APPENDIX B.

PROJECT PRIORITIZATION

Appendix B. Project Prioritization

Prioritization Summary

Prioritizing projects helps guide investments toward projects that provide the greatest benefits. In addition, the prioritization process can help identify projects and their applicability to different grant and funding opportunities.

Projects were prioritized using the following factors:

- Access to Key Destinations
- Safety
- Equity
- For bicycle projects: connectivity and comfort

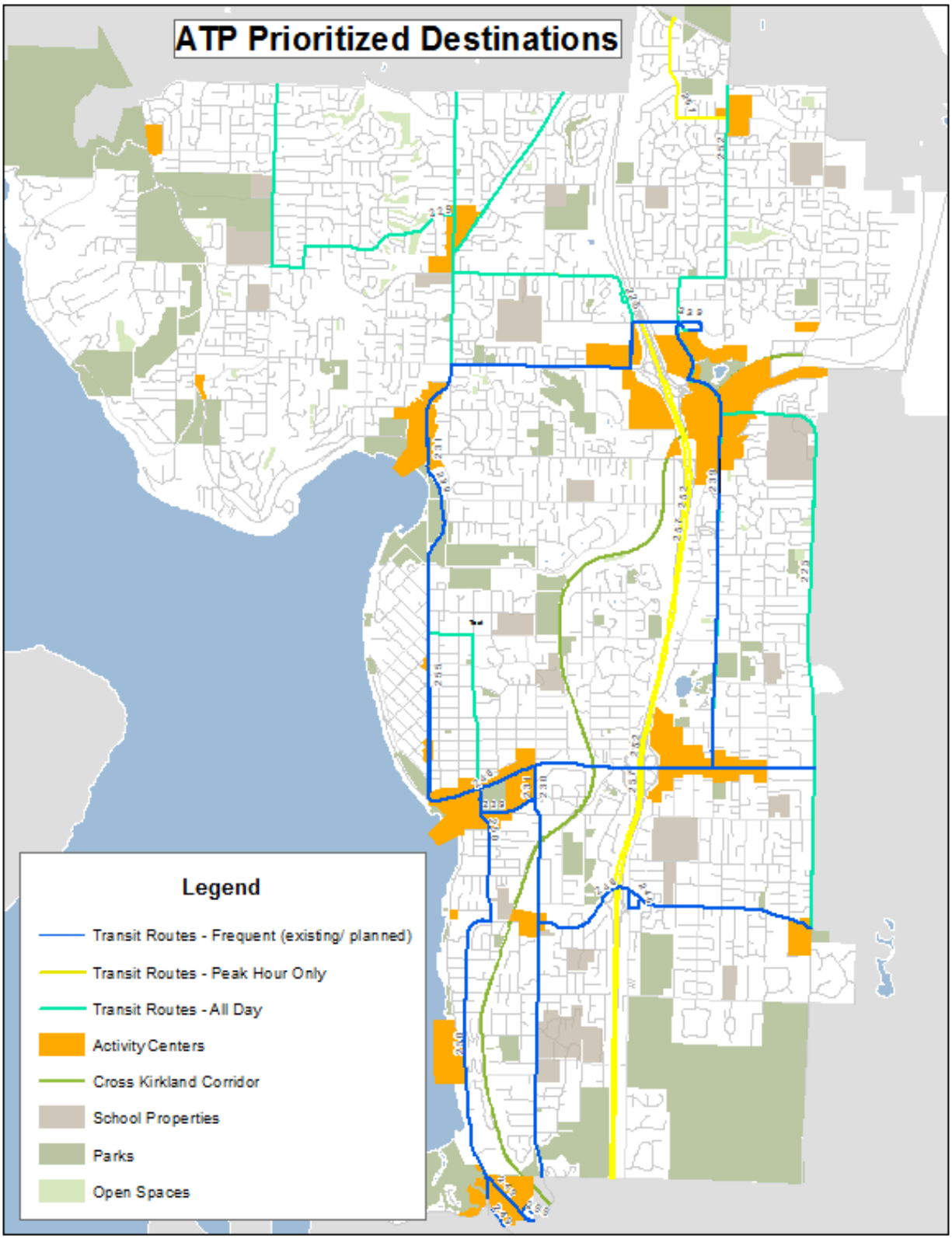
Safety is evaluated using weighted crashes on a per mile basis (sliding window analysis).

Bicycle comfort and connectivity is measured through the level of traffic stress and bike network analysis.

Access to Key Destinations

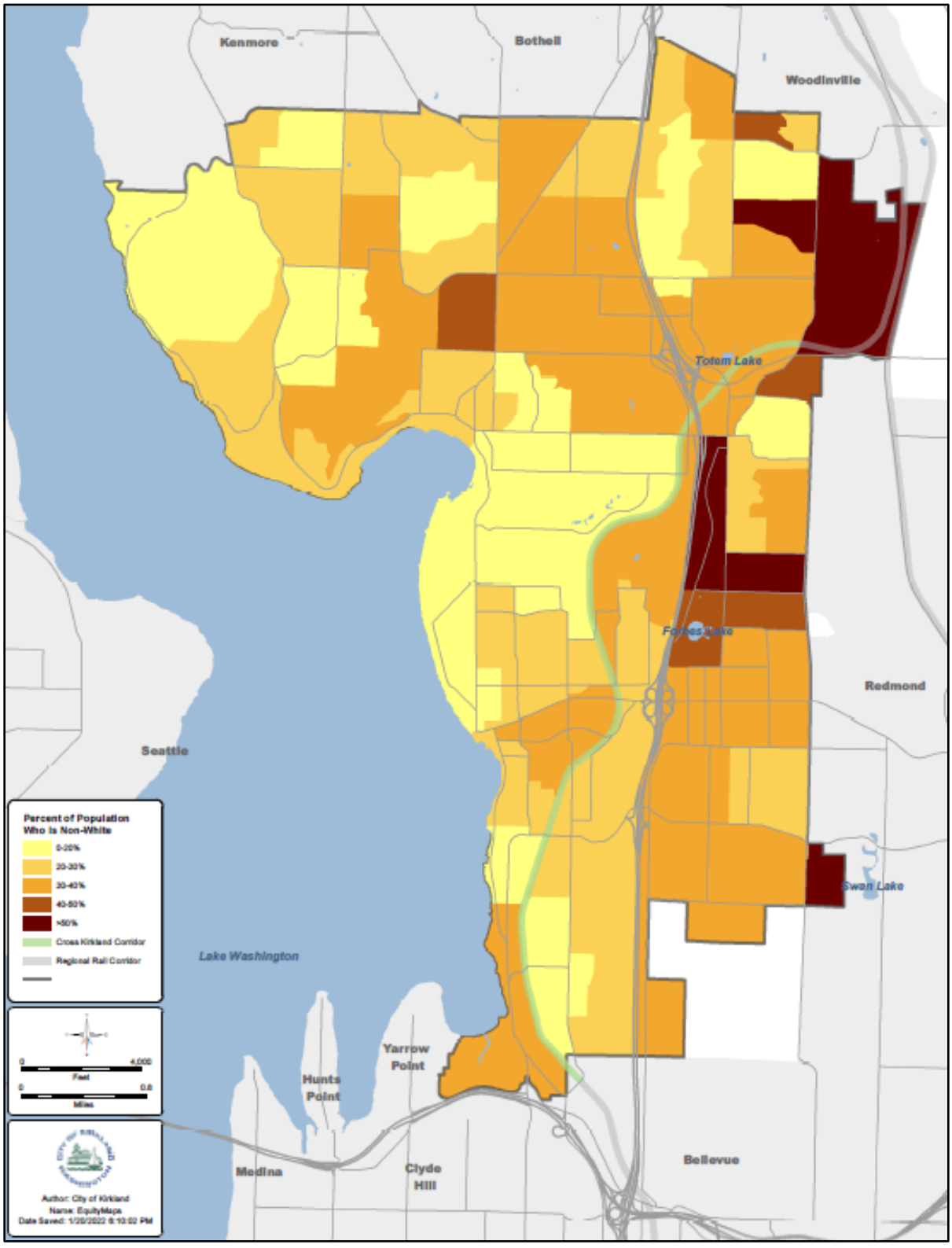
Both bicycle network and pedestrian network recommendations were prioritized by access to:

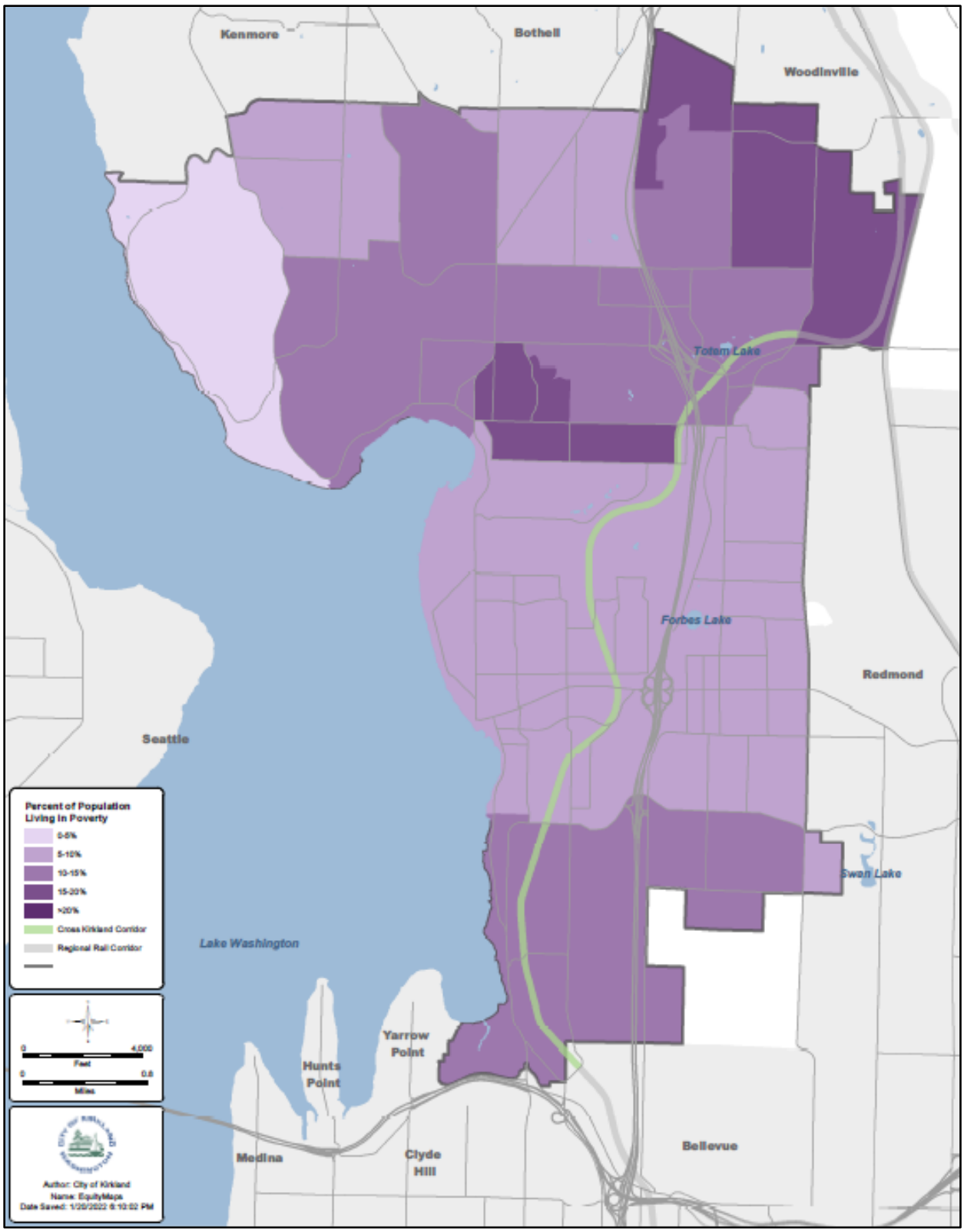
- Activity centers - zoned for commercial and mixed-use land uses
- Transit - routes that are more frequent were prioritized higher than other transit routes but all transit routes were included
- Parks and Cross Kirkland Corridor
- Schools - schools were included as access points for the bike network prioritization and pedestrian projects received a higher score when overlapping with the Safer Routes to School Action Plan recommended projects


ATP Prioritized Destinations
Legend
Transit Routes - Frequent (existing/ planned)
Transit Routes - Peak Hour Only
Transit Routes - All Day
Activity Centers
Cross Kirkland Corridor
School Properties
Parks
Open Spaces

Equity Analysis

For both the bike and pedestrian prioritization, equity was also a key component. Areas with higher concentration of people of color, people with low-incomes, people with disabilities were prioritized.




Kenmore
Bothell
Woodinville
Totem Lake
Forbes Lake
Redmond
Seattle
Lake Washington
Yarrow Point
Hunts Point
Medina
Clyde Hill
Bellevue
Swan Lake
Percent of Population Living in Poverty
0-5%
5-10%
10-15%
15-20%
>20%
Cross Kirkland Corridor
Regional Rail Corridor
0
4,000
Feet
0
0.8
Miles
Author: City of Kirkland
Name: EquityMaps
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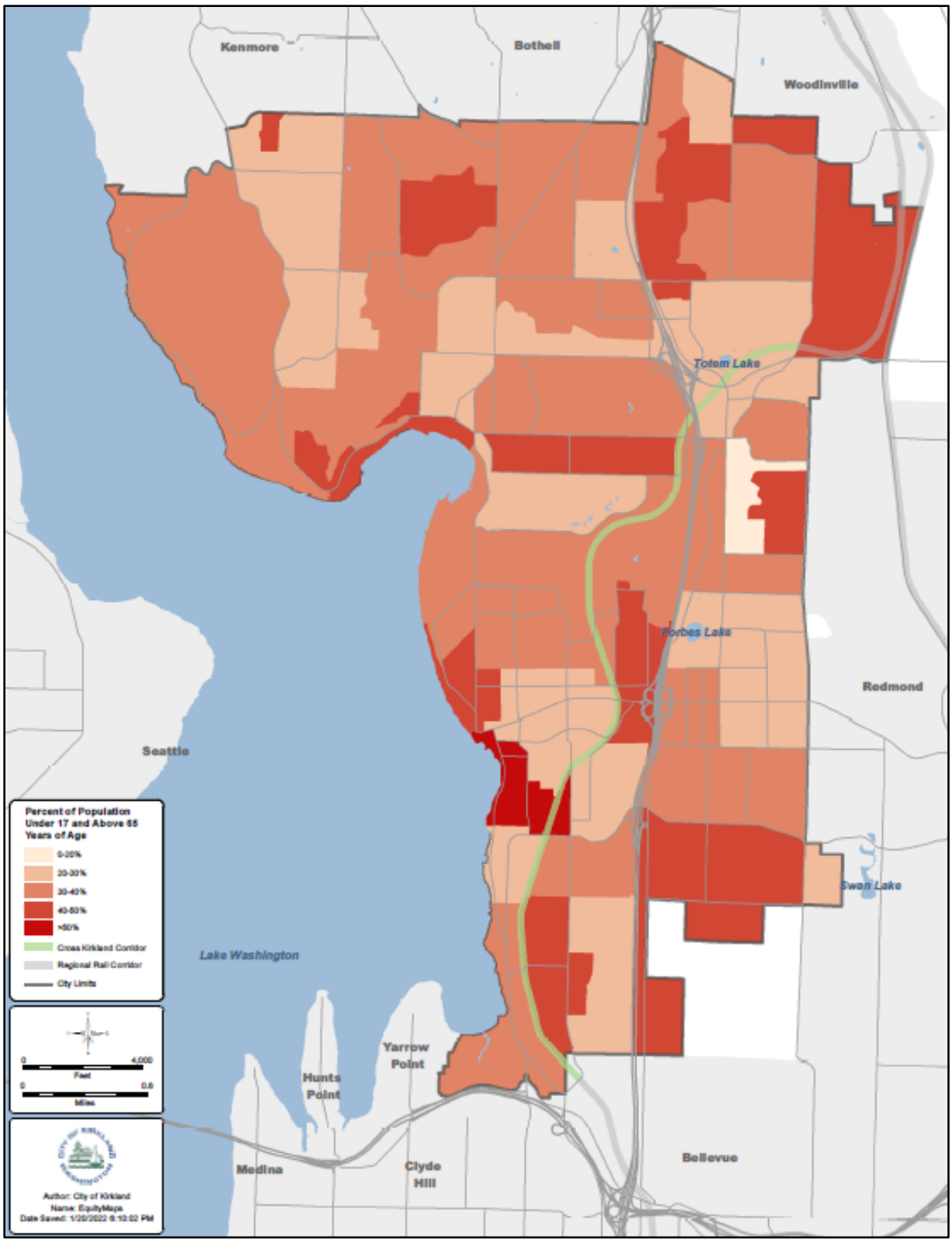
Kenmore
Bothell
Woodinville
Totem Lake
Forbes Lake
Redmond
Seattle
Lake Washington
Swan Lake
Yarrow Point
Hunts Point
Medina
Clyde Hill
Bellevue
Percent of Population Under 17 and Above 65 Years of Age
0-20%
20-30%
30-40%
40-50%
>50%
Cross Kirkland Corridor
Regional Rail Corridor
City Limits
0
4,000
Feet
0
0.8
Miles
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Name: EquityMaps
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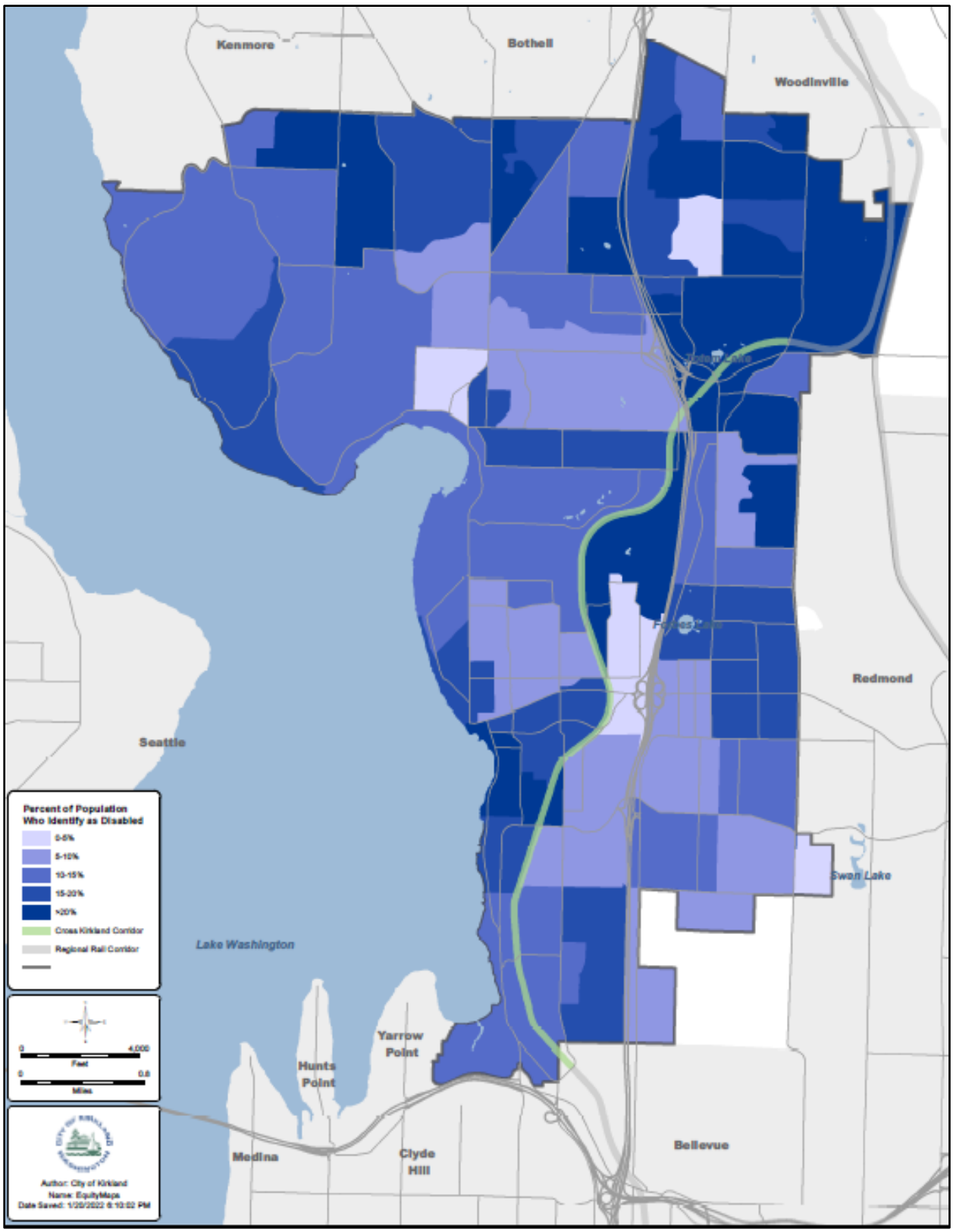

Kenmore
Bothell
Woodinville
Redmond
Seattle
Lake Washington
Yarrow Point
Hunts Point
Medina
Clyde Hill
Bellevue
Swan Lake
Percent of Population Who Identify as Disabled
0-5%
5-10%
10-15%
15-20%
>20%
Cross Kirkland Corridor
Regional Rail Corridor
0
4,000
Feet
0
0.8
Miles
Author: City of Kirkland
Name: EquityMaps
Date Saved: 1/20/2022 6:10:02 PM

Walking Access to Frequent Transit and Activity Centers

Approach

Access to frequent transit stops and activity centers is measured based on a typical, albeit slow, walking speed for average, able bodied adults. Specifically, this is measured at 4 ft per second means that for most people walking slowly, they will travel almost a half a mile in about 10-minutes.

Frequent Transit Access Results

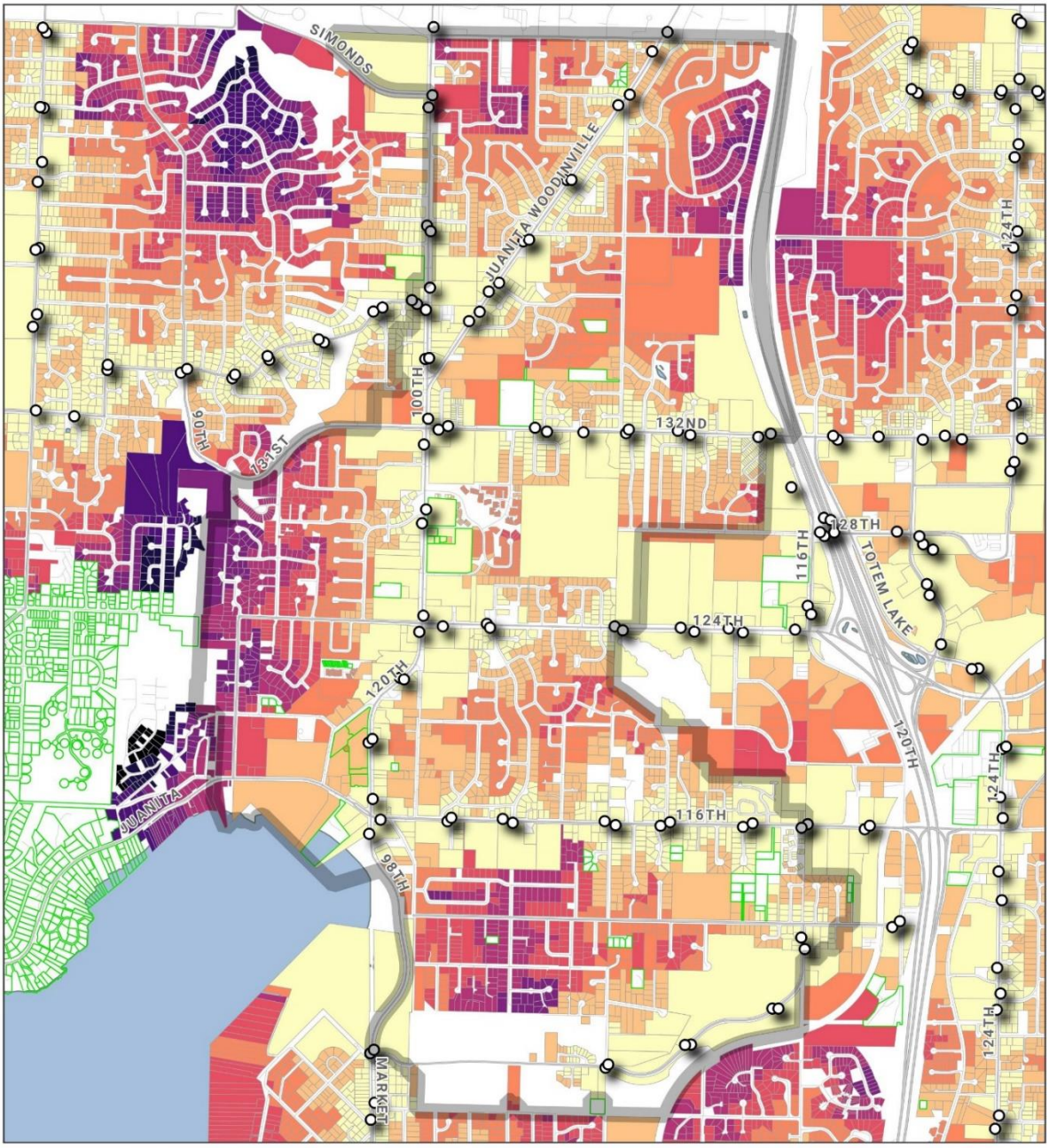
The results of the analysis using the typical adult pedestrian model are displayed in maps to highlight the reach of the pedestrian network in each neighborhood. The walk shed maps are arranged with the same yellow-to-black color scheme and green highlights.

Activity Center Access Results

Using the same typical-pedestrian model, access to Activity Centers was modeled. The Activity Centers are composed of clusters of commercial properties identified by City staff. Clusters were automatically identified using a 50-foot distance threshold. There were some commercial properties which were isolated and not part of a cluster. These have been retained as their own activity center.

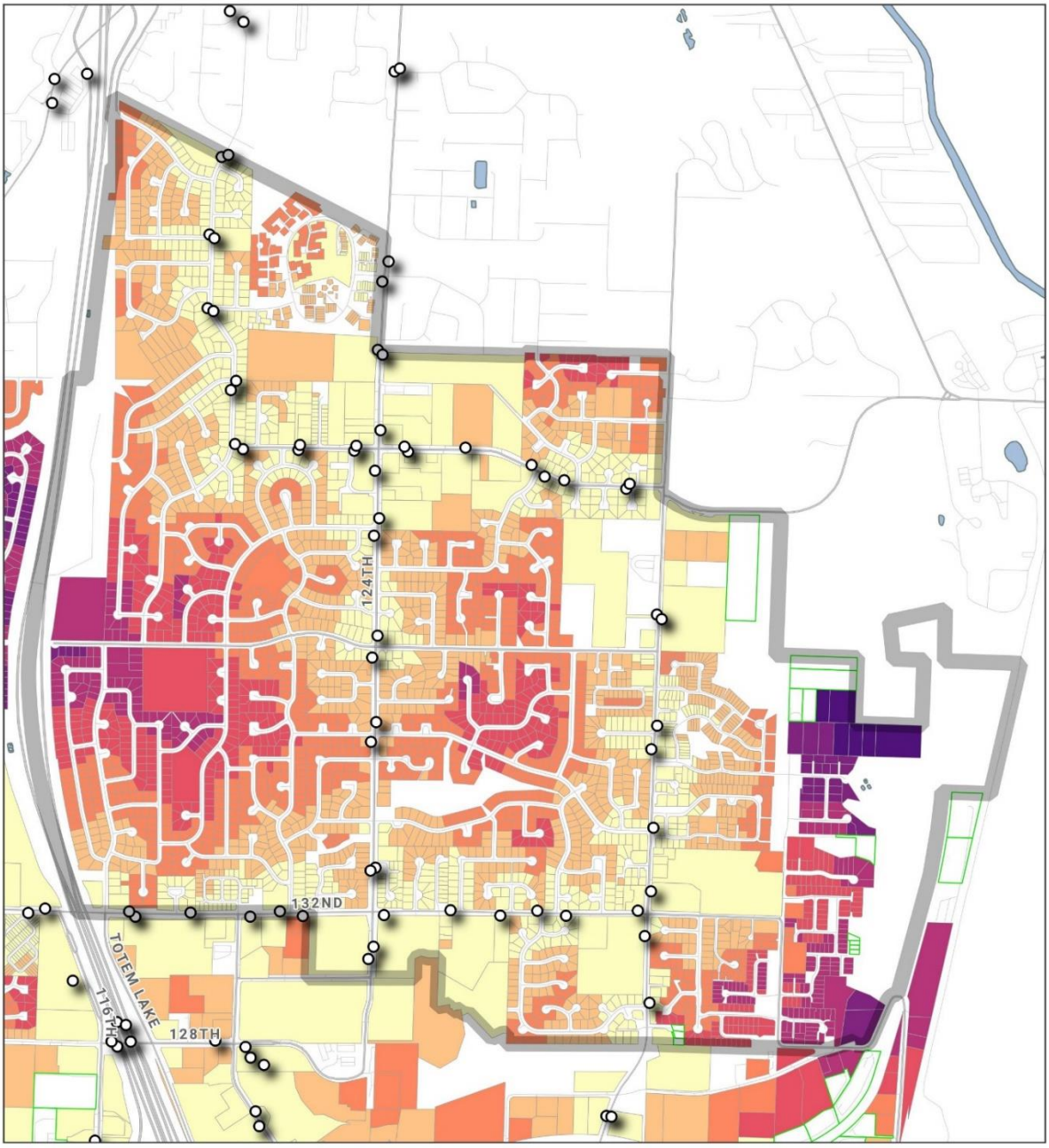
City of Kirkland

Walk Access to Frequent Transit



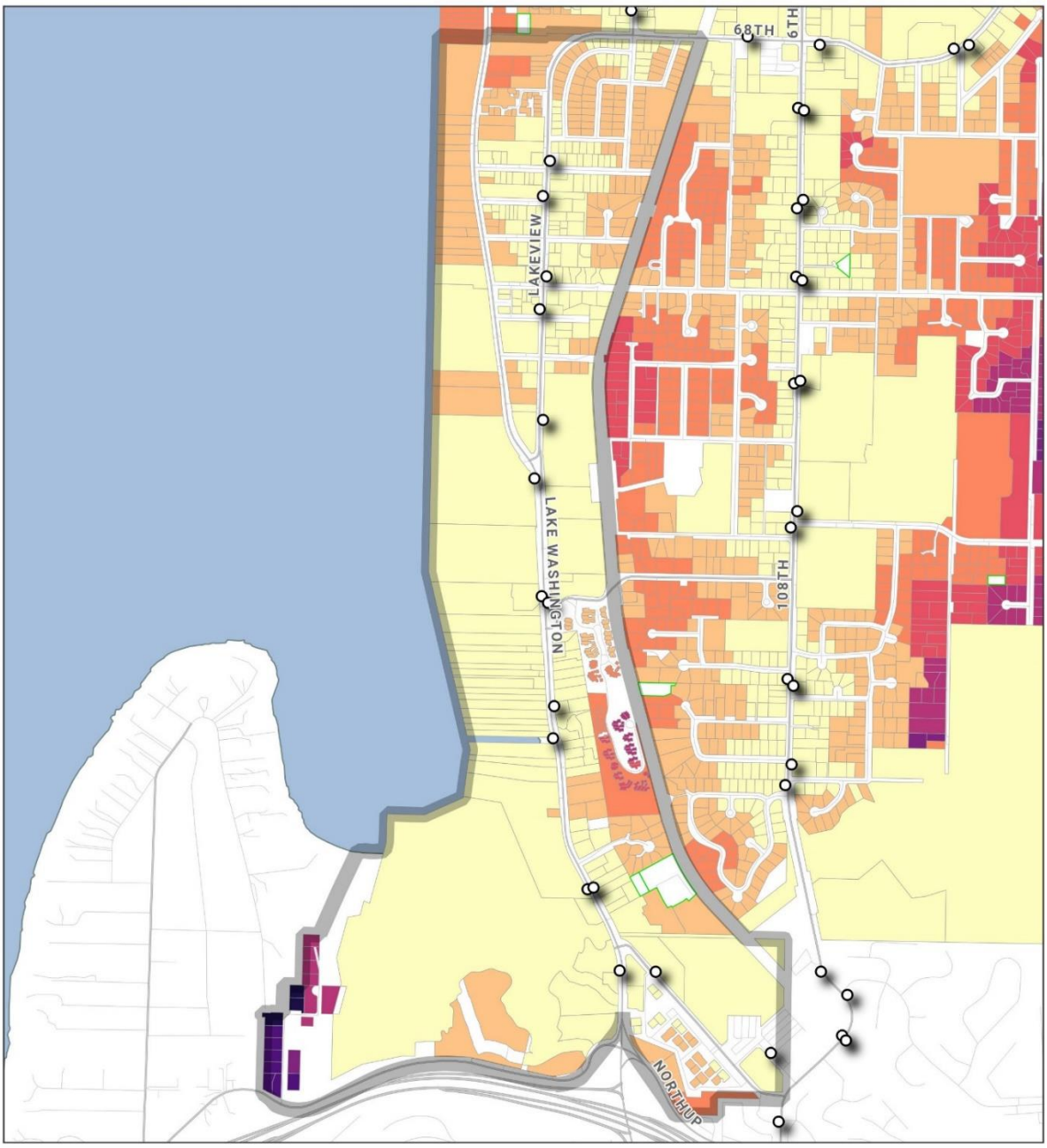
City of Kirkland

Walk Access to Frequent Transit



City of Kirkland

Walk Access to Frequent Transit



LWSD bus stops

Parcels with reduced or no access

Lakeview neighborhood

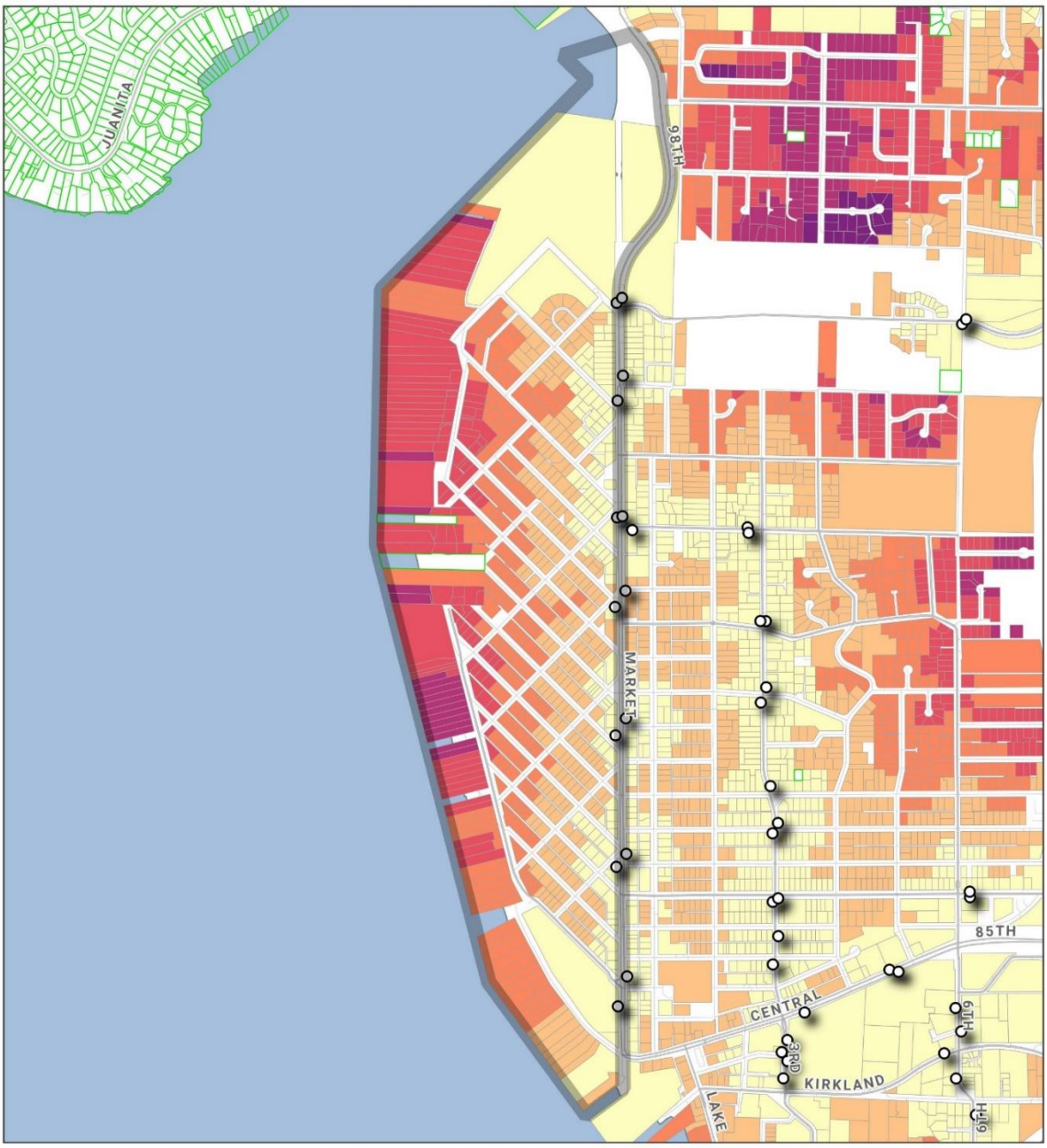
Distance from bus stop

0 mi 1/2 mi 1 mi

0 0.25 0.5 mi

City of Kirkland

Walk Access to Frequent Transit



LWSD bus stops

Parcels with reduced or no access

Market neighborhood

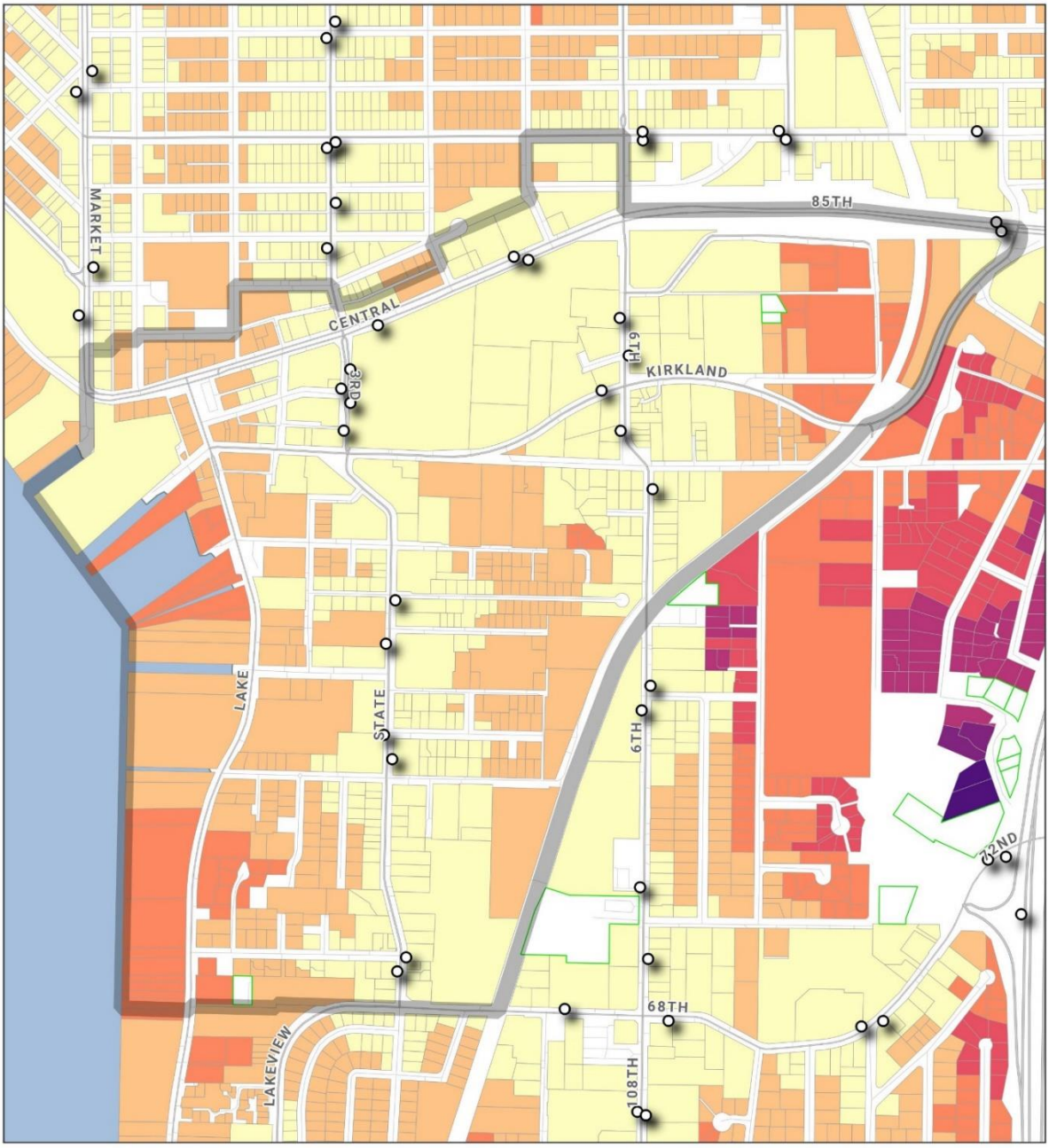
Distance from bus stop

0 mi 1/2 mi 1 mi

0 0.25 0.5 mi

City of Kirkland

Walk Access to Frequent Transit



LWSD bus stops

Parcels with reduced or no access

Moss Bay neighborhood

Distance from bus stop

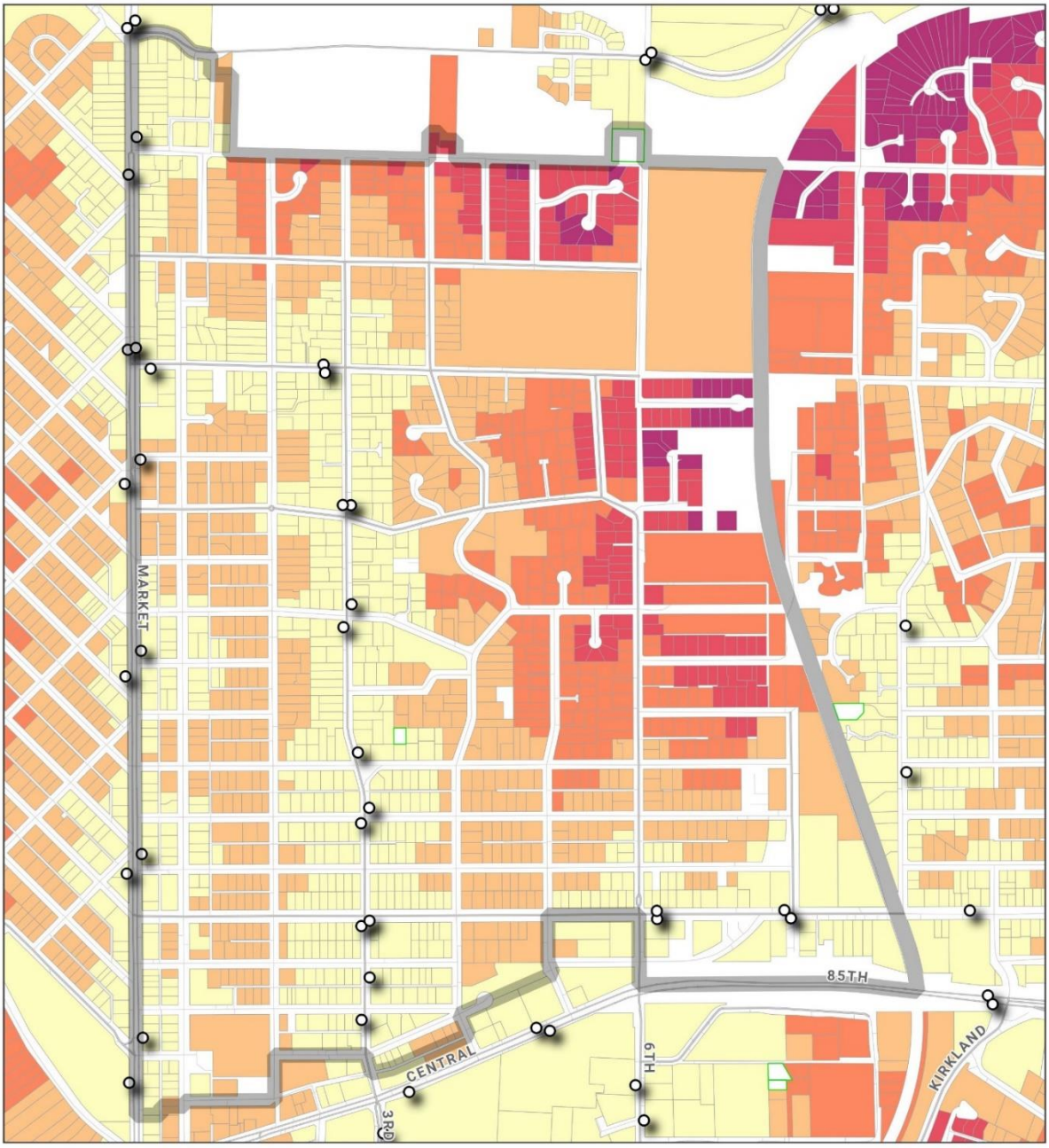
0 mi 1/2 mi 1 mi

0 0.25 0.5 mi

City of Kirkland

Walk Access to Frequent Transit

TOOLE DESIGN



LWSD bus stops

Parcels with reduced or no access

Norkirk neighborhood

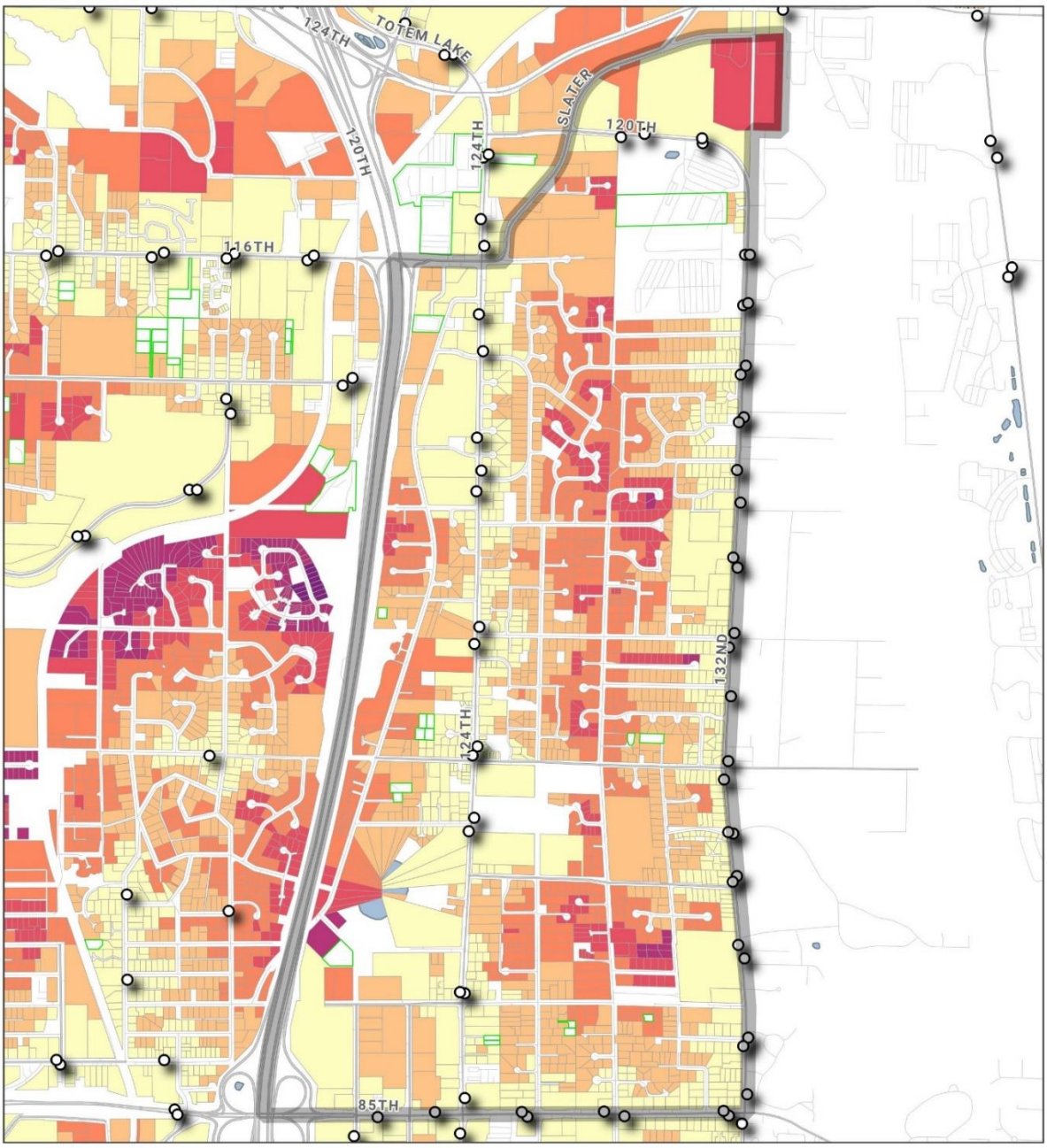
Distance from bus stop

0 mi 1/2 mi 1 mi

0 0.25 0.5 mi

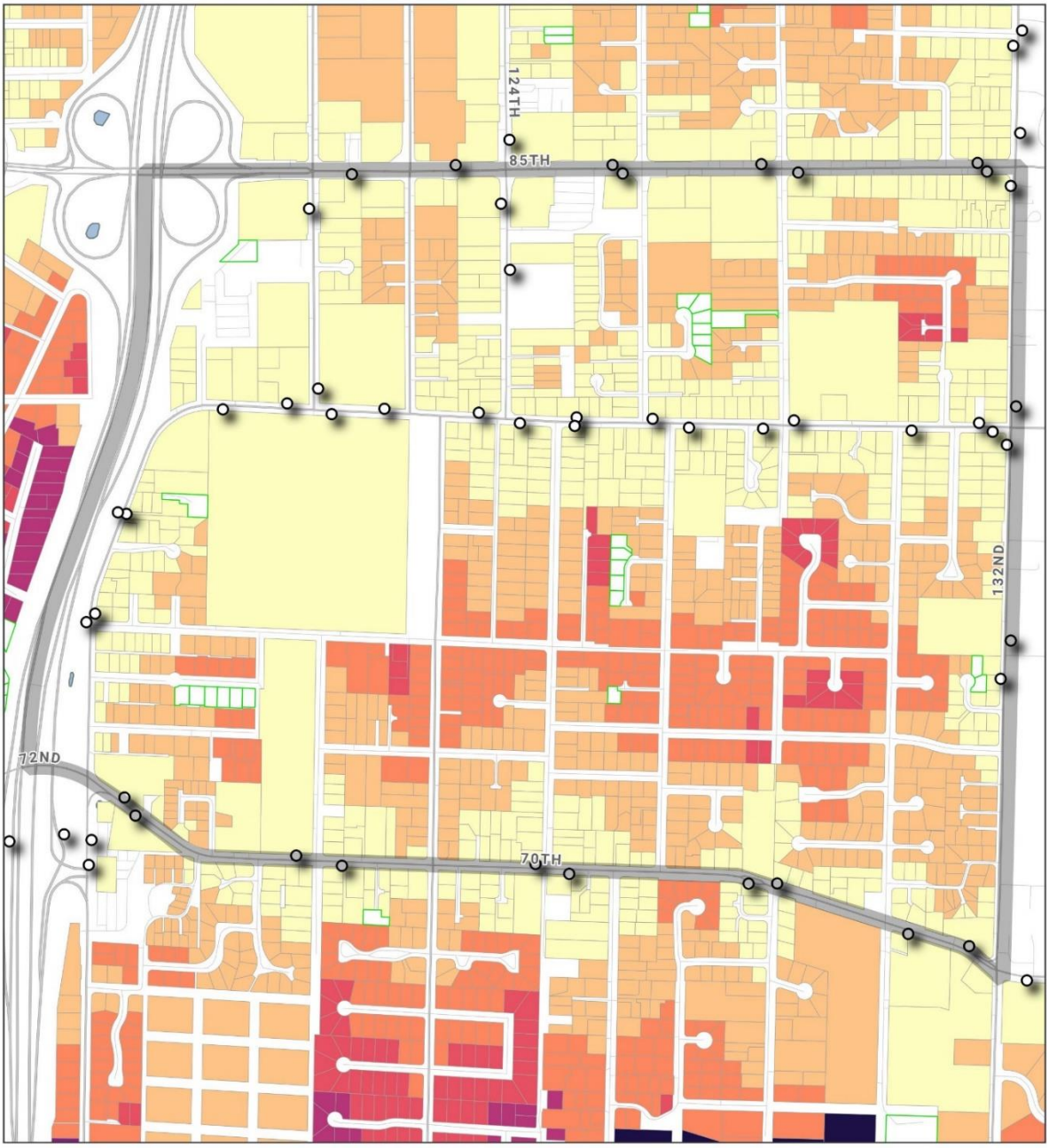
City of Kirkland

Walk Access to Frequent Transit



City of Kirkland

Walk Access to Frequent Transit



LWSD bus stops

Parcels with reduced or no access

South Rose Hill neighborhood

Distance from bus stop

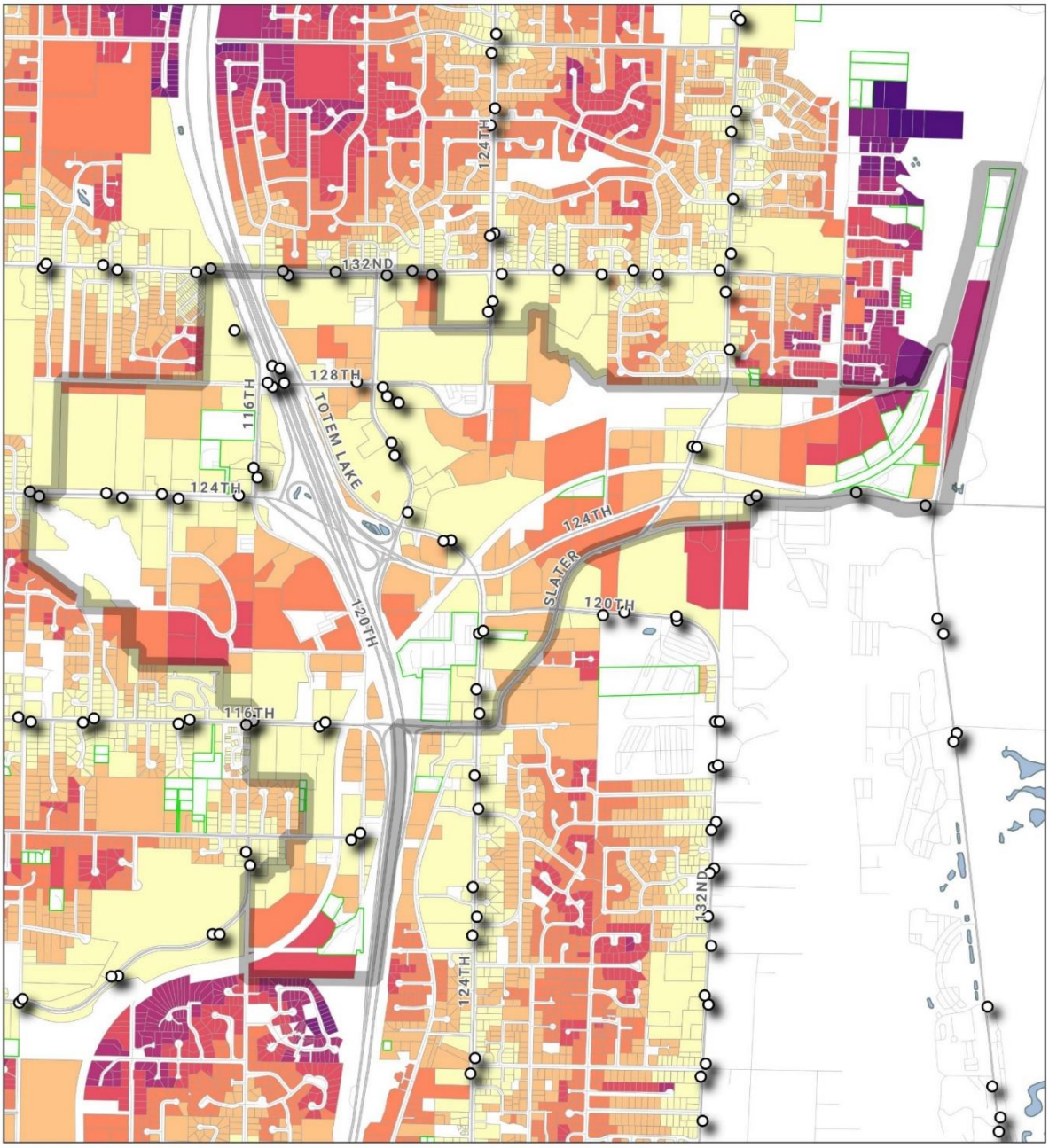
0 mi 1/2 mi 1 mi

0 0.25 0.5 mi

City of Kirkland

Walk Access to Frequent Transit

TOOLE DESIGN



LWSD bus stops

Parcels with reduced or no access

Totem Lake neighborhood

Distance from bus stop

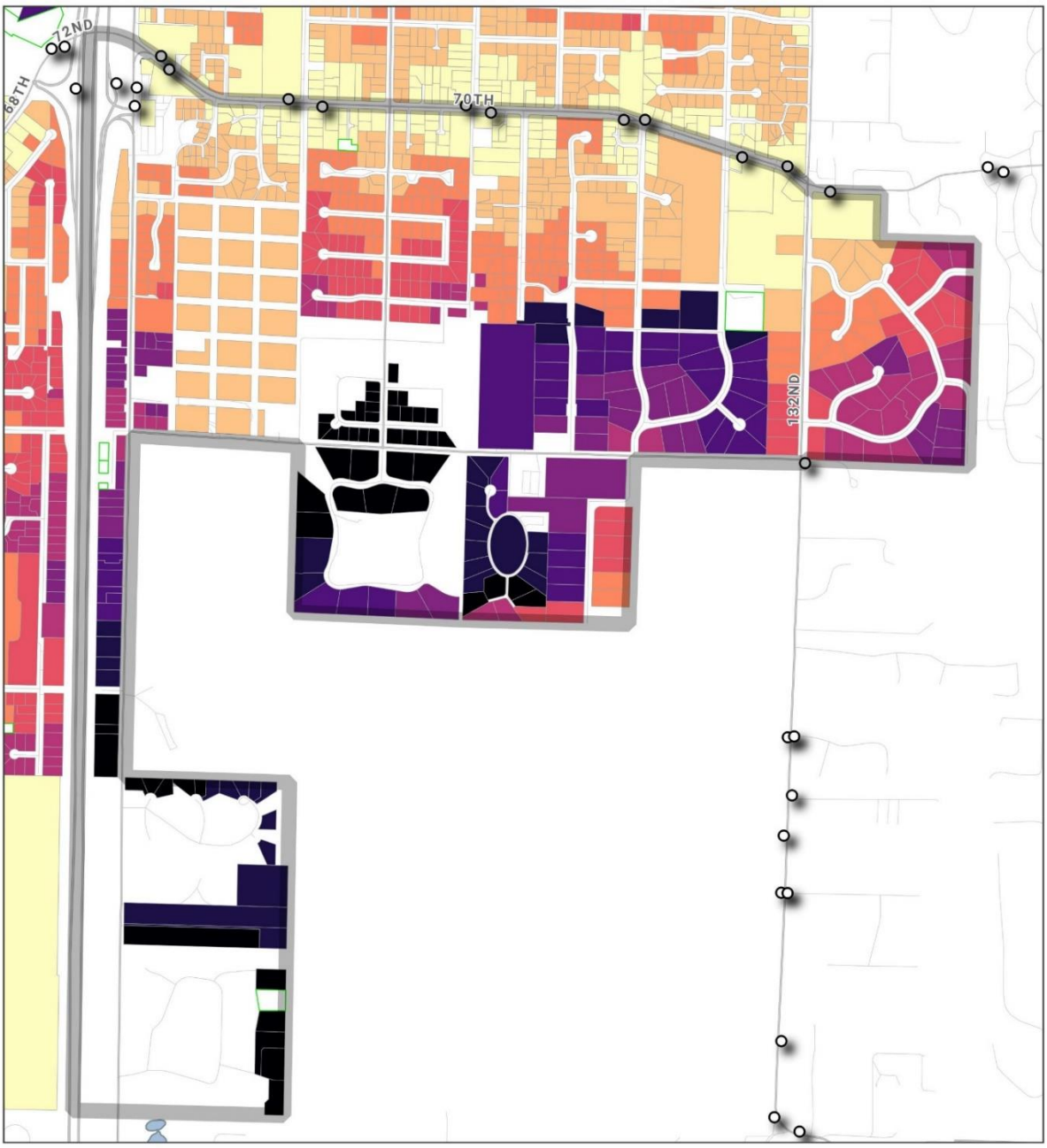
0 mi 1/2 mi 1 mi

N

0 0.25 0.5 mi

City of Kirkland

Walk Access to Frequent Transit



LWSD bus stops

Parcels with reduced or no access

Bridle Trails neighborhood

Distance from bus stop

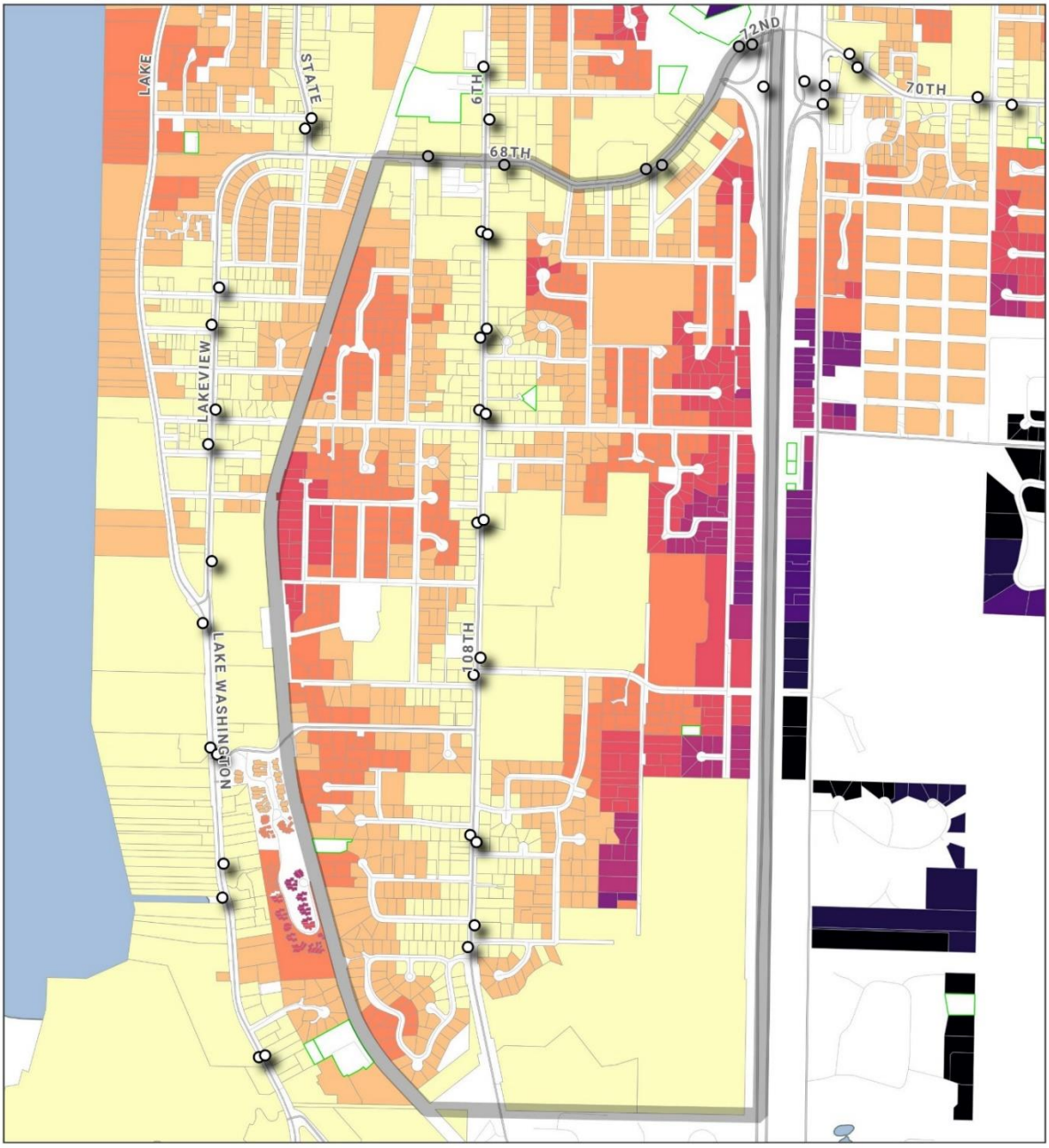
0 mi 1/2 mi 1 mi

0 0.25 0.5 mi

City of Kirkland

Walk Access to Frequent Transit

TOOLE DESIGN



City of Kirkland

Walk Access to Frequent Transit

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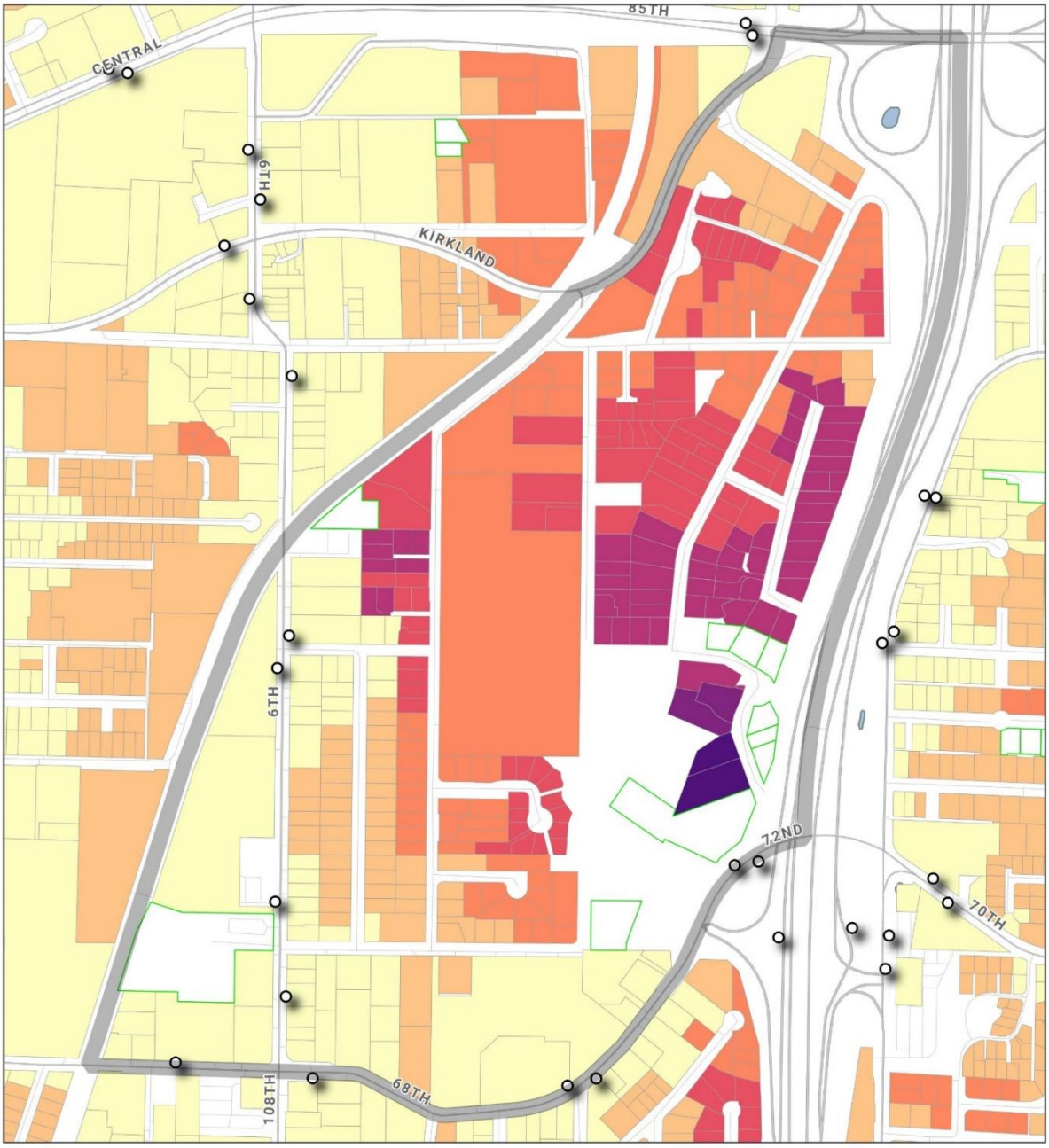


LWSD bus stops

Parcels with reduced or no access

Everest neighborhood

Distance from bus stop

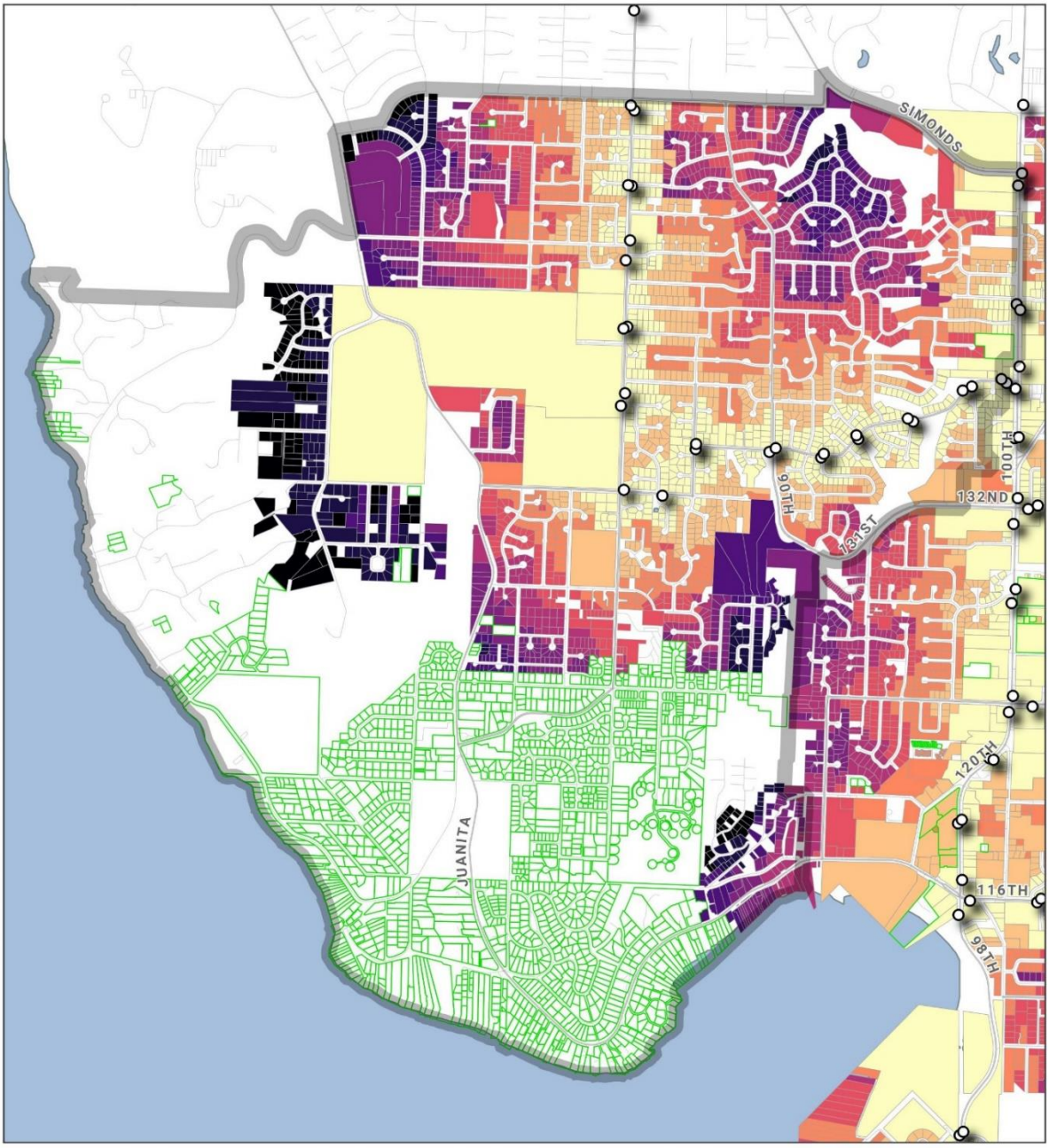
0 mi 1/2 mi 1 mi

0 0.25 0.5 mi

City of Kirkland

Walk Access to Frequent Transit

TOOLE DESIGN



LWSD bus stops

Parcels with reduced or no access

Finn Hill neighborhood

Distance from bus stop

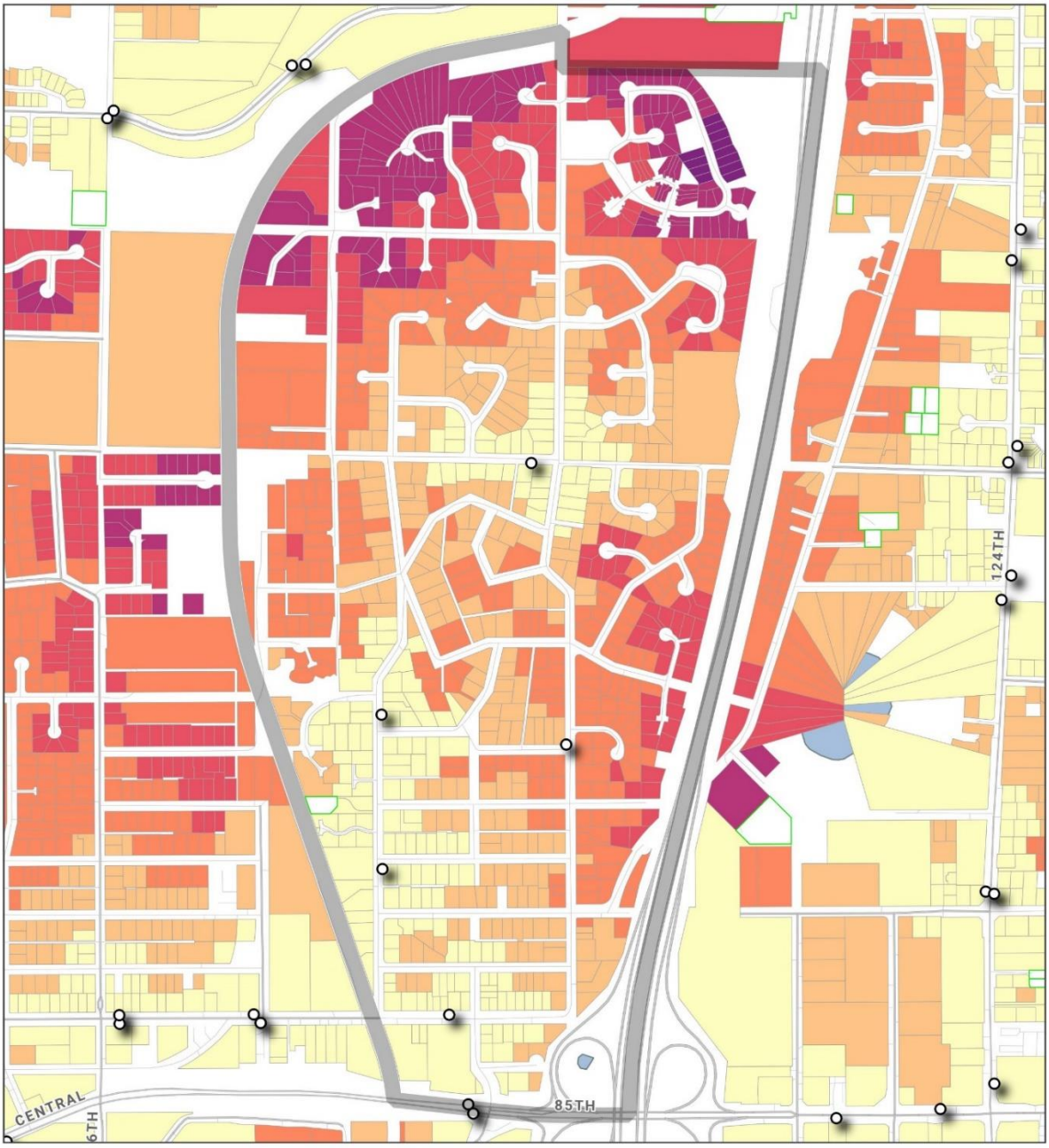
0 mi 1/2 mi 1 mi

N

0 0.25 0.5 mi

City of Kirkland

Walk Access to Frequent Transit



LWSD bus stops

Parcels with reduced or no access

Highlands neighborhood

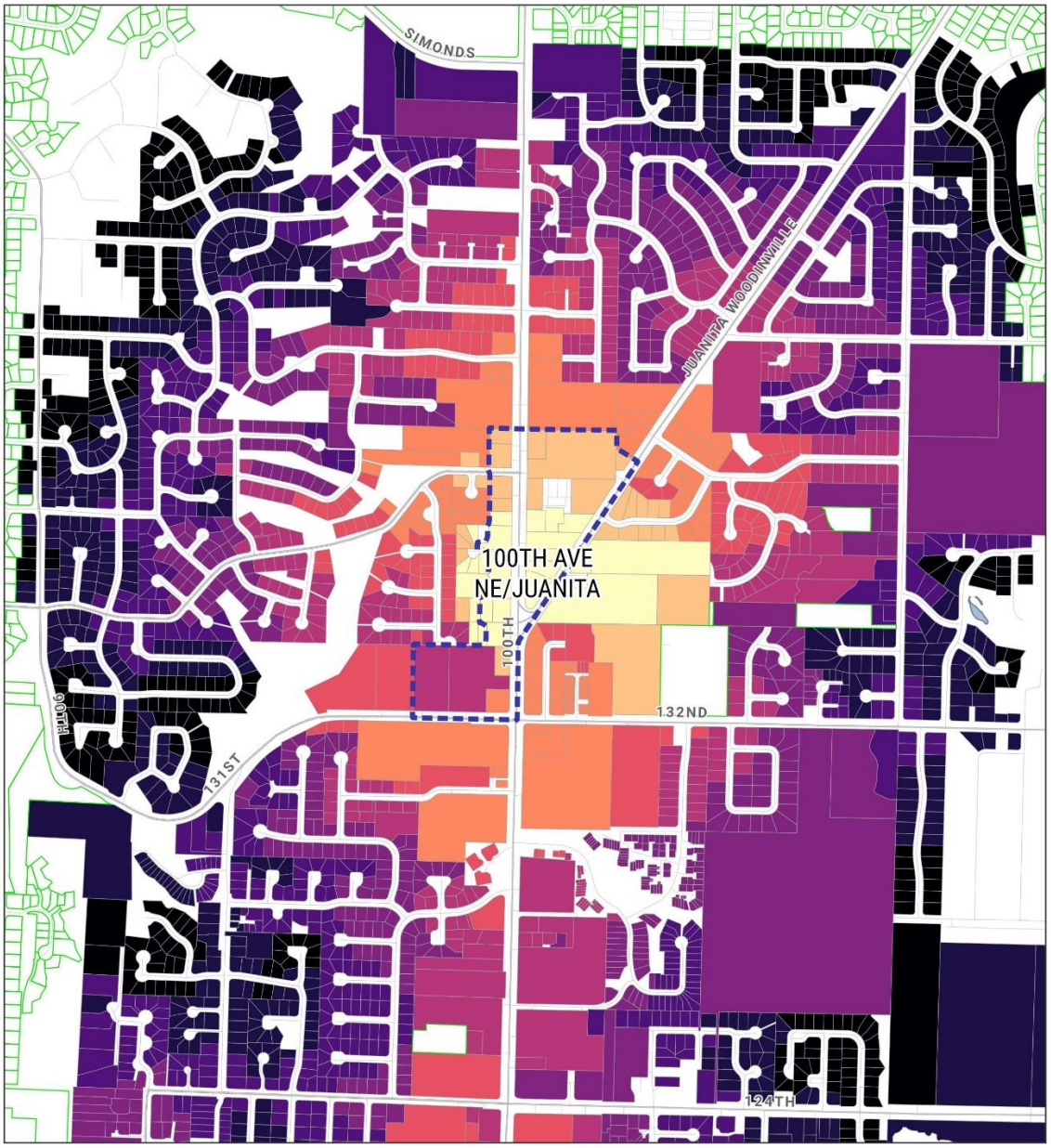
Distance from bus stop

0 mi 1/2 mi 1 mi

0 0.25 0.5 mi

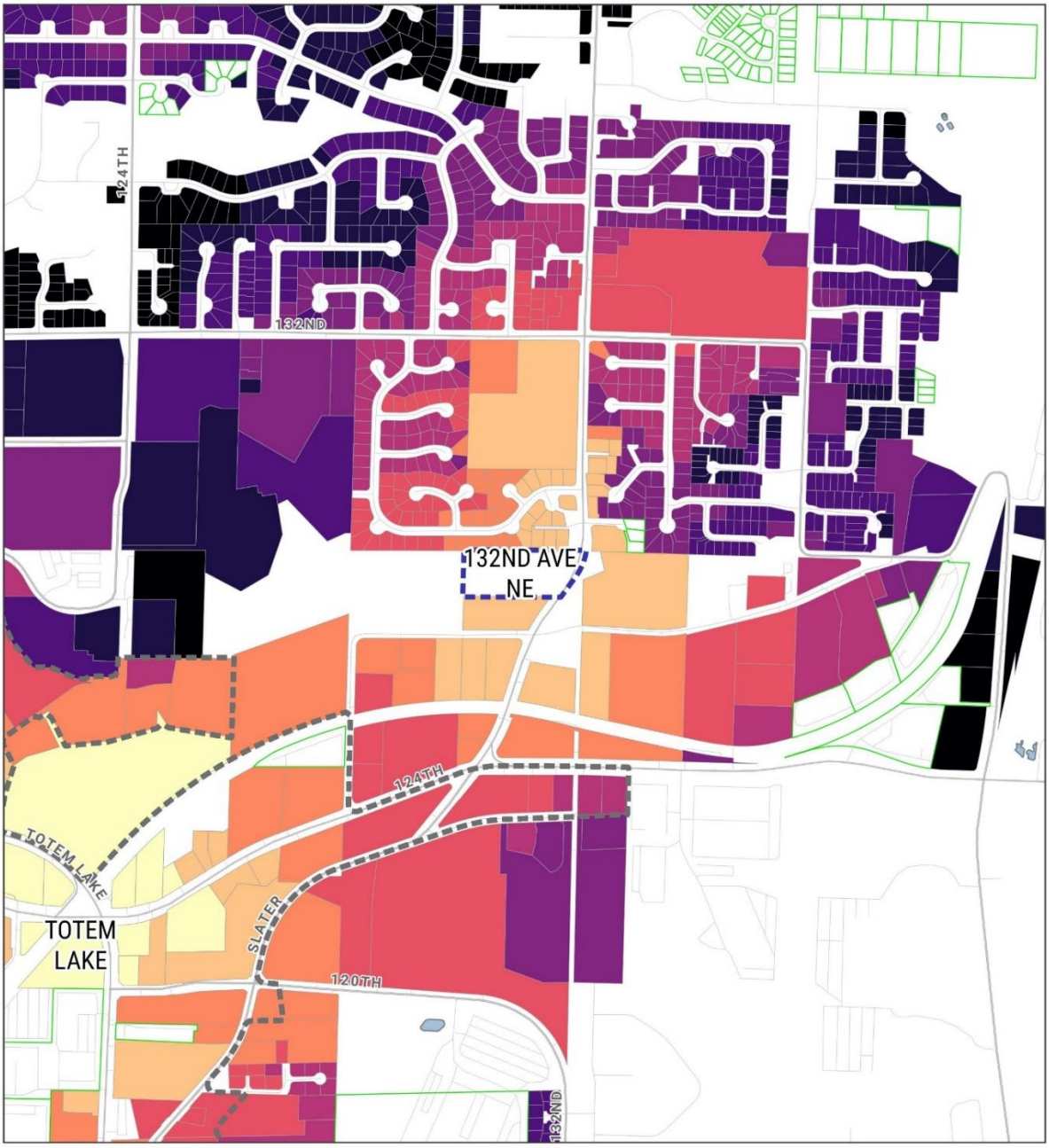
City of Kirkland

Walk Access to Activity Centers



City of Kirkland

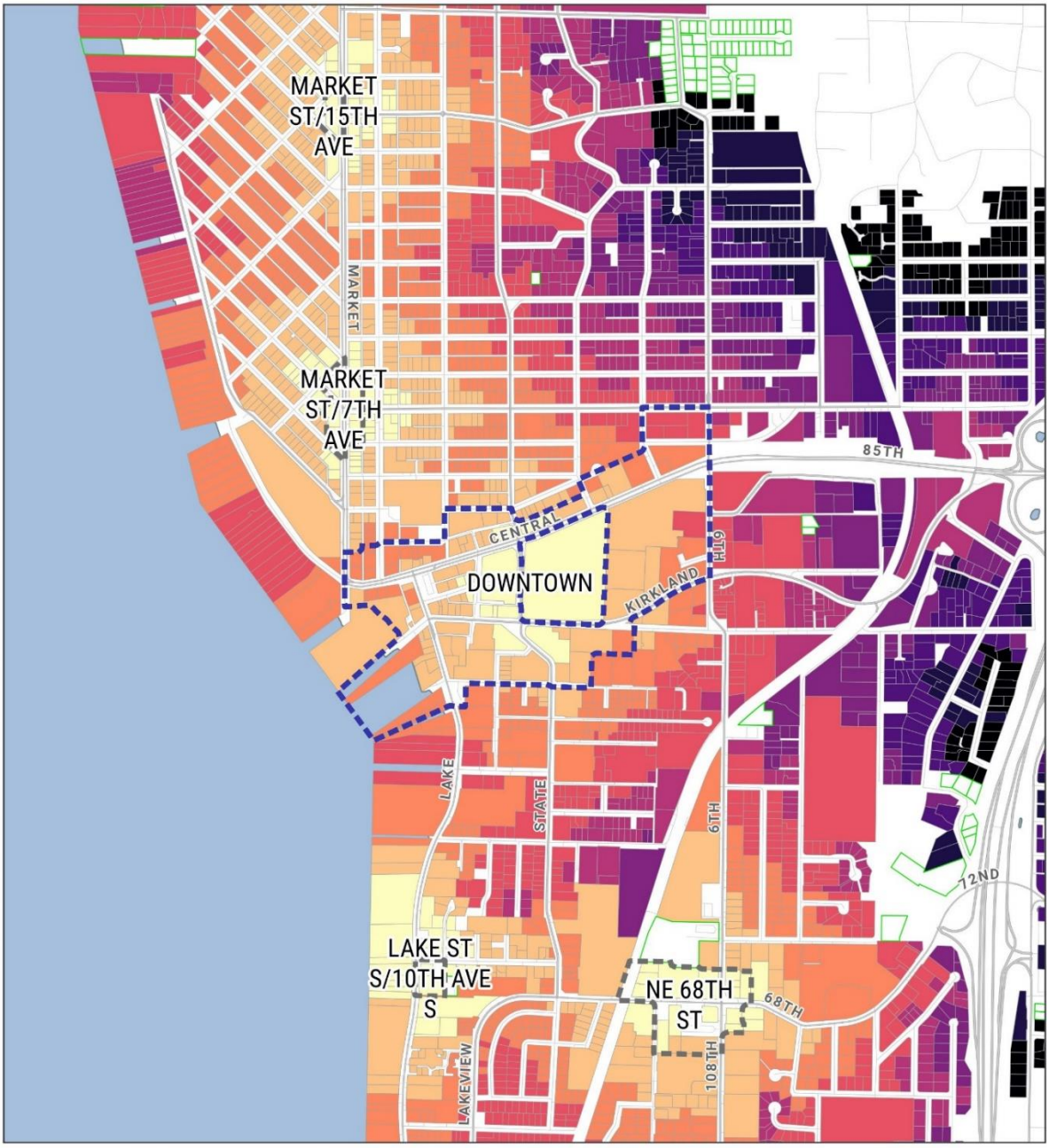
Walk Access to Activity Centers



City of Kirkland

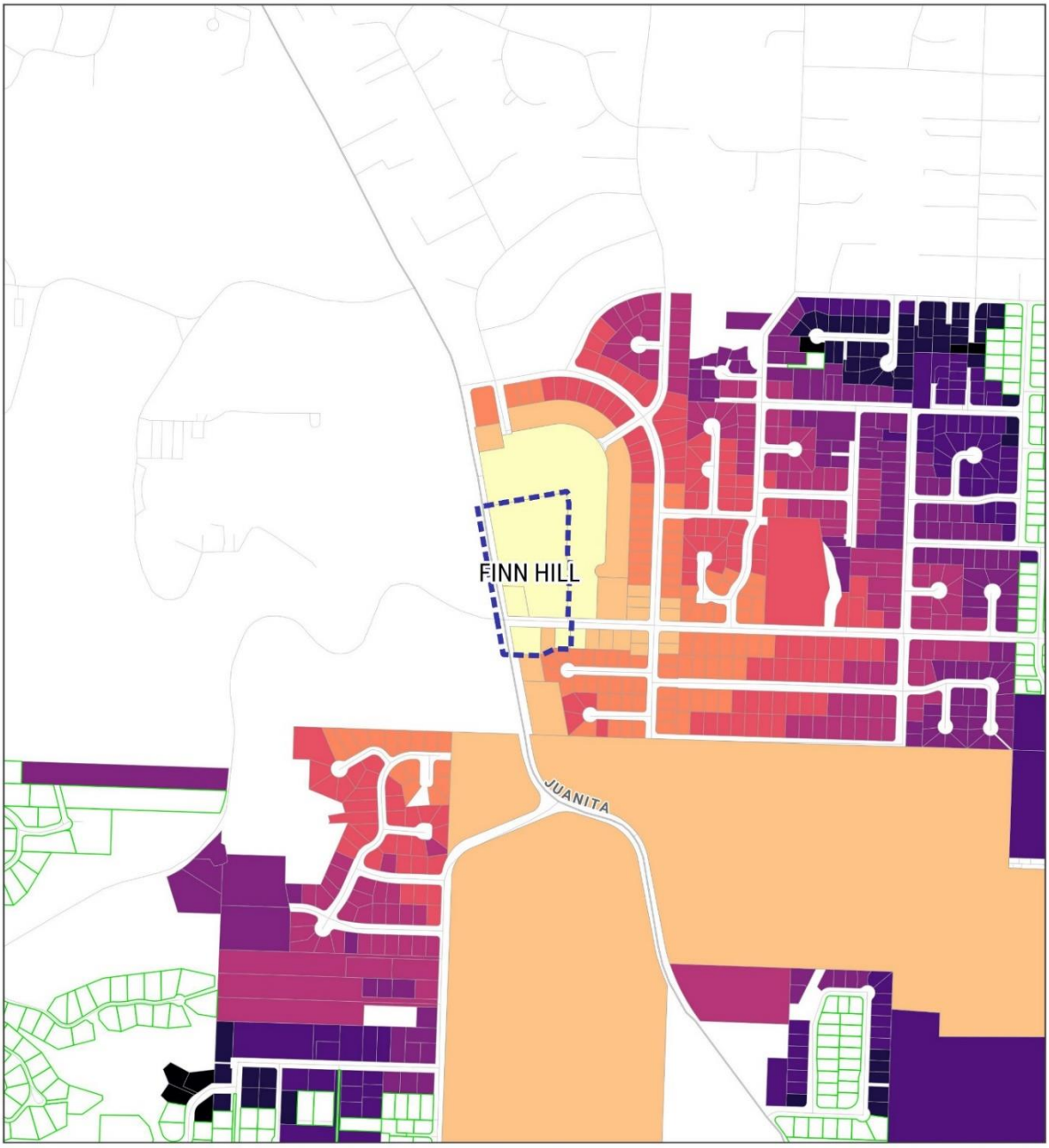
Walk Access to Activity Centers

TOOLE DESIGN



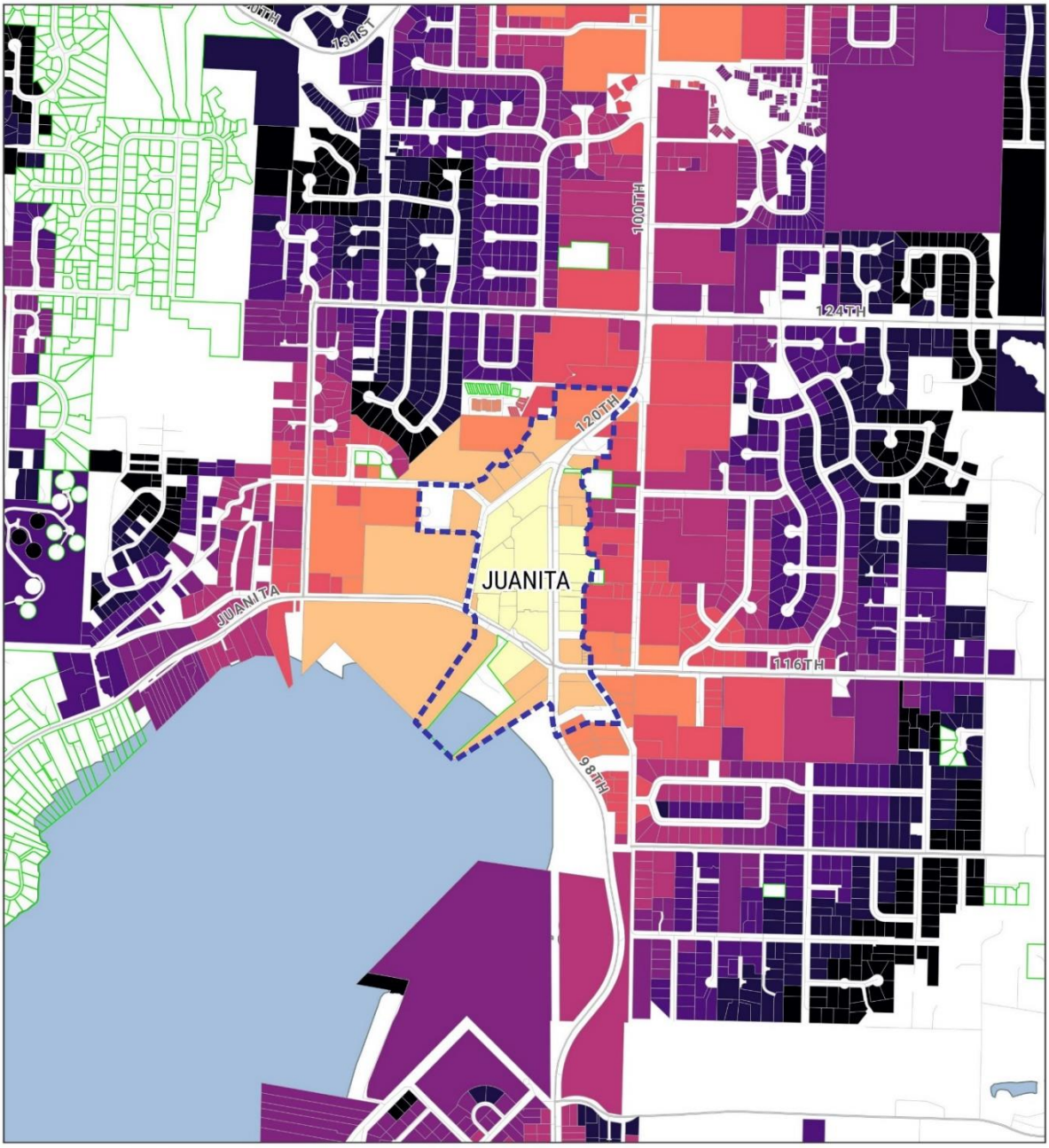
City of Kirkland

Walk Access to Activity Centers



City of Kirkland

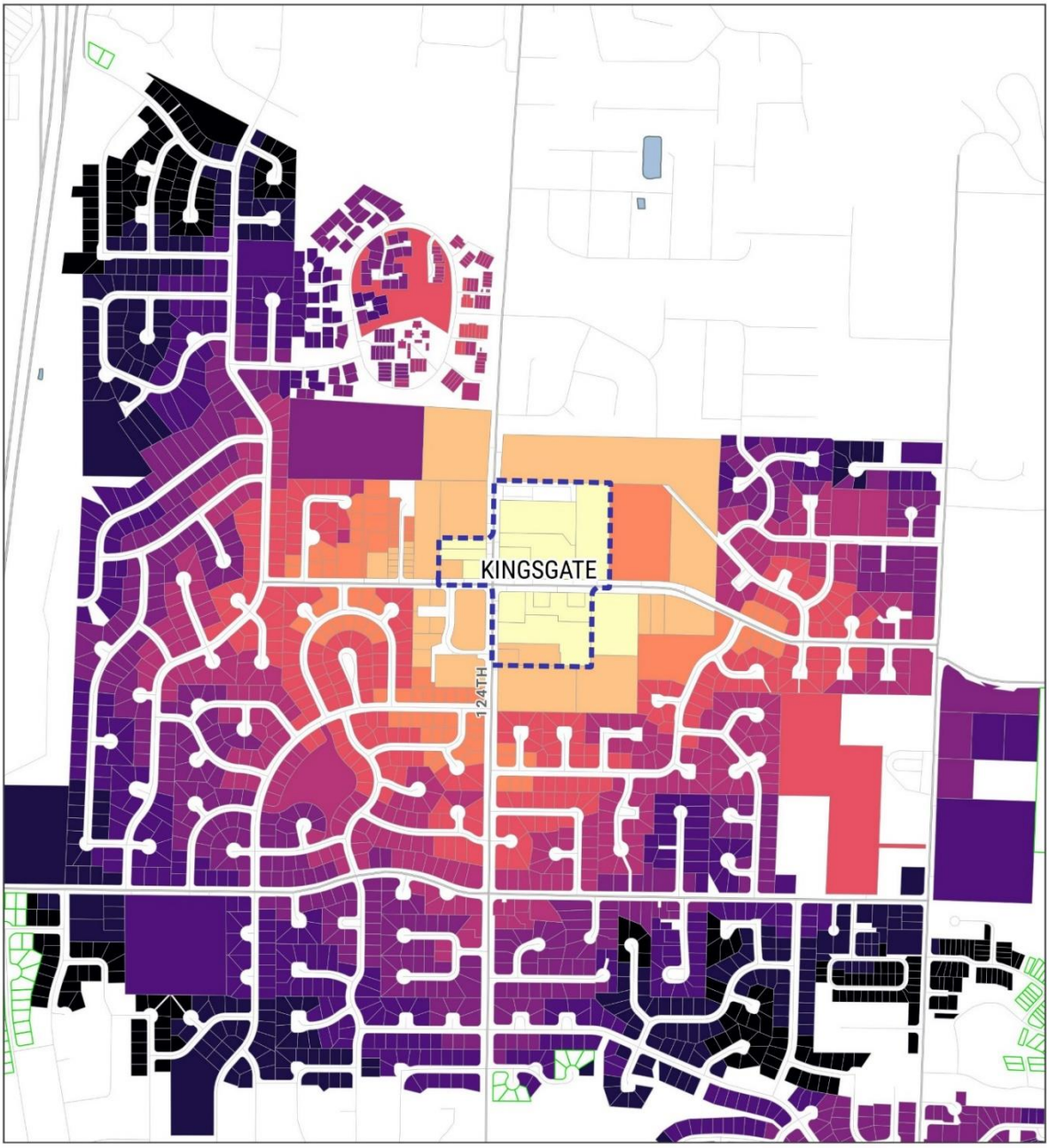
Walk Access to Activity Centers



City of Kirkland

Walk Access to Activity Centers

TOOLE DESIGN



City of Kirkland

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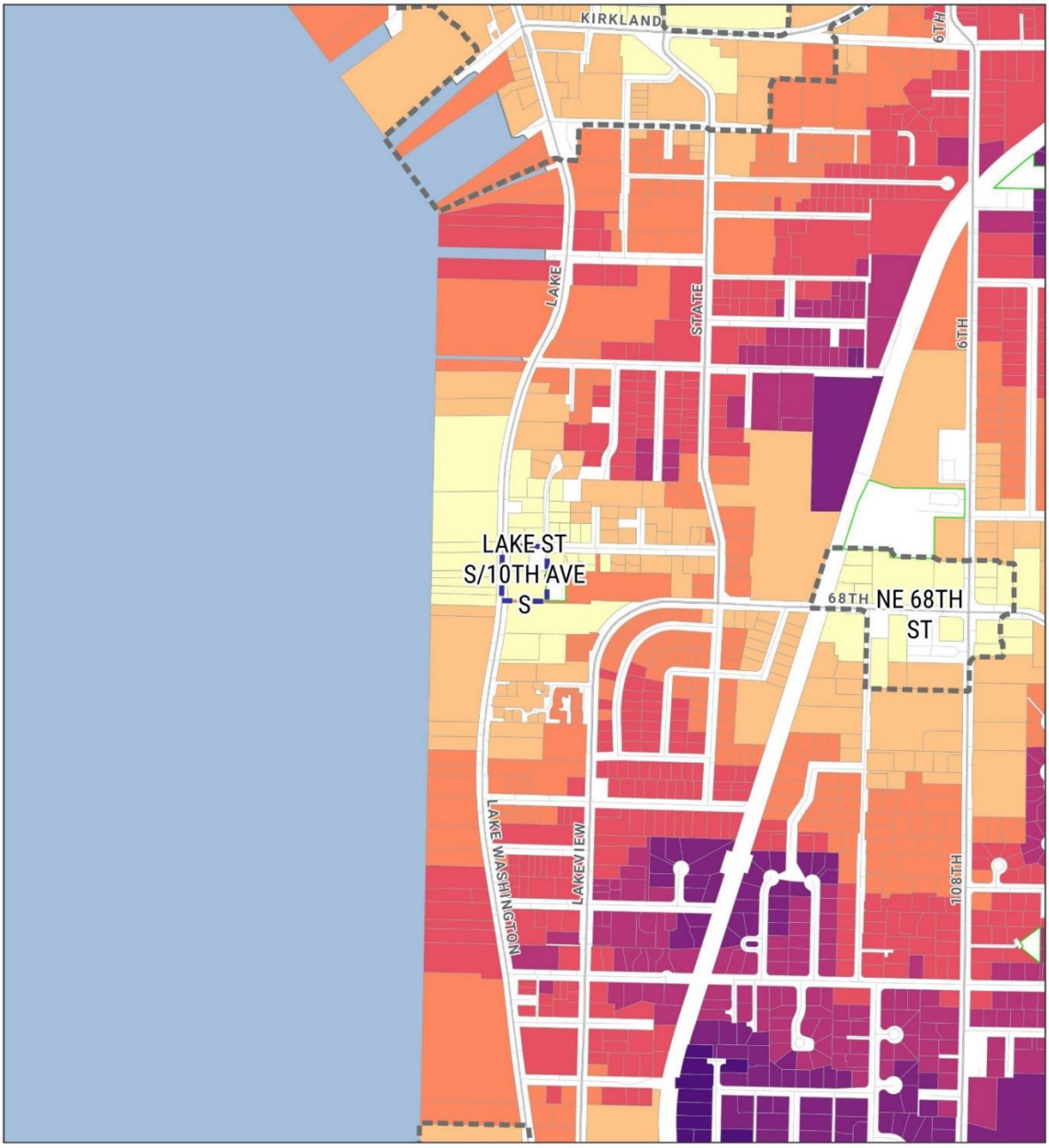
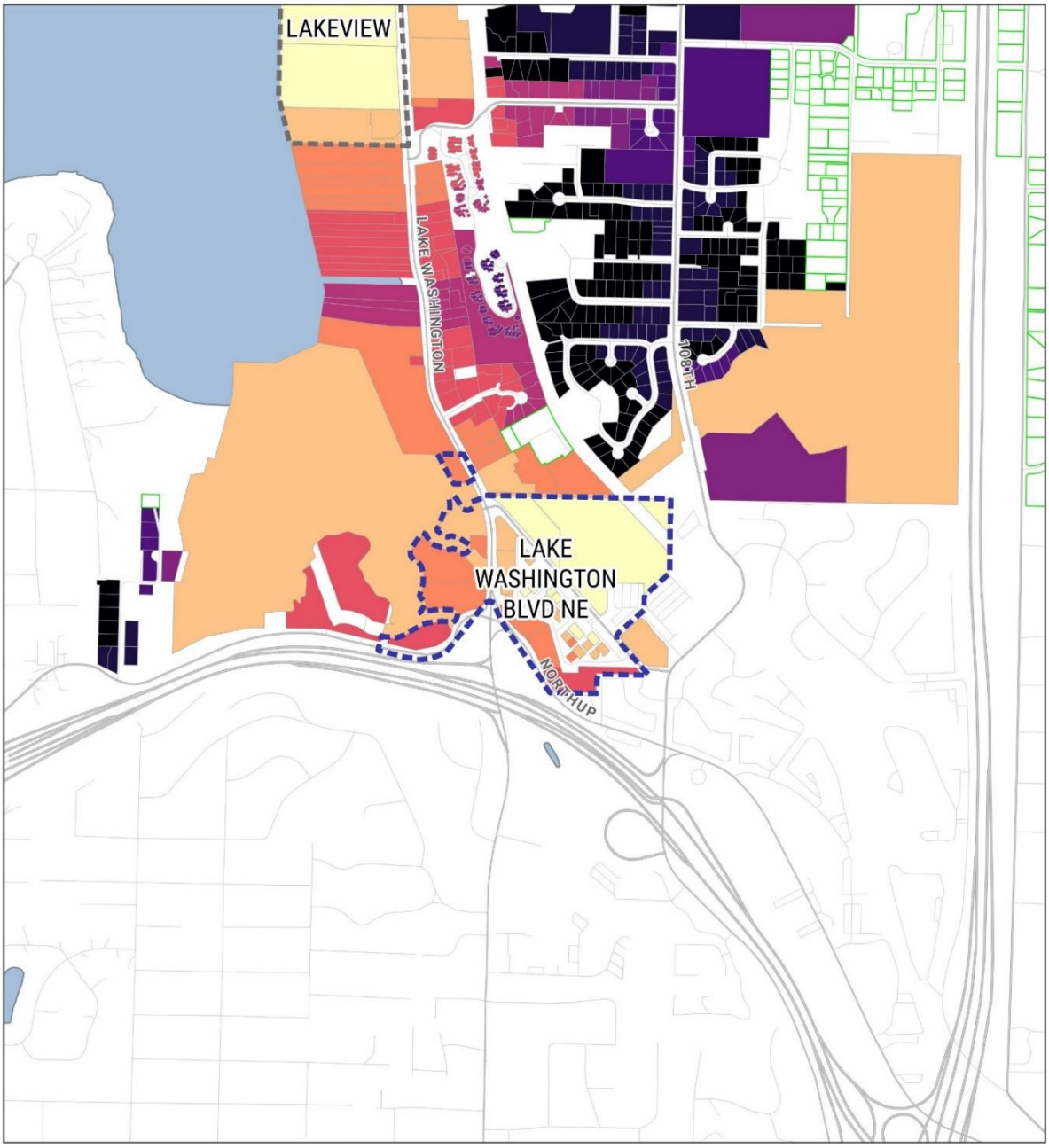


City of Kirkland

Walk Access to Activity Centers



City of Kirkland

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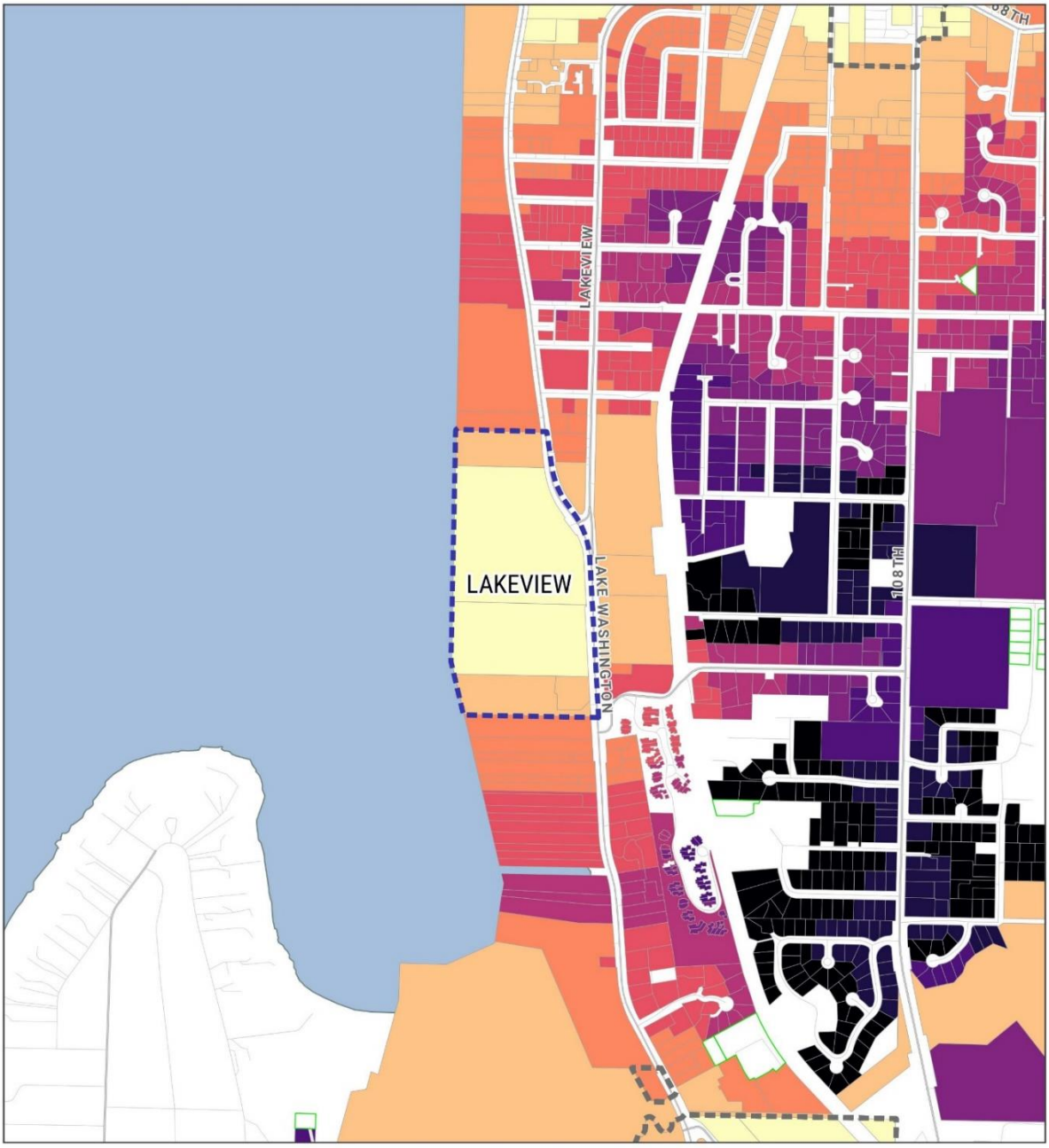

City of Kirkland

Walk Access to Activity Centers

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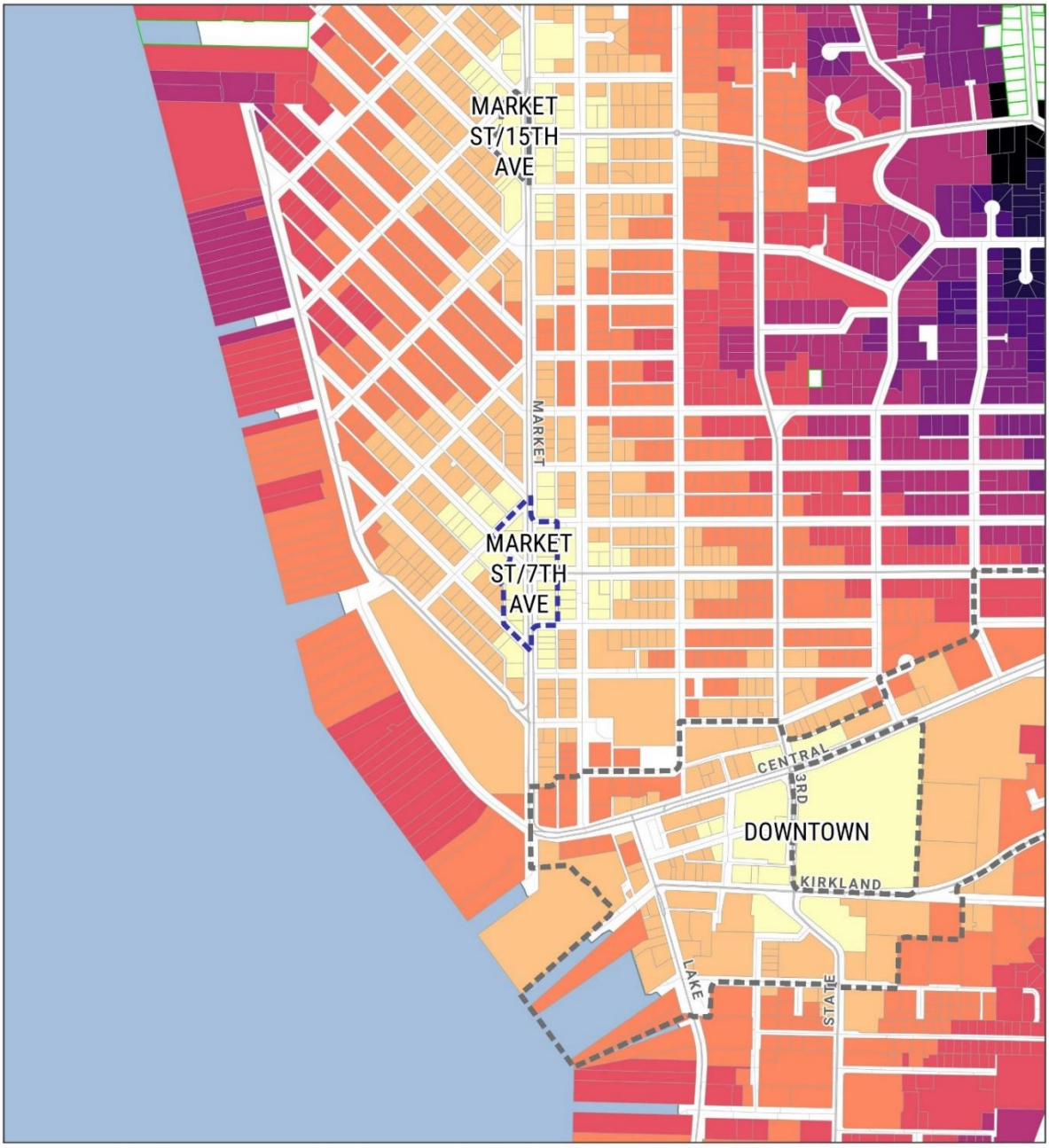

City of Kirkland

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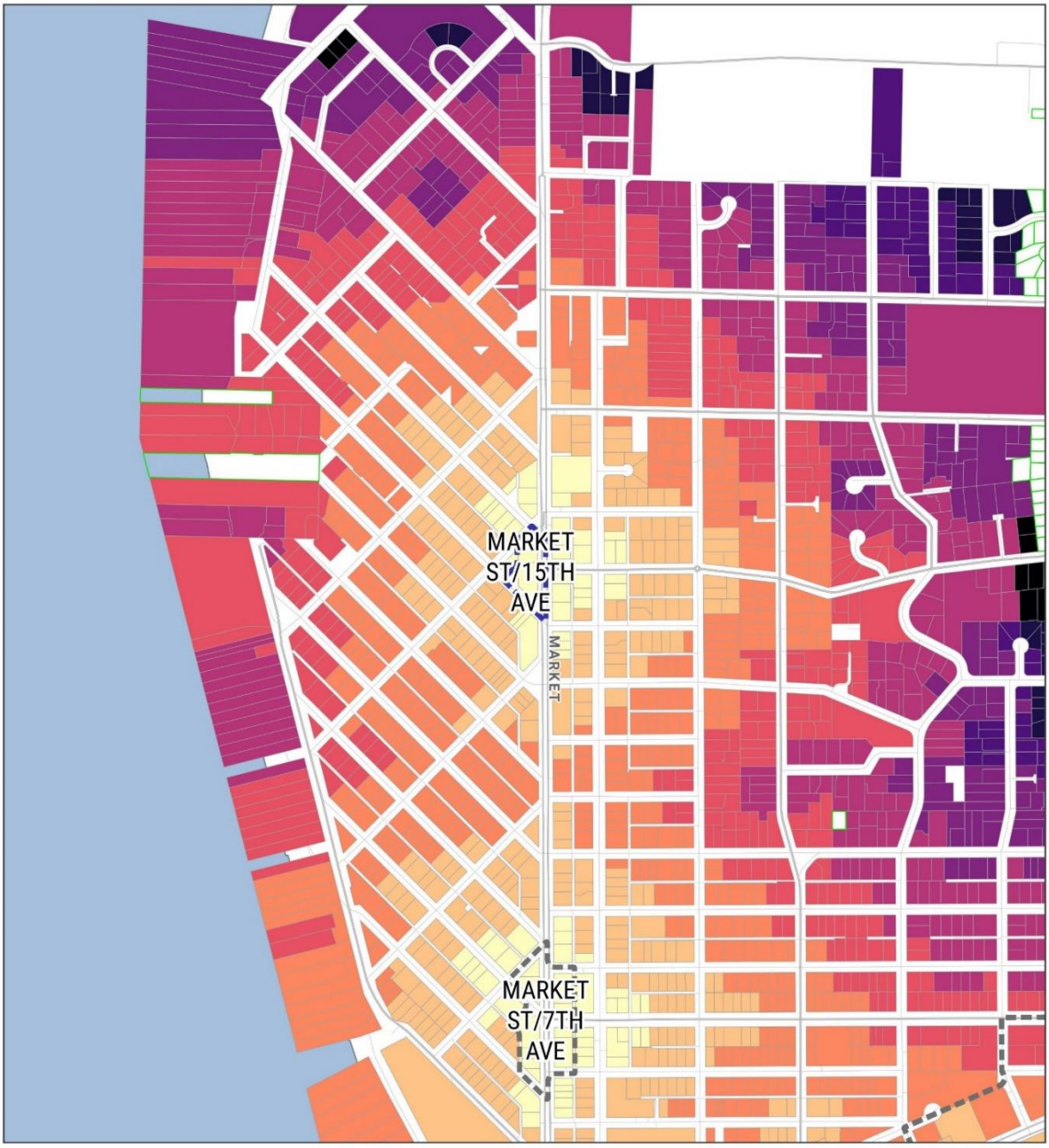
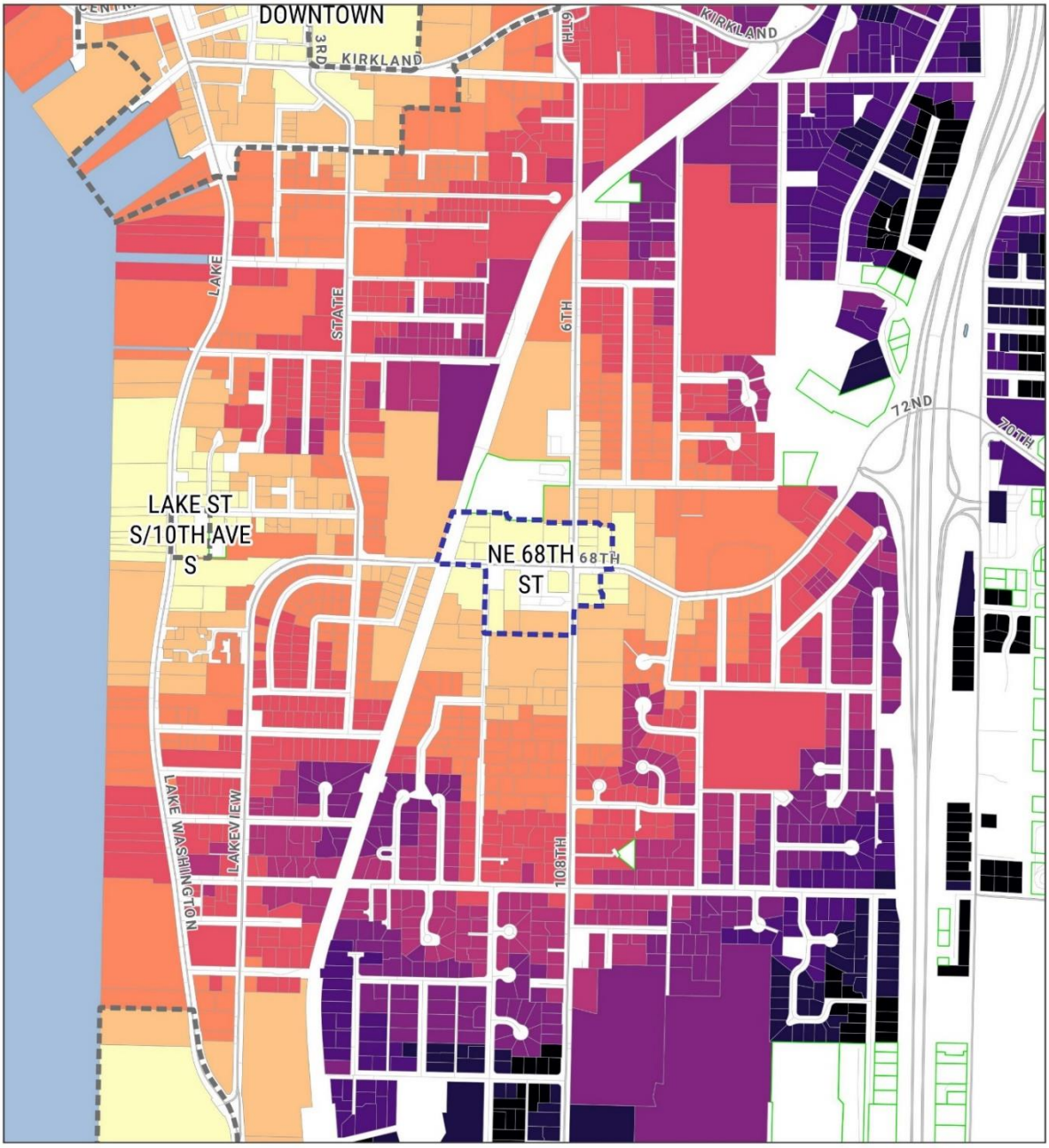


City of Kirkland

Walk Access to Activity Centers

TOOLE DESIGN



Parcels with reduced or no access

NE 68th St

Other activity centers

Distance from nearest activity center

0 mi 1/2 mi 1 mi

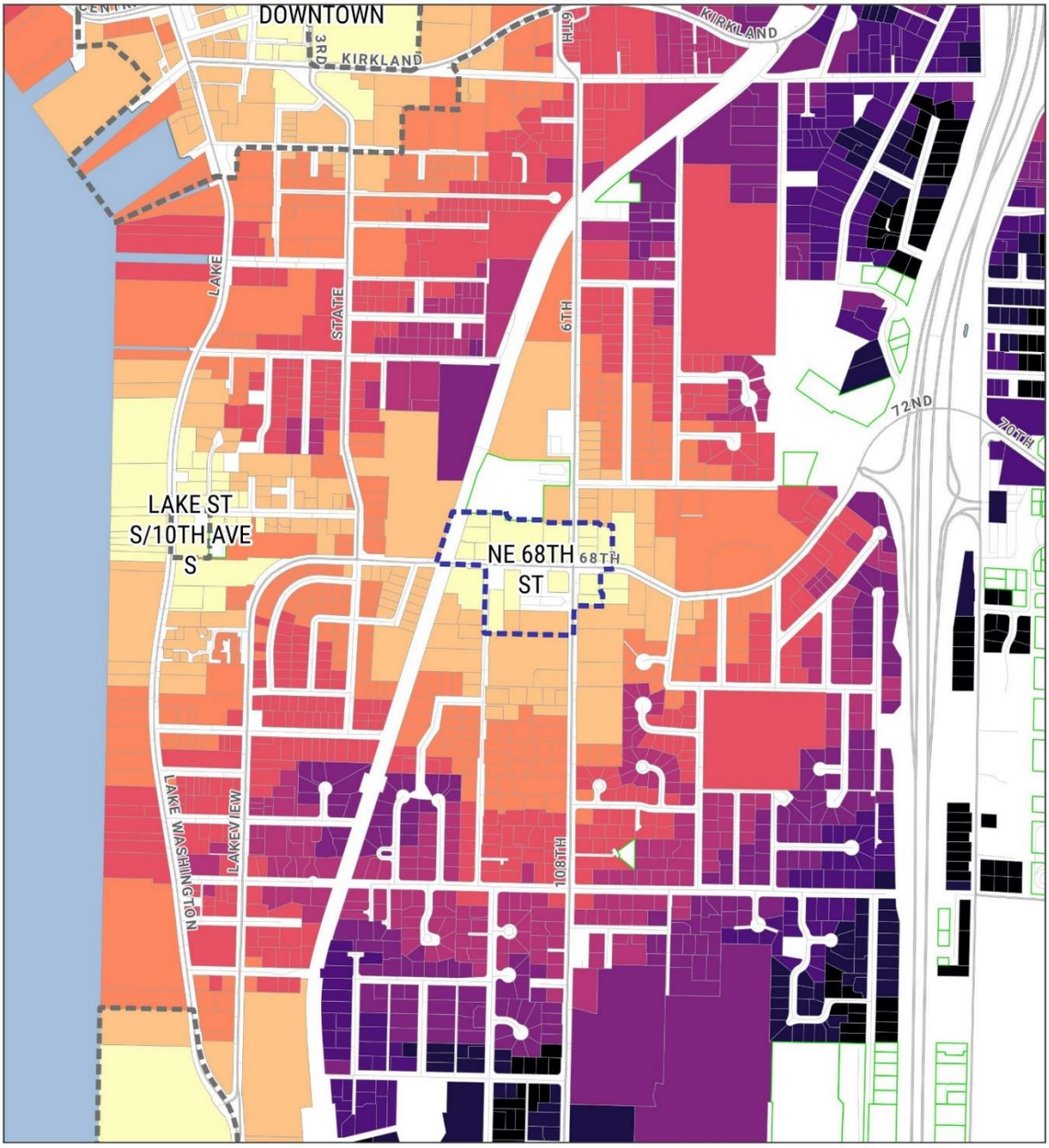
N

0 500 1000 ft

City of Kirkland

Walk Access to Activity Centers

TOOLE DESIGN



Parcels with reduced or no access

NE 68th St

Other activity centers

Distance from nearest activity center

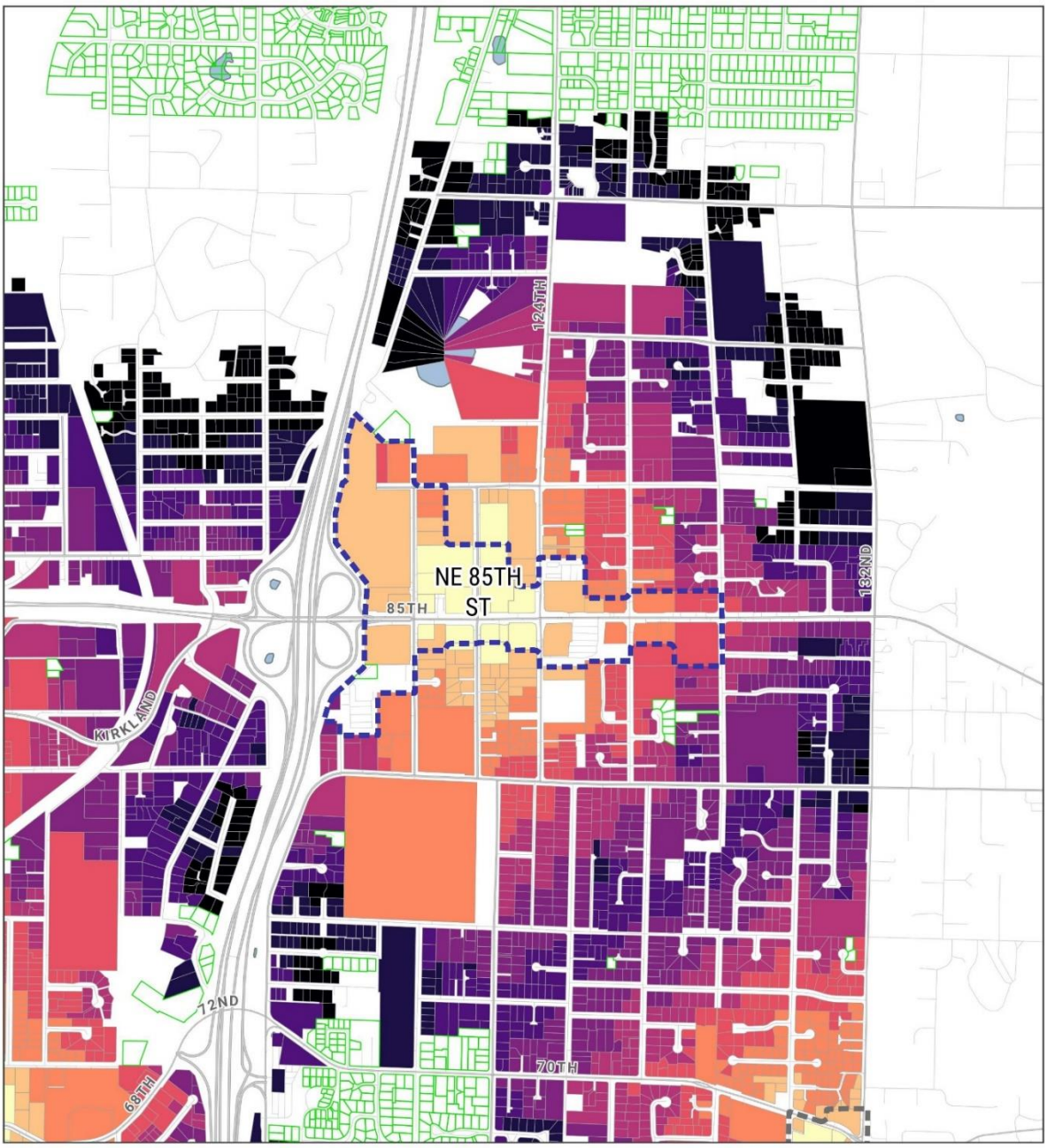
0 mi 1/2 mi 1 mi

N

0 500 1000 ft

City of Kirkland

Walk Access to Activity Centers



Parcels with reduced or no access
NE 85th St
Other activity centers

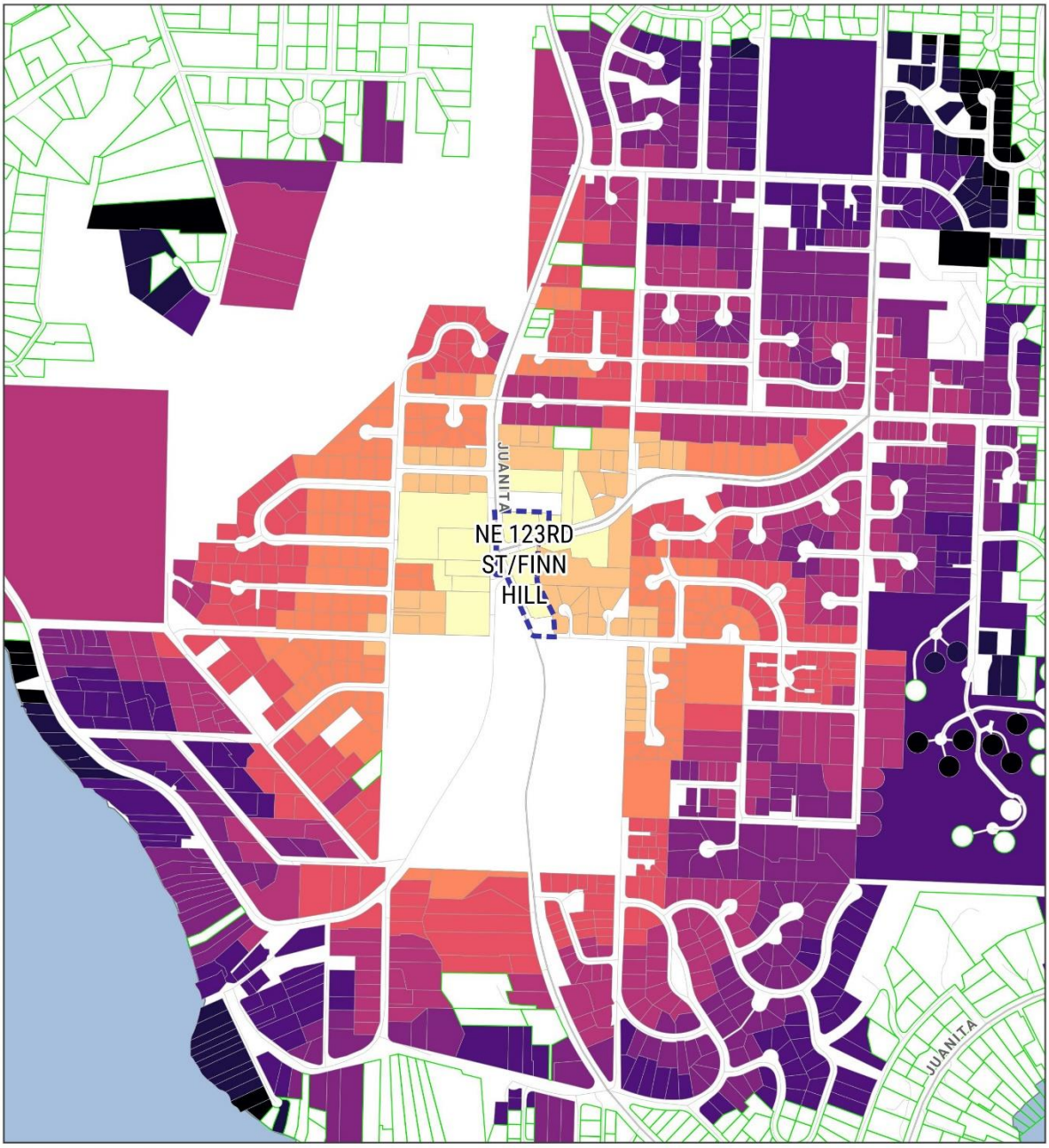
Distance from nearest activity center
0 mi 1/2 mi 1 mi

0 500 1000 ft

City of Kirkland

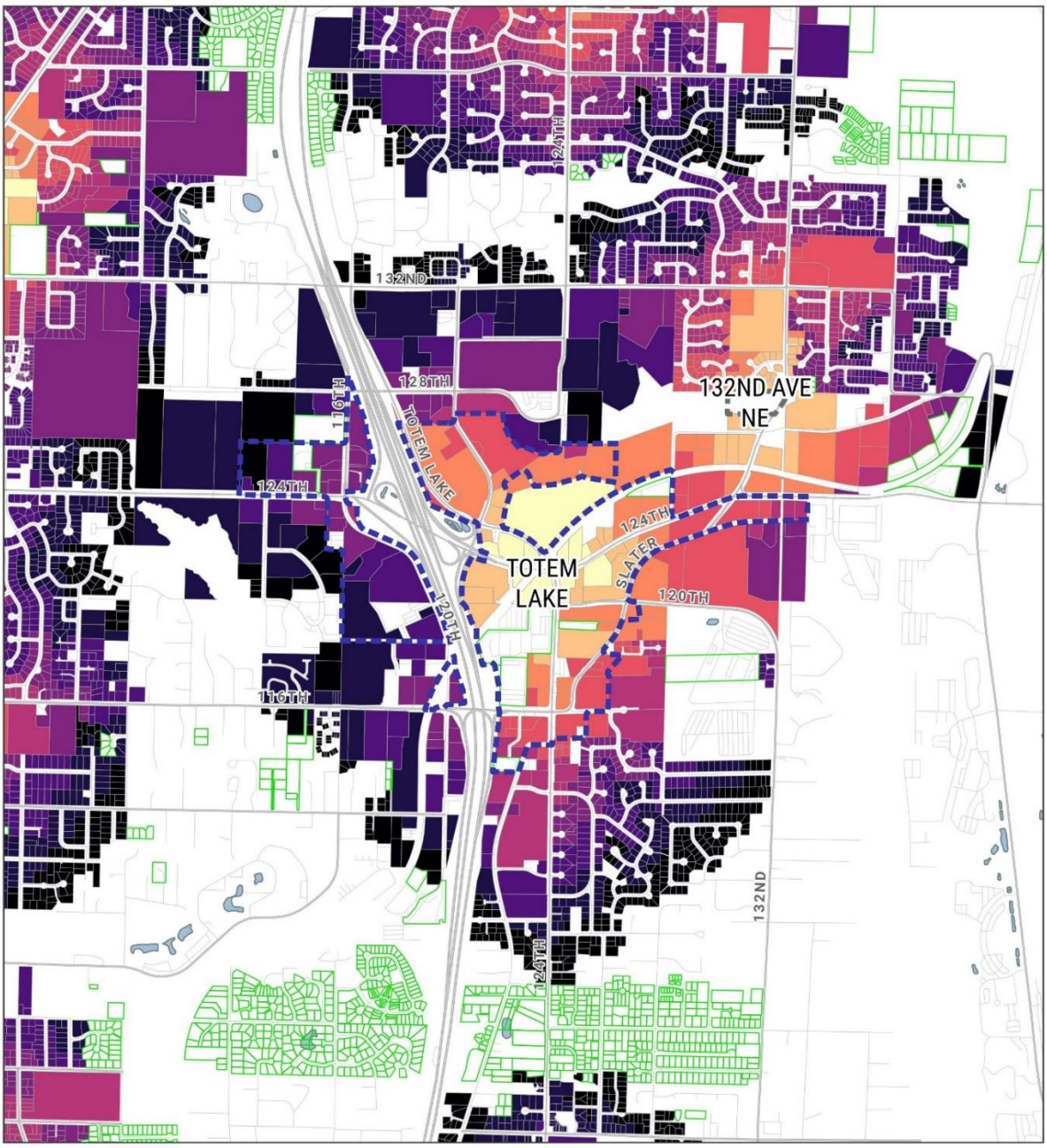
Walk Access to Activity Centers

TOOLE DESIGN



City of Kirkland

Walk Access to Activity Centers



Citywide Bicycle Network Analysis

The citywide bicycle network analysis is composed of four primary steps (see Figure 1). The first step consists of calculating existing conditions LTS. The LTS results predict how comfortable the street and trail network are to ride a bicycle along under current conditions and how well the planned bicycle facilities address bicyclist comfort. The next step involves taking the existing and future conditions LTS results and feeding those networks into the BNA tool to model existing and future bicycle access to destinations. The result of the existing and future conditions BNA results highlights locations that are connected to other places and people via the low-stress bicycle network, and locations that are disconnected because they lack low-stress connections. To improve low-stress connectivity, on-street and off-street connections are identified and recommended for improvements that reduce the estimated level of stress. Lastly, a final BNA is run using the newly identified recommended improvements to evaluate the how citywide low-stress bicycle connectivity is enhanced.

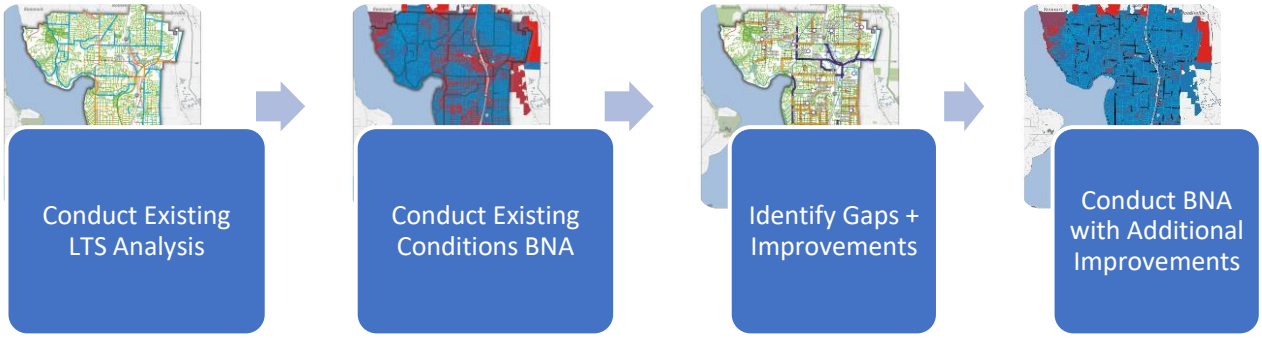


Figure 1: Bicycle Network Analysis Process

Bicycle Level of Traffic Stress

Before using the BNA tool, an LTS analysis is conducted under existing conditions and future conditions to measure comfort along every segment of the transportation network in Kirkland. The current bicycle network is factored into the existing conditions LTS calculation. The future conditions LTS calculation incorporates the planned bike lanes, neighborhood greenways, and off-street connections such as bridges and shared-use paths. Using the LTS analysis results, the BNA is conducted to measure low-stress connectivity throughout Kirkland. Table 1 through

Table 3 outline the LTS classification criteria used in this analysis.

Table 1: Mixed traffic criteria

Number of lanes	ADT	Posted Speed Limit ≤ 20 mph	25 mph	30 mph	35 mph	40 mph	45 mph	50+mph
Unlaned 2-way street (no centerline)	0-750	LTS 1	LTS 1	LTS 2	LTS 2	LTS 3	LTS 3	LTS 3
	751-1500	LTS 1	LTS 1	LTS 2	LTS 3	LTS 3	LTS 4	LTS 4
	1501-3000	LTS 2	LTS 2	LTS 2	LTS 3	LTS 4	LTS 4	LTS 4
	3000+	LTS 2	LTS 3	LTS 3	LTS 3	LTS 4	LTS 4	LTS 4
1 thru lane per direction (1-way, 1-lane street or 2-way street with centerline)	0-750	LTS 1	LTS 1	LTS 2	LTS 2	LTS 3	LTS 3	LTS 3
	751-1500	LTS 2	LTS 2	LTS 2	LTS 3	LTS 3	LTS 4	LTS 4
	1501+	LTS 2	LTS 3	LTS 3	LTS 4	LTS 4	LTS 4	LTS 4
2 thru lanes per direction	0-8000	LTS 3	LTS 3	LTS 3	LTS 3	LTS 4	LTS 4	LTS 4
	8001+	LTS 3	LTS 3	LTS 4	LTS 4	LTS 4	LTS 4	LTS 4
3+ thru lanes per direction	any ADT	LTS 3	LTS 3	LTS 4	LTS 4	LTS 4	LTS 4	LTS 4

Table 2: Bike lanes and shoulders not adjacent to a parking lane

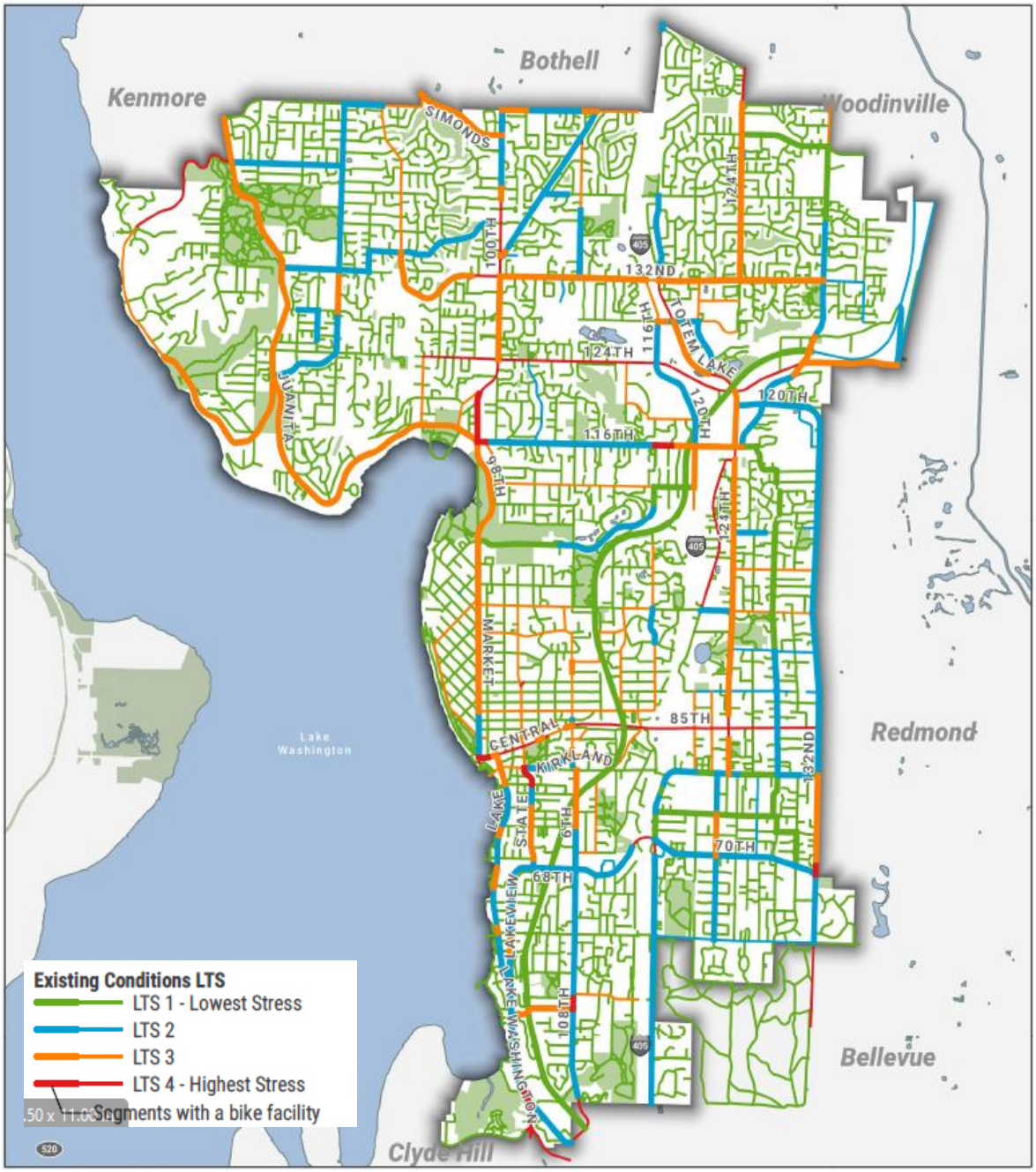
Number of lanes	Bike lane width	Posted Speed Limit ≤ 25 mph	30 mph	35 mph	40 mph	45 mph	50+ mph
1 thru lane per direction, or unlaned (no centerline)	6+ ft	LTS 1	LTS 1	LTS 2	LTS 3	LTS 3	LTS 3
	4 or 5 ft	LTS 2	LTS 2	LTS 2	LTS 3	LTS 3	LTS 4
2 thru lanes per direction	6+ ft	LTS 2	LTS 2	LTS 2	LTS 3	LTS 3	LTS 3
	4 or 5 ft	LTS 2	LTS 2	LTS 3	LTS 3	LTS 4	LTS 4
3+ lanes per direction	any width	LTS 3	LTS 3	LTS 3	LTS 4	LTS 4	LTS 4

Table 3: Bike lanes alongside a parking lane

Number of Lanes	Bike lane reach = Bike lane width + Parking lane width	Posted Speed Limit ≤ 25 mph	30 mph	35 mph
1 lane per direction	15+ ft	LTS 1	LTS 2	LTS 3
	12-14 ft	LTS 2	LTS 2	LTS 3
2 lanes per direction (2-way)	15+ ft	LTS 2	LTS 3	LTS 3
2-3 lanes per direction (1-way)		LTS 2	LTS 3	LTS 3
other multilane		LTS 3	LTS 3	LTS 3

Bicycle Level of Traffic Stress Results

The first map displays the LTS analysis under existing conditions. Existing bike facilities are highlighted using thicker lines. The majority of collector and arterial roadways, many of which have an existing bicycle facility, are classified as being high stress (LTS 3 or LTS 4). When possible, this analysis considers locations where a striped bike lane is dropped at intersection. These locations can be seen at NE 116th Ave at 98th Ave NE, NE 132nd St at 100th Ave NE, and at NE 85th Ave at 124th Ave NE. At these location, the mixed traffic criteria are used to categorize LTS (see Table 1).



Bicycle Network Analysis

Using the results from the existing and future conditions LTS analysis, the BNA tool is used to evaluate every census block in Kirkland to determine how well the existing and future bicycle networks connect places and people to one another. Two census blocks are considered connected if and only if there is an unbroken low-stress connection between them that does not require a trip more than 25% longer than the shortest car trip. Even a short stretch of stressful biking negates a potential connection.

The BNA also summarizes the number and types of destinations available in each census block, including population, opportunities (jobs and education), core services, recreation, retail, and transit. Pairing this information with the knowledge of which census blocks are connected on the low-stress network, the BNA tool calculates a score for each census block by comparing the number and type of reachable destinations on the low-stress network to the destinations reachable by car within the same distance. Table 4 outlines the scoring categories used in the BNA.

Table 4: BNA Scoring Categories

Scoring category	Weight	Measure	Subcategory weight
People	15	Population	N/A
Opportunity	20	Employment	35
		K-12 education	35
		Technical/vocational school	10
		Higher education	20
Core Services	20	Doctor offices/clinics	20
		Dentist offices	15
		Pharmacies	15
		Supermarkets	30
		Social services	20
Recreation	15	Parks	60
		Community centers	40
Retail	15	Retail shopping	N/A
Transit	15	Stations/transit centers	N/A

Existing and Future Bicycle Network Analysis Results

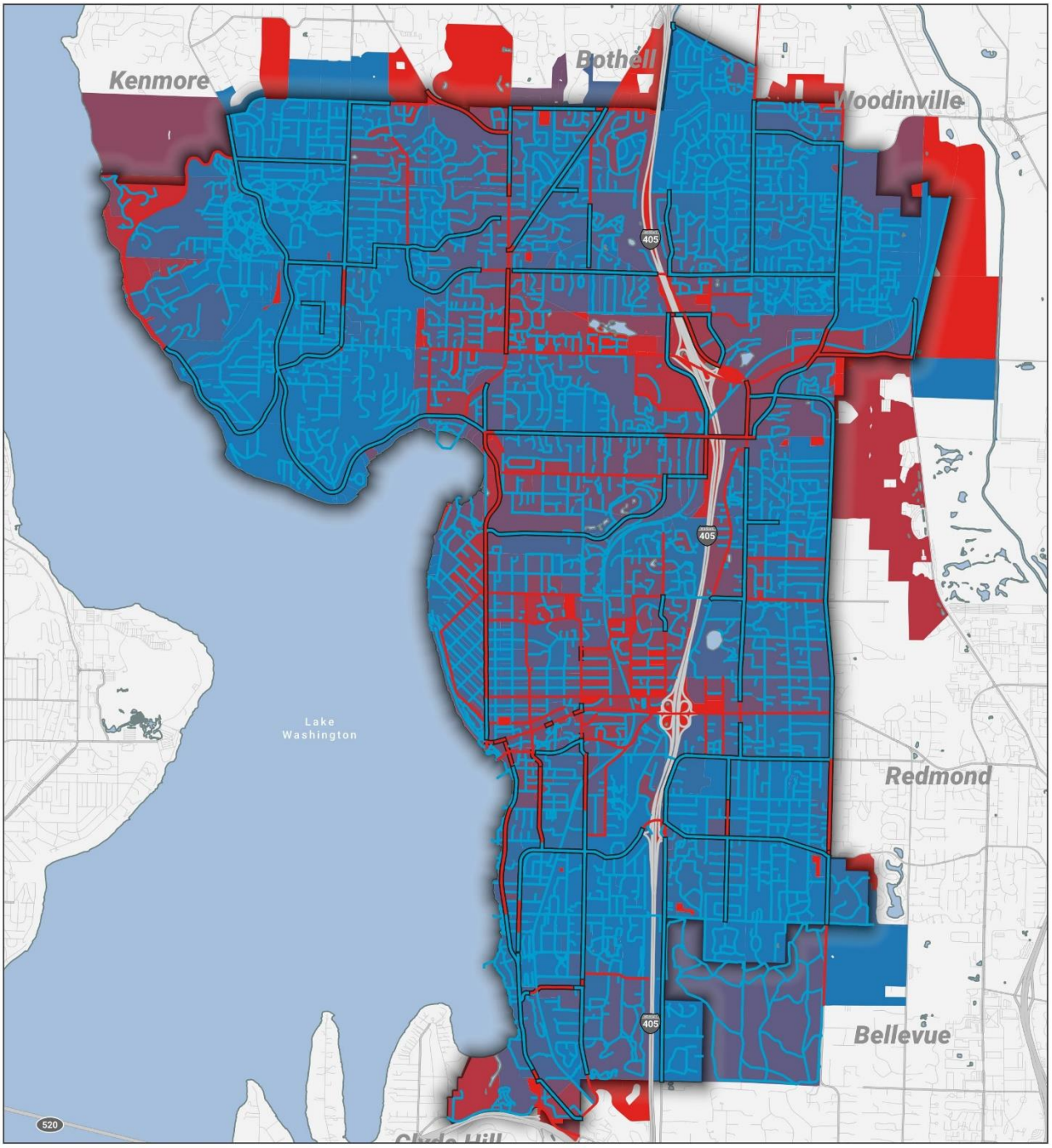
The next two maps displays the results from the existing conditions BNA and the future conditions BNA using the planned bike lane, neighborhood greenways, and feasible off-street connections. The two maps provide a snapshot of the degree the planned bicycle improvements improve low-stress connectivity. Improvements in low-stress connectivity in the future condition are not dramatic and widespread. Several key planned bikeway projects are classified as being high-stress (LTS 3-4) even after implementation, which prohibits some areas from experiencing major improvements in low-stress connectivity.

To improve low-stress connectivity, key corridors and segments are highlighted and recommended for a bicycle improvement that will improve the LTS score to either an LTS 1 or LTS. The method in selecting these corridors is simply to improve the LTS score in areas with a low BNA score or at locations that are key gateways or connections to destinations.

City of Kirkland Active Transportation Plan

Bicycle Network Analysis (BNA) - Existing Conditions

TOOLE DESIGN



Existing BNA Score

Low — High

Existing LTS

Low-Stress (LTS 1 - LTS 2)

High-Stress (LTS 3 - LTS 4)

Segments with a on-street bike facility

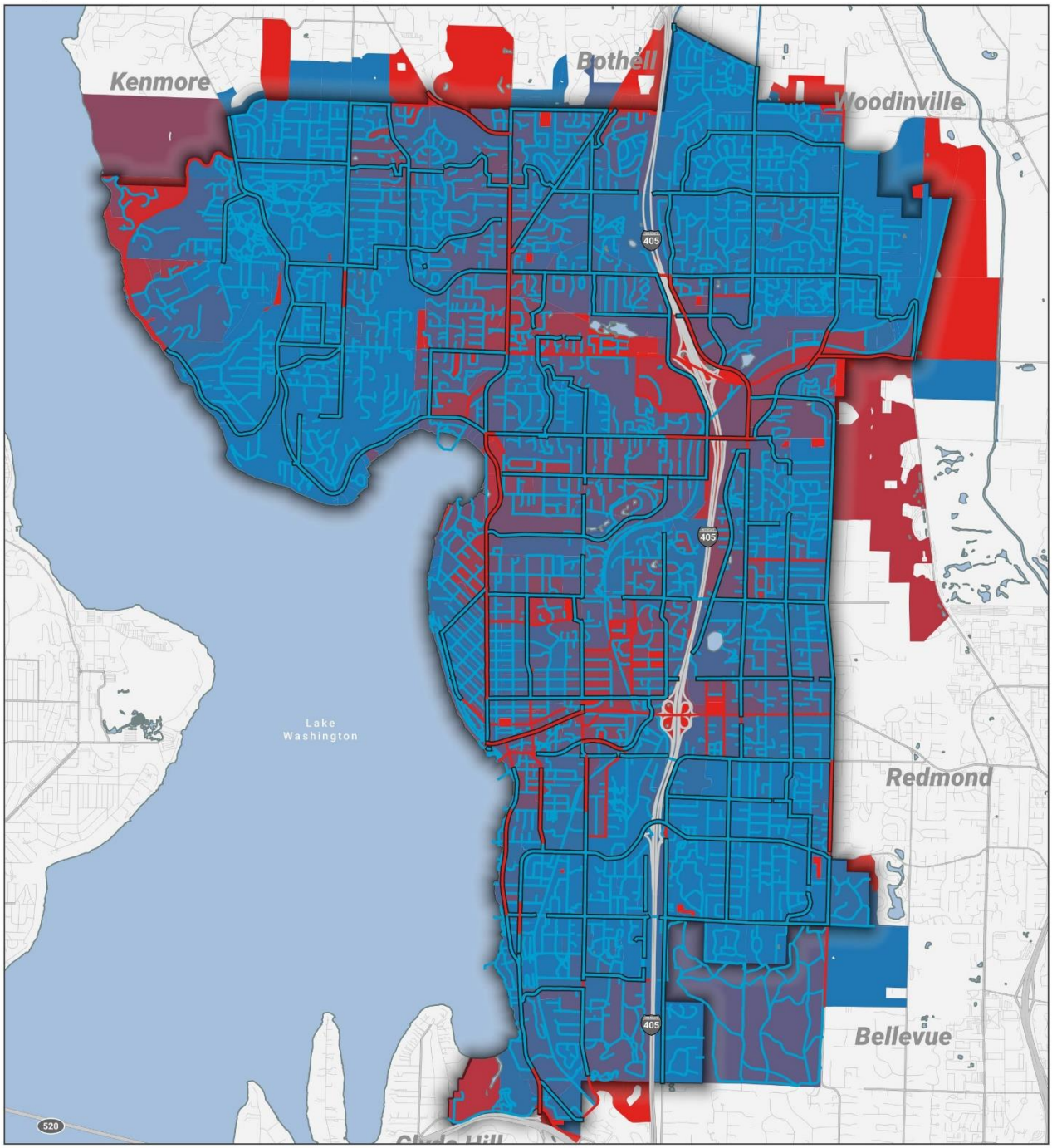
N

0 0.5 1 miles

City of Kirkland Active Transportation Plan

TOOLE DESIGN

Bicycle Network Analysis (BNA) - Future Conditions



Future BNA Score

Low — High

Future LTS

Low-Stress (LTS 1 - LTS 2)

High-Stress (LTS 3 - LTS 4)

Segments with a on-street bike facility

N

0 0.5 1 miles

Prioritization Scoring

The scores and specific measures to prioritize walk and bike routes are outlined below.

Connectivity to Destinations Served			
Factor	**Pedestrian Measure**	**Bicyclist Measure**	**Weight of Score**
Parks, Libraries, and Community / Senior Centers, (schools – bikes only)	# of destinations within 1/2 mile Score scaled by # of destinations	# of destinations within 1 mile Score scaled by # of destinations per mile	med
# of Transit Stops	Within ¼ mile of high frequency transit stop	Within ½ mile of high frequency transit stop	high
	within ¼ mile of non-high frequency bus stop	Non-high frequency bus stop within ½ mile Score scaled by # of stops per mile	low
	Location within ¼ mile of transit with no sidewalks on any side of the street	N/A	med
	Location within ¼ mile of transit with sidewalk on only one side of street	N/A	low
Schools	Along SRTS sidewalk project scored as high priority	N/A	med
	Along SRTS sidewalk project	N/A	low
Proximity to Activity Centers	Within ½ mile Score scaled by distance	Within 1 mile Score scaled by distance	med
Proximity to Cross Kirkland Corridor access point	Within ½ mile scaled by distance	Intersects access point	med

Connectivity		
Factor	**Bicyclist Measure**	**Score**
Bicycle Network Analysis	Lowest scoring BNA locations receive the highest score.	high
Level of Traffic Stress	High-stress under existing conditions	High+

Safety		
Factor	**Pedestrians and Bicycle Measure**	**Score**
Crash History	weighted crashes on a per mile basis (sliding window analysis)	High+

Equity	
Pedestrians and Bicycle Measure	**Score**
% of population who is non-white	med
% of population under 17 and above 65 years of age	med
% of population who identify as disabled	med
% of population living in poverty	med