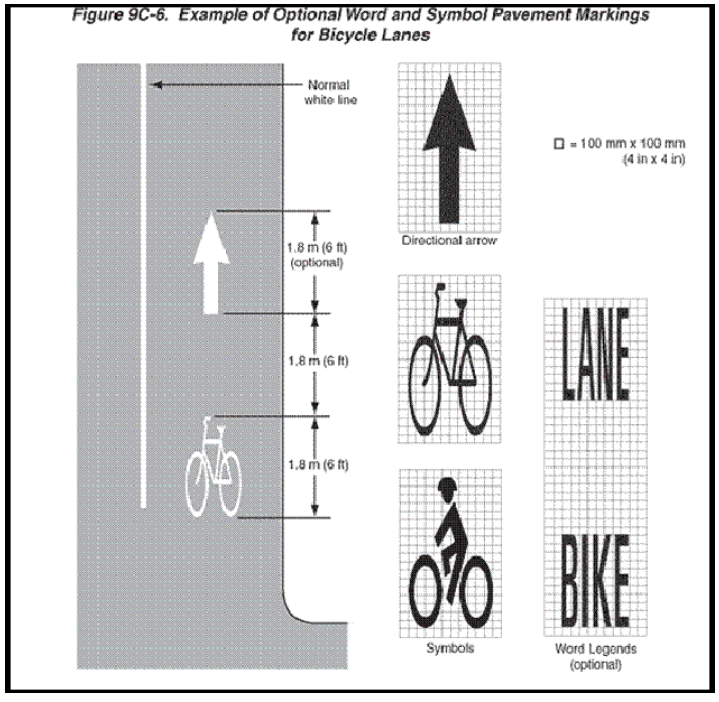


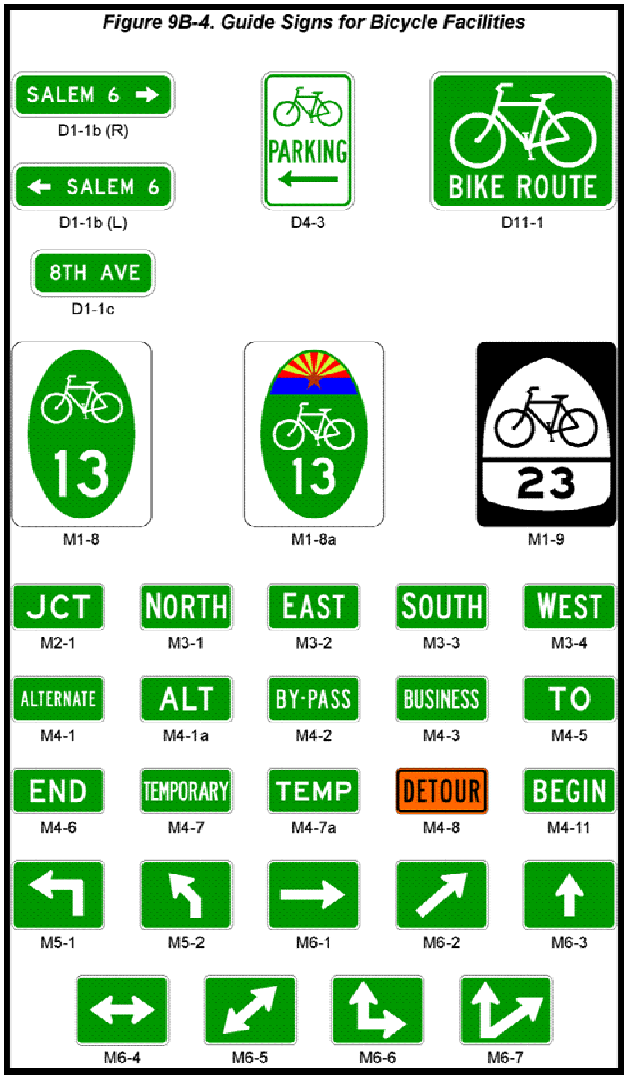
Figure 6-13. MUTCD Standard Bike Lane Symbols



Bicycle Route Signing

Auxiliary signs may be used with standard bicycle route signs to inform cyclists of route continuity and major cycling attractions. Revised research by MUTCD sub-committee work has recently been completed and the MUTCD will be updated to include findings. Meanwhile, examples are shown in **Figure 6-14**.

Figure 6-14. Example of Auxiliary Bike Signs



The City will consider implementation of a city-wide bike route signing program that better links the on-street facilities and the shared-use paths. Once the MUTCD is revised, the City will consider the following for use in the installation of *junction*, *cardinal direction* and *alternative route auxiliary*

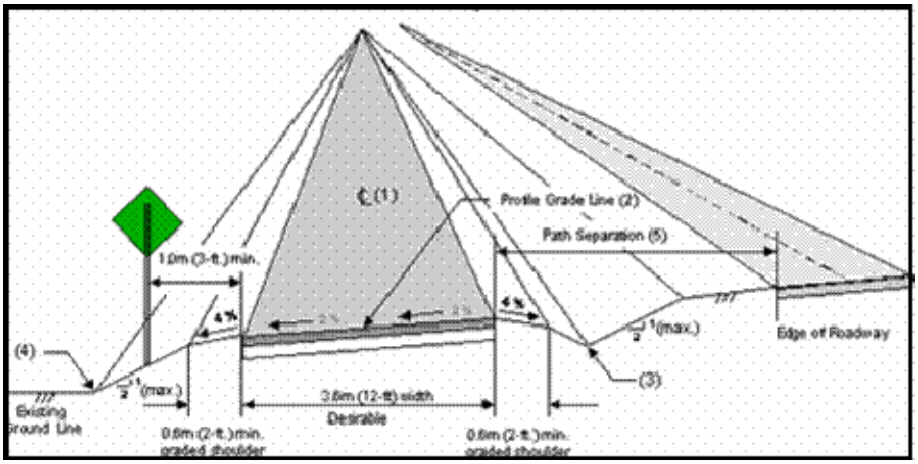
signs (in conjunction with appropriate Bicycle Route Guide signs, Bicycle Route signs, or US Bicycle Route signs):

- Advance Turn Arrow (M5 series) and Directional Arrow (M6 series) auxiliary signs should be mounted below the appropriate Bicycle Route Guide signs, Bicycle Route signs, or US Bicycle Route signs.
- Route sign auxiliaries carrying word legends that are used on bicycle routes should have a minimum size of 12 x 6 inches.
- Route sign auxiliaries carrying arrow symbols that are used on bicycle routes should have a minimum size of 12 x 9 inches.
- All route sign auxiliaries are to match the color combination of the route sign that they supplement.
- Destination may be mounted below Bicycle Route Guide to furnish additional information, such as directional changes in the route, or intermittent distance and destination information.

Shared-Use Path Standards

As the City proceeds to extend the Interurban, Green River and Soos Creek trails, a consistent design standard will be used. The City will consider adopting those standards set forth in FHWA's *Designing Sidewalks and Trails for Access* for ADA compliance and AASHTO *Guide for the Development of Bicycle Facilities.* See **Figure 6-15** for a typical cross-section. AASHTO considers ten feet as *recommended* pavement width (8 feet is *adequate* under low volume conditions), but 12 or 14 feet as *desirable* if significant volume and mix of users (jogger, walkers, cyclists, etc.) is present.

Figure 6-15. Example Cross Section of Two-Way Shared Use Path on Separate Right-of-Way



Re-Striping Arterials with Bike Lanes

As the City considers re-striping some of its arterials with on-street bike lanes it may encounter the need to reduce travel lane widths and parking space. An excellent guide for consideration when reducing travel lane widths is ITE's *Context Sensitive Solutions in Designing Major Urban Thoroughfares for Walkable Communities*[14].

Other Bicycle Design Features

BICYCLE PARKING

Many potential bicyclists are hesitant to ride for utilitarian trips because they fear their bicycles will get stolen. There is a widespread perception that any bicycle rack or hardware is not very helpful in deterring theft. The real and perceived fear of bicycle theft is a major impediment to greater bicycle ridership.

The City will review and consider appropriate revisions to its building code and development ordinance to help ensure the appropriate placement (convenient and safe) and number of bicycle racks through the following measures:

- Placement — an adequate number of bicycle parking racks and/or lockers as needed at the appropriate destinations, such as schools and colleges, public gathering places, transit stations, bus stops, and shopping centers.
- Design—the recommended style of bicycle rack is the inverted "U" Bike Rib bicycle rack or the equivalent.
- Security—encourage employers and property owners to either provide secure parking near building entrances and protected from rain, or allow secure storage inside buildings.
- Convenience—encourage merchants to provide secure, practical bicycle parking for customers.

BICYCLE SIGNAL COORDINATION

The City will conduct more detailed traffic engineering studies of the at-grade intersections of the Interurban Trail and major arterials. Consideration of new traffic signal equipment should be given, and the City will establish new policies for the construction of appropriate signal

actuation features at these intersections where bicyclists may be unduly delayed.

SUMMARY

Kent will need to evaluate and consider a number of their design standards and policies with respect to the full range of pedestrian and bicycle travel needs. The Kent Local Non-Motorized Design Guide identifies the sidewalk, curb ramp and driveway crossing standards that will be amended to best comply with the ADA. The Design Guide also identifies needed revisions to the City's street standards for consistency with the most recent federal bicycle standards and policies. Other policies and standards will be re-evaluated so the City can better provide a balance of transportation facilities to best meet the multi-modal needs and expectations of Kent residents. FHWA's Designing Sidewalks and Trails for Access is an excellent, comprehensive resource for Kent's use as it evaluates its broader design standards and policies with respect to pedestrian access. AASHTO's *Guide for the Development of Bicycle Facilities* is a good source for bicycle facility design features.

End Notes

[1] Americans with Disabilities Act Accessibility Guidelines, U.S. Access Board, 2002.

[2] Designing Sidewalks and Trails for Access; Part II – Best Practices Design Guide, U.S. Department of Transportation, 2002; and, Developing Curb Ramp Design Based on Curb Radius. Edward R. Stollof. Institute of Transportation Engineers Journal, April 2005.

[3] Guide for the Planning, Design and Operation of Pedestrian Facilities, American Association of State Highway and Transportation Officials, 2004.

[4] Pedestrian Facilities Users Guide – Providing Safety and Mobility, Federal Highway Administration, March, 2002.

[5] Guide for the Development of Bicycle Facilities, American Association of State Highway and Transportation Officials, 1999.

[6] Manual of Uniform Traffic Control Devices, U.S. Department of Transportation, Federal Highway Administration, 2004. See also Washington State Modifications to the MUTCD, M 24-01.

[7] WSDOT Design Manual, Bicycle Facilities—Section 1020, 2001

[8] Americans with Disabilities Act Accessibility Guidelines, U.S. Access Board, 2002.

[9] See FHWA Memorandum, July 30, 2004. "The US Access Board, the federal agency responsible for developing accessibility guidelines under the Americans with Disabilities Act (ADA), published the ADA/ABA Accessibility Guidelines (ADA/ABA-AG) on July 23, 2004. The Access Board is charged with developing minimum guidelines to assist the Department of Transportation (DOT) and Department of Justice (DOJ) in establishing design standards. Although the publication of these guidelines marks the completion of the Access Board's responsibilities, these guidelines will not become ADA standards until the Departments of Justice and Transportation go through standard notice-and-comment rulemaking to adopt the new guidelines into the standards they maintain under the ADA, a process which is expected to take one to two years. In the interim, agencies must continue to use current ADA standards -- including those for detectable warnings at curb ramps and blended transitions -- when building new and altering pedestrian facilities. Therefore, there have been no changes to the existing requirements (since July 26, 2001) that detectable warnings must be applied to curb ramps in new construction and alterations.

As part of updating the guidelines, the Access Board has developed more specific guidelines for public rights-of-way. On June 17, 2002 the Board released a draft of these guidelines for public comment in advance of publishing a proposed rule. Included are provisions for sidewalks, curb ramps, street crossings and related pedestrian facilities that are not addressed in the newly published ADA/ABA-AG. Both FHWA and the Access Board encourage use of the June 17, 2002 draft's scoping and technical provisions for detectable warnings as an equivalent facilitation to the current requirements in the 1991 (current) ADAAG.

USDOT is an implementing agency for the title II of the Americans with Disabilities Act and for section 504 of the Rehabilitation Act; the FHWA is the USDOT agency responsible for overseeing Title II and 504 compliance for pedestrian access in public rights-of-ways. USDOT is evaluating the ADA/ABA-AG and considering possible changes to USDOT section 504 regulations to reflect current detectable warning requirements until such time as the new public rights-of-way guidelines can be issued. The FHWA MUTCD staff are also pursuing inclusion of detectable warnings in Chapter 3 Markings. NCHRP and FHWA research is also underway to improve truncated dome maintenance and contrast."

[10] Context Sensitive Solutions in Designing Major Urban Thoroughfares fro Walkable Communities. An ITE Proposed Recommended Practice. Institute of Transportation Engineers, 2006.

[11] Guide for the Planning, Design and Operation of Pedestrian Facilities. American Association of State Highway and Transportation Officials, 2004.

[12] See (a) Manual of Uniform Traffic Control Devices, U.S. Department of Transportation, Federal Highway Administration, 2004; (b) Signalized Intersections: Information Guide, FHWA, August 2004; (c) Accessible Pedestrian Signals: Synthesis and Guide to Best Practice. National Cooperation Highway Research Program (NCHRP), Research Results Digest, July 2003, Number 278; and, (d) on-going NCHRP research grant 3-62.

[13] Shared-Lane Pavement Marking Study, City of San Francisco, February 2004.

[14] *Context Sensitive Solutions in Designing Major Urban Thoroughfares for Walkable Communities, Institute of Transportation Engineers, 2006*.

Chapter 7—Pedestrian and Bicycle System Studies

INTRODUCTION

The Transportation Master Plan Task Force was essential in helping establish pedestrian priorities and in the review and general consensus of draft pedestrian and bicycle study recommendations—mainly the respective, draft pedestrian and bicycle system study maps. These draft maps indicated the priority pedestrian and bicycle projects identified in the urban area, generally to be constructed over the next 20 years. In addition, the Kent Bicycle Advisory Board (KBAB) provided review and comment on the draft bicycle system map, initial comments which were considered by the Task Force and reflected in the final bicycle system study map.

Pedestrian System Study

Chapter 2 summarized the process establishing the priority sidewalk and curb ramp improvement needs and their costs. The pedestrian system study is categorized in two major priority groups:

Highest/High - projects that can likely be funded within the next 20 years (generally based on traditional funding sources and levels), and

Medium - projects that are constructed as additional funding becomes available, likely beyond the 20-year planning period.

New Sidewalks

Figure 7-1 and **Figure 7-2** map and illustrate the High/Highest and Medium priorities. These figures also illustrate a sizeable increase in new sidewalks that will be constructed as part of the street plan development (see Kent Transportation Master Plan), which are not itemized in terms of stand-alone pedestrian system needs identified in the NMTS. Major street projects that add critical sidewalk connections and help complete the pedestrian system include:

- Military Road
- West Meeker Street
- SE 256th Street
- 116th Avenue
- 132nd Avenue

Figure 7-1. Pedestrian System Map – Highest and High Priorities

Table 7-1 lists the new sidewalk project priorities by street class, particularly in areas around schools and parks, and near civic and commercial centers. Many of the new sidewalk needs are found along Local streets within neighborhoods, as is the case for the Highest and High priority projects. The Highest and High priority pedestrian system improvements include the completion of sidewalks along Principal and Minor Arterial streets, including portions of:

Missing Sidewalks on Cambridge Street

- Military Road
- Reith Road
- Kent-Des Moines Road
- East Smith Road
- SE 248th Street
- Canyon Drive

These projects, totaling more than 100 miles in new sidewalk construction, provide important system connections to major pedestrian trip generators and safety enhancements for pedestrians traveling along busy city arterials streets. Medium priority projects are located more on the periphery within the urban area.

Missing Sidewalks on 116th Avenue

Table 7-1. New Sidewalk Miles

	New Sidewalks (miles)			
Street Class	**Highest**	**High**	**Medium**	**Low**
Principal Arterial		0.7	4.0	0.2
Minor Arterial	0.2	1.7	12.7	6.5
Industrial Collector Arterial		1.2	2.1	
Industrial Collector Arterial		1.7	3.8	
Residential Collector	0.6	6.6	18.2	51.0
Local	1.8	93.2	155.3	0.7
Total	2.6	105.1	196.2	58.4

Sidewalk Repairs

There are some existing sidewalks that need to be replaced, either because they have insufficient width or are in poor condition. Slightly more than 25 miles of existing sidewalks are in need of repair within the Kent urban area. **Figure 7-3** maps those existing sidewalks that should be reconstructed due to poor conditions. Some of the critical corridors in need of sidewalk repairs include portions of Reiten Road, Kent Kangley Road, 104th Avenue, 84th Avenue and 208th Street.

Table 7-2. Sidewalk Repairs

	Sidewalk Repairs (miles)			
Street Class	**Highest**	**High**	**Medium**	**Low**
Principal Arterial		0.1	5.5	1.2
Minor Arterial		0.2	3.3	0.2
Industrial Collector Arterial			2.4	0.2
Industrial Collector Arterial		0.1	1.9	0.3
Residential Collector			5.0	5.2
Local		0.2	1.3	0.1
Total		0.6	19.5	7.1

New Curb Ramps and Curb Ramp Replacement

Individual curb ramp projects are not mapped in this chapter but are included within the City GIS database for reference in project planning. However, the cost for new curb ramps and curb ramp replacements are included in the following section.

New Curb Ramps with Truncated Domes

Funding Needs for Pedestrian Improvements

Funding pedestrian system improvements will require a policy commitment by the city. As summarized in **Table 7-3**, the costs of the combined Highest/High priorities, when averaged over 20 years, results in an annual cost of about $1.7 million to add or repair over 100 miles sidewalks and curb ramps in critical corridors.

Table 7-3. Priority Pedestrian Improvement Costs

	Priority		
	Highest	**High**	**Medium**
New Sidewalks	$1,291,100	$32,050,900	$67,916,700
Sidewalk Repairs		$191,400	$3,237,400
New Curb Ramps	$148,500	$424,500	$2,155,500
Curb Ramp Replacements	$534,000	$715,500	$523,500
Total	$1,974,600	$33,382,300	$73,833,100
Annual Cost (20-yr period)	$98,700	$1,669,100	

Bicycle System Study

Priority was placed in the study process to identify opportunities to build new (as part of street projects identified in the Transportation Master Plan) or re-stripe existing arterial streets with bicycle lanes to close critical gaps in the existing system. The city, unfortunately, is tasked with trying to effectively connect its east and west neighborhoods to downtown and industrial employment centers by means of overcoming extremely steep terrain and crossing the Green River, two sets of railroad tracks and SR 167. There are limited corridors making these connections, and in each corridor the public rights-of-way are constrained or already filled with needed sidewalk and travel lane capacity.

As an alternative, along existing streets where space is limited (existing travel lanes and curb/sidewalks) or there are underlying design constraints (often steep terrain is the culprit) bicycle lane re-striping was found to be impractical. As an alternative to bike lanes, the study recommends striping and posting many of these routes as shared lanes.

Many cyclists in Kent enjoy the existing shared-use path (trail) system, particularly for recreation but some commuter traffic as well. A series of new shared-use path connections are identified in the study along Green River and Soos Creek.

Figure 7-4 (a) and (b) maps the existing and planned bicycle system for the Kent urban area. The bicycle system study includes re-striping about 27 miles of bicycle lanes, 19 miles of shared-use lane routes, and over 9 miles of new shared-use paths to fill critical gaps in Kent's bicycle system.

New Bike Lanes

As seen in Figure 7-4, the arterial street improvements identified in the Transportation Master Plan add significant mileage to the bike lane network, including major sections of:

- Military Road
- SE 248th Street
- SE 256th Street
- 116th Avenue
- 132nd Avenue

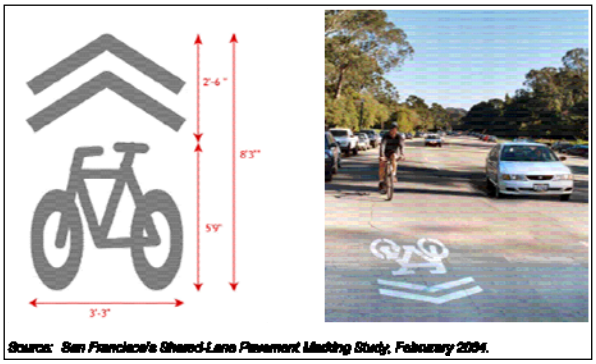
New Bike Lanes on 256th Street

Several arterial streets have sufficient paved width for the possibility of re-striping travel lanes to accommodate on-street bike lanes (see Chapter 6 for design guidance on marking and posting bike lanes). These routes provide critical linkages to major cycling activity centers, particularly in downtown, and connections to the shared-use path system. These streets include:

- 260th Street/259th Place/Reith Road
- 76th Avenue S/4th Avenue N
- Meeker Street
- 92nd Avenue/200th Street
- 132nd Avenue

Shared-Lane Routes

The NMTS examined a number of options to help connect the bicycle system within and through the urban area. Unfortunately, several major corridors are severely constrained making it difficult to re-stripe existing streets without removing important travel lane vehicular capacity or incurring significant costs to purchase new right-of-way and widen existing streets. As noted in Chapter 6 (Local Non-Motorized Design Guide), use of "sharrow" symbols, and sign-posting shared-use routes can help inform motorists and cyclists of those critical corridors intended for significant bike use. See Chapter 6 for design guidance on marking and posting shared-lane routes.



Source: San Francisco's Shared-Lane Pavement Marking Study, February 2004.

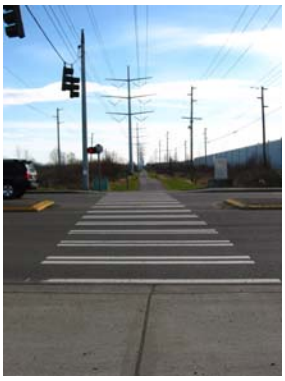
As illustrated in Figure 7-4 a, the proposed shared-lane routes provide critical linkages for cyclists in a number of corridors, including: Cambridge Street, South 272nd Street, 64th Avenue, 94th Avenue, 96th Avenue and Talbot Road, 100th Avenue, 108th Avenue, 124th Avenue, Reiten Road, James Street, SE 224th Street, and SE 192nd Street.

Shared-Use Path Extensions and Connections

The extension of the Green River and Soos Creek trails to the perimeter of the urban area will provide important linkages for future trail users, and provide greater regional access, especially for commuter and recreational cyclists and pedestrians. There are also a number of locations where greater access to the Green River Trail can

Interurban Trail Crossing of Smith Street

help develop important east-west bike routes, particularly near Grandview Park and the extension of the Uplands Greenbelt to the Interurban Trail. These projects will require significant design efforts, considering the level of topographic and environmental constraints.



Interurban Trail Crossing of 212th Street

Shared-use paths usually intersect major city arterials at critical junctions. The city has already programmed in the current TIP, intersection traffic control enhancements at some of the Interurban Trial junctions. Similar design treatments may be warranted at other junctions in the future.

Routes for Future Study

The NMTS includes various new bike lane, shared-lane and shared-use path connections within a fairly comprehensive system spanning the Kent urban area. However, due to topographical and geographical constraints and obstacles, not all corridors are optimally connected and require further study to identify the appropriate, long-range plan solutions. Routes with severe limitations, primarily overcoming steep grades, include the SE 192nd Street, SE 208th /212th Street, Canyon Drive, and South 272nd Street corridors. A number of critical connections that will require further study are identified in the NMTS, including:

- SE 282nd Street Corridor – 108th Avenue to 152nd Avenue
- SE 267th Street Extension – 104th Avenue to 116th Avenue
- Mill Creek Canyon – possible trail connection from Titus Street to Canyon Drive at 94th Avenue (requires significant structural access overcoming grade and creek crossing)
- SE 218th Street Extension – grade separation of SR 167 to 84th Avenue
- S 208th Street Extension – 84th Avenue to S 212th Street
- S 272nd Street - Pacific Highway 99 to Reith Road (requires coordination with the city of Federal Way)

Furthermore, analysis of future traffic conditions within in the Kent industrial area may yield findings that suggest the possibility of re-striping some arterial streets either with on-street bike lanes or as shared-lane facilities. In these corridors the original street design characteristics were established to facilitate truck mobility serving the industrial lands.

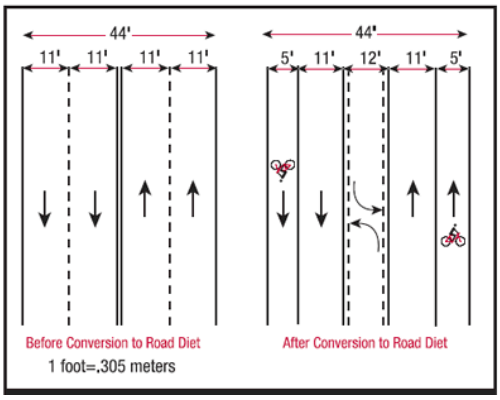
Balancing the needs for trucking and cycling access and mobility will be important in future re-assessments of the NMTS.

Downtown Kent

There are limited streets in the downtown area where bicycle facility enhancements can be made without removing on-street parking (undesirable to local merchants) or travel lanes (undesirable to commuters). Yet downtown Kent is an important non-motorized destination and inter-modal hub. The NMTS identified key corridors in which bicycle lanes can be added by changing current traffic control measures.

Meeker Street Today – 4 Travel Lanes

Meeker Street is the best-suited corridor that links the Meeker Bridge crossing of the Green River through downtown with connections across the railroad and Central Avenue to Canyon Road. Today, Meeker Street, east of SR 167, has two travel lanes in each direction but no bicycle lanes. Examination of current and future vehicle traffic volumes indicate that a 3-lane configuration (one lane in each direction and a left-turn lane) should suffice for vehicular operations. By re-striping Meeker Street to 3 lanes instead of 4, there is sufficient space to add on-street bicycle lanes in each direction. There may also be the need for minor intersection traffic control revisions.



Example of Road Diet

1st Street provides direct, north-south connection within the downtown area, linking Meeker Street and James Street with an important connection to the Kent Transit Center. Today, 1st Street has two travel lanes and on-street parking, but sufficient space that a combination of reduced travel lane widths and possible parking space reduction can accommodate the addition of striped bicycle lanes. Further, 1st Street is currently disconnected at Smith Street. Bike-only access and

1st Street Corridor

street crossing traffic control devices will be required for a continuous bike route along 1st Street.

4th Street currently holds four travel lanes in the downtown area (between Willis and Smith Street), transitioning to five lanes north of Smith Street to James Street. Due to limited space, it is likely untenable to reduce the number of travel lanes or remove on-street parking to accommodate new bike lanes. This section of 4th Street can be posted and marked with "sharrow" symbols as a shared-lane facility.

Meeker Street Bridge

The Meeker Street Bridge over the Green River is subject to long-range plans for replacement as the structure is antiquated and eventually reaching the end of its design lifetime. The bridge is located at a major junction for Kent area cyclists, linking Reith Road (planned on-street bike lanes) to downtown via Meeker Street bike lanes; and north-south via the Green River Trail shared-use path. Westbound cyclists can leave the Meeker Street bike lanes and join the shared-use path system bridging the Green River. Eastbound cyclists from west of the SR 516/Meeker Street intersection cannot access the eastbound bike lanes on Meeker Street. Long-range plans for the Meeker Street Bridge should include continuous, on-street bike lanes on Meeker Street and the bridge, with fully-accessible connections to the Green River Trail in each direction.

Meeker Street Bridge & Bike Lanes

Green River Bridge Connection

WSDOT Coordination

There are a number of corridors that require coordination of the NMTS findings with WSDOT as the state proceeds on short- and long-term highway improvements. The City recently completed the streetscape, travel lane and high occupancy vehicle (HOV) lane improvements to Pacific Highway 99, along its western city limits. Cyclists in the community have offered suggestions that the HOV lane be re-signed and designated to allow for bicycle use. WSDOT does not currently support policy and design criteria for bicycle use of HOV lanes. The City will continue to coordinate with WSDOT for possible future policy revisions or clarification of bicycle access and use of HOV lanes along Pacific Highway 99.

Pacific Highway 99 HOV Lanes

As noted in **Figure 7-4b** notes, within the downtown Kent area Meeker Street provides one of the most important east-west corridor connections. Meeker Street is proposed to be re-striped with two travel lanes, a center left-turn lane and bicycle lanes on each side, east of SR 167. The SR 167 under-crossing is a significant barrier to both bicycle and pedestrian travel. As WSDOT continues its upgrading projects along SR 167, the under-crossing improvements should include enhancements to non-motorized access, circulation and safety by the following:

Meeker Street Undercrossing of SR 167

- Add pedestrian-scale lighting for improved safety (it's dark, even during daylight hours)
- Add bicycle lanes
- Relocate sidewalks, behind support columns if necessary, to accommodate added bike lanes

Similar non-motorized design and safety issues should be addressed as part of other SR 167 interchange and under-crossing improvements.

Funding Needs for Bicycle System Pedestrian Improvements

Planning-level costs were estimated for stand-alone bike lane and shared lane re-striping, and the extension of the shared-use path network. The total cost of the bicycle system improvements is estimated at $2.2 million over the next 20 years.

Funding the bicycle improvements will also require a policy commitment by the city of Kent. As summarized in **Table 7-4**, the total costs of bicycle system priorities when averaged over 20 years, results in an annual cost of slightly more than $111,000.

Table 7-4. Priority Bicycle Improvement Costs

	Miles	Cost	Annual Cost
Bike Lane Signing and Marking	16	$405,000	$20,300
Shared-Lane Signing and Marking	27	$903,750	$45,200
New Shared-Use Path Construction	6	$924,000	$46,200
Total	49	$2,232,750	$111,700

Non-Motorized Funding Policy

The combined non-motorized system improvement costs total about $37.6 million, including the Highest/ High pedestrian priorities and the bicycle system study projects. A preliminary funding analysis was conducted on the various pedestrian and bicycle improvement needs as input into the larger transportation funding analysis of the Transportation Master Plan. This analysis is reflected in the cost summaries for both the pedestrian and bicycle system studies and is generally predicated on the city's recent history of funding unique non-motorized programs and projects as part of their Transportation Improvement Program. It is generally anticipated that the 20-year plan needs can be met if the following programs are confirmed for sustained funding:

Sidewalk Construction Program—totaling more than $33 million. Sources include General Fund, New Development and state & federal grants.

Sidewalk Repair Program—a proposed 50%-50% cost share between the City and adjacent private property owners (total—$191,000). City source is General Fund.

Curb Ramp Replacement Program—totaling $1.8 million as a continuance of the city's ADA Compliance program. City source is General Fund and available grants.

Bicycle System Expansion Program—totaling $2.2 million. City source is General Fund.

Increased funding levels from existing sources or new funding sources will be necessary should the city pursue more aggressive funding of the Medium priority pedestrian improvements or additional bicycle system facilities.

Chapter 8—Measures to Implement NMTS

SUMMARY

Pedestrians on Gowe Street

The Kent NMTS process identified a number of planning issues that will require the City's attention and in some cases further evaluation. The findings and recommendations of the NMTS will likely require the City to serve in a coordinating role, with significant cooperation from the school district, re-development agencies, WSDOT, neighboring cities, transit providers and other government entities. Coordination will be required to implement the NMTS, with further enhancements to the City's design standards, as part of inter-jurisdictional and private transportation projects. A fragmented implementation of the NMTS carries the risk of inconsistent application of its findings and recommendations.

ADA Coordinator

In accordance with current ADA requirements[i] the City is to designate an ***ADA Coordinator***. As described in this chapter, there are many important measures that the City can and will undertake to implement the findings of the NMTS. A well coordinated effort is essential to success. As such, it is recommended that the City re-designate a staffing position - the ***Coordinator of Non-Motorized Facilities*** - to effectively and consistently implement the NMTS. The Coordinator of Non-Motorized Facilities can also serve as the ADA Coordinator in a consistent, dual role. This section describes the various NMTS implementation measures to be administered by the Coordinator of Non-Motorized Facilities.

ADA Policy Coordination

The U.S. Access Board has recently completed a more comprehensive design guideline for pedestrian facilities as part of the ADAAG update. It will be critical for the City to keep current with the revised ADA rules and guidelines. Changes and additions to ADAAG may require the City to revise its pedestrian facilities standards and perhaps update the NMTS.

ADA Title II

New ADA rules, guidelines and standards will be communicated with the local mobility– and vision-impaired community. The City will take a proactive and lead coordination role, as continued ADA rule revisions and

guidelines will likely affect the standards and practices that the City administers.

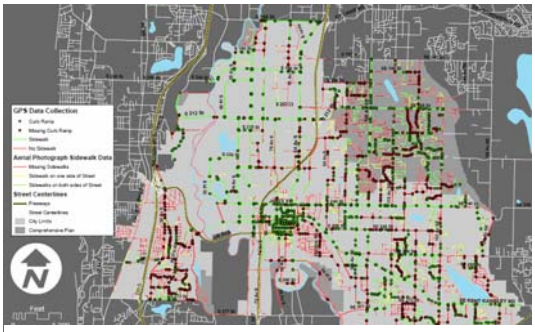
Project Programming, Coordination and Development

The Coordinator of Non-Motorized Facilities can effectively lead the City's efforts to engage neighboring cities, regional transportation agencies, school districts and neighborhood associations in prioritizing neighborhood sidewalk and curb ramp improvements and bicycle facility enhancements. These efforts will be necessary to develop the annual update of sidewalk and curb ramp improvement projects and bicycle system enhancements as input into the six-year Transportation Improvement Program (TIP). Defining short-term projects will involve more detailed planning than simply selecting the high priority projects to construct as already noted in the NMTS. Other issues that will affect project priority-setting include:

- Defining "packaged" pedestrian improvements that span or mix *high* and *moderate* priorities, resulting in comprehensive corridor enhancements for construction programming and cost efficiencies
- Complimenting long-range street projects with intersecting sidewalk , curb ramp and bicycle facility improvements to complete neighborhood accessibility
- Coordinating state highway improvement projects with WSDOT and transit station, stop and route improvements with neighboring city pedestrian and bicycle system enhancements
- Re-striping and signing major corridors with on-street bicycle lanes or "sharrow" (shared travel lanes) to link major sub-areas and activity centers to the City's shared-use path system and major employment, recreation and commercial destinations

NMTS Database Maintenance

The NMTS (GIS) database will be updated periodically to reflect new or replacement pedestrian and bicycle system improvements within the Kent urban area. Updates to the City's GIS database can either be made on a case-by-case basis or in a comprehensive effort at the end of each year (prior to updates of the 6-year TIP).



GIS Mapping of Existing and Missing Sidewalks and Curb Ramps

Site Plan Review

Even if Kent does everything right by revising its design standards and ensuring that pedestrian and bicycle improvements in its public rights-of-way jurisdiction are constructed to meet ADA guidelines and the findings of the NMTS, significant obstacles that impeded safe pedestrian travel might still be constructed elsewhere. Within private developments or along state highways there is similar need to administer and guide good non-motorized design, with emphasis on pedestrian and bicycle circulation and access. The City continue to coordinate with neighboring cities, WSDOT and Metro to administer better site plan review practices regarding pedestrian and bicycle access and safety.

WSDOT Coordination

WSDOT's highways provide critical regional connections within and through Kent. Non-motorized accessibility and mobility issues are important along state highways within the city. The City has no immediate jurisdiction over the design and construction of WSDOT facilities. However, the City has a responsibility to ensure that WSDOT requires all new project construction to adhere to the ADA requirements.

The City will encourage WSDOT to complete a thorough examination of each state highway corridor within Kent with respect to pedestrian and bicycle facilities. The state's evaluation will address all of the ADA Transition Plan requirements, including a Self-Evaluation and plan to remove pedestrian access obstacles. Such findings can then be administered through each of WSDOT's design and construction projects to comply with the ADA. Of significant project design consideration are the various SR-167 interchanges and overpasses, as these have historically resulted in various barriers to full, non-motorized accessibility.

Sidewalk and Bicycle Design Standards

The *Local Non-Motorized Design Guide* (see Chapter 6) provided insight of several critical design issues relating to pedestrian treatments on sidewalks, driveway crossings, curb ramps and crosswalks, and bicycle treatments on streets and shared-use paths. The City will revise and update its design standards to address current ADA rules and the findings and recommendations of the NMTS.

Diagonal Curb Ramp on 256th Street

In this process the City will need to lead discussions and contractors and design firms concerning modifications to its design standards.

Stakeholders involved in the NMTS process, especially the mobility-impaired, voiced concern regarding diagonal curb ramps. *At issue is the curb ramp, which by current design and application provides conflicting information to guide the direction of travel – diagonally into the intersection rather than to the crosswalk.* Revised curb ramp and street design standards that encourage park strip buffers and perpendicular curb ramp designs can address these design concerns.

The City will also continue to conduct further research in the application of audible signals to best meet local user needs. Continued research and evaluation of audible signals and truncated dome placement (and curb ramp design) will be conducted by the City, working with the local stakeholders, to best meet user needs.

The City will examine and possibly apply "sharrow" bicycle facility designation, where cyclists and motorists are provided signage and pavement markings to indicate bicycle routes and the sharing of the outside travel lane for joint, vehicle and bicycle use. While not yet adopted by WSDOT in a revision to the state Design Manual, the "sharrow" has been adopted by the state of California and will likely prove beneficial and supportive of bicycle travel within highly constrained arterial street corridors. The City will also coordinate inter-departmental project development along the Green River, Interurban and Soos Creek trails to ensure that new and re-developed shared-use paths meet ADA accessibility design guidelines (e.g. 10-12 foot widths).

Temporary Access in Work Zones

Pedestrian accessibility needs to be maintained in areas of street construction and maintenance. The City will review its standards and policies to ensure that alternative walking routes are secured within designated work zones.

Removing Obstacles

There are significant moveable and fixed obstacles along Kent's sidewalks that limit the minimum pedestrian clear width (4 feet). The City can and will exercise its authority to ensure that these obstacles are removed from the public rights-of-way as early and to the extent possible.

Movable Obstacles that Obstruct Pedestrian Access

Many but not all fixed obstacles need to be removed in adequate clear width for pedestrian access. For exampl poles have been frequently placed within the public sidewalk. The cost to move these poles can be extremely high. However, the City has existing agreements with utility providers to move utility lines when reasonable and

feasible. Other fixed obstacles include mailboxes, fire hydrants, irrigation control valves and head gates, and traffic signal poles and equipment.

Transit Stop Coordination

As Metro implements new transit system enhancements within and through the Kent urban area (see Kent Transportation Master Plan), project planning and design for site specific bus stops and stations will intensify. Further work is needed to coordinate the NMTS priorities, and ensure that bus stop facilities within Kent's rights-of-way are constructed in compliance with ADA.

Walk-to-School Route Planning and Bicycle Education

Currently, there are a number of walk-to-school route plans for schools within the three school districts. School districts also have busing plans. However, the walk-to-school route plans are not fully comprehensive, and were prepared prior to the NMTS. The absence of a comprehensive and consistent set of plans makes it difficult to include school walking routes as priority corridors in the NMTS methodology. Walk-to-school route planning may best serve as the mechanism to refine the NMTS, with neighborhood-specific priority refinements and comprehensive projects that best match the initial priorities identified in the NMTS.

Designated School Crossing and Guards on Meeker Street

Walk-to-school route planning is also an excellent mechanism to advance pedestrian and bicycle safety education.

Funding

There are several ways in which pedestrian and bicycle system improvements are funded. This section highlights both current funding mechanisms and the options the City might consider to increase funding of pedestrian and bicycle system improvements. Whenever possible the distinction is made between funding programs and funding sources. Pedestrian and bicycle system improvements are funded both *privately* and *publicly*.

Private Pedestrian & Bicycle Systems Development

Within new developments, new sidewalk and curb ramp improvements are often funded privately as required or conditioned by local city subdivision policies. Typically, these system improvements are located along local, residential streets; less frequently on collector and arterial streets.

Public Pedestrian & Bicycle Systems Development

STATE HIGHWAYS

In general, the City and WSDOT have jurisdiction over most public streets and highways. The funding for state highway and freeway improvements is coordinated through PSRC and construction projects are programmed through Washington's Statewide Transportation Improvement Program (STIP). These highway improvements often include pedestrian and bicycle system components. The funding source for these improvements are generally a combination of federal and state gas taxes, fees and sales tax.

In 2005 the Legislature passed a new transportation revenue package to fund 274 projects across the state over the next 16 years. The 2005 funding package includes:

- 9.5 cents gas tax increase phased in over four years ($5.5 billion)
- Vehicle Weight Fee on passenger cars ($908 million)
- The light truck weight fee increase ($436 million)
- Annual motor home fee of $75 ($130 million)

Projects which received partial funding by the 2005 Legislature in Kent include the 212th Street and Willis Road grade separation improvements (see Kent TIP, 2007-2012). Portions of these projects include new sidewalk improvements or sidewalk replacements and bicycle system improvements.

STATE PEDESTRIAN AND BICYCLE SAFETY AND SAFE ROUTES TO SCHOOL PROGRAMS

In 2005, the Washington State Legislature included $74 million over 16 years to support pedestrian and bicycle safety projects such as pedestrian and bicycle paths, sidewalks, safe routes to school and transit. The purpose of the Pedestrian and Bicycle Safety program is to aid public agencies in funding cost-effective projects that improve pedestrian and bicycle safety through engineering, education and enforcement. Eligible projects may include engineering improvements, education programs and enforcement efforts.

WSDOT also administers the Safe Routes to School program, which coordinates federal and state funding commitment to support pedestrian and bicycle safety projects such as safe routes to school, transit and pedestrian and bicycle paths. The purpose of the Safe Routes to Schools program is to provide children a safe, healthy alternative to riding the bus or being driven to school. Eligible projects include engineering improvements, education projects, and enforcement efforts within two-miles of primary and middle schools (K-8).

WSDOT has initiated grant funding for both programs. For the 2007-2009 biennium, approximately $18 million is available for the two programs ($11 million of state funds and $7 million of Safe Routes to School federal funds).

CITY TRANSPORTATION IMPROVEMENT PROGRAM (TIP)

Pedestrian and bicycle system improvements, separate or as part of street projects, are generally programmed through the City's TIP in three major ways:

(1) Major Streets

The TIP defines major street improvements. Pedestrian and bicycle improvements (new or replacement) are often included with these street improvements. A variety of short- and long-range plans and studies and individual requests help identify projects that are included and prioritized in the City's TIP and budget. The City updates its TIP each year and regularly coordinates with other jurisdictions and the community at-large with regards to timing and project priorities.

(2) Sidewalk Repair Improvements

The City administers its sidewalk repair policy within the Transportation Improvement Program to help fund needed sidewalk repairs. A small number of sidewalk repair improvements are made each year. The funding for the sidewalk repair program is coordinated annually through the City's TIP and budget. The primary source to fund these improvements is the general fund, supported by state gas taxes, vehicle registration fees and property taxes.

(3) Americans with Disabilities Act (ADA)

The City also administers an ADA program to fund critical curb ramp and sidewalk improvements as identified in the NMTS, which also serves as the City's Transition Plan. The funding for the ADA program is also coordinated annually through the City's TIP and budget. The primary source to fund these improvements is the general fund, supported by state gas taxes, vehicle registration fees and property taxes.

Other Funding Options

Local Improvement Districts

In the past the City has administered development of local improvement districts (LID) to fund sidewalk improvements (new and replacement sidewalks) within specified areas. Community support for street LIDs is also prevalent. However, projected public support for LID funding of significant street and sidewalk systems is uncertain. The City will continue to support the formation of LIDs for critical neighborhood pedestrian system enhancements, alone or as part of street improvements.

Funding Policies for Kent Consideration

The City is currently funding significant pedestrian and bicycle system improvements within the urban area, based on its current major funding sources: federal and state gas taxes and state fees. As an extension of current practice, the City will actively pursue additional funding support for pedestrian and bicycle funding through application to various federal and state programs as identified by FHWA as part of SAFET-LU and WSDOT, in particular the State Pedestrian and Bicycle Safety and Safe-Routes-to-School Program.

The combination of these policies will help the City supplement its current funding programs for pedestrian and bicycle system improvements. As outcome, priority pedestrian improvements may be accelerated, helping the City meet growing demands.

NEXT STEPS

The City will take the following steps, in order of priority, to implement the findings and recommendations of the NMTS:

1. Review and refine its street standards. The review will focus on balancing auto/truck and non-motorized needs, considering these NMTS findings included in Chapter 6 – Local Non-Motorized Design Guide. For pedestrians, these include the critical *corridors* and junction points: *intersections*, *cross walks* and *sidewalk connections*. For cyclists, these include shared space on arterial streets between (or within) the outside travel lanes, and along shared-use paths, including major street crossings of the Green River, Interurban and Soos Creek trails.
2. Conduct further examination of NMTS project definition criteria based on the funding plan and policies derived from the Kent

Transportation Master Plan process. As part of this effort the City may convene individual working groups with each school and develop more current Safe Route to School maps, plans and policies. Guidelines for these efforts are provided by the Washington State Safety Commission[ii] and the Institute of Transportation Engineers[iii].

Pedestrian Features on 4th Street

3. Convene a special city staff working group in the revision of local standards for sidewalks, curb ramps, driveway crossings and traffic signal control facilities to meet ADA requirements, and "sharrow" bicycle facility designations and coordinate consistent regional and local policies for "off-system," ADA compliance, especially focused on site-plan review. The City will ensure the expeditious review, refinement and adoption of street and sidewalk standards that comply with ADA.
4. Convene a special task force to help the City complete the local evaluation of truncated dome (color and contrasting for community-based fit), curb ramp (type and orientation) and audible signal applications, materials and processes. The task force will include representatives of the local mobility-impaired and vision-impaired community and City staff.
5. Convene local training and development workshops to help educate local contractors, developers and design/engineering professionals with regards to revised ADA-compliant construction standards and applications, and site-plan review procedures. Distribution of the NMTS will precede the workshop invitations as relevant background material.
6. Convene school-specific, walk-to-school route planning efforts to either confirm existing plans or develop new plans. The outcome of these plans, priority sidewalk and bicycle improvements, will then be integrated into refinements to the NMTS project priorities. Participation in these efforts will include the school district and school representatives, parent and neighborhood representatives, law enforcement and City planning and engineering staff.

7. Continue to pursue federal and state funding, especially the WSDOT Pedestrian and Bicycle Safety and Safe Routes to School grant

programs, to supplement the City's current revenue programs for pedestrian and bicycle system improvements.

SUMMARY

The recent public opinion research indicates that Kent residents regard safe walking routes a public priority, and value the public's investment in bicycle facilities, especially the shared-use path (trail) system. The City serves a critical role in the planning, development and construction of needed pedestrian and bicycle improvements. The NMTS will certainly elevate the City's public exposure as a designer and provider of street and *non-motorized* systems. This increased exposure will likely give rise to increased expectations.

Pedestrian Features on Meeker Street

The Coordinator of Non-Motorized Facilities will need to regularly coordinate with the City's *Community and Public Affairs Manager* to help ensure that all of the NMTS findings and recommendations are sufficiently communicated to its constituents.

END NOTES

[i] Americans With Disabilities Act Accessibility Guidelines, U.S. Access Board, 2002.

[ii] *School Administrator's Guide to School Walk Routes and Student Pedestrian Safety*, Washington Traffic Safety Commission and Washington State Department of Transportation, 2003.

[iii] School Trip Safety Program Guidelines – Recommended Practice, Institute of Transportation Engineers, 1984.

Appendix A

GPS DATA INVENTORY MAPPING

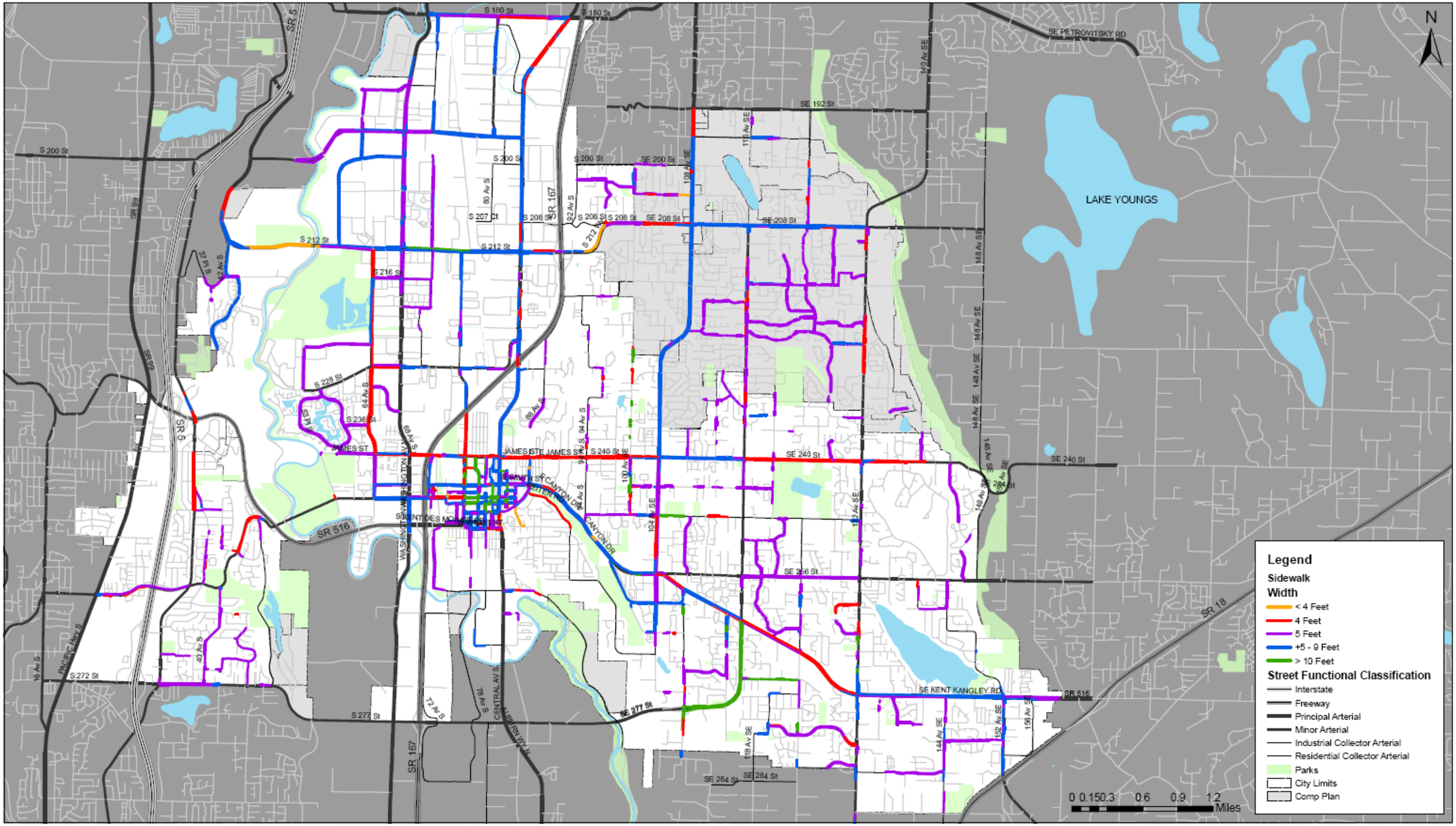


Figure A
Existing Sidewalks - Width

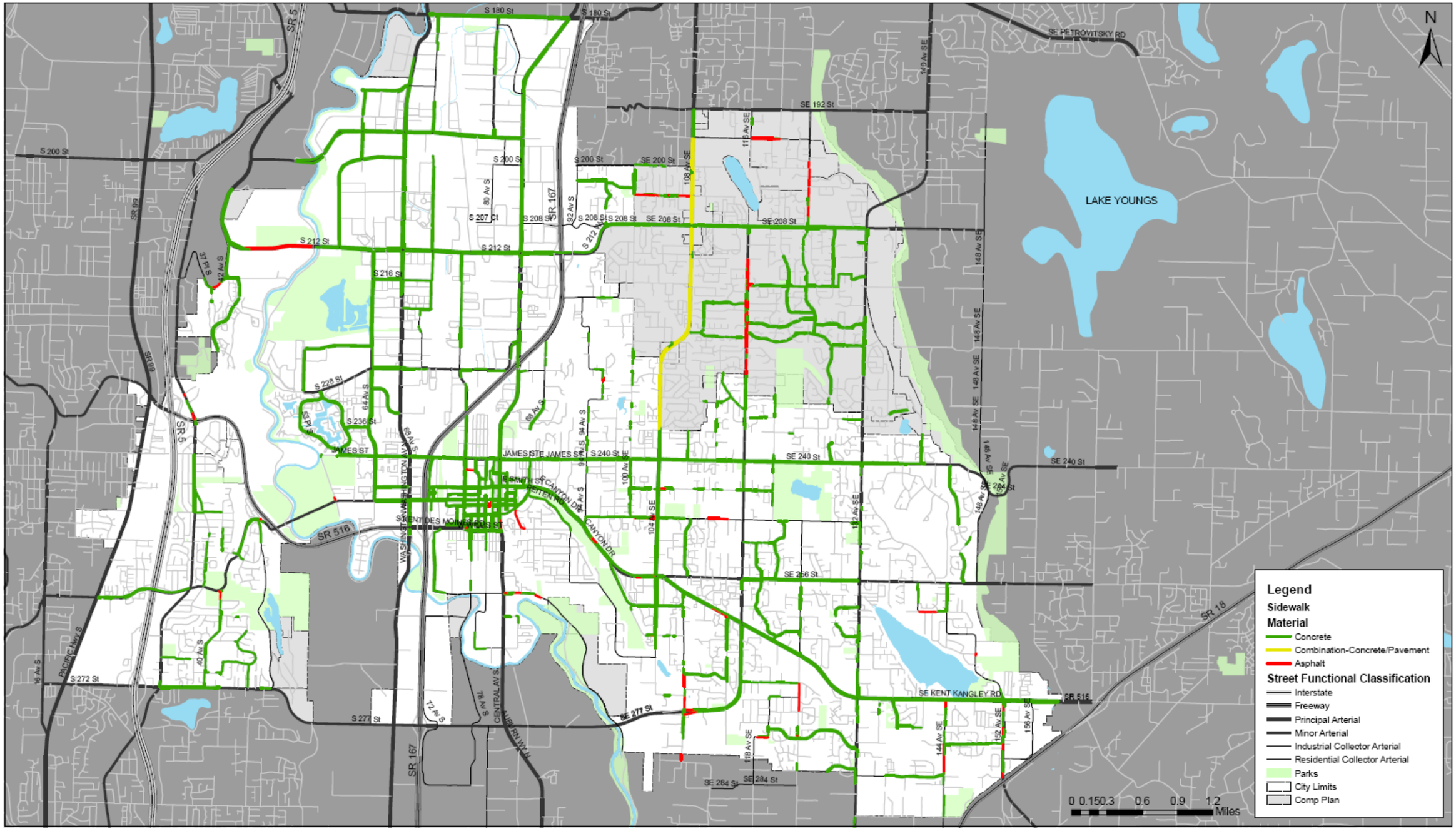


Figure B
Existing Sidewalks - Material

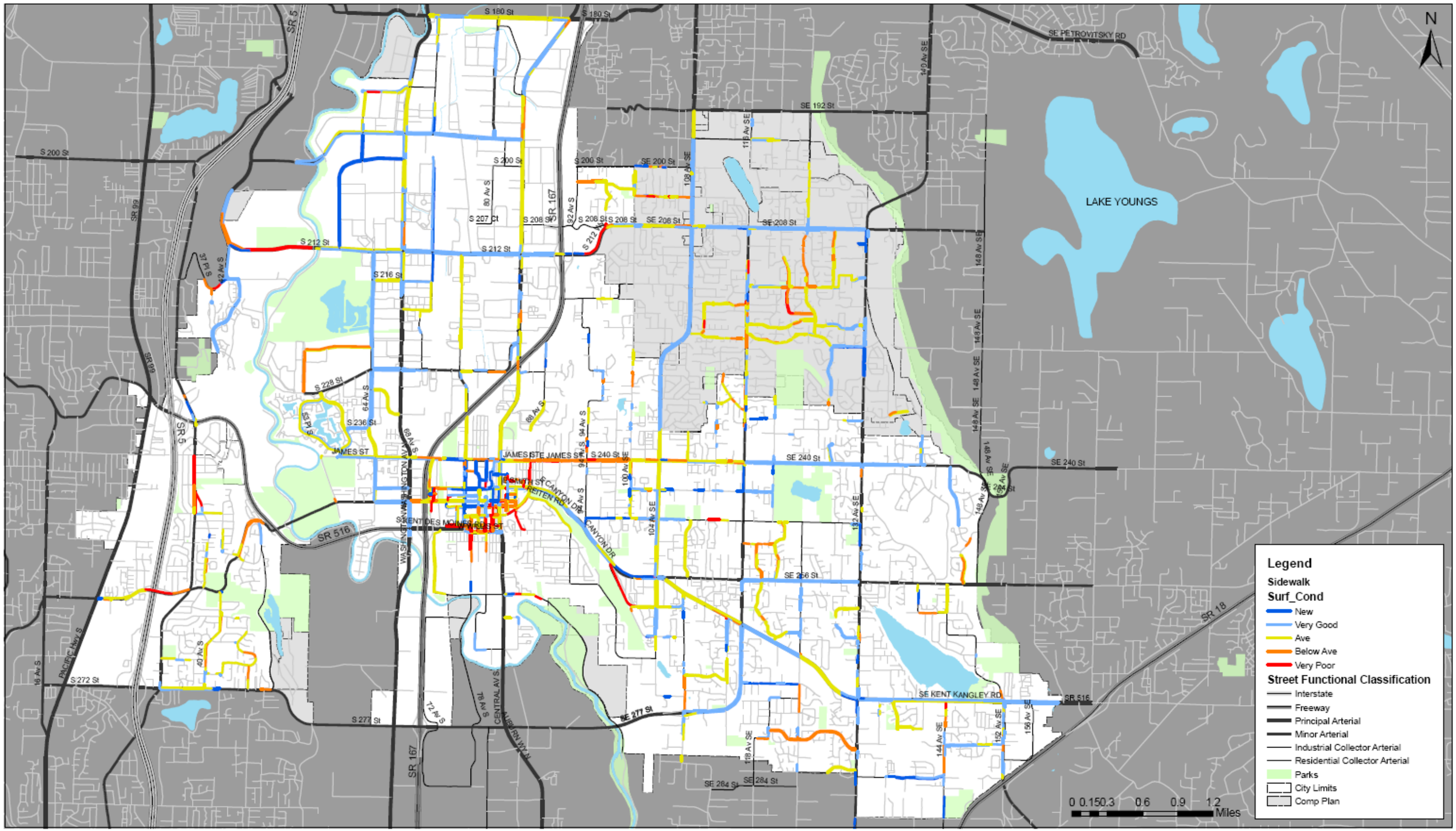


Figure C
Existing Sidewalks - Surface Conditions

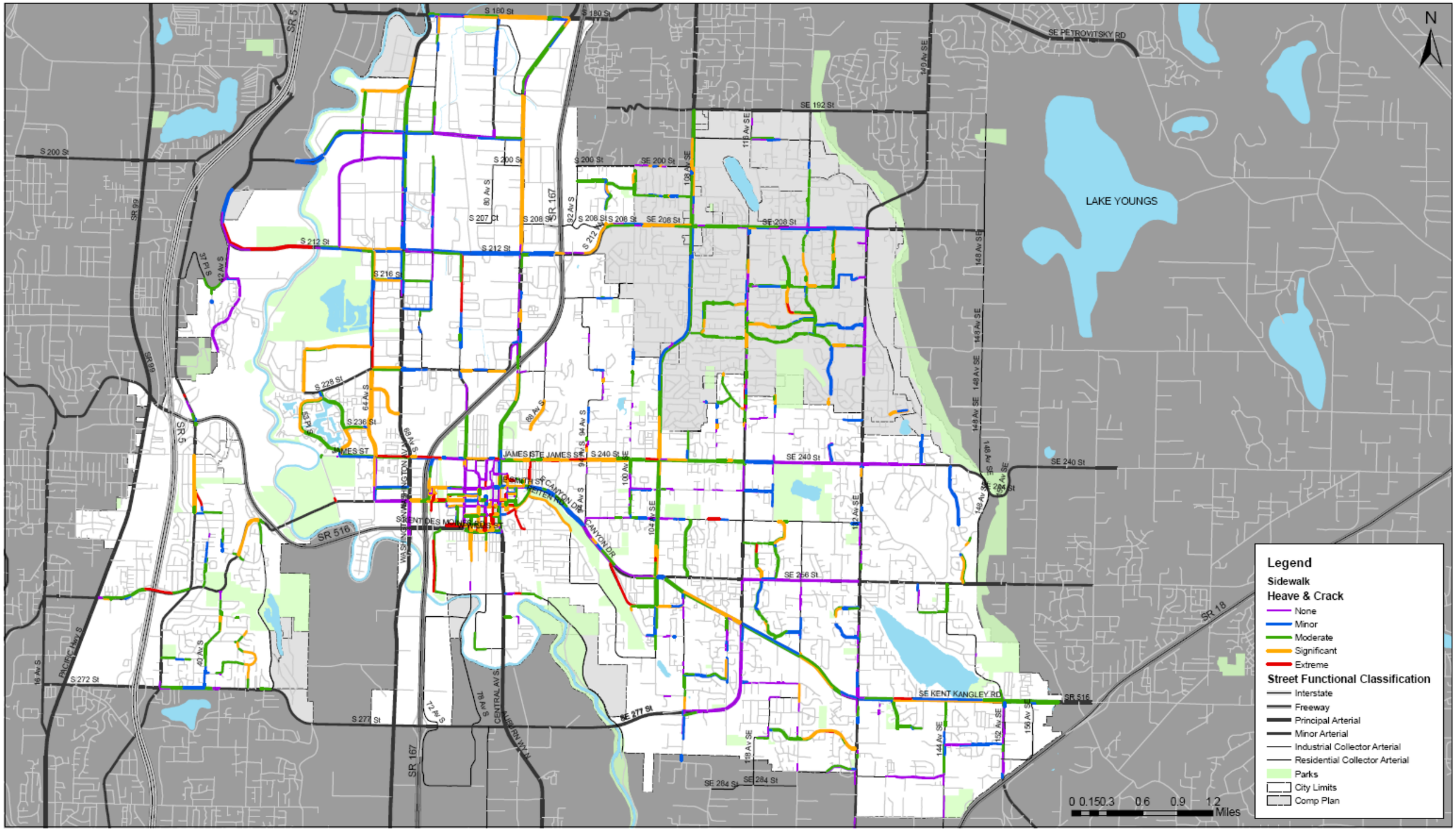


Figure D
Existing Sidewalks - Heave & Crack

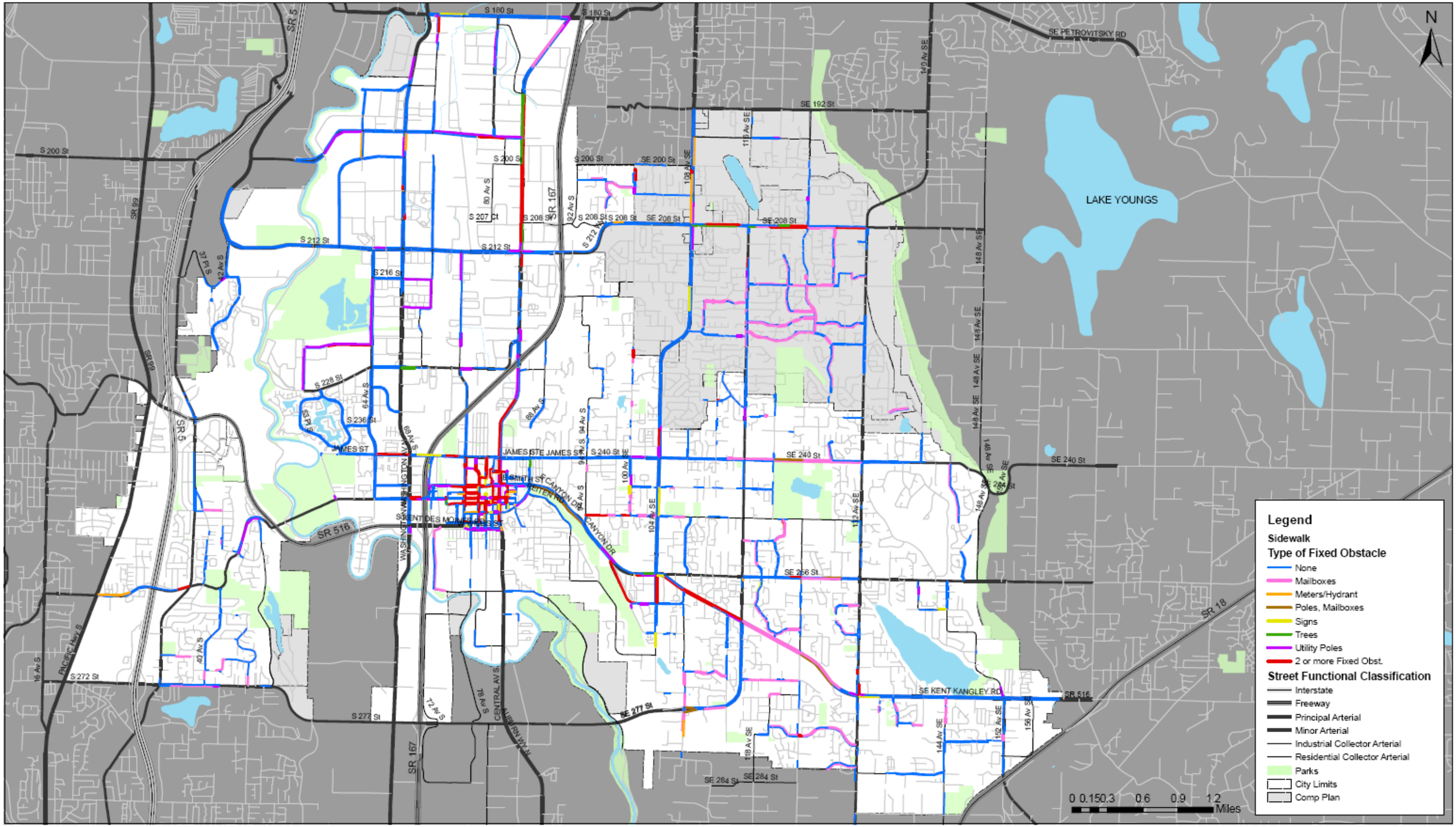


Figure E
Existing Sidewalks - Fixed Obstacle Type

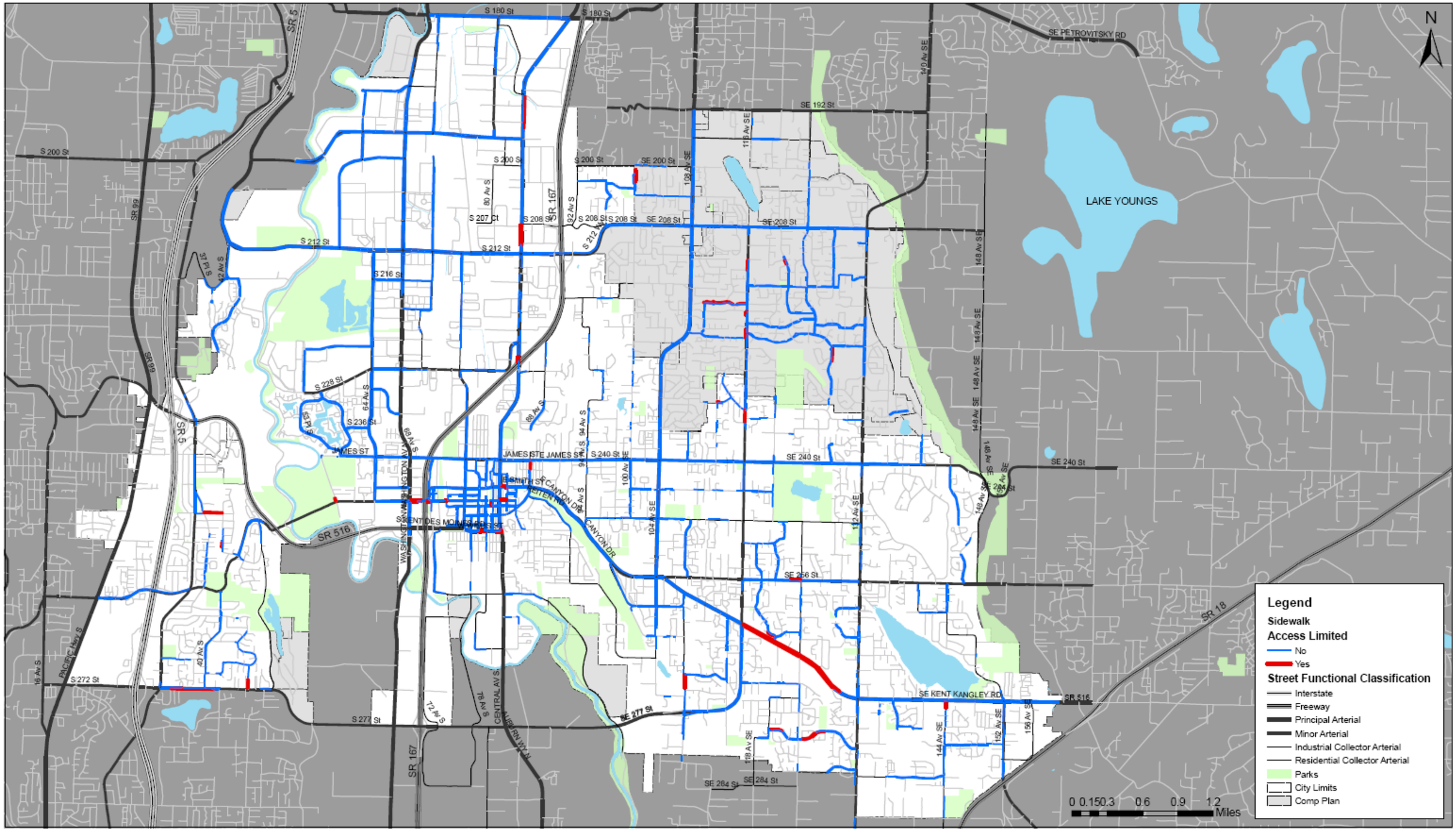


Figure F
Existing Sidewalks - Limited Access due to Fixed Obstacle

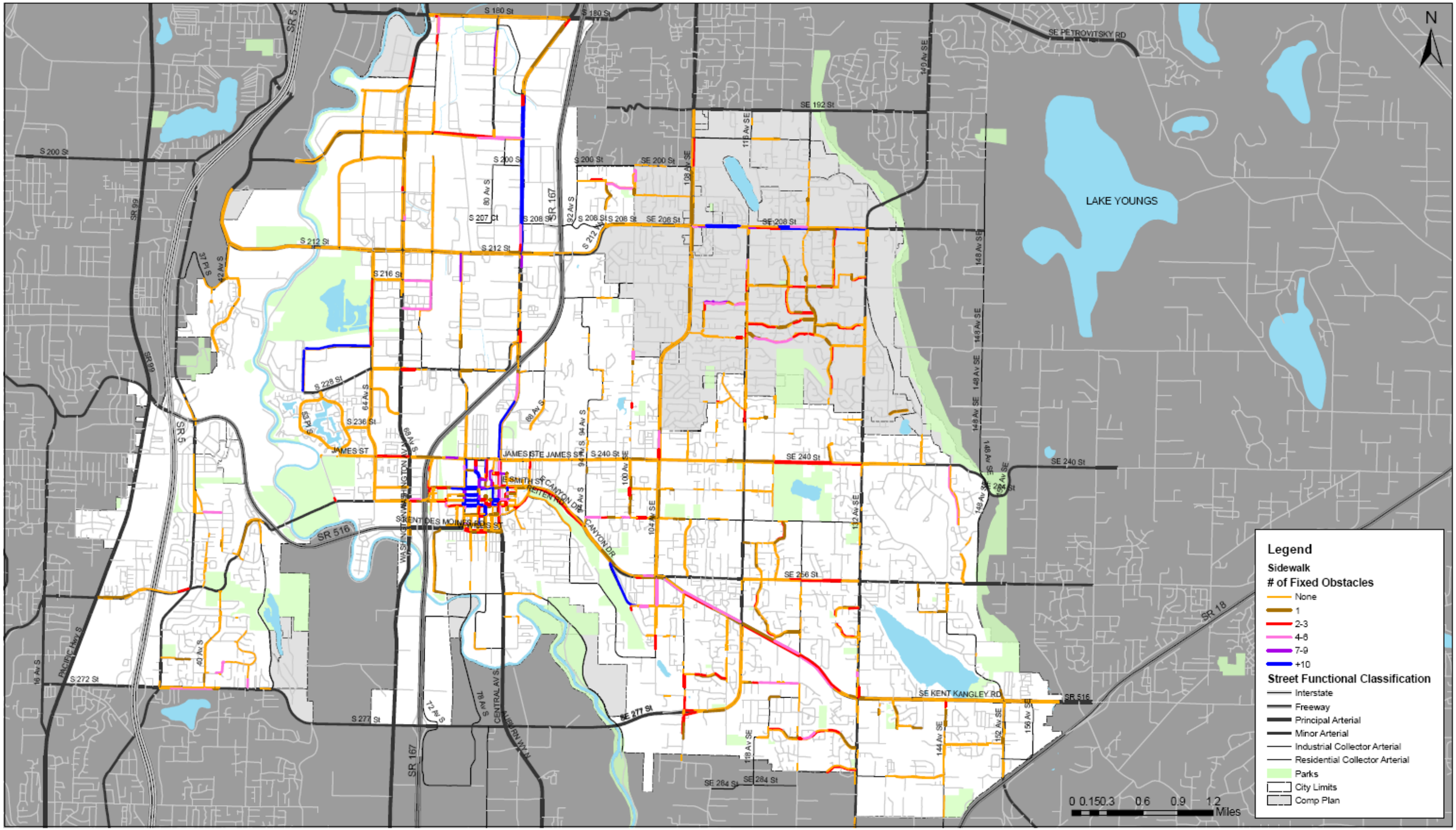


Figure G

Existing Sidewalks - Number of Fixed Obstacles

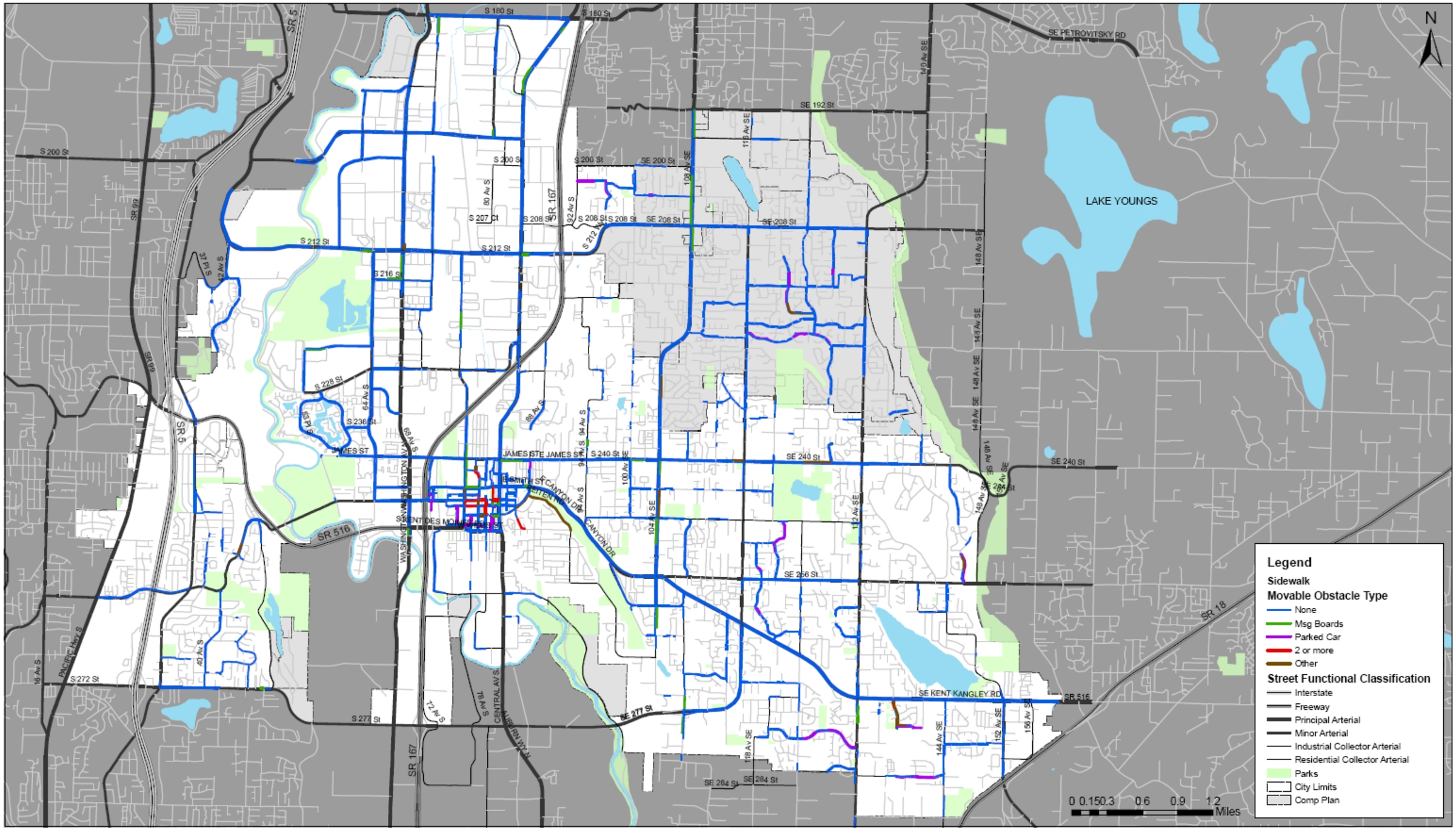


Figure H

Existing Sidewalks - Type of Movable Obstacle

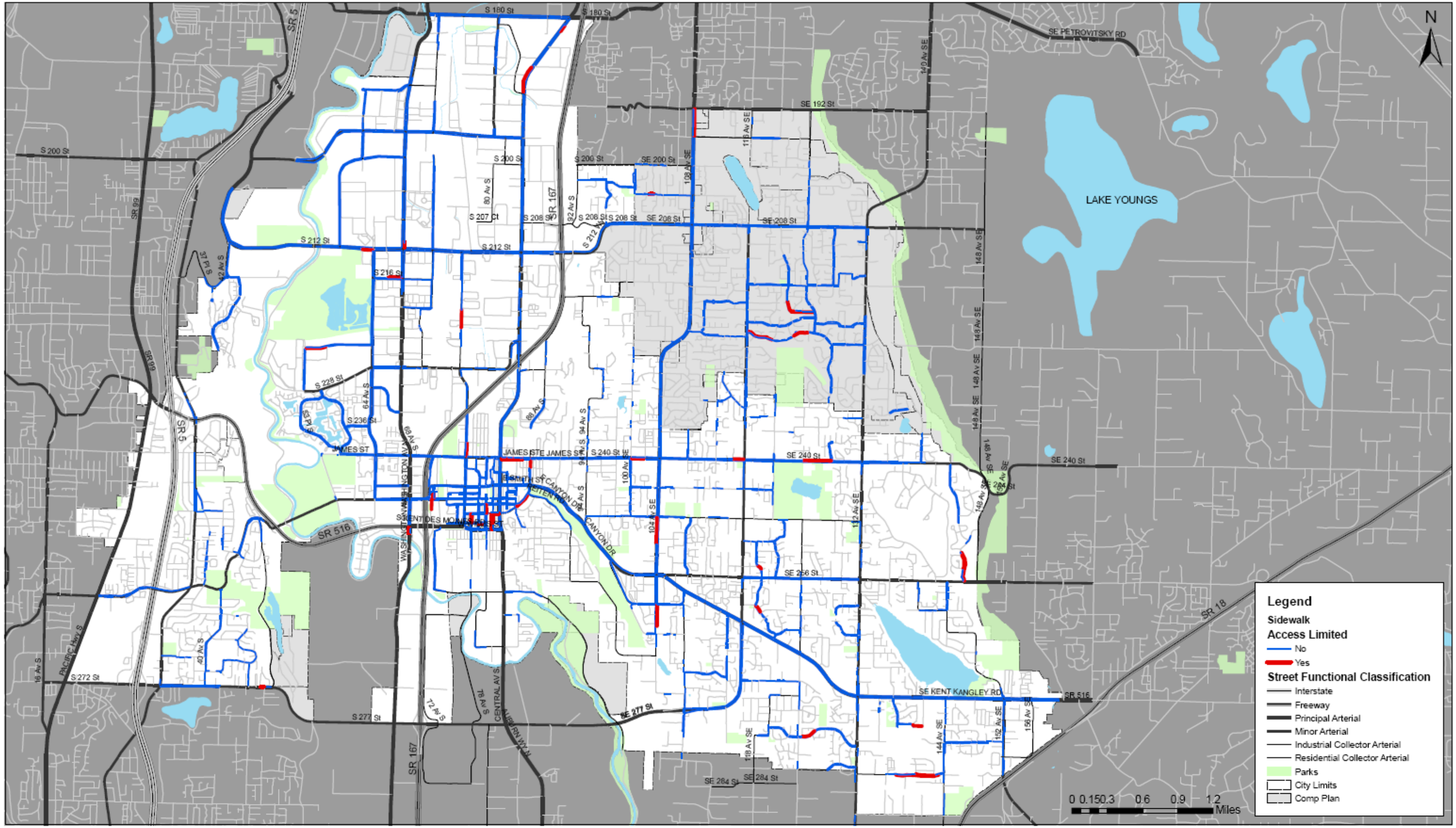


Figure I
Existing Sidewalks - Access Limited by Movable Obstacle

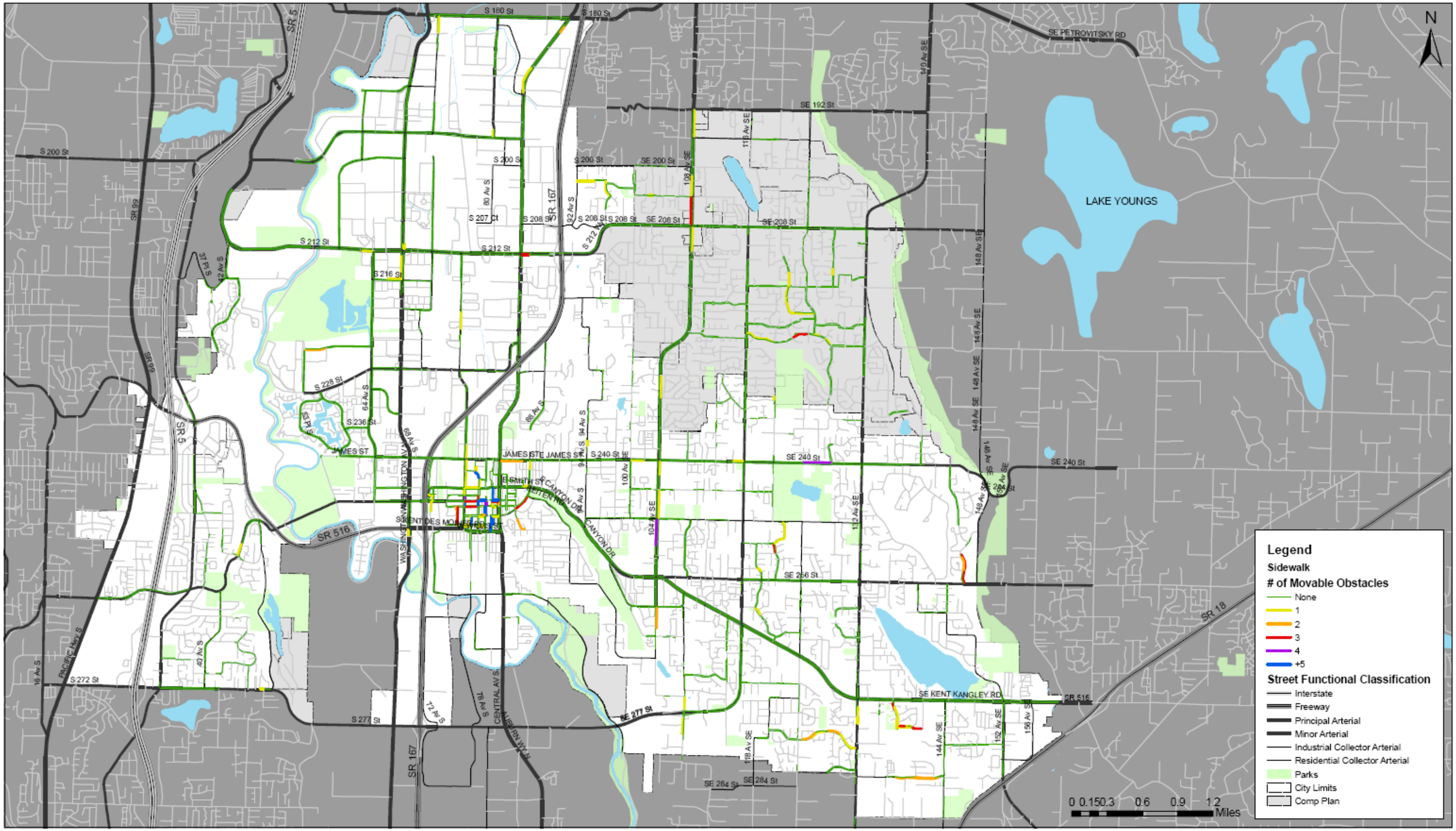


Figure J

Existing Sidewalks - Number of Movable Obstacles

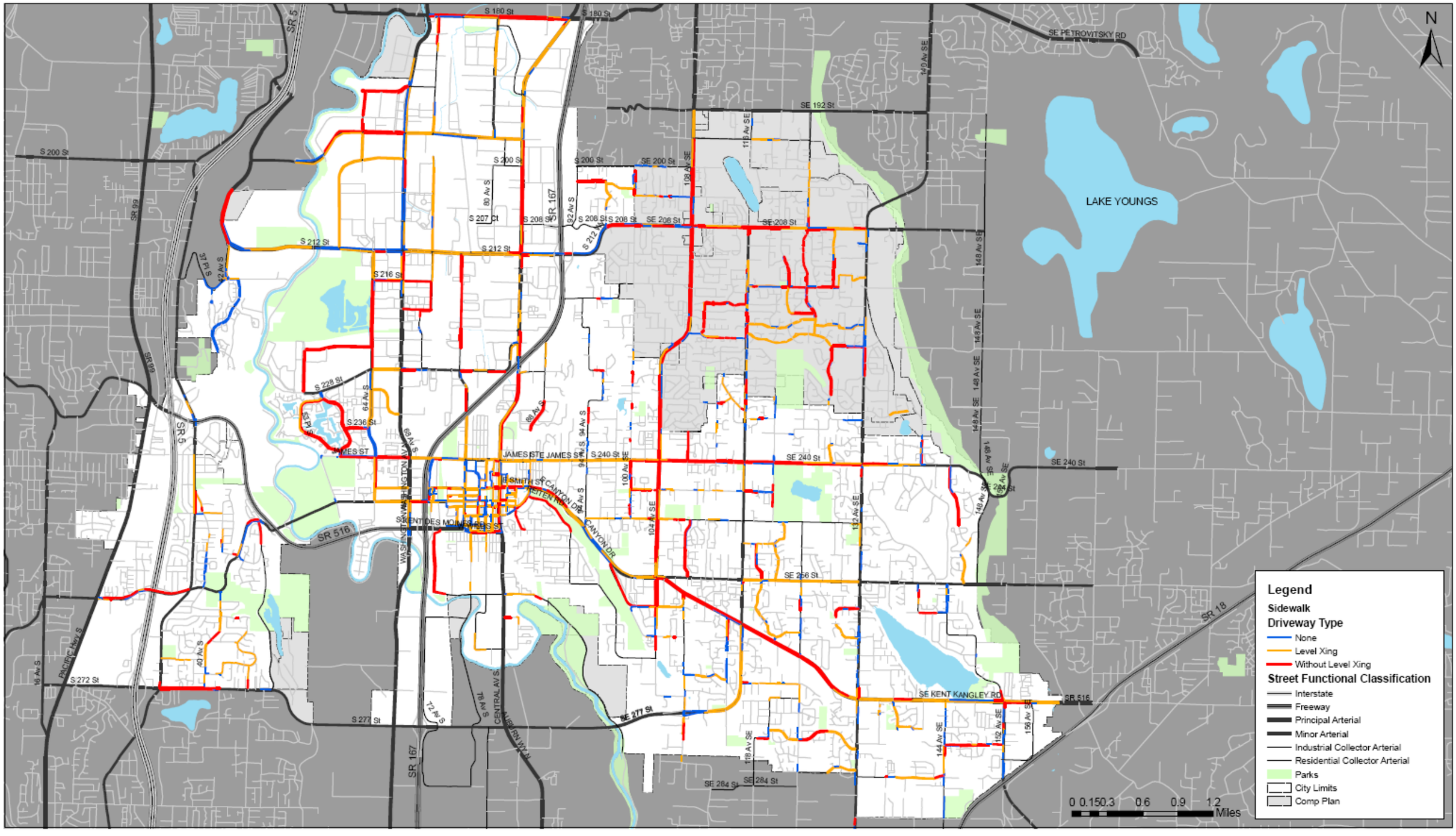


Figure K

Existing Sidewalks - Driveway Crossings

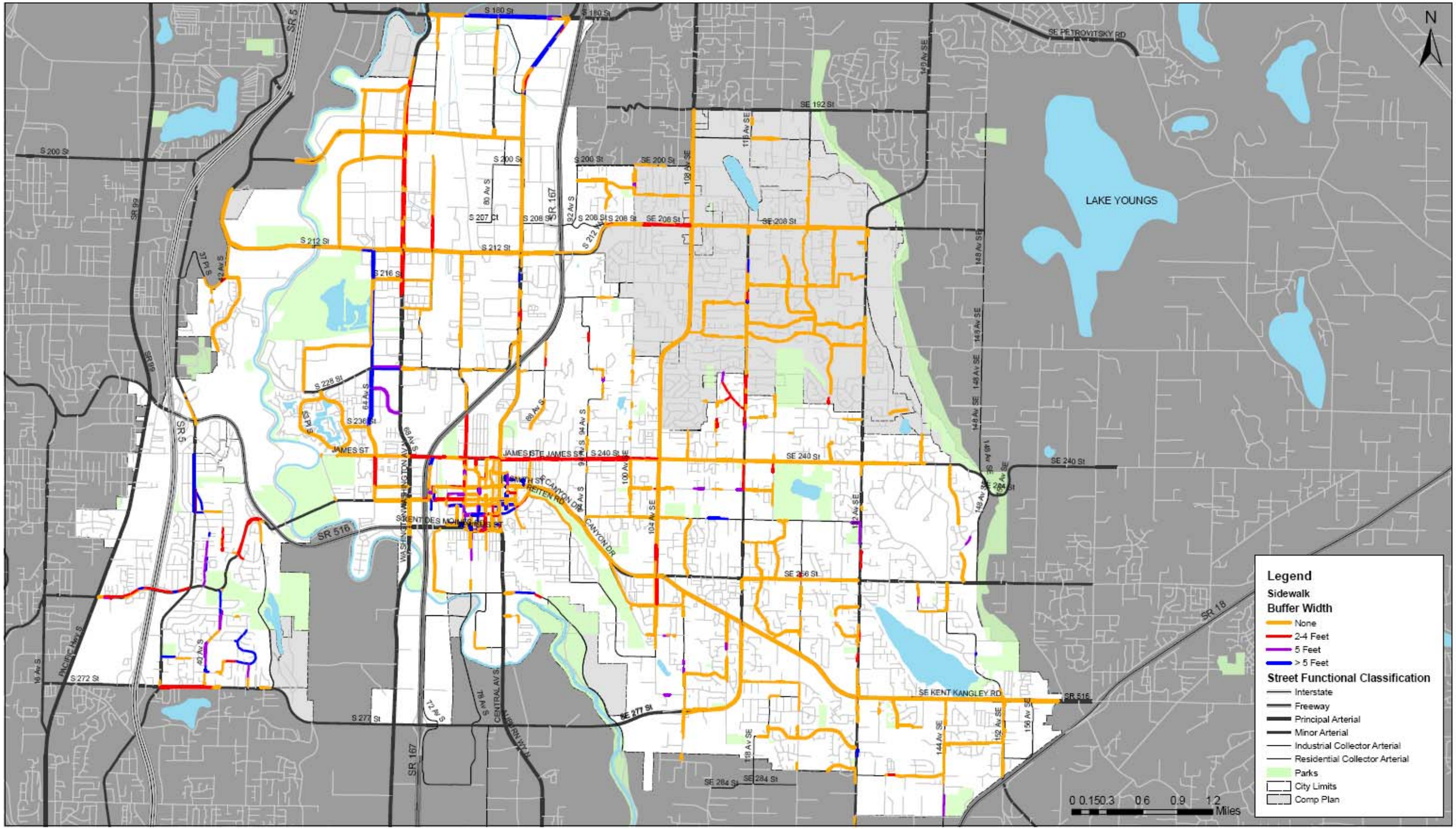


Figure L
Existing Sidewalks - Width of Buffer

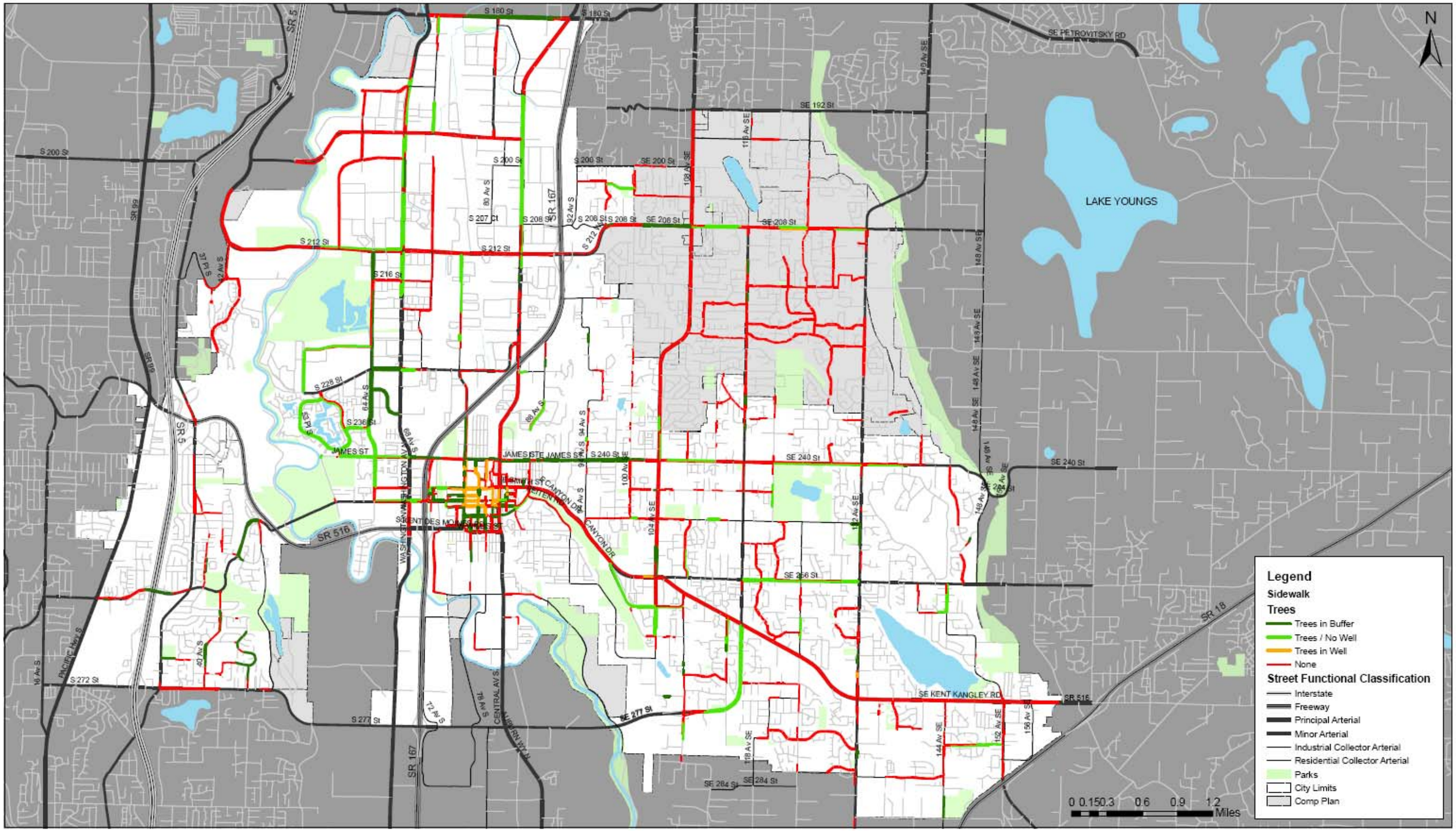


Figure M
Existing Sidewalks - Trees

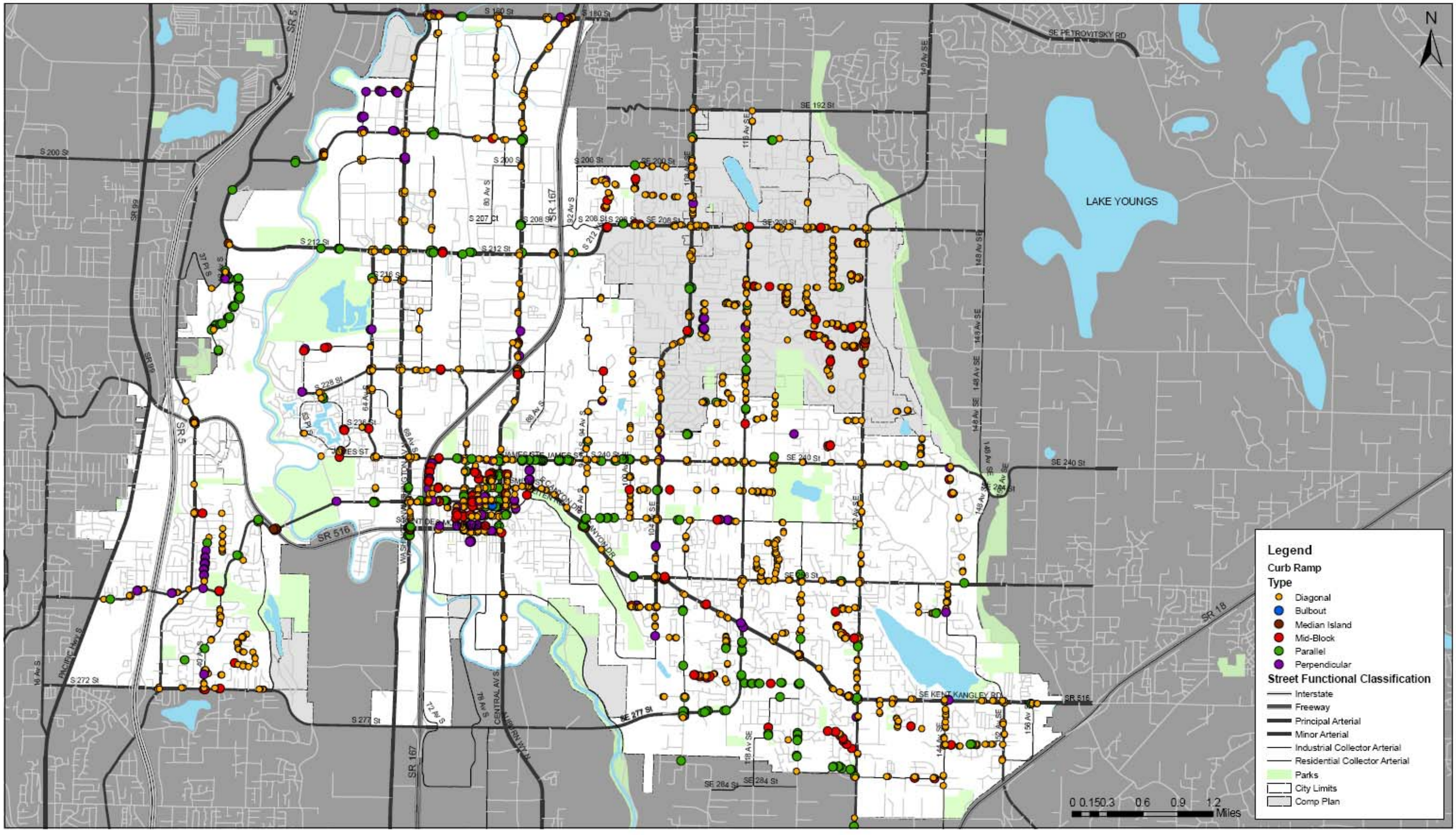


Figure N
Existing Curb Ramps - Type

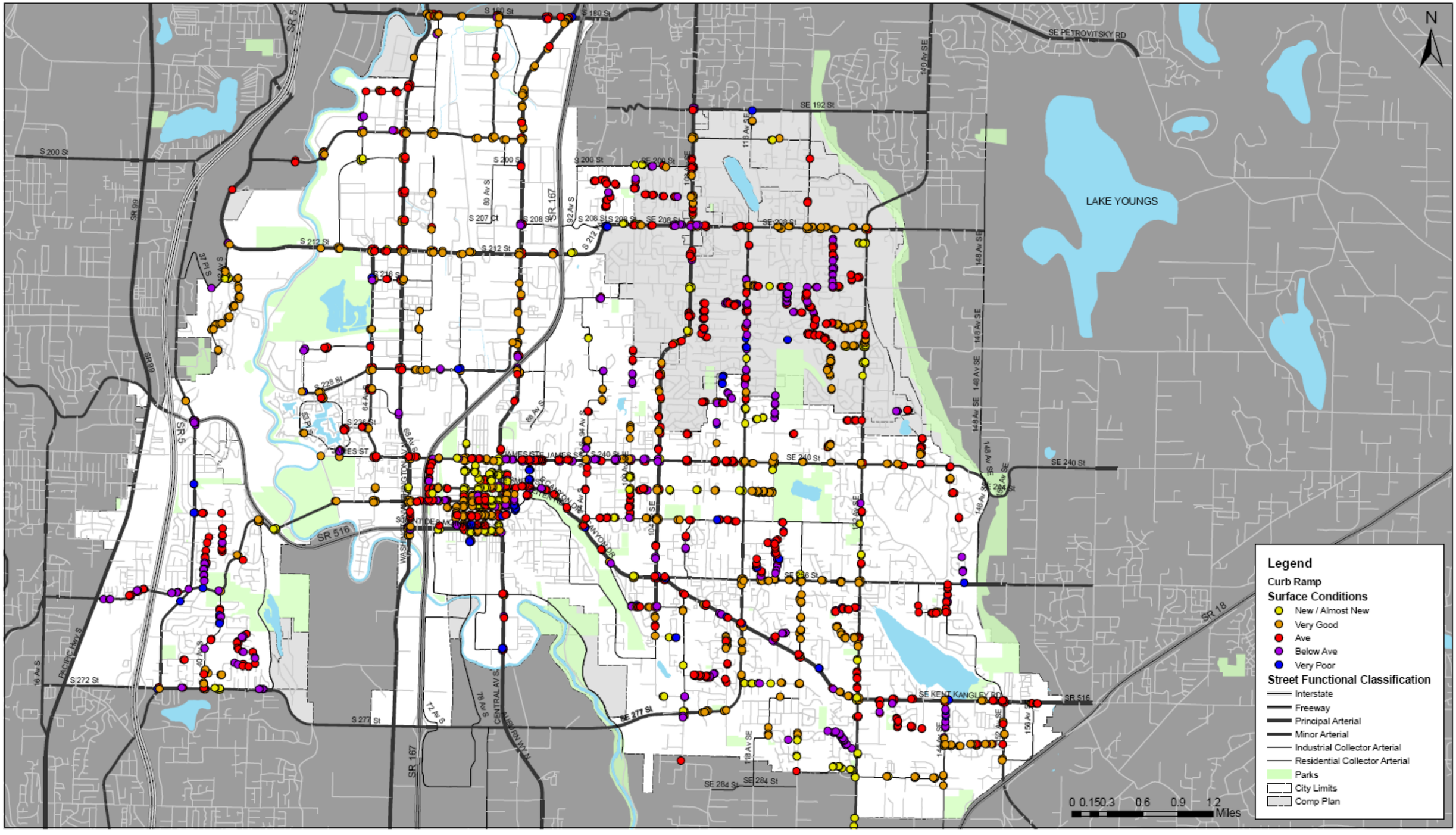


Figure O
Existing Curb Ramps - Surface Condition

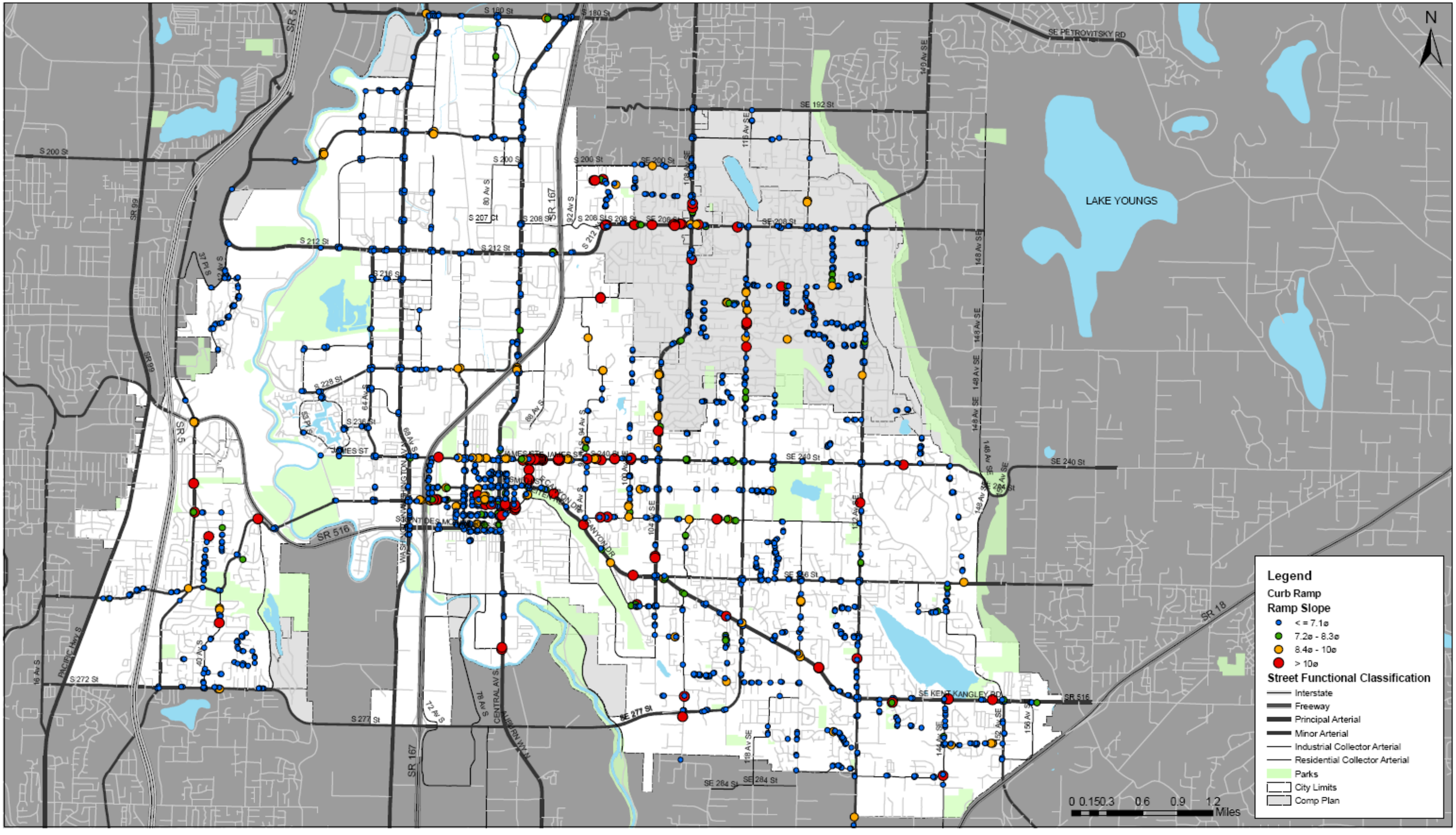


Figure P
Existing Curb Ramps - Slope

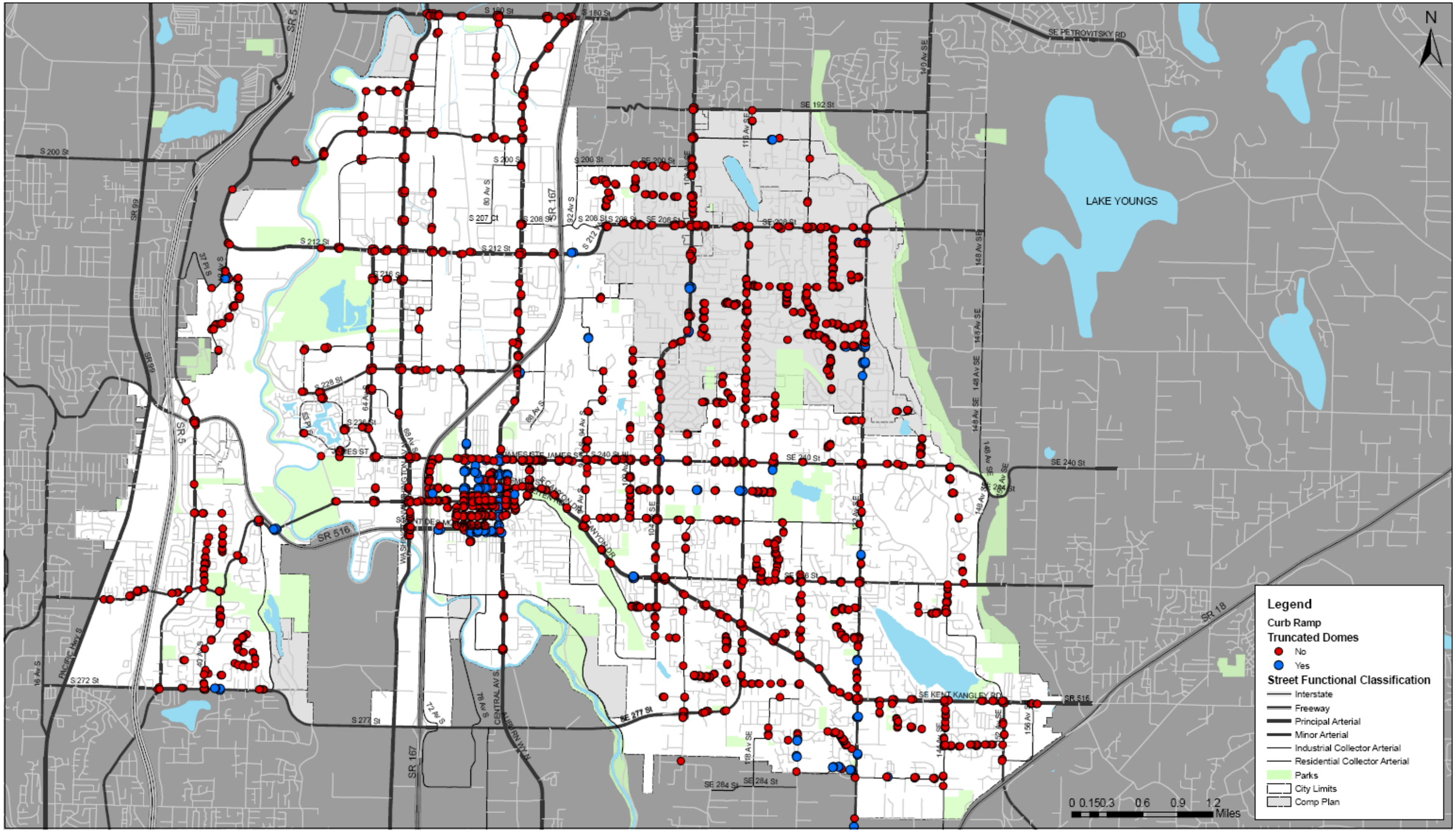


Figure Q
Existing Curb Ramps - Truncated Domes

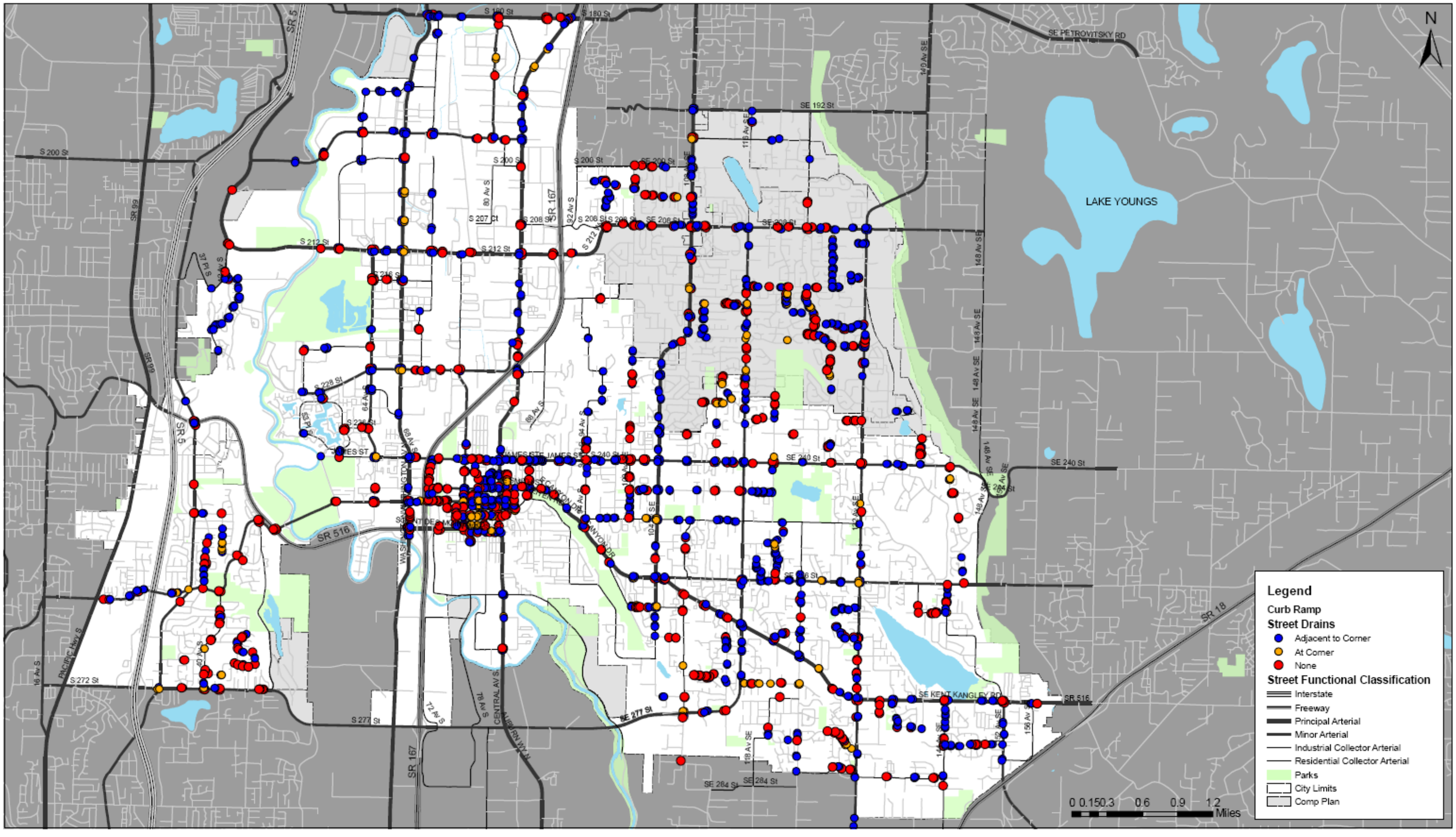


Figure R
Existing Curb Ramps - Street Drains

Appendix B

ACCESSIBILITY INDEX MAPPING

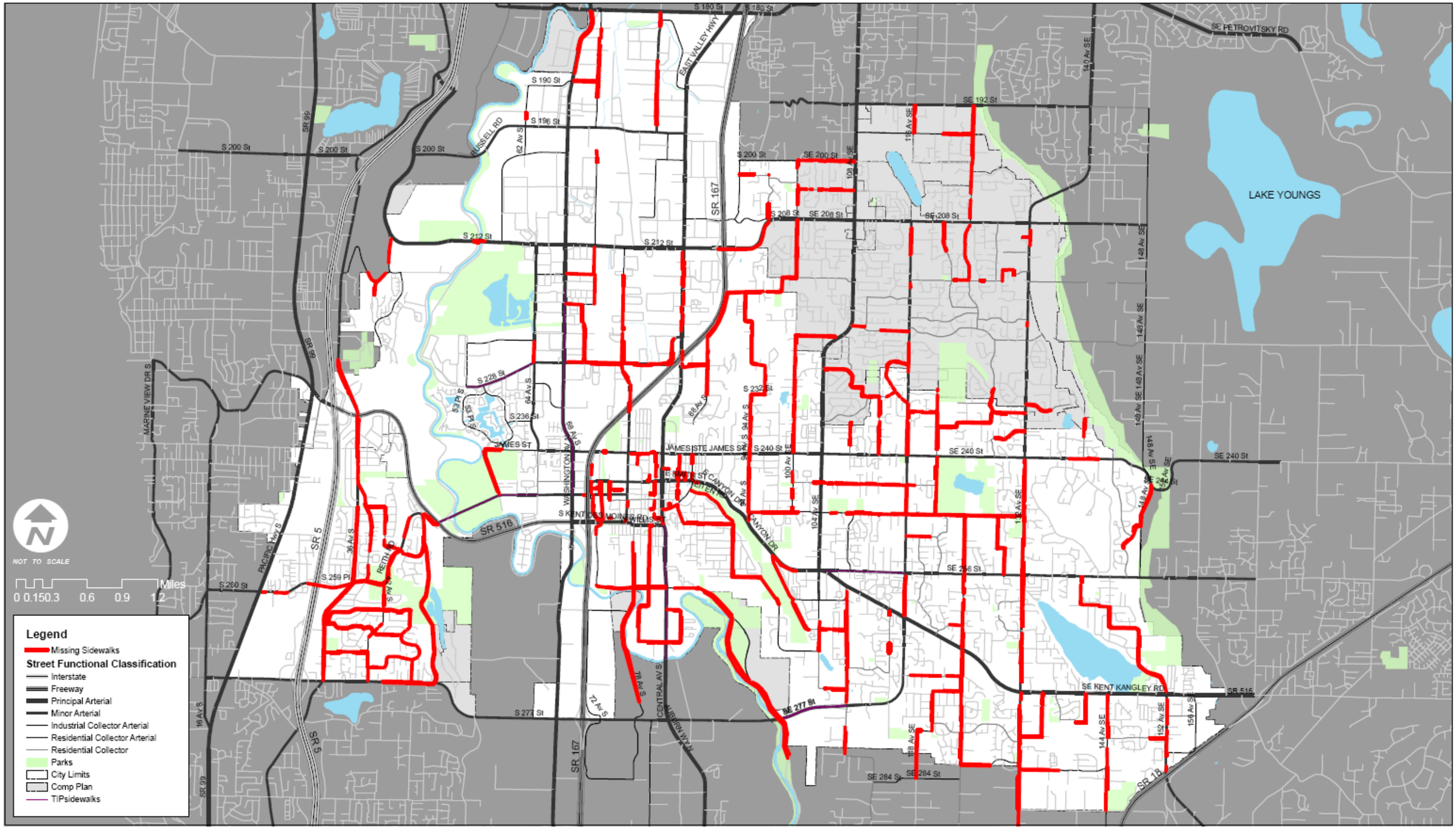


Figure 1a

Attribute Index - Missing Sidewalks on Arterials/Collectors

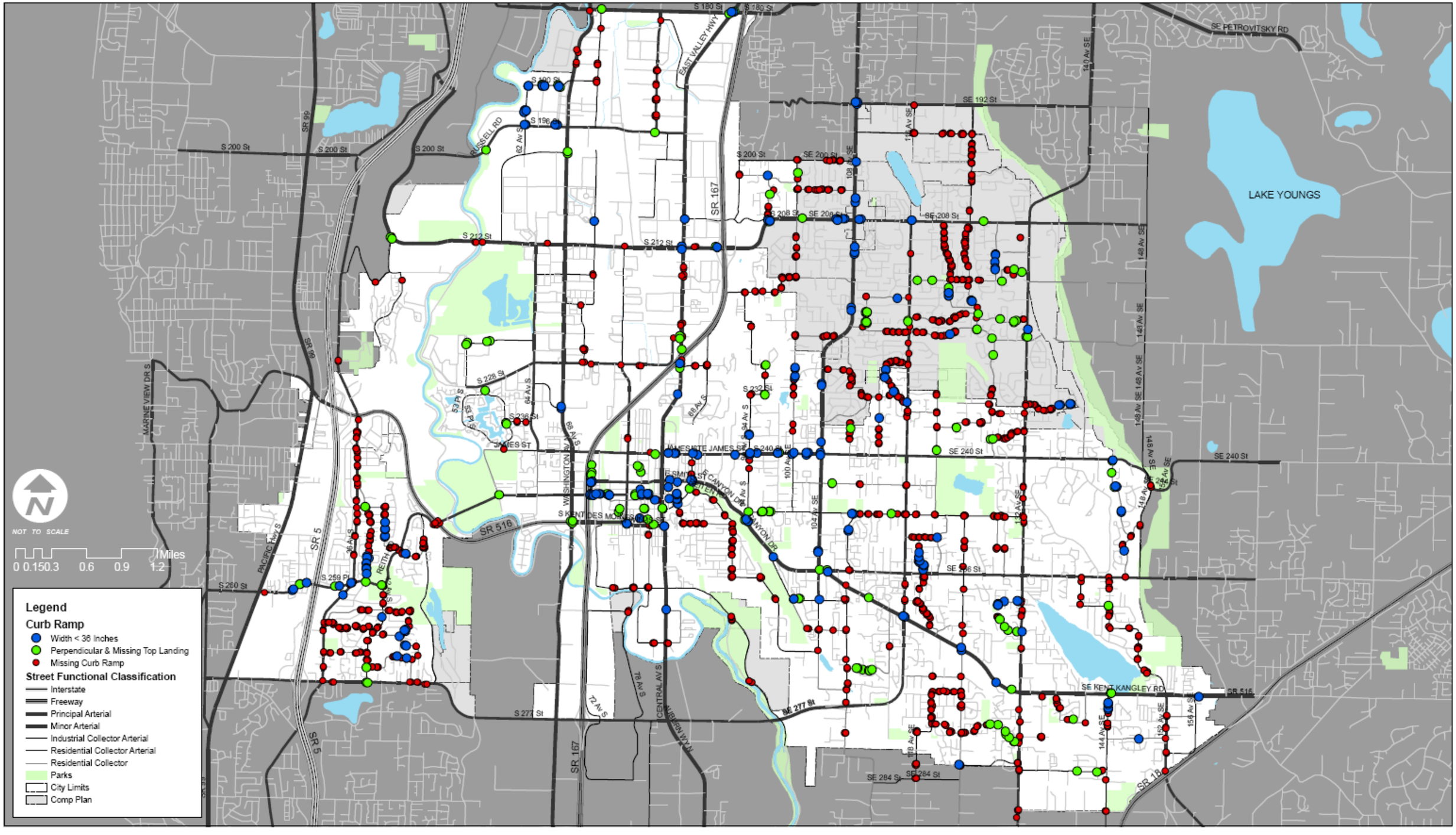


Figure 1b
Attribute Index - Curb Ramps

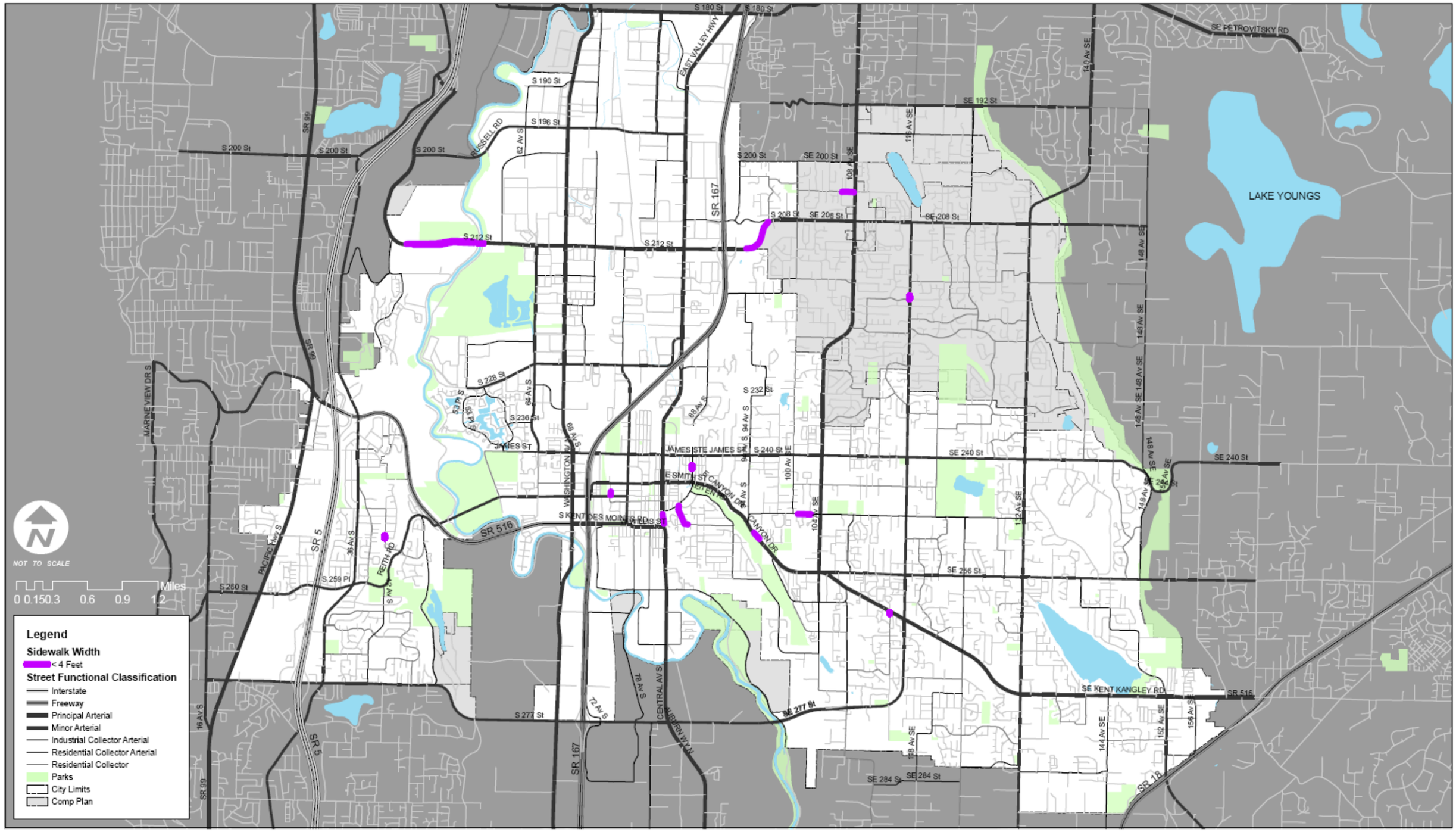


Figure 2
Attribute Index - Width Is Less Than 4 Feet

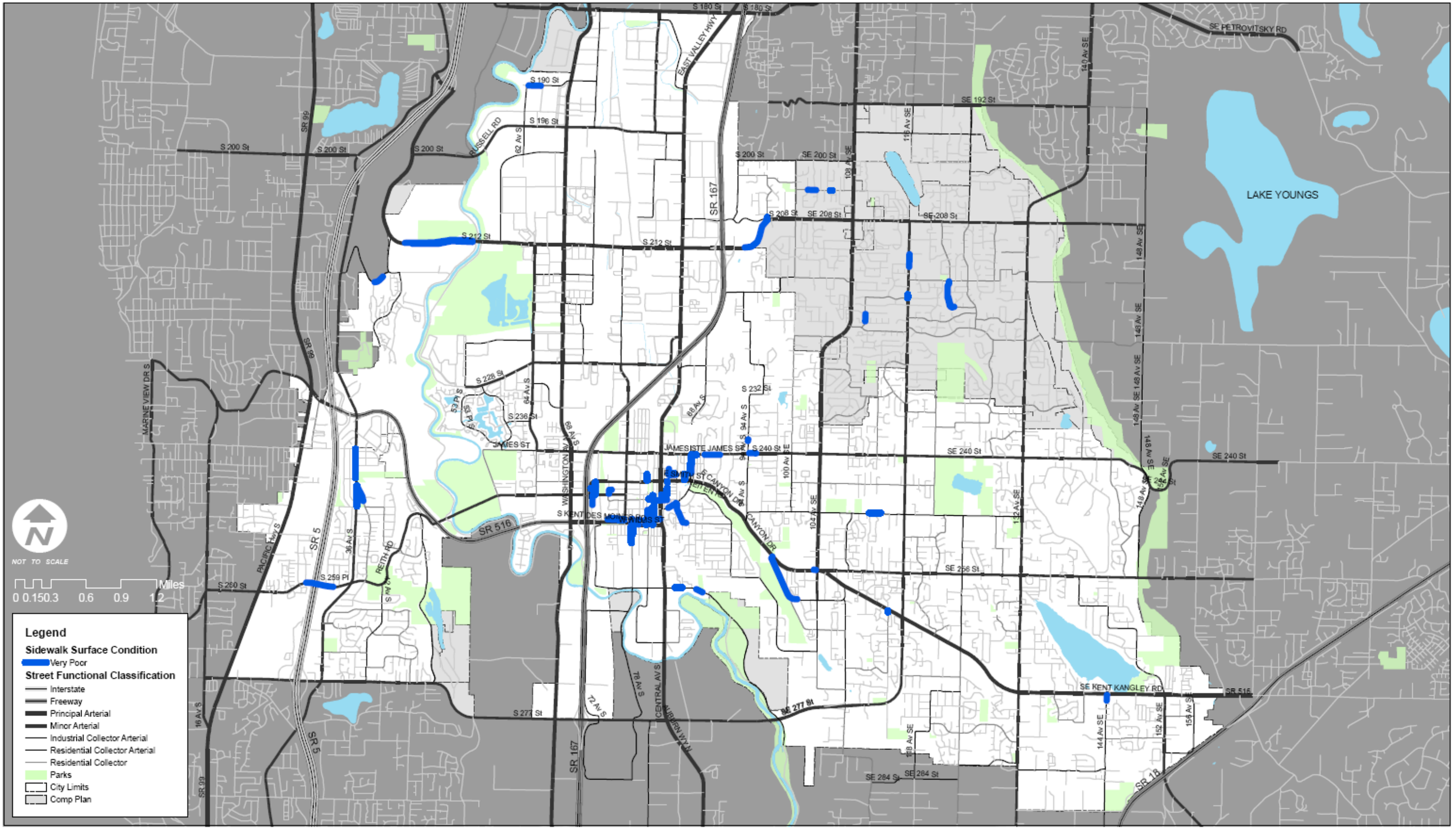


Figure 3
Attribute Index - Surface Condition is Very Poor

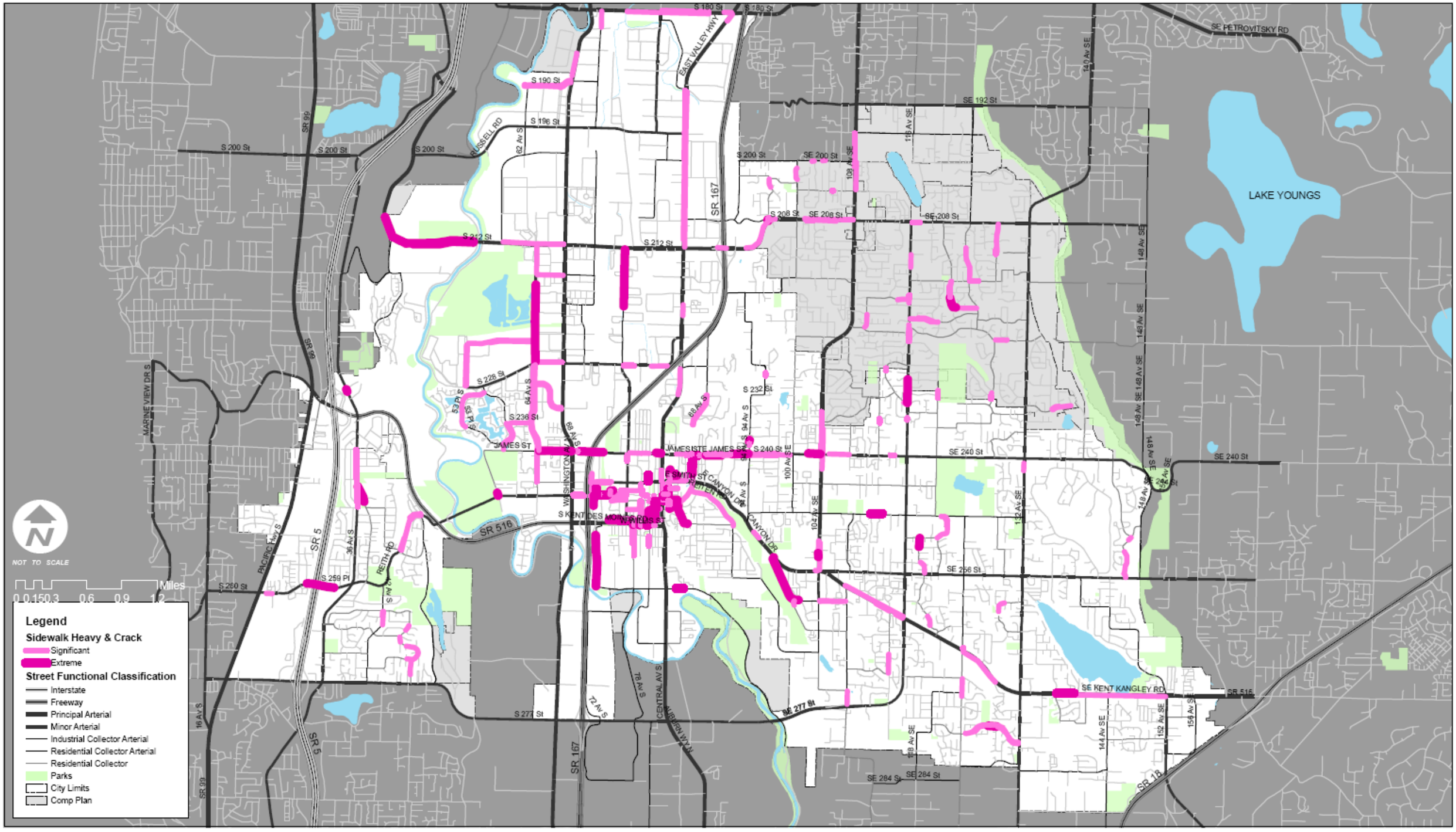


Figure 4
Attribute Index - Heave & Crack

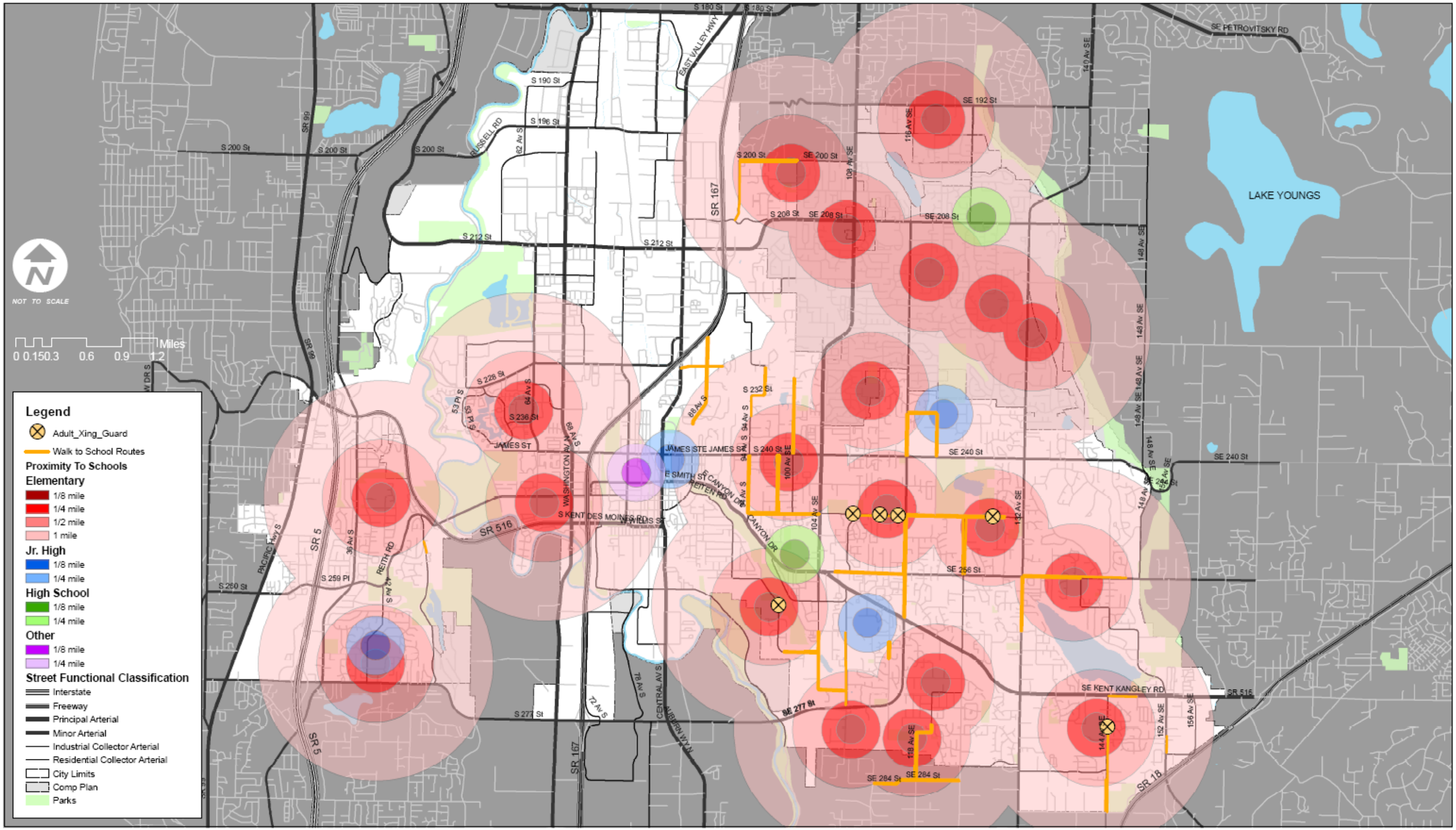


Figure 5

Accessibility Index - Proximity to Schools, Walk to School Routes, & School Crossings

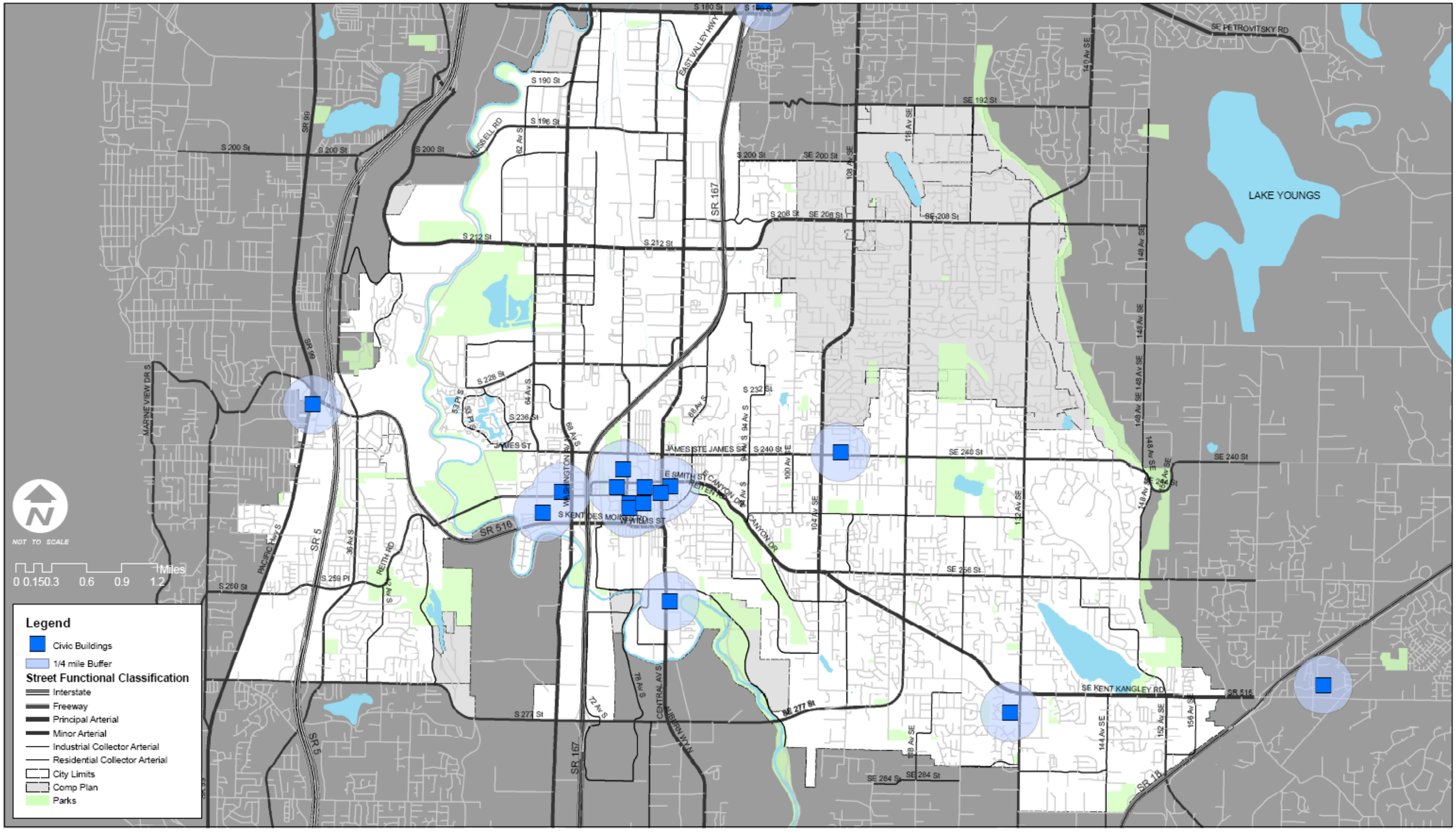


Figure 6
Accessibility Index - Civic Buildings

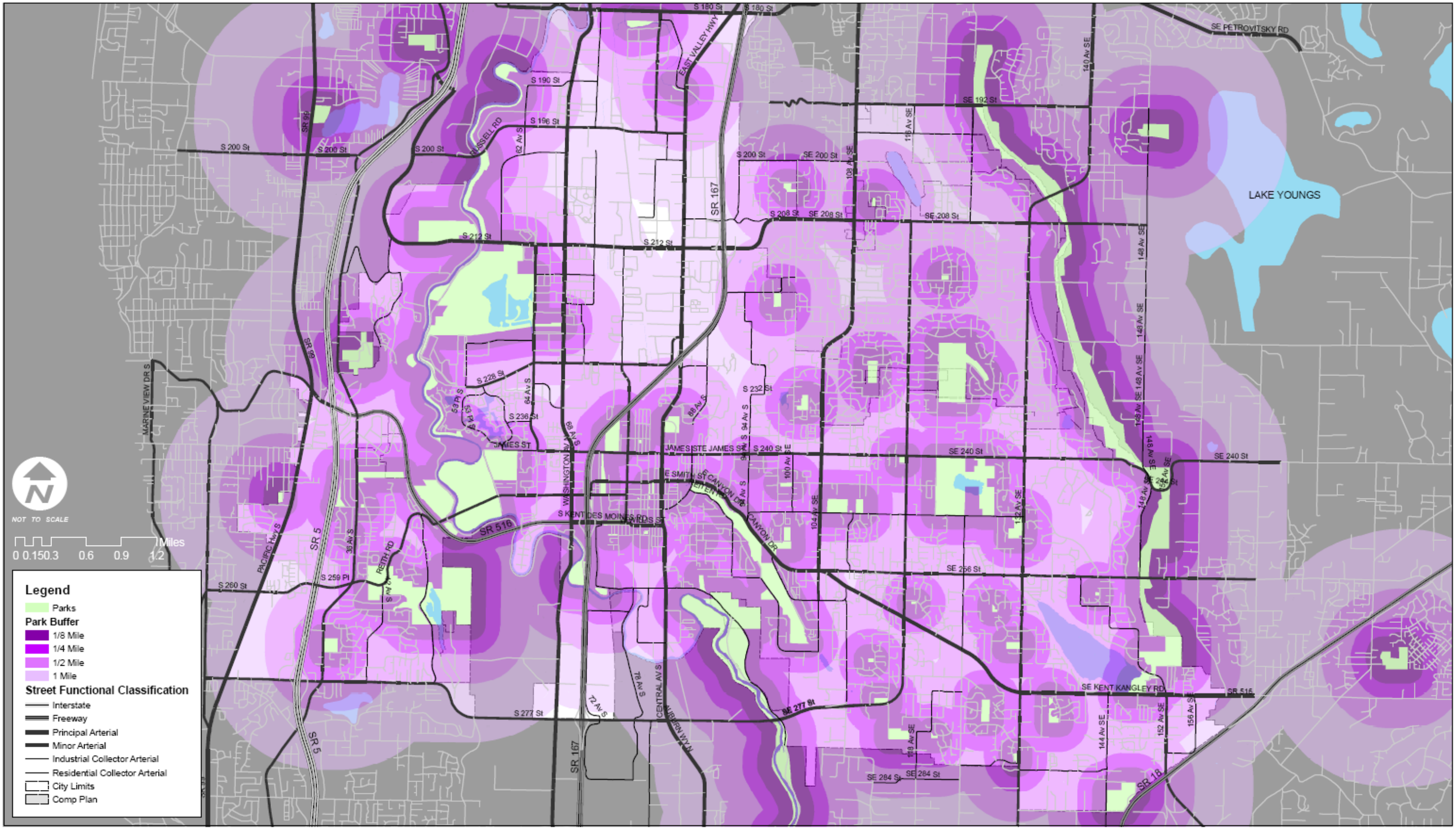


Figure 7
Accessibility Index - Parks

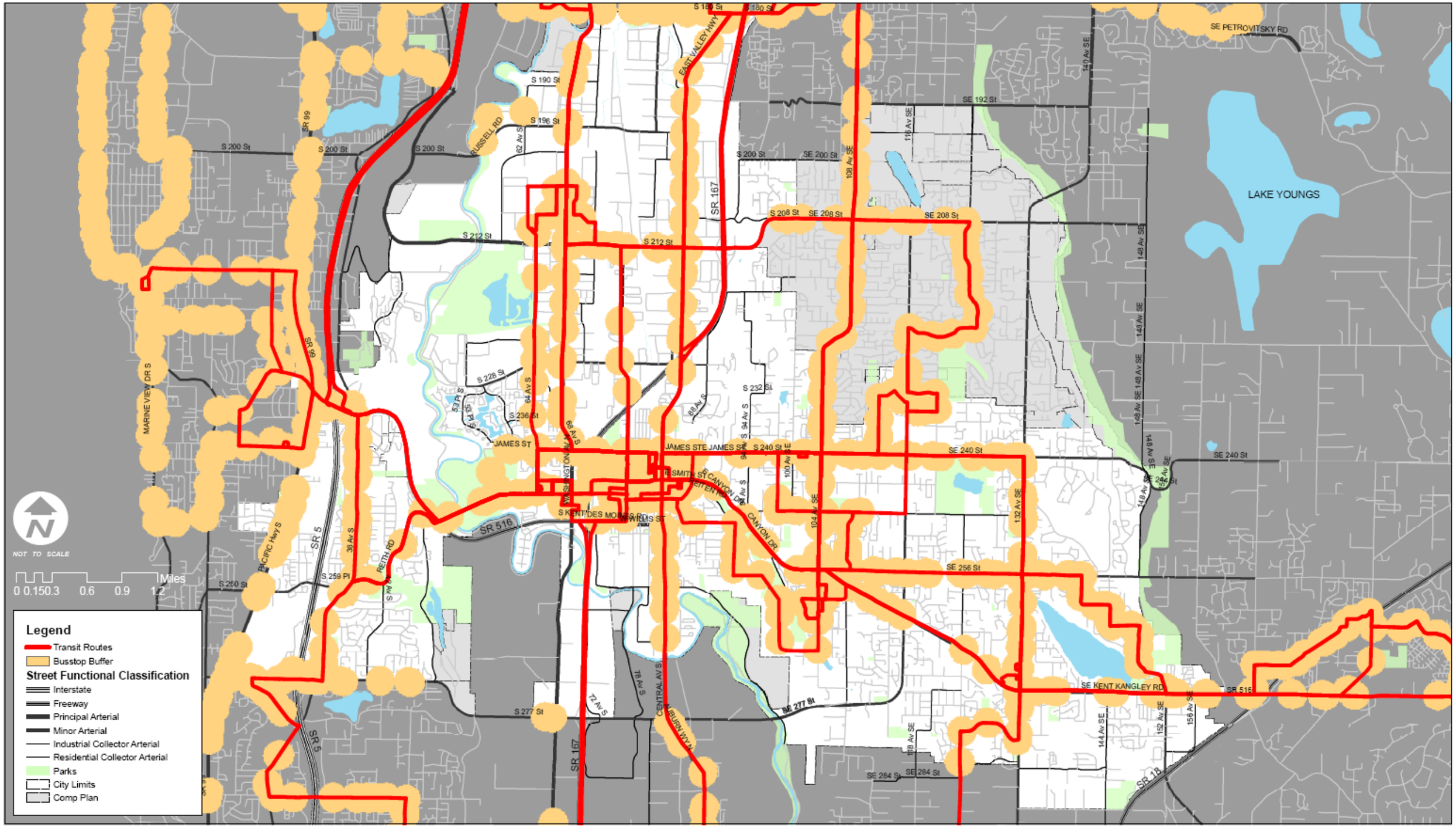


Figure 8
Accessibility Index - Transit Routes and Stops

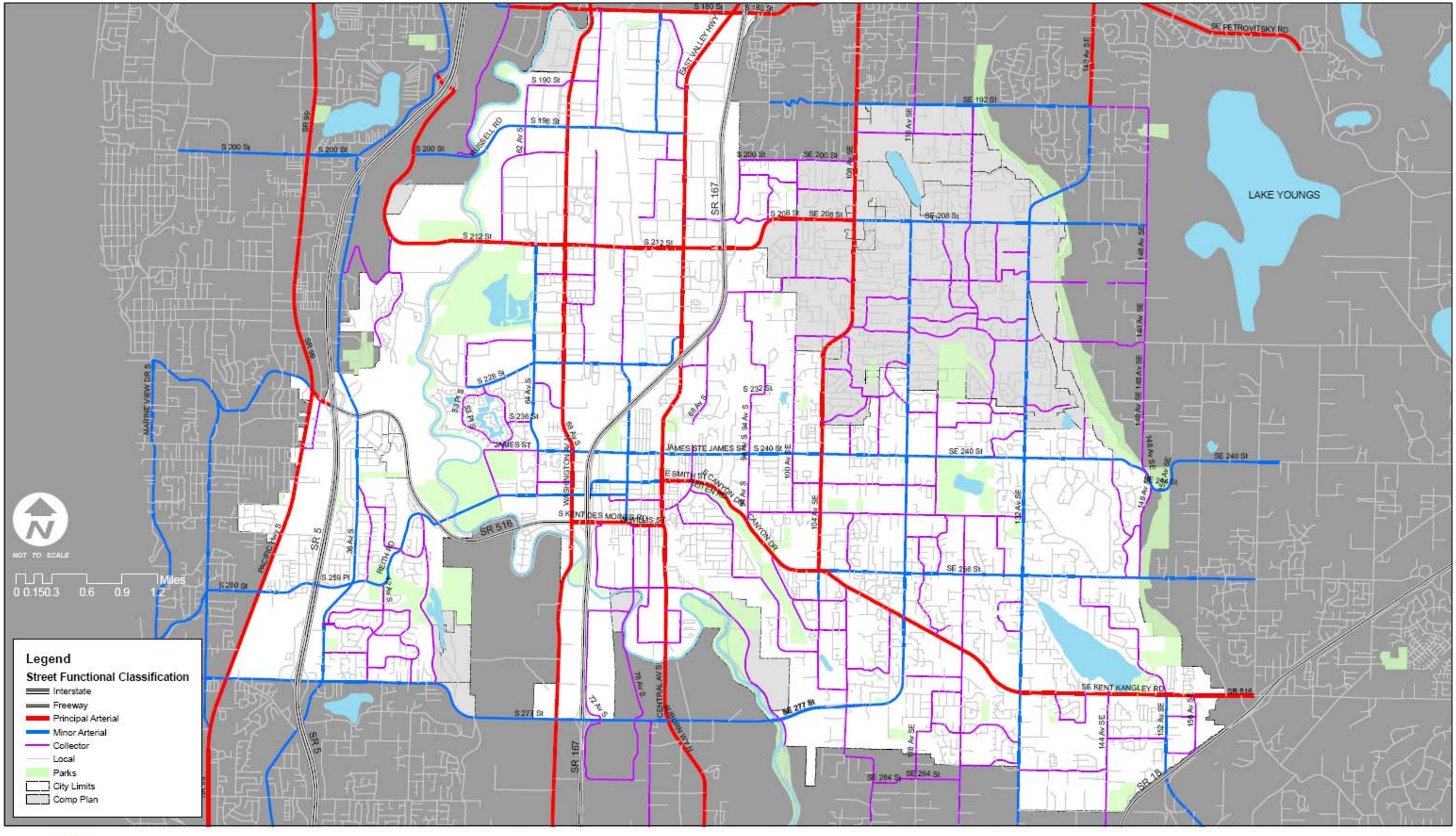


Figure 9
Accessibility Index - Functional Classification

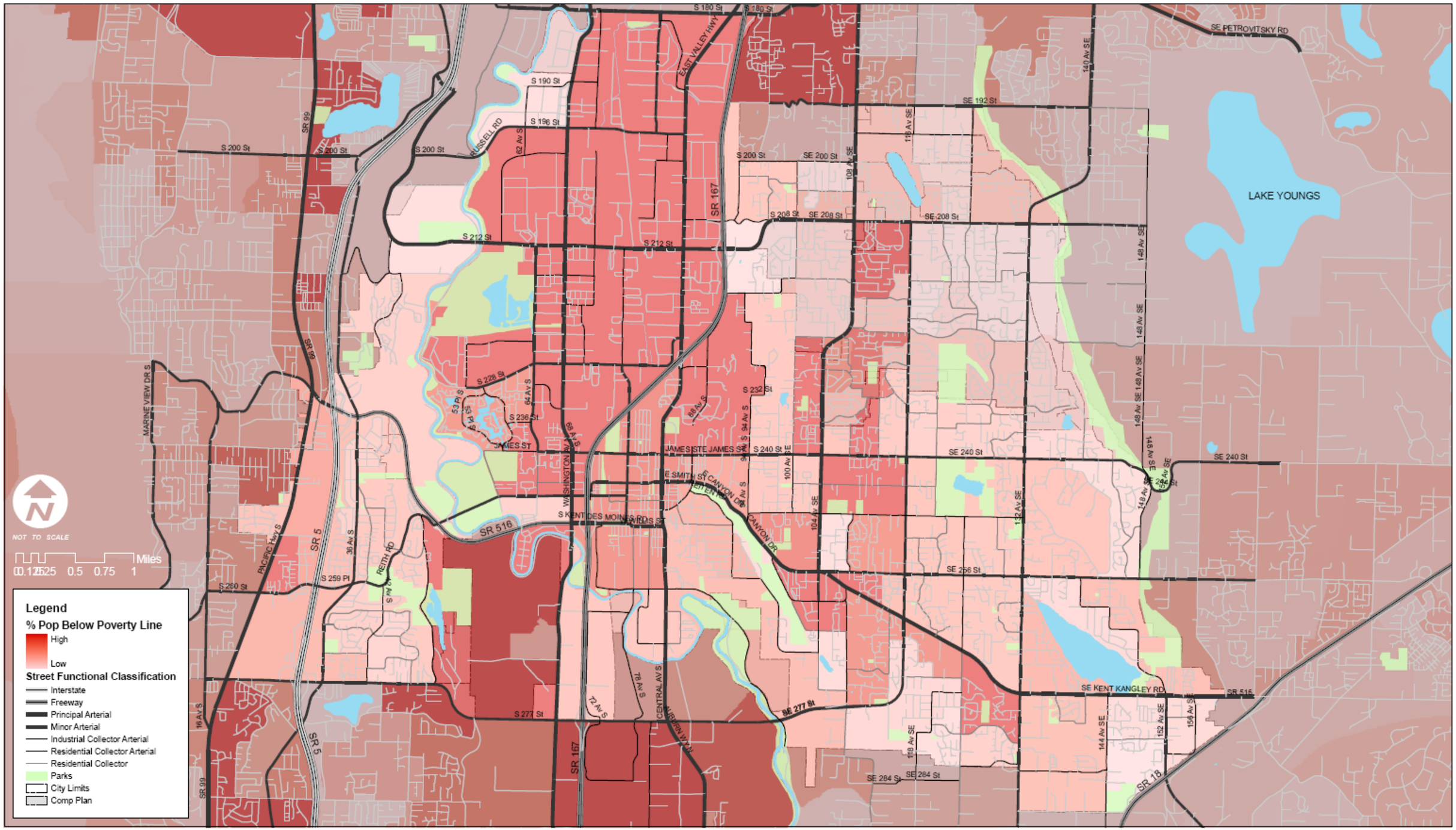


Figure 10
Accessibility Index - % of Population Below Poverty Line by Census Tract

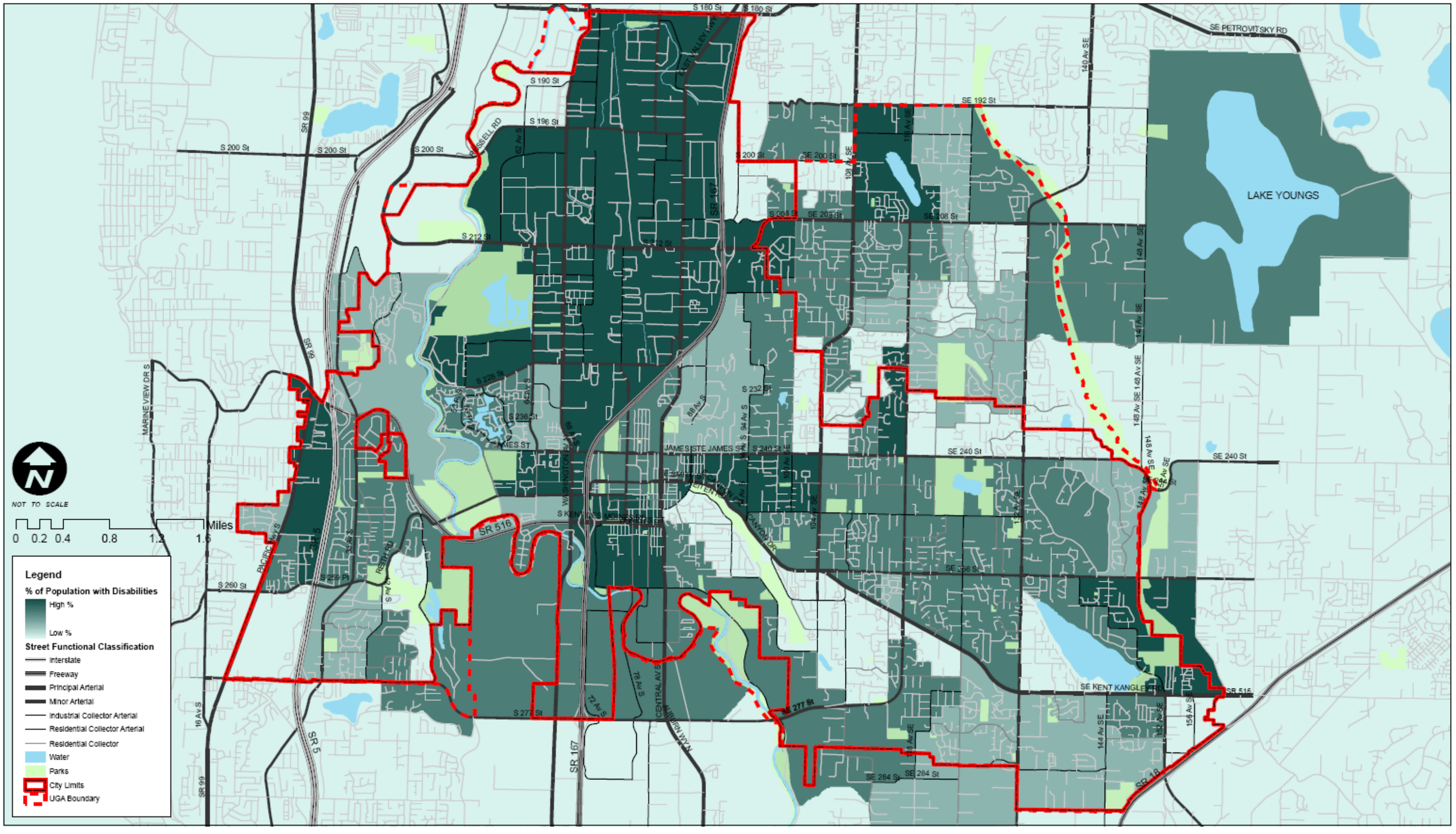


Figure 11
Accessibility Index - % of Population with Disabilities by Block Group

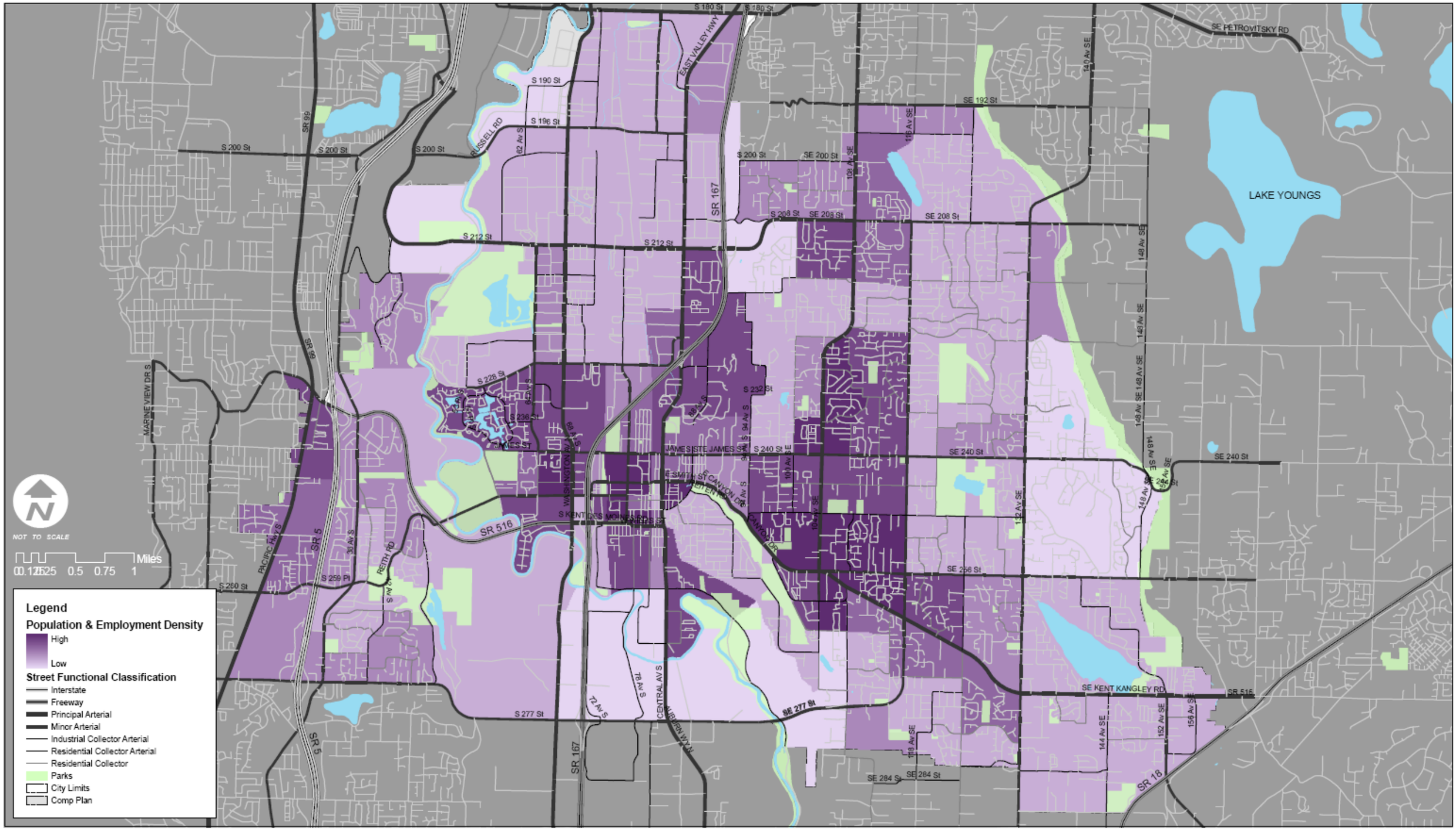


Figure 12
Accessibility Index - Population & Employment Density by Block Group

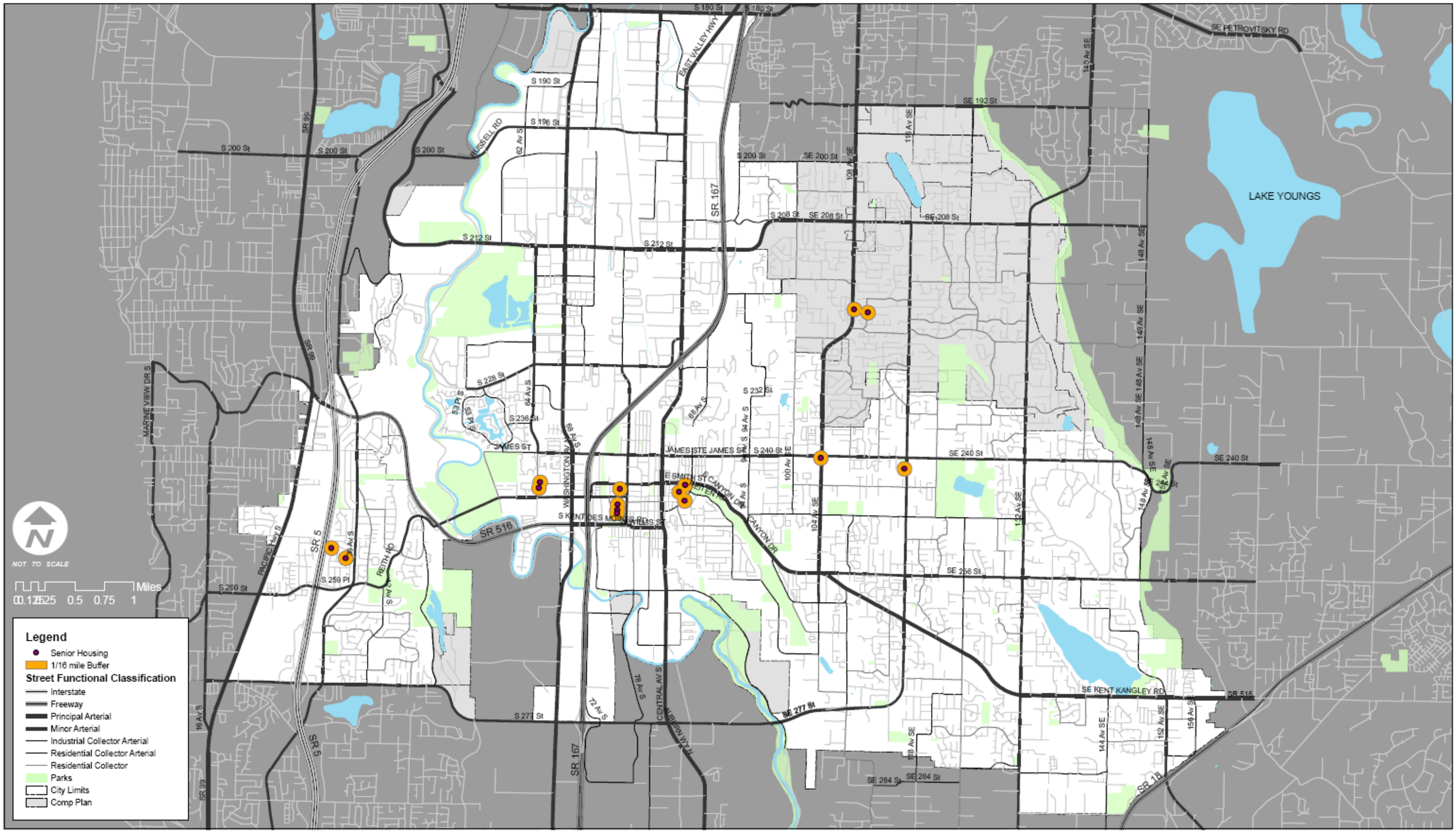


Figure 13
Accessibility Index - Senior Housing

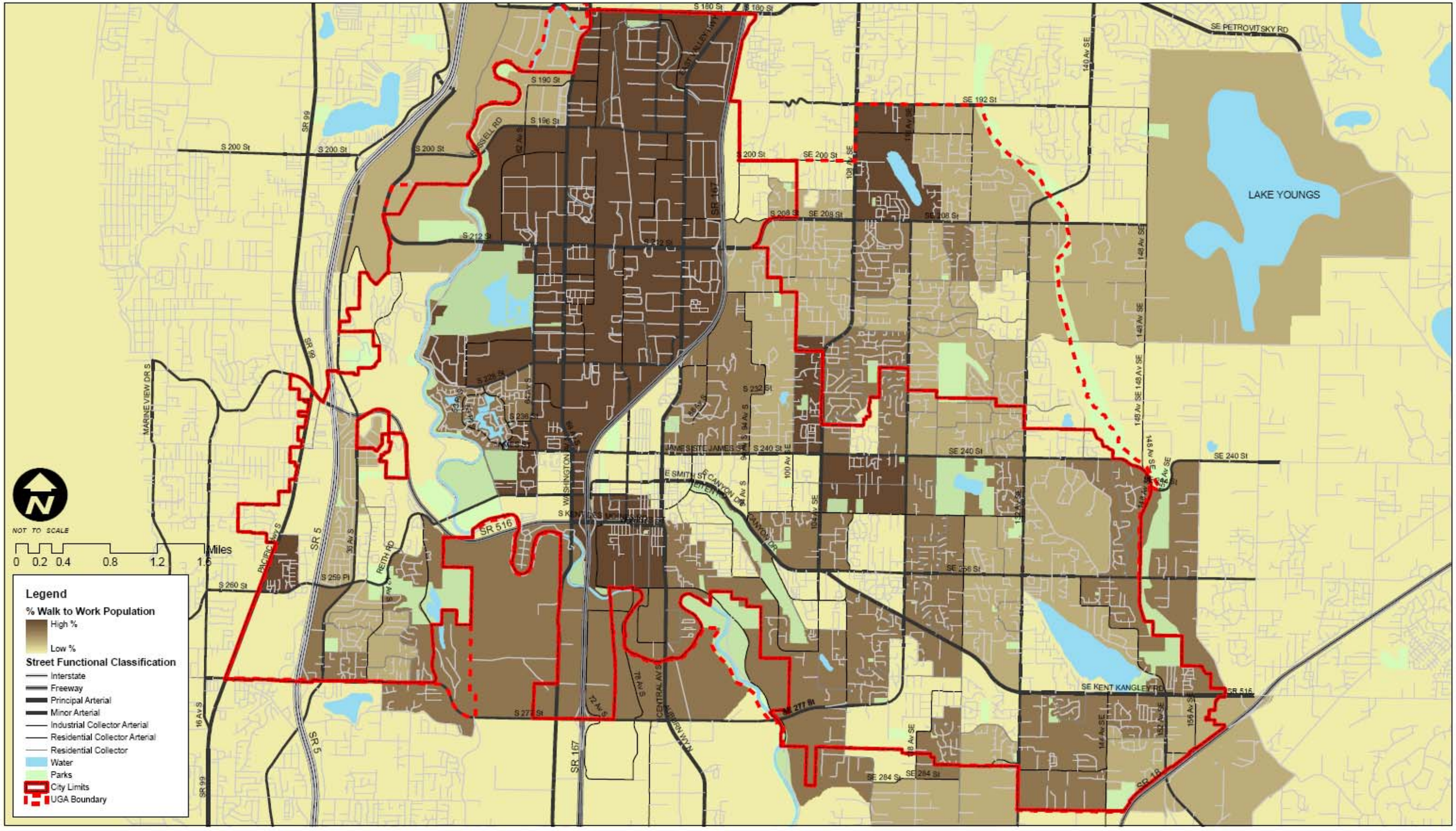


Figure 14
Accessibility Index - % of Population that Walks to Work by Block Group