



# Memorandum

To: Brad Johnson, Community Development Director, City of Burlington

Date: February 28, 2025

From: Jed Roberts, Senior GIS Analyst, Maul Foster & Alongi, Inc.

Project No.: M2736.02.001

Re: City of Burlington Climate Risk Assessment—Vulnerable Populations, Areas, and Infrastructure

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## Introduction

This document aims to provide the City of Burlington (City) in Washington state with a comprehensive analysis of its climate resilience. Recognizing the increasing challenges posed by climate change, it is essential to evaluate the City's ability to withstand and adapt to these environmental shifts. This analysis will serve as a resource for planners, policymakers, and community leaders to integrate climate resilience into Burlington's comprehensive planning efforts, enhancing the City's preparedness for climate-induced challenges.

The report is structured to cover several critical areas. The first section focuses on vulnerable populations, identifying those most at risk from climate impacts, including the elderly, young children, and economically disadvantaged groups. Next, the report examines community assets, highlighting key infrastructure, resources, and services that play a crucial role in the City's resilience. Finally, the document addresses climate-induced hazards, such as flooding, excessive heat, and drought, outlining the potential risks and mitigation strategies.

This analysis follows the Washington Department of Commerce Climate Element Planning Guidance (Commerce Guidance). These guidelines help create a thorough climate resilience plan to support Burlington in achieving a sustainable future for its residents. This analysis is also used to produce recommended mitigation strategies to effectively address potential climate impacts.

## Vulnerable Populations

To plan effectively for climate resilience, it's crucial to identify and locate populations vulnerable to climate-induced natural hazards. Knowing where sensitive groups such as the elderly, children, and economically disadvantaged people live helps prioritize resources and implement targeted strategies. This analysis examines detailed population data and existing development data to provide a comprehensive picture of where vulnerable populations are within the city.

## Demographic Profile of Burlington

Through review of demographic data highlighted in climate resilience and environmental justice tools, such as the Environmental Protection Agency's Environmental Justice Screening and Mapping Tool (EJScreen), the U.S. Department of Commerce Justice40 Initiative's Climate & Economic Justice Screening Tool (CEJST), and the Washington State Department of Health Environmental Health

Disparities Map, the following demographic indicators were compiled to provide a citywide summary of vulnerable populations in Burlington compared to Washington State as a whole (Tables 1 through 3).

**Table 1. Citywide Population by Race and Ethnicity**

Race/Ethnicity	2020 City Population	Percent of City	2020 State Population	Percent of State
White	5,176	56.6	4,918,820	63.8
Hispanic or Latino ethnicity	2,998	32.8	1,059,213	13.7
Two or more races	450	4.9	511,114	6.6
Asian	243	2.7	723,062	9.4
Black or African American	101	1.1	296,170	3.8
American Indian and Alaska Native	94	1.0	91,191	1.2
Other race	57	0.6	43,221	0.6
Native Hawaiian and Other Pacific Islander	33	0.4	62,490	0.8
Total Population	9,152	--	7,705,281	--

Source: 2020 U.S. Census (Table P9). Race counts are exclusive of Hispanic ethnicity.

**Table 2. Citywide Vulnerable Population Indicators**

Group	2020 City Population	Percent of City	2020 State Population	Percent of State
Under 5 years old	595	6.5	437,231	5.7
65 years old and over	1,556	17.0	1,252,428	16.3
Group	2022 Estimated City Population	Percent of City	2022 Estimated State Population	Percent of State
With a disability	1,503	16.4	1,069,089	13.9
Below poverty level	960	10.4	794,426	10.3
Speak Spanish at home, 5 years old and over	1,626	18.1	684,332	9.3
Speak Asian and Pacific Island languages at home, 5 years old and over	151	1.7	483,173	6.5
Speak other Indo-European languages at home, 5 years old and over	74	0.8	315,708	4.3
Speak other languages at home, 5 years old and over	12	0.1	105,152	1.4
Group	2022 Estimated City Population	Percent of Reporting Area	2022 Estimated State Population	Percent of State
Asthma prevalence	1,175	11.6	679,657	11.1

**Sources**

Age from 2020 U.S. Census (Table DP1).

Disability, poverty status, and language spoken at home from 2022 American Community Survey 5-year estimates (Tables B18101, S1701, and S1601, respectively).

Asthma prevalence from the U.S. Center for Disease Control PLACES database. The reporting comprises the three census block groups intersecting the City of Burlington and has a 2022 total estimated population of 10,141.

**Table 3. Citywide Vulnerable Household Indicators**

Group	2022 Estimated City Households	Percent of City	2022 Estimated State Households	Percent of State
Renter Households	2,028	52.7	1,125,696	36.3
Household Income < \$10,000	169	4.4	139,557	4.5
Household Income \$10,000 to \$24,999	450	11.7	235,696	7.6
Household Income \$25,000 to \$49,999	886	23.0	415,570	13.4
Total Households	3,850	--	3,101,265	--

Sources: Renter households and household income from 2022 American Community Survey 5-year estimates (Tables B25011 and S1901, respectively).

### Vulnerable Population Maps

Appendix A includes a set of maps illustrating the distribution of vulnerable population indicators for populated areas within each city census block.

Geospatial data readily accessible through Esri's demographic variable database were used. The following is a list of the demographic variables mapped and the corresponding maps, located in Appendix A.

- U.S. 2020 Decennial Census
  - Households with Residents Older than 65 Years (Figure A-1)
  - Population 0–4 Years Old (Figure A-2)
- American Community Survey 5-Year (2018–2022) Estimates
  - Households with Residents with Disability (Figure A-3)
  - Population Ages 18–64 Speaking Spanish at Home (Figure A-4)
  - Renter Households (Figure A-5)
  - Households Below the Poverty Level (Figure A-6)
  - Median Household Income (Figure A-7)

A composite index of vulnerable populations was developed for the city. Census blocks were ranked by the ratio of vulnerable persons or households to the total count in each block. Median household income was directly ranked. The overall index is the sum of ranks for each of the seven indicators (Figure A-8).

The most vulnerable populations are concentrated in four areas of the city: (1) the southeastern corner along Whitmarsh Road; (2) the vicinity of Creekside Continuing Care Community near Gages Slough; (3) the northwestern section bounded by Highway 20, N Section Street, E Fairhaven Avenue, and the city limits; and (4) the area around Heritage Place Apartments near the I-5 and Highway 20 interchange.

### Community Assets

To assess the potential impacts of climate-induced hazards on the community, community assets were identified and mapped. City staff provided essential input to this process by supplying an initial

list of assets. The categorization of these assets followed the sectors outlined in the Commerce Guidance. These community asset sectors include the following:

- Agriculture and food systems
- Buildings and energy
- Cultural resources and practices
- Economic development
- Emergency management
- Health and well-being
- Ecosystems
- Transportation
- Water resources
- Zoning and residential development

## Source Data

### Land Areas

Property parcels were used as the primary data source for classifying areas within the city by community asset sector. An initial mapping of land use types to asset sectors was conducted. For example, all residential land uses were categorized under the zoning and development sector, while all food cold storage uses were categorized under the agriculture and food systems sector. All sector classifications were subsequently reviewed, and adjustments were made where necessary. A common adjustment was for land uses categorized as miscellaneous business, which were initially classified under the economic development sector. However, many of these businesses are open to the public and were instead reclassified into sectors such as buildings and energy or agriculture and food systems.

### Point Locations and Linear Features

Many community assets were identified during discussion with City staff. These included civic and cultural centers providing community services, notable residential developments, transit centers, parks, a food bank, and a solar panel fabrication facility.

Additional locations were acquired from Skagit County, Skagit Transit, City of Burlington Department of Public Works, and Google Maps. They include assets such as flood gates, pump stations, public utilities, parks, bus stops and routes, large residential developments, and government buildings.

## Community Asset Maps

Appendix B includes a set of maps showing the location of community assets by sectors.

- Land Area by Community Asset Sector (Figure B-1)
- Community Assets: Agriculture/Food Systems, Buildings/Energy, and Economic Development Sectors (Figure B-2)
- Community Assets: Cultural Resources, Health/Well-Being, and Ecosystems Sectors (Figure B-3)
- Community Assets: Emergency Management, Transportation, and Utilities Sectors (Figure B-4)

Community Assets: Residential Development Sector (Figure B-5)

## Climate-Induced Hazards

The analysis for the City of Burlington's community assets incorporated data from climate-induced hazards most likely to affect the area, namely flooding, excessive heat, drought, and wildfire smoke. This assessment used hazard data from the University of Washington Climate Mapping for a Resilient Washington tool to project future climate scenarios, Federal Emergency Management Agency (FEMA) flood maps to identify flood-prone areas, Environmental Protection Agency AirNow database to provide air quality observations, and U.S. Geological Survey land cover maps to identify the natural and altered landscapes susceptible to these climate hazards. These data sources were

used to highlight location-specific impacts and potential threats to vulnerable populations. When available, the projections of future climate are shown with both low and high greenhouse gas emissions scenarios to provide a range.

## **Priority Hazards and Data Sources**

### **Flooding**

The primary flooding source for the City of Burlington is the Skagit River, which originates in the Cascade Range and empties into the Puget Sound. The river's drainage basin encompasses 3,093 square miles upstream of the stream gage located in the City of Mount Vernon (USGS 2025). Recent major flood events measured at the gage include November 1990 (37.4 feet National Geodetic Vertical Datum of 1929), November 1995 (37.3 feet), and November 2021 (37.3 feet) (NWPS 2025). An extensive levee system runs along the Skagit River, extending far upstream and downstream of the city limits, and has reduced flood impacts in the city since its construction.

A secondary flooding source is Gages Slough, which originates northeast of the city and flows southwest through the city before discharging into the Skagit River. During the rainy season, water enters the slough through a culvert from a side channel of the Skagit River at Hart Island. Water also enters the slough through subsurface exchange with the Skagit River, groundwater recharge, seeps, and overland stormwater flow. The slough discharges through a flood gate under normal flow conditions and a pump station is used to manage increased discharge during the rainy season (Otak 2007).

Peak flows on the Skagit River are expected to increase under both low and high greenhouse gas (GHG) emission scenarios, according to the University of Washington (2025). Compared to peak flows observed between 1980 and 2009, low and high GHG emission scenarios result in 10 percent and 7 percent increases in peak flows, respectively, over the period from 2020 to 2049.

Given that stormwater runoff contributes to flows in Gages Slough, extreme precipitation events can result in flooding within the interior of the levee system. In a high GHG emission scenario, the highest daily rain total during a 25-year storm event is expected to increase by 6 percent over the period of 2020 to 2049 when compared to observed totals from 1980 to 2009. The predicted impact of a low GHG emission scenario was not available (UW 2025).

For the purposes of mapping flood hazards at a scale appropriate for assessing risk to vulnerable populations and community assets, a recent and digital flood map was sought. The regulatory FEMA flood map for Burlington is from 1985 and has not been made available in a digital format that is conducive to mapping the city's flood hazard in detail. In June 2010, FEMA produced a preliminary digital flood map (FEMA 2010). Its validity was challenged (PII 2011), and it was ultimately not adopted as the regulatory flood map; however, it remains available as a digital source of flood elevations for planning purposes. The flood elevations represent a 100-year event, an extreme peak flow event in the context of recent observed peak flows, which were approximately 25-year events according to analysis performed by the U.S. Army Corp of Engineers (USACE n.d.).

### **Landslides**

Steep slopes in Burlington greater than 15 percent are limited to Burlington Hill in the north of the city. The hill has no mapped landslide areas but does have vertical rock faces that may be susceptible to rock fall (City of Burlington 2018).

While rock falls may occur for a variety of reasons unrelated to climate, extreme precipitation events are a primary trigger for shallow-seated landslides. In a high GHG emission scenario, the highest daily rain total during a 25-year storm event is expected to increase by 6 percent over the period of 2020 to 2049 when compared to observed totals from 1980 to 2009. An increase in the intensity of

extreme precipitation events raises the likelihood of new landslides or re-activation of long-dormant landslides.

### **Excessive Heat**

Summer maximum temperatures in Burlington are expected to increase in low and high GHG emission scenarios, according to the University of Washington (2025). Compared to summer maximum temperatures observed from 1980 to 2009, low and high GHG emission scenarios result in 3.2°F and 3.9°F increases, respectively, over the period from 2020 to 2049. Similarly, cooling degree days are expected to increase 3.6 days and 5.5 days annually in low and high GHG emission scenarios, respectively, over the 2020 to 2049 period compared to 1980 to 2009. More cooling degree days mean higher potential cooling demand for buildings in summer.

The Tree Equity Score tool (<https://www.treeequityscore.org/>), provided through a partnership between the Washington Department of Natural Resources and American Forests, publishes various measures related to the urban heat island effect, which will be exacerbated under expected GHG emission scenarios. Burlington has a citywide tree canopy cover of 16 percent and an average heat disparity index<sup>1</sup> of +4.9°F across the city's seven block groups.

High-resolution land cover data provided by the U.S. Geological Survey and National Oceanic and Atmospheric Administration have been used here to depict the heat island effect in Burlington (Figure C-3).

### **Drought**

Burlington's public water source is managed by the Skagit Public Utility District (PUD). Burlington is served within the Judy Reservoir Water System, which is fed by the Skagit River and four tributaries (the Gilligan, Salmon, Turner, and Mundt Creeks) originating on Cultus Mountain (Skagit PUD 2024).

Drought can reduce public water source availability in systems like the Judy Reservoir, particularly in the summer months. Several climate indicators reflect water availability. As an example indicator, the likelihood of precipitation drought in Skagit County is expected to increase in a high GHG emission scenario, according to the University of Washington (2025). A high GHG emission scenario is projected to result in a 26 percent annual chance for precipitation drought (total summer precipitation [June through August] below 75 percent of historical levels) over the period from 2020 to 2049. This is compared to the 24 percent annual chance observed from 1980 to 2009.

Water consumption has been declining over the past 15 years, due to efficiency fixtures in new construction, reduced landscaping irrigation, and reduced water use in response to rate increases. Water consumption is forecasted to remain consistent through 2030, then rise gradually beginning 2046. Given the higher likelihood of drought, Skagit PUD expects the Judy Reservoir Water System will have capacity to meet water needs for at least 50 years under projected operational conditions (Skagit PUD 2024).

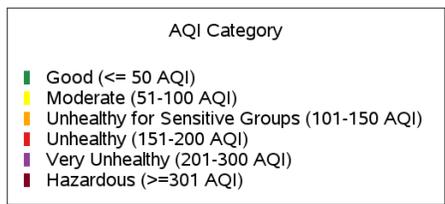
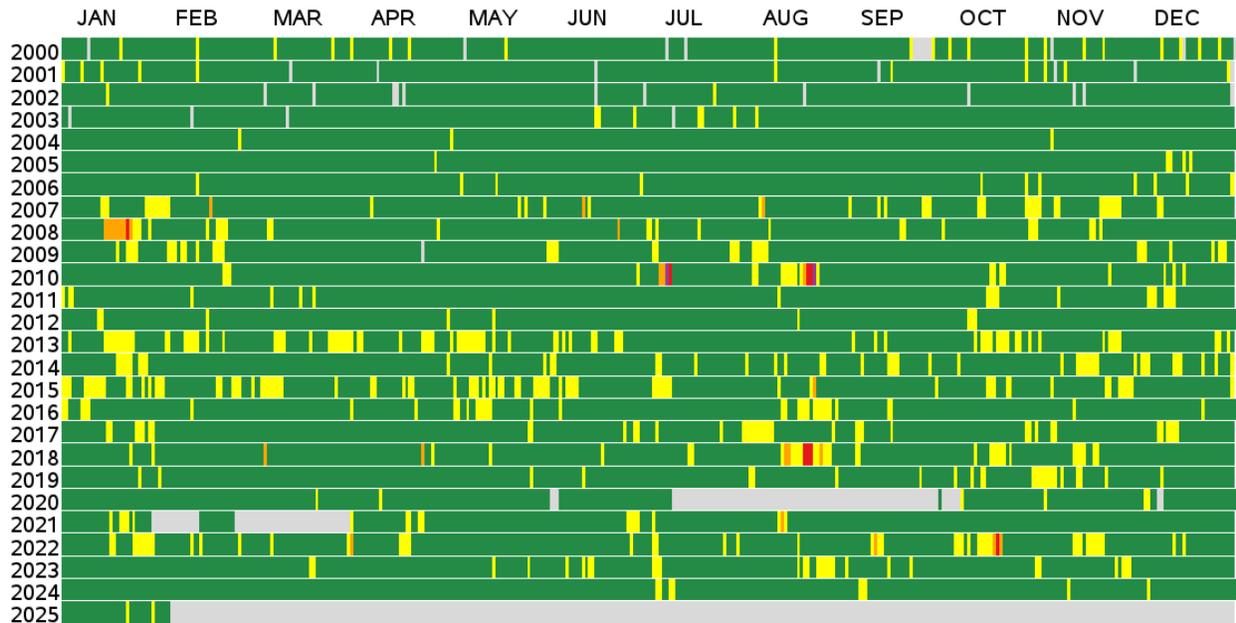
### **Wildfire Smoke**

Wildfire danger is extremely low in Burlington and is expected to remain so in various GHG emission scenarios, according to the University of Washington (2025). However, northern Washington will face a significant rise in wildfire risk, leading to more widespread smoke. From 2000 to 2025, the air quality index in Skagit County saw an increasing trend in occurrence and duration in moderate or worse air quality during the fire season from June to October (Figure 1 below).

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<sup>1</sup> The average heat disparity index compares all urban areas in the United States to their collective average maximum surface temperature and expresses the difference from that average in degrees.

**Figure 1: Daily Air Quality Values, 2000–2025, Skagit County, Washington**



**Notes**

Graph from the Environmental Protection Agency AirNow database.  
AQI = air quality index.

**Climate-Induced Hazard Maps**

Appendix C includes a set of maps showing the distribution of climate-induced hazards and related overlays.

- Flooding Depth (Figure C-1)
- Steep Slopes (Figure C-2)
- Urban Heat Factors (Figure C-3)

**Risk Assessment**

The climate risk assessment analyzed the vulnerable population, community asset, and climate-induced hazard data to understand the potential climate impacts in Burlington. This examination enabled the determination of specific locations and populations at risk from flooding, excessive heat, and drought and was built on principles established in the Commerce Guidance. Results from the risk assessment informed the proposed mitigation strategies.

## Pairing Hazards with Vulnerable Populations and Community Assets

The following is a summary of the possible impacts to vulnerable populations and community assets resulting from the priority hazards identified (Table 4).

**Table 4. Climate-Induced Hazard Exposure and Impacts**

Asset/Population-Hazard Pair (Sector)	Exposure of Population/Asset to Hazard	Impacts
Vulnerable populations and flood (Health/Well-Being, Residential Development)	Some of the city's most vulnerable populations reside in areas likely to flood in minor events and areas exposed to the deepest and most destructive conditions in a major flood. Areas include the residences in the vicinity of Creekside Continuing Care, E Hazel Ave/N Section St, and the Burlington RV Park.	During a major flood event, increased risk of injury or death due to mobility limitations. In any event, increased pressure on emergency management resources.
Vulnerable populations and excessive heat (Health/Well-Being, Residential Development)	Vulnerable populations often reside in areas most susceptible to existing and increasing urban heat island effects. In particular, residents in the vicinity of Heritage Place Apartments are most vulnerable and have only 8 percent tree canopy and a +8.4° F heat disparity index.	Increased pressure on emergency management resources to mitigate acute health impacts. Long-term chronic health impacts.
Tree canopy and excessive heat (Ecosystems, Health/Well-Being)	16 percent tree canopy across much of the city.	Exacerbation of urban heat island effects affecting community health. Disconnected habitat.
Cooling-related energy use and excessive heat (Buildings/Energy, Utilities)	Projected increase in maximum temperatures and cooling degree days across the city.	Increased energy demand and load on power infrastructure.
Vulnerable populations and wildfire smoke (Health/Well-Being, Residential Development)	Approximately 11% of the city population suffers from asthma and widespread wildfire smoke events expected to become more common, resulting in increasing risk factors for the population affected by asthma.	Increased pressure on emergency management resources to mitigate acute health impacts. Long-term chronic health impacts.
Levee system and flooding (Utilities, Emergency Management)	Low points in the levee system exist (elevation 42 to 45.5 feet relative to the North American Vertical Datum of 1988) immediately northwest of the railroad bridge. The sections are below the preliminary 100-year flood elevations published in 2010. Nearest populations to the low points are in the top 80% of city's vulnerability index.	Levee breach in an extreme peak flow event on the Skagit River, most immediately affecting most vulnerable populations.
Roads/stormwater infrastructure and flooding/extreme precipitation (Transportation, Utilities)	Low elevation roads and utilities, particularly in areas near and south of Gages Slough.	More extreme precipitation events will increase the occurrence of nuisance flooding.

## Overlay Maps of Vulnerable Populations and Climate-Induced Hazards

Appendix D includes two maps showing the distribution of the most vulnerable populations relative to climate-induced hazards.

- Most Vulnerable Populations and Flooding Depth (Figure D-1)
- Most Vulnerable Populations and Urban Heat Factors (Figure D-2)

## Mitigation Strategies

The increasing threat of climate-induced hazards necessitates the development of mitigation strategies to protect community assets and vulnerable populations. Burlington's existing comprehensive plan recognizes these challenges and outlines goals to address them. The following is a review of those goals and suggested additional mitigation strategies to address the results of the climate risk assessment.

### Existing Climate Goals and Policies

A review of the Burlington's 2023 comprehensive plan identified a series of goals related to climate-induced hazards and their potential impacts (City of Burlington 2018). These include:

- **Land Use Goal and Policy 2.4.3.1** – Development should be prohibited in hazardous areas unless protective improvements or other mitigation measures can reduce risks to an acceptable level. The creation of new lots or parcels in highly hazardous areas should be prohibited except in limited circumstances.
- **Land Use Goal and Policy 2.4.3.2** – Land within a designated floodplain may only be added to the City's urban growth area if the land will be used for park, conservation, or open space purposes, or if the land is already developed at, or near, urban densities.
- **Land Use Goal and Policy 2.4.3.4** – Gages Slough, Burlington Hill, and the corridor along the Skagit River dike shall be designated as "Special Management Areas". Special goals and policies for these areas are identified in the Natural Resources Element. Densities and uses shall be limited in these areas and site planning and subdivision techniques that limit development impacts, such as clustering, should be employed. Public acquisition of open space land and conservation easements should be prioritized.
- **Land Use Goal and Policy 2.4.3.5** – Support and permit the construction of dikes and other flood control improvements that protect land within the current UGA or municipal boundaries. Annexations or UGA expansions beyond the boundaries of existing or planned flood protection improvements shall be discouraged or prohibited.
- **Land Use Goal and Policy 2.4.6.7** – A very long range plan, covering a period beyond 20 years, should be developed for the area surrounding the City's UGA. This plan should identify land suitable for future UGA expansions. The plan should also identify land that is unsuitable for future urban growth due to flood hazards, critical areas, regional open space plans, or the need to preserve agricultural land. The City should work with surrounding jurisdictions and regional planning groups to develop, and implement, this plan.
- **Natural Resources Goal and Policy 4.4.1.6 (also Parks and Recreation 7.3.3.1)** – Prioritize the acquisition of land or easements along the Gages Slough corridor and promote projects that improve wetland functions and values, water quality, and increase storm and flood water storage capacity.
- **Natural Resources Goal and Policy 4.4.3.1** – Low impact development (LID) techniques, such as rain gardens, bio-retention, vegetated roofs, and permeable pavement, shall be the preferred and commonly used approach for all development and construction activities.
- **Natural Resources Goal and Policy 4.4.3.2** – Storm-water and site development regulations should focus on methods that mimic natural hydrologic processes and minimize impervious surface coverage.

- **Natural Resources Goal and Policy 4.4.3.4** – The removal of native vegetation should be limited to what is minimally necessary to accommodate development. Healthy mature trees should be retained whenever possible and landscaping for new development should include native drought tolerant vegetation.
- **Natural Resources Goal and Policy 4.4.6.1** – Evaluate the floodwater displacement impacts of new development and require mitigation for significant impacts.
- **Natural Resources Goal and Policy 4.4.6.2** – The UGA shall not be further expanded into floodplain areas unless the expansion encompasses an existing municipal facility or an area that is already developed at urban densities.
- **Natural Resources Goal and Policy 4.4.6.4** – Flood control structures should be constructed or improved to protect the City's existing urbanized areas but shall not be constructed for the purpose of facilitating the urbanization of rural or undeveloped land in the floodplain.
- **Natural Resources Goal and Policy 4.4.6.5** – Development housing essential public services or vulnerable populations shall be constructed with a flood protection elevation of at least three feet above the base flood elevation.
- **Natural Resources Goal and Policy 4.4.7.1** – Elevate new buildings sufficiently to account for changing natural conditions and the cumulative impact of past development and planned growth.
- **Natural Resources Goal and Policy 4.4.7.2** – New lots that lack an adequate building site outside the special flood risk zone shall not be created except for conservation purposes, or to accommodate a public facility or utility.
- **Natural Resources Goal and Policy 4.4.7.3** – Buildings located in the special flood risk zone shall be designed with open foundations that allow floodwaters to pass through unimpeded.

### **Recommended Mitigation Strategies**

- Enhance emergency preparedness, response, and recovery efforts to mitigate risk and impacts associated with flooding and excessive heat worsened by climate change.
- Restore floodplains and connectivity within the Gages Slough watershed to improve the resilience and reduce flood risk.
- Map transportation infrastructure that is vulnerable to recurring and projected flooding and designate alternative travel routes for critical transportation corridors when roads must be closed.
- Identify and quantify the ecosystem services benefits of natural systems, and include these natural capital assets in cost-benefit assessments for community and development planning.
- Protect community health and well-being from the impacts of climate-exacerbated hazards, prioritizing focus on overburdened communities, and ensure the most vulnerable residents do not bear disproportionate health impacts.
- Adopt a forest master plan and implement ordinances to maintain and expand tree canopy cover.
- Increase tree canopy (including parks, greenbelts, and urban forests) to decrease climate-exacerbated risk, protect residents, and improve ecosystem health and habitat.
- Develop and maintain a program to distribute cooling units and install heat pumps, prioritizing households with residents most vulnerable to extreme temperature events.

- Work with energy utilities to improve the safety and reliability of infrastructure vulnerable to climate change.
- Factor climate impacts into the planning of operations and coordination of preparedness, response, and recovery activities among first responders and partners, including public health, law enforcement, fire, school, and emergency medical services (EMS) personnel.
- Develop resilience hubs or enhance existing resilience hubs for vulnerable populations in the event of climate-exacerbated hazards.

Install distributed renewable energy generation and battery infrastructure at public facilities to store renewable electricity generated on site and provide emergency power that ensures continuity of operations.

## **Attachments and Appendixes**

References

Limitations

Appendix A—Vulnerable Population Maps

Appendix B—Community Asset Maps

Appendix C—Climate-Induced Hazard Maps

Appendix D—Overlay Maps of Vulnerable Populations and Climate-Induced Hazards

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## **Limitations**

The services undertaken in completing this technical memorandum were performed consistent with generally accepted professional consulting principles and practices. No other warranty, express or implied, is made. These services were performed consistent with our agreement with our client. This technical memorandum is solely for the use and information of our client unless otherwise noted. Any reliance on this report by a third party is at such party's sole risk.

Opinions and recommendations contained in this technical memorandum apply to conditions existing when services were performed and are intended only for the client, purposes, locations, time frames, and project parameters indicated. We are not responsible for the impacts of any changes in environmental standards, practices, or regulations subsequent to performance of services. We do not warrant the accuracy of information supplied by others, or the use of segregated portions of this technical memorandum.

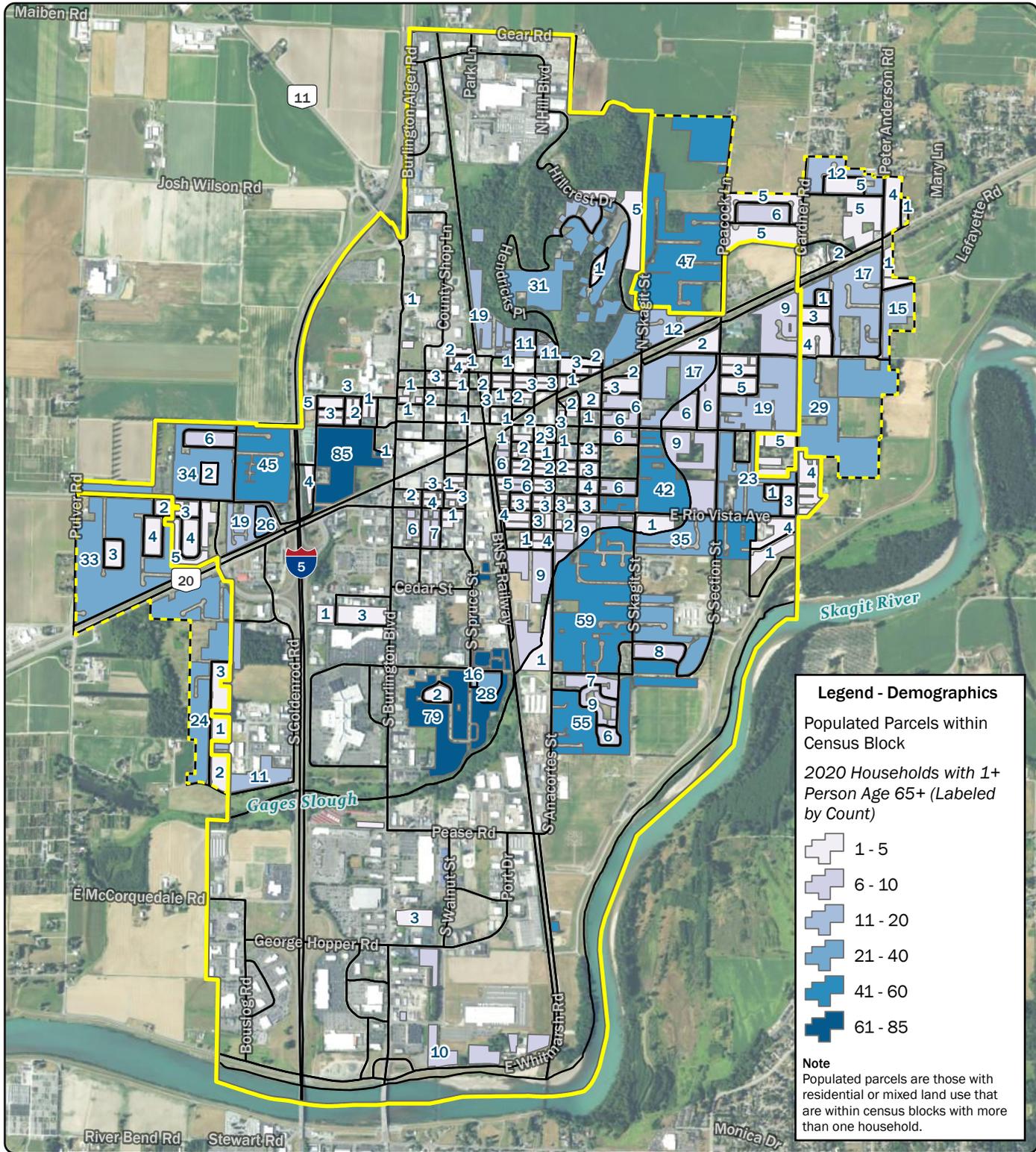
# Appendix A

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## Vulnerable Population Maps



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**Legend - Demographics**

Populated Parcels within Census Block

2020 Households with 1+ Person Age 65+ (Labeled by Count)

Lightest Blue	1 - 5
Light Blue	6 - 10
Medium Light Blue	11 - 20
Medium Blue	21 - 40
Dark Blue	41 - 60
Darkest Blue	61 - 85

**Note**  
 Populated parcels are those with residential or mixed land use that are within census blocks with more than one household.

**Data Sources**  
 Demographic data from Esri and the 2020 U.S. Decennial Census; city boundary and parcels (2025) from Skagit County; urban growth areas from the Washington State Department of Ecology.

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 p. 971 544 2139 | www.maulfooster.com

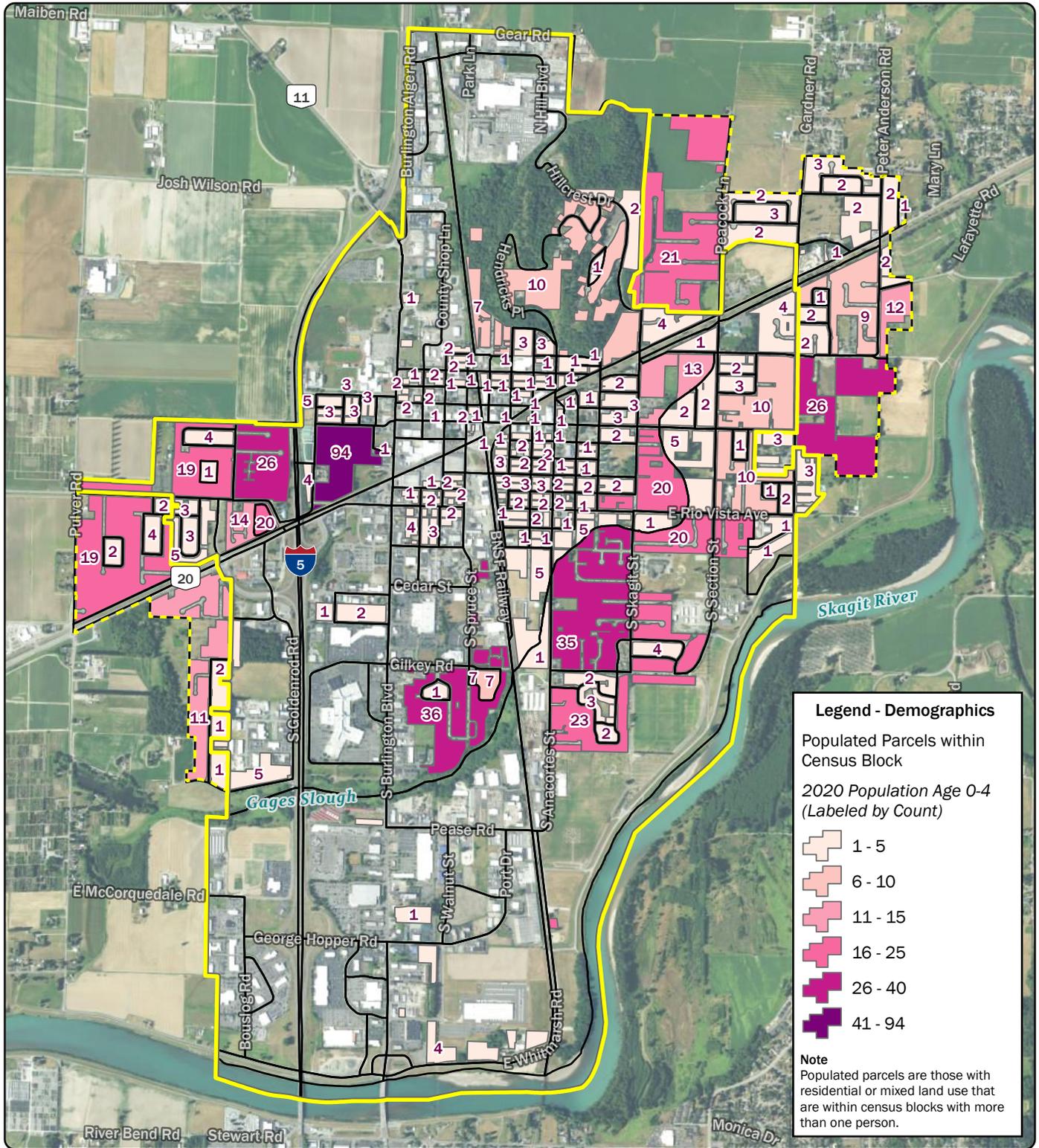
**Legend - Boundaries**

- Burlington City Boundary
- Burlington Urban Growth Area (County Jurisdiction)
- Census Block

**Figure A-1**  
**Households with One or More People Age 65 or Older**  
 City of Burlington, WA

0 0.5  
  
 Miles

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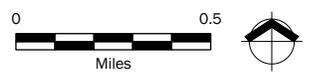


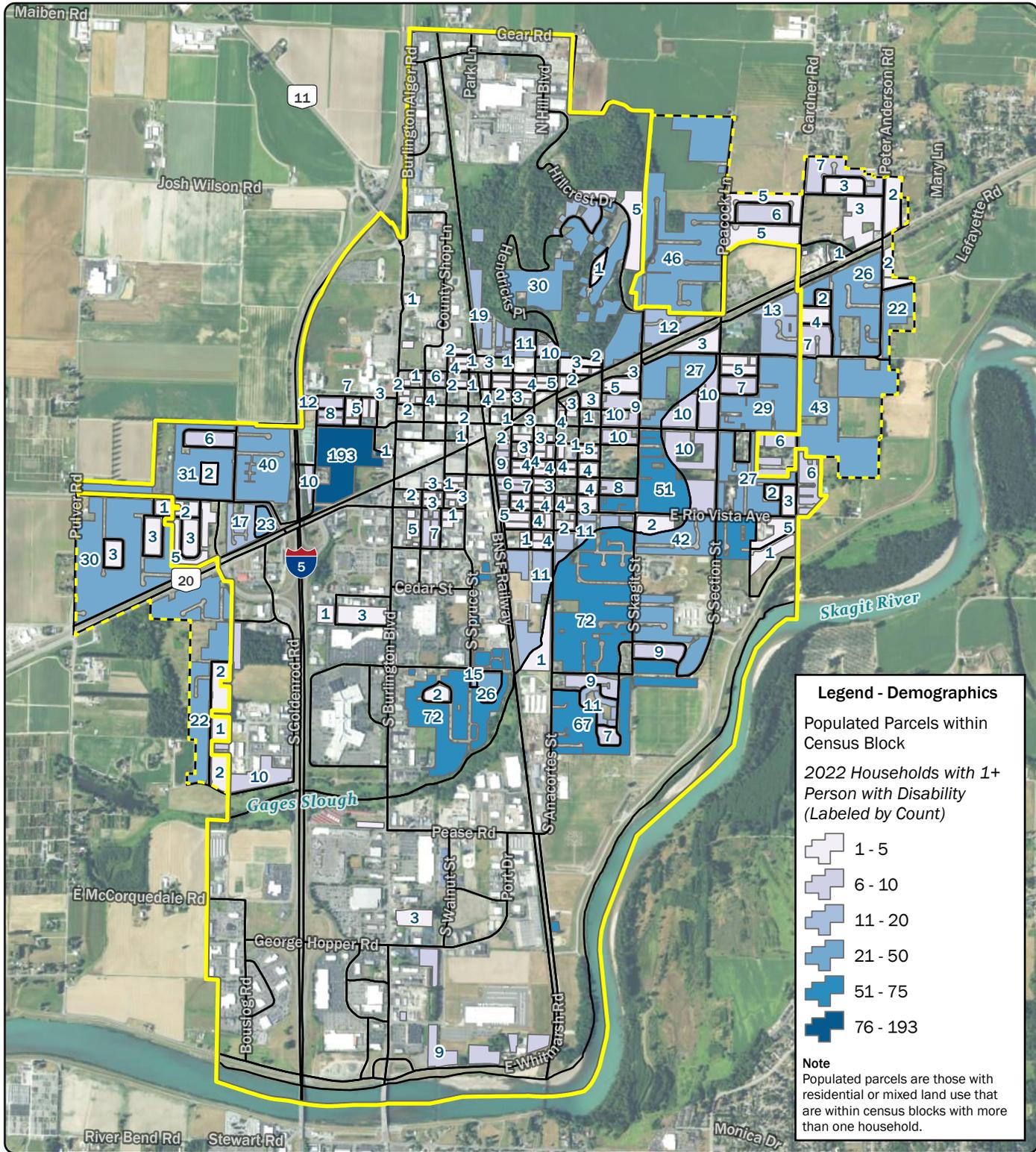
**Data Sources**  
 Demographic data from Esri and the 2020 U.S. Decennial Census; city boundary and parcels (2025) from Skagit County; urban growth areas from the Washington State Department of Ecology.



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**Figure A-2**  
**Population of Children**  
**Age 4 or Younger**  
 City of Burlington, WA





**Legend - Demographics**

Populated Parcels within Census Block

2022 Households with 1+ Person with Disability (Labeled by Count)

- 1 - 5
- 6 - 10
- 11 - 20
- 21 - 50
- 51 - 75
- 76 - 193

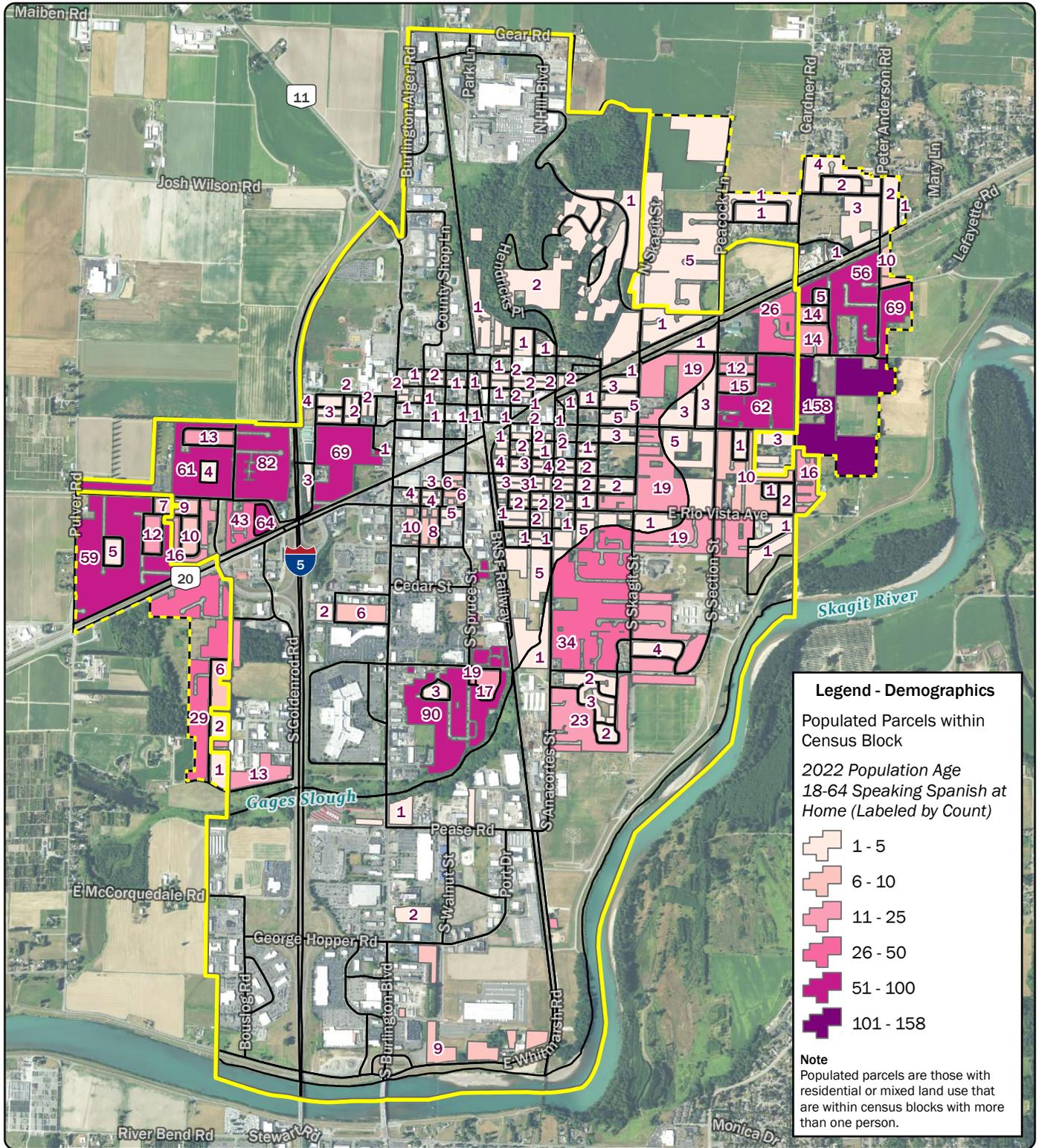
**Note**  
 Populated parcels are those with residential or mixed land use that are within census blocks with more than one household.

**Data Sources**  
 Demographic data from Esri and the 2022 American Community Survey (5-Year); city boundary and parcels (2025) from Skagit County; urban growth areas from the Washington State Department of Ecology.

**Legend - Boundaries**

- Burlington City Boundary
- Burlington Urban Growth Area (County Jurisdiction)
- Census Block

**Figure A-3**  
**Households with One or More People with a Disability**  
 City of Burlington, WA



**Legend - Demographics**

Populated Parcels within Census Block

2022 Population Age 18-64 Speaking Spanish at Home (Labeled by Count)

	1 - 5
	6 - 10
	11 - 25
	26 - 50
	51 - 100
	101 - 158

**Note**  
 Populated parcels are those with residential or mixed land use that are within census blocks with more than one person.

**Data Sources**  
 Demographic data from Esri and the 2022 American Community Survey (5-Year); city boundary and parcels (2025) from Skagit County; urban growth areas from the Washington State Department of Ecology.

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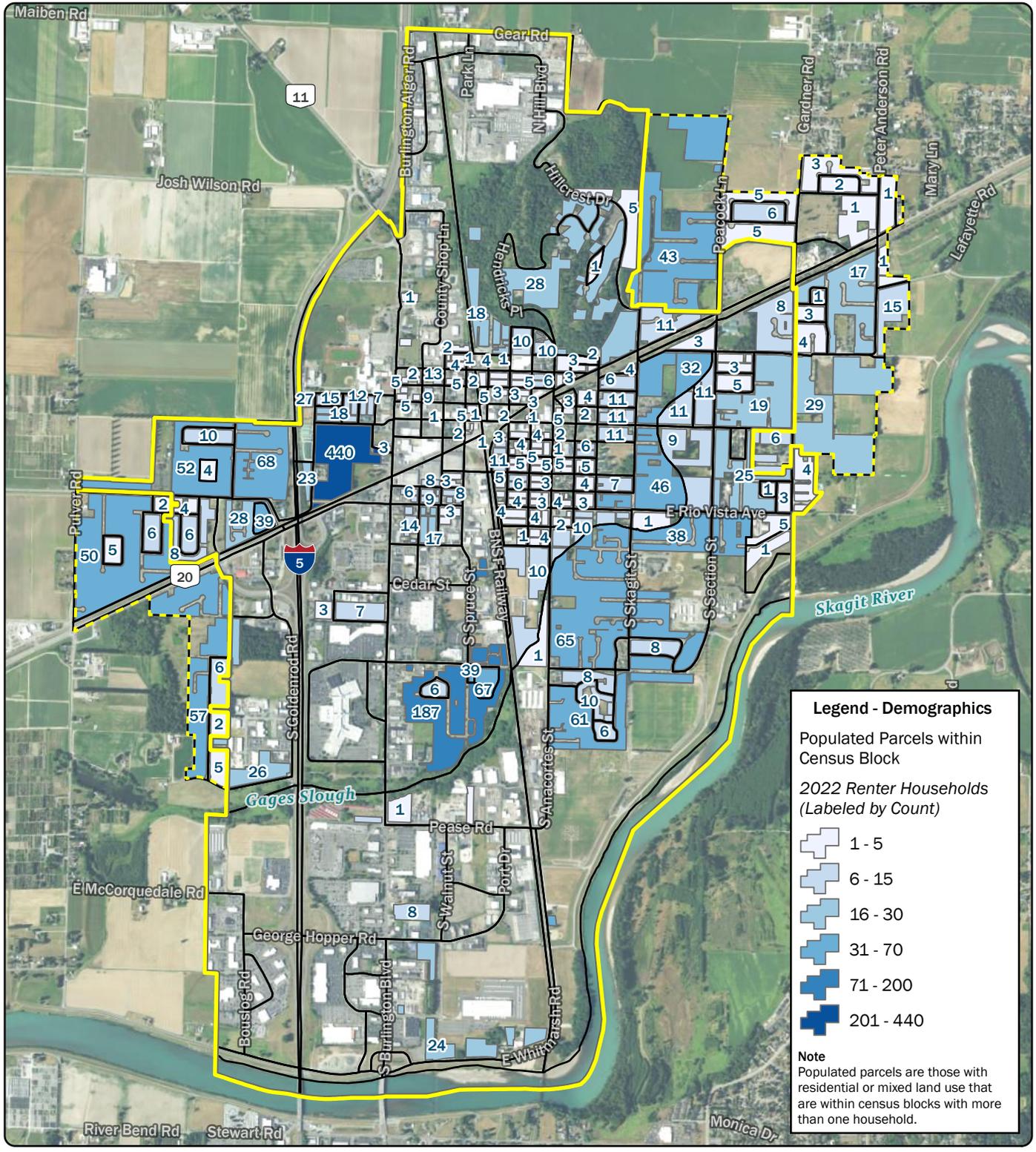
**Legend - Boundaries**

- Burlington City Boundary
- Burlington Urban Growth Area (County Jurisdiction)
- Census Block

**Figure A-4**  
**Population Age 18-64**  
**Speaking Spanish at Home**  
 City of Burlington, WA

0 0.5  
  
 Miles

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**Legend - Demographics**

Populated Parcels within Census Block

2022 Renter Households (Labeled by Count)

	1 - 5
	6 - 15
	16 - 30
	31 - 70
	71 - 200
	201 - 440

**Note**  
 Populated parcels are those with residential or mixed land use that are within census blocks with more than one household.

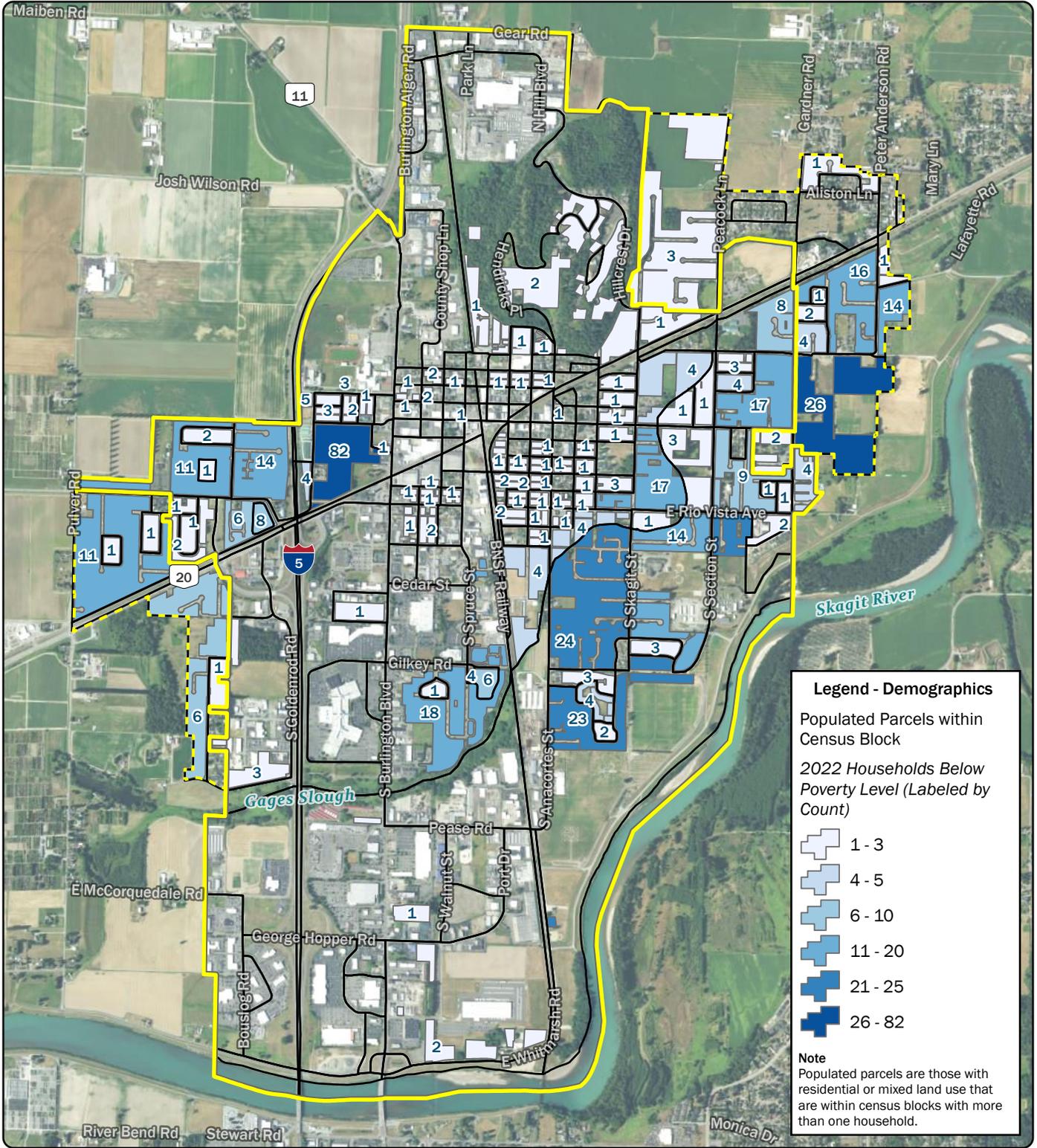
**Data Sources**  
 Demographic data from Esri and the 2022 American Community Survey (5-Year); city boundary and parcels (2025) from Skagit County; urban growth areas from the Washington State Department of Ecology.

**Legend - Boundaries**

- Burlington City Boundary
- Burlington Urban Growth Area (County Jurisdiction)
- Census Block

**Figure A-5**  
**Renter Households**  
 City of Burlington, WA

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**Legend - Demographics**

Populated Parcels within Census Block

2022 Households Below Poverty Level (Labeled by Count)

	1 - 3
	4 - 5
	6 - 10
	11 - 20
	21 - 25
	26 - 82

**Note**  
 Populated parcels are those with residential or mixed land use that are within census blocks with more than one household.

**Data Sources**  
 Demographic data from Esri and the 2022 American Community Survey (5-Year); city boundary and parcels (2025) from Skagit County; urban growth areas from the Washington State Department of Ecology.

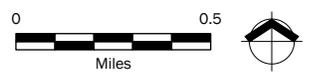
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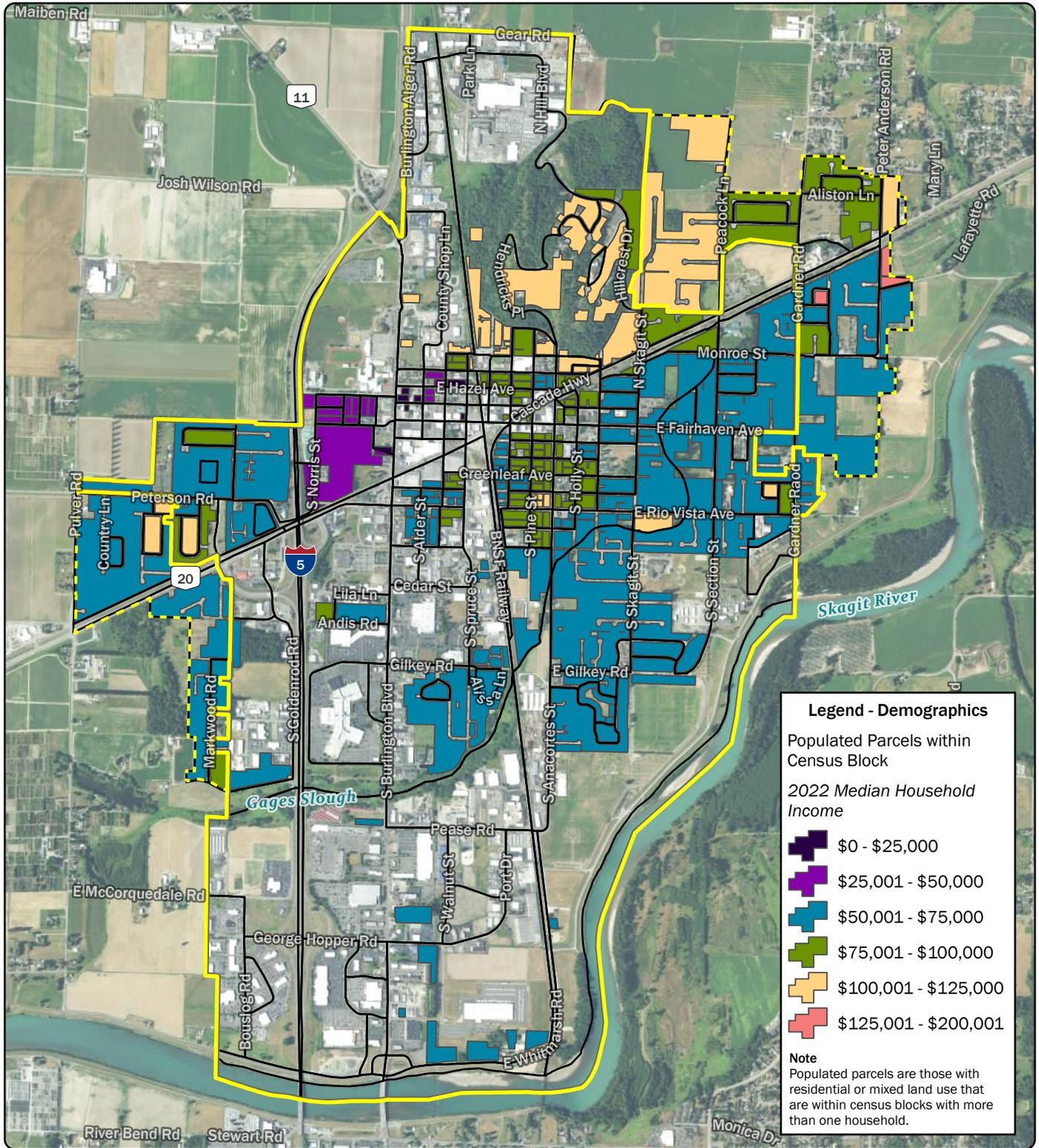
- Burlington City Boundary
- Burlington Urban Growth Area (County Jurisdiction)
- Census Block

**Figure A-6**  
**Households Below the Poverty Level**  
 City of Burlington, WA

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**Legend - Demographics**

Populated Parcels within Census Block

2022 Median Household Income

- \$0 - \$25,000
- \$25,001 - \$50,000
- \$50,001 - \$75,000
- \$75,001 - \$100,000
- \$100,001 - \$125,000
- \$125,001 - \$200,001

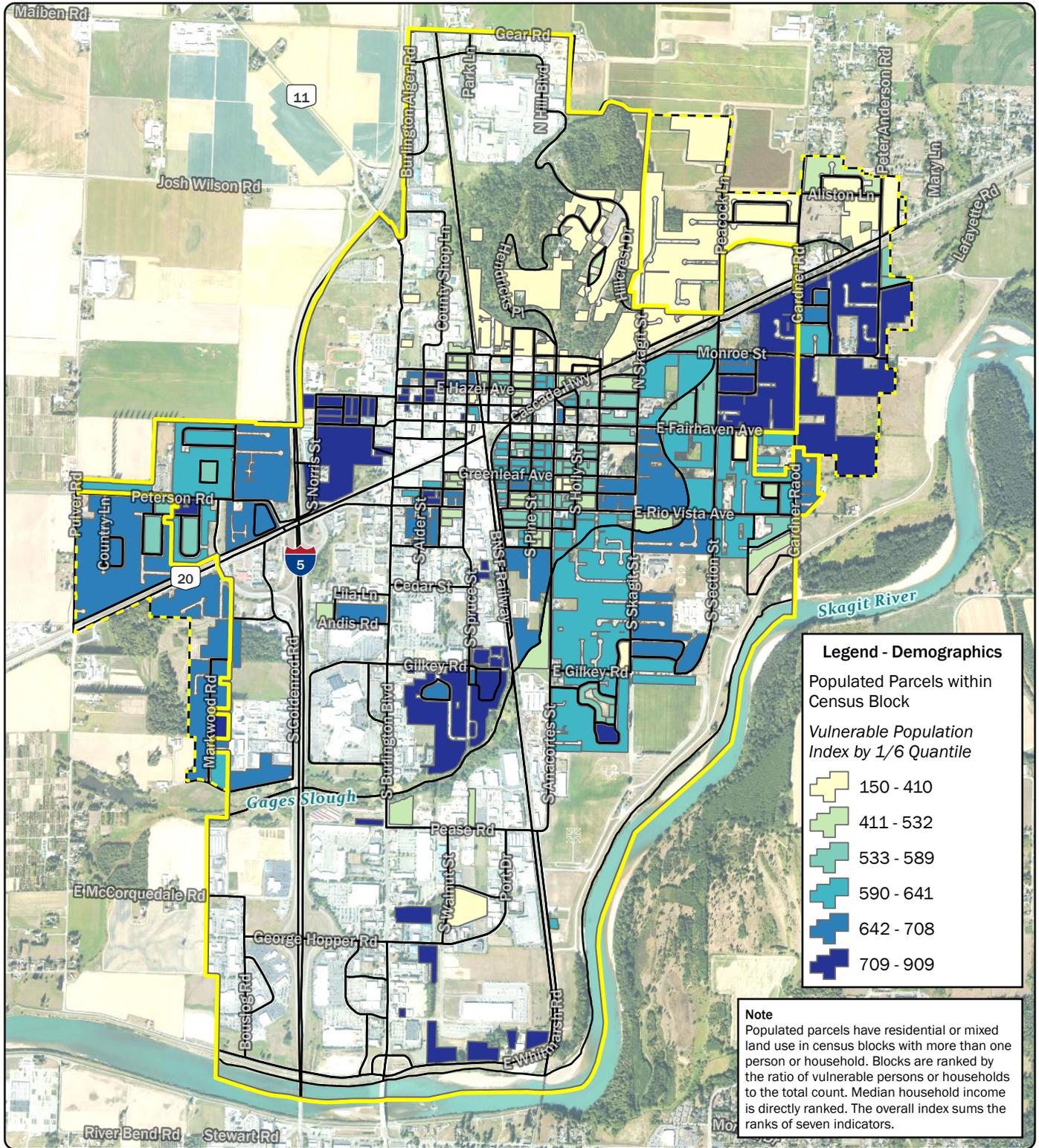
**Note**  
 Populated parcels are those with residential or mixed land use that are within census blocks with more than one household.

**Data Sources**  
 Demographic data from Esri and the 2022 American Community Survey (5-Year); city boundary and parcels (2025) from Skagit County; urban growth areas from the Washington State Department of Ecology.

**Legend - Boundaries**

- Burlington City Boundary
- Burlington Urban Growth Area (County Jurisdiction)
- Census Block

**Figure A-7**  
**Median Household Income**  
 City of Burlington, WA



**Legend - Demographics**

Populated Parcels within Census Block

*Vulnerable Population Index by 1/6 Quantile*

	150 - 410
	411 - 532
	533 - 589
	590 - 641
	642 - 708
	709 - 909

**Note**  
 Populated parcels have residential or mixed land use in census blocks with more than one person or household. Blocks are ranked by the ratio of vulnerable persons or households to the total count. Median household income is directly ranked. The overall index sums the ranks of seven indicators.

**Data Sources**  
 Demographic data from Esri and the 2022 American Community Survey (5-Year); city boundary and parcels (2025) from Skagit County; urban growth areas from the Washington State Department of Ecology.

**Legend - Boundaries**

- Burlington City Boundary
- Burlington Urban Growth Area (County Jurisdiction)

**Figure A-8**  
**Vulnerable Population Index**  
 City of Burlington, WA



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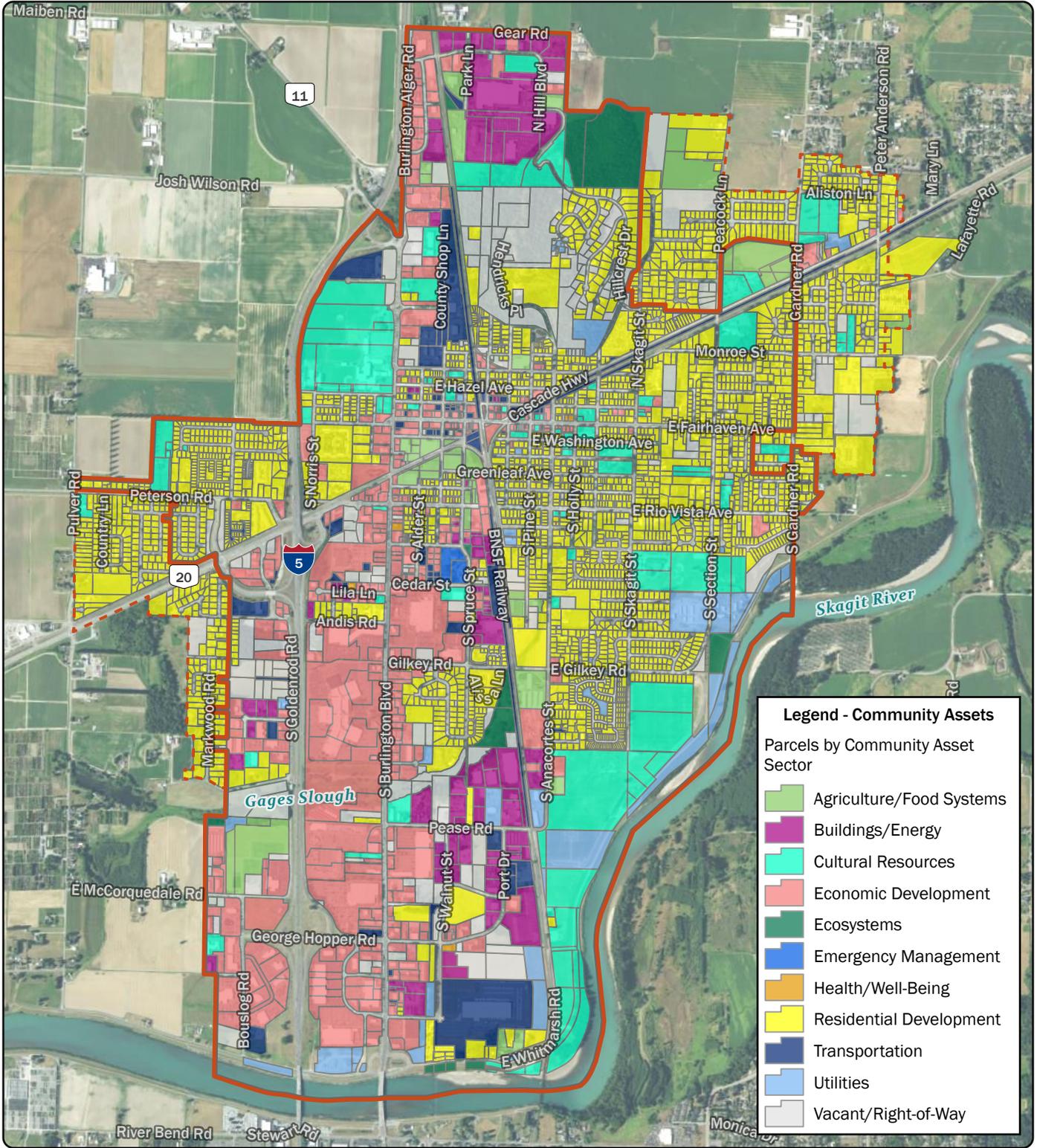
# Appendix B

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## Community Asset Maps



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**Data Sources**  
 City boundary and parcels (2025) from Skagit County;  
 urban growth areas from the Washington State  
 Department of Ecology.

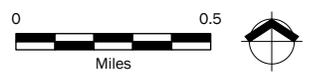
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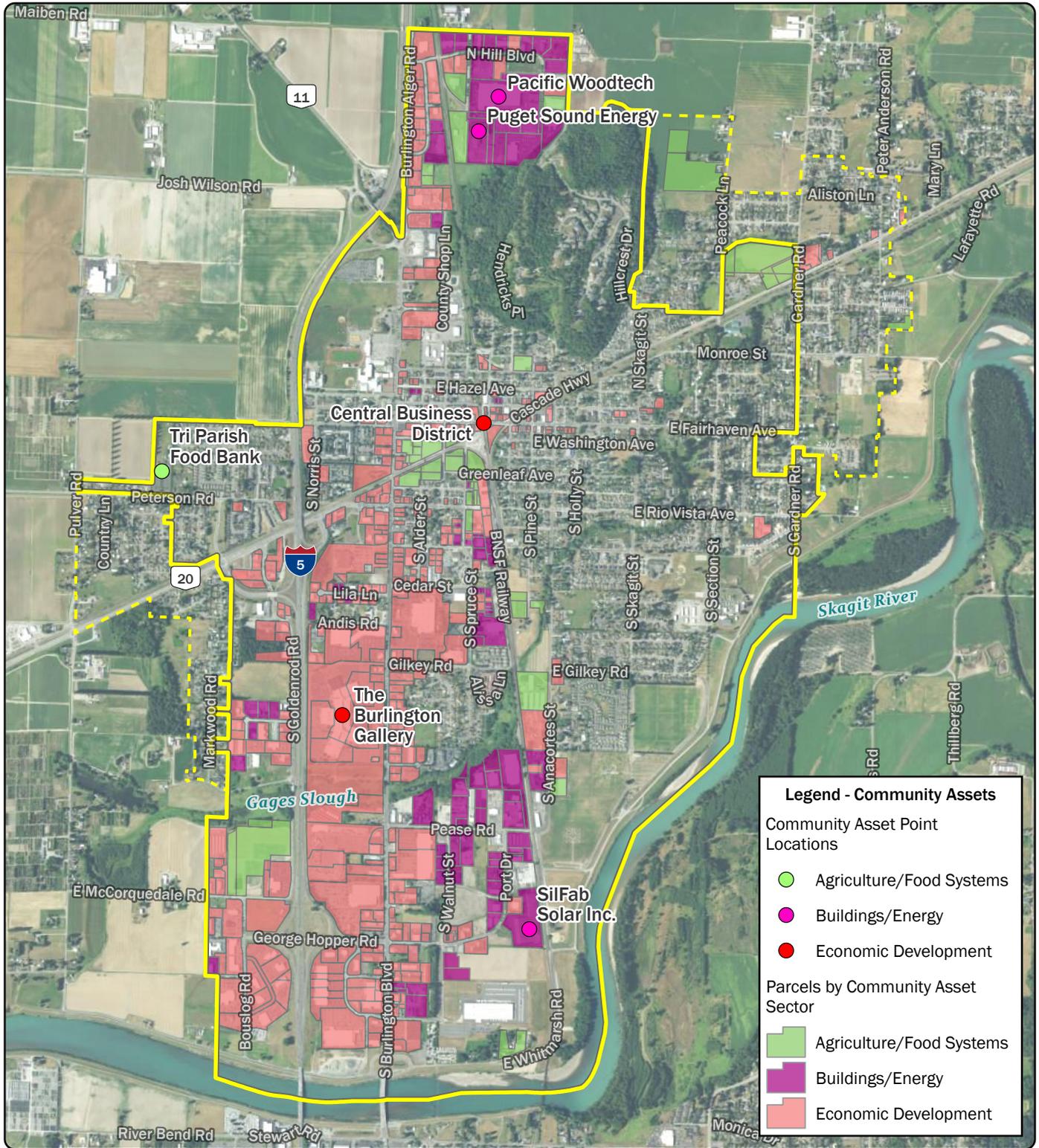
- Burlington City Boundary
- Burlington Urban Growth Area (County Jurisdiction)

**Figure B-1**  
**Land Area by**  
**Community**  
**Asset Sector**  
 City of Burlington, WA

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**Legend - Community Assets**

Community Asset Point Locations

- Agriculture/Food Systems
- Buildings/Energy
- Economic Development

Parcels by Community Asset Sector

- Agriculture/Food Systems
- Buildings/Energy
- Economic Development

**Data Sources**  
 City boundary and parcels (2025) from Skagit County; urban growth areas from the Washington State Department of Ecology.

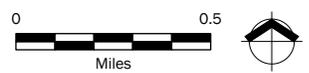
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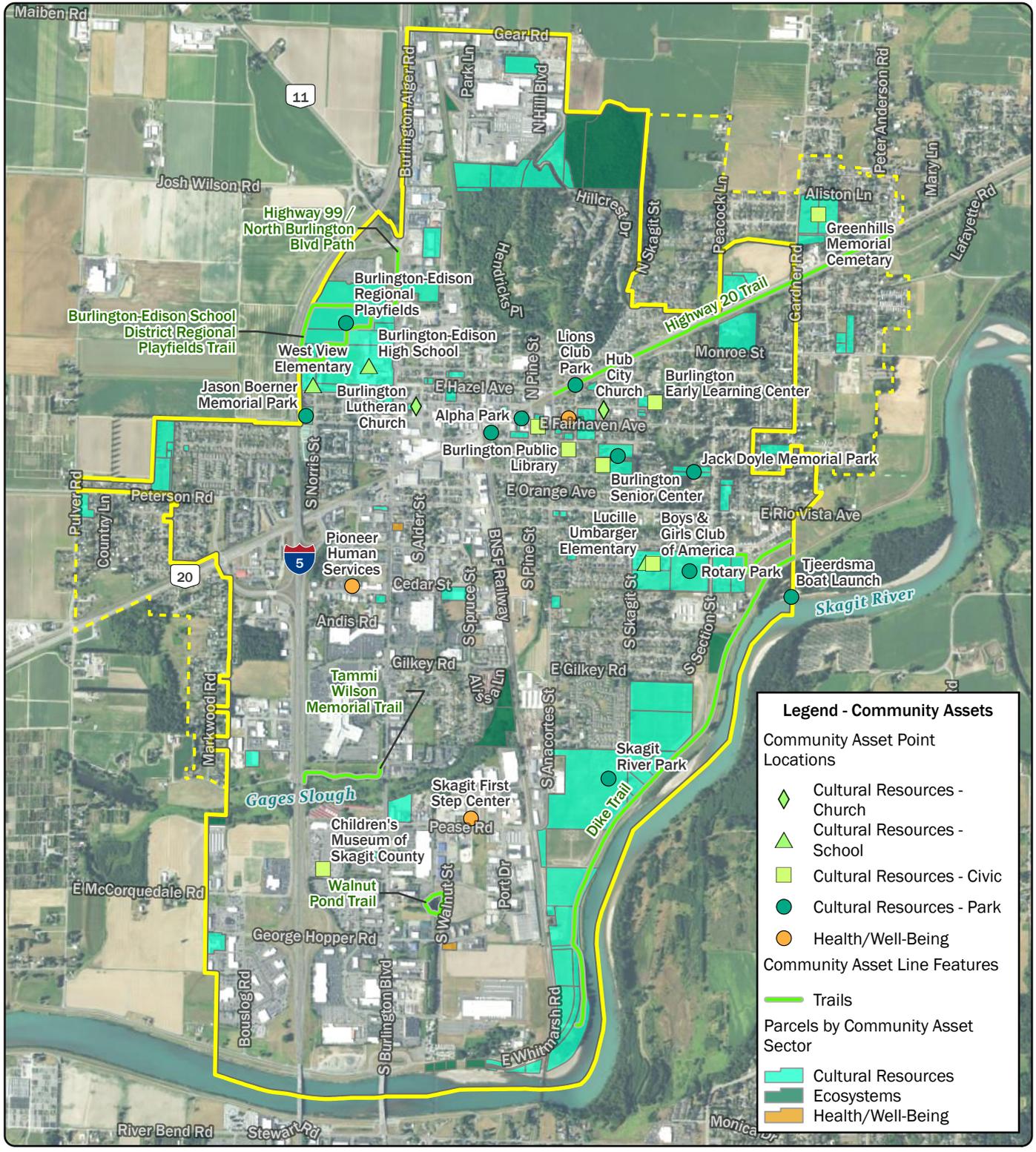
- Burlington City Boundary
- Burlington Urban Growth Area (County Jurisdiction)

**Figure B-2**  
**Community Assets:**  
**Agriculture/Food Systems,**  
**Buildings/Energy, and**  
**Economic Development Sectors**  
 City of Burlington, WA

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**Legend - Community Assets**

Community Asset Point Locations

- ◆ Cultural Resources - Church
- ▲ Cultural Resources - School
- Cultural Resources - Civic
- Cultural Resources - Park
- Health/Well-Being

Community Asset Line Features

- Trails

Parcels by Community Asset Sector

- Cultural Resources
- Ecosystems
- Health/Well-Being

**Data Sources**  
 Place names, trails, city boundary, and parcels (2025) from Skagit County; urban growth areas from the Washington State Department of Ecology.

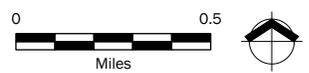
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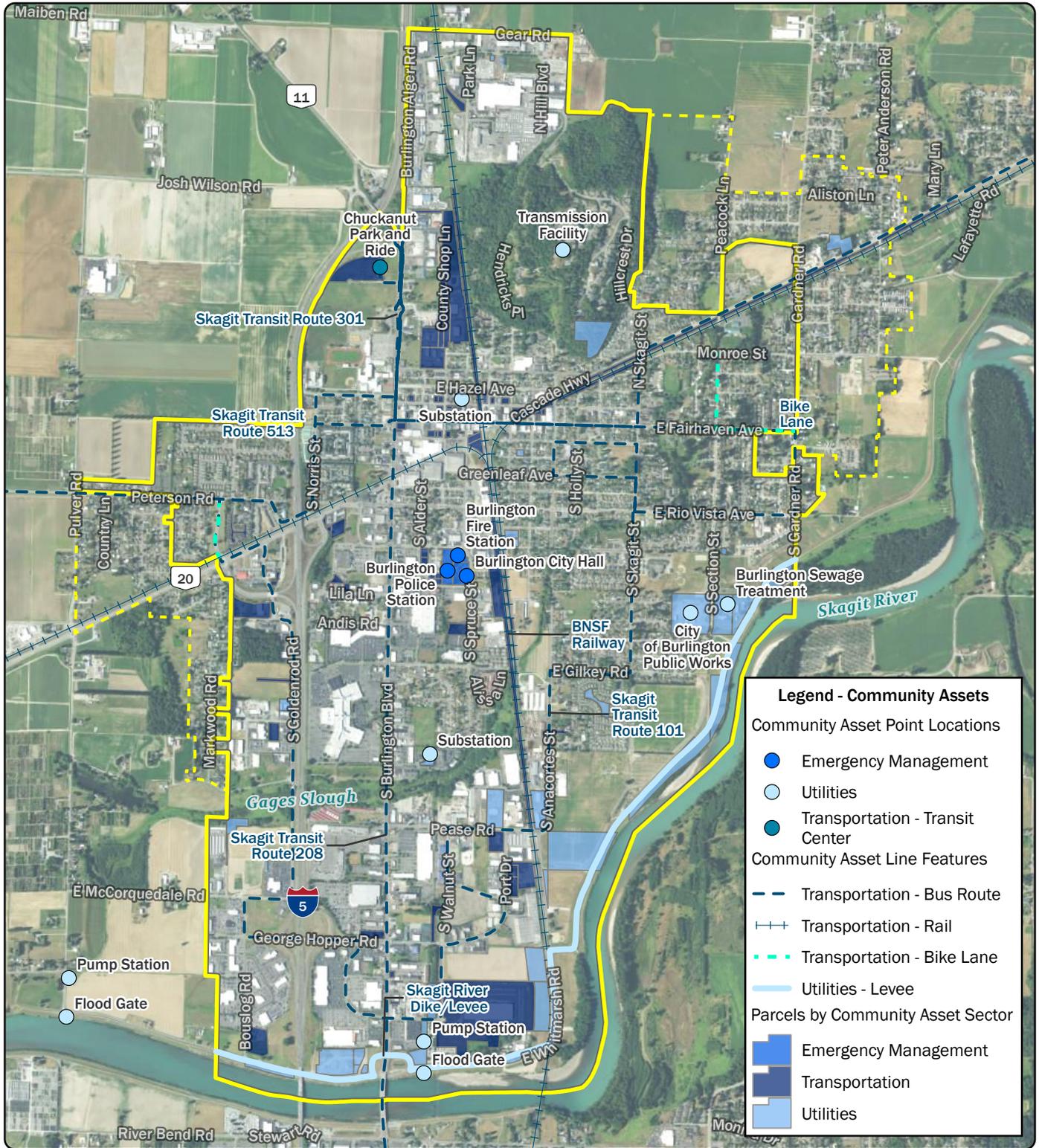
- Burlington City Boundary
- Burlington Urban Growth Area (County Jurisdiction)

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**Figure B-3**  
**Community Assets:**  
**Cultural Resources,**  
**Health/Well-Being,**  
**and Ecosystem Sectors**  
 City of Burlington, WA



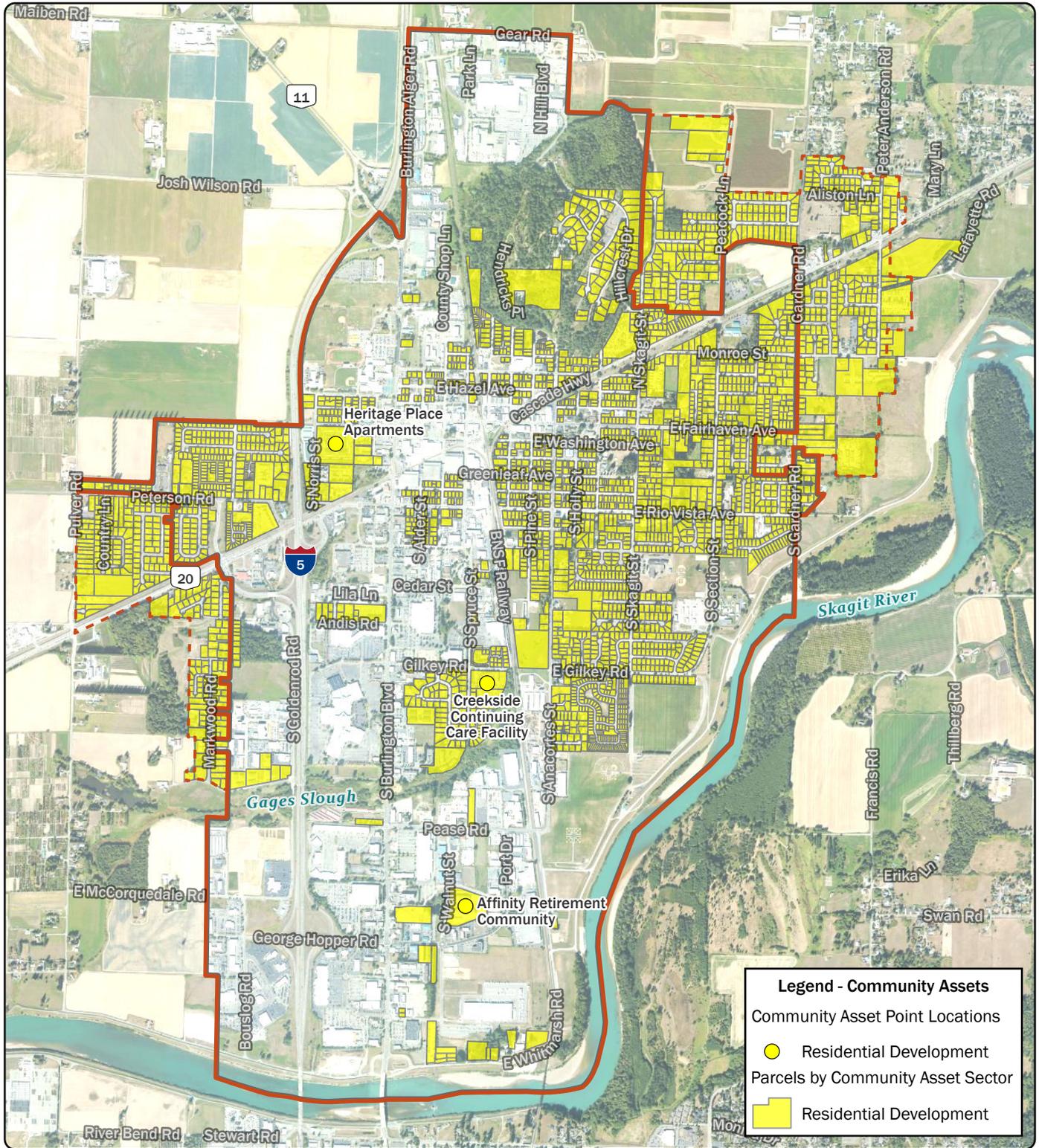


**Data Sources**  
 Place names, hydro utilities, city boundary, and parcels (2025) from Skagit County; urban growth areas from the Washington State Department of Ecology.

**Legend - Boundaries**

- Burlington City Boundary
- Burlington Urban Growth Area (County Jurisdiction)

**Figure B-4**  
**Community Assets:**  
**Emergency Management,**  
**Transportation,**  
**and Utilities Sectors**  
 City of Burlington, WA



**Legend - Community Assets**

- Community Asset Point Locations
- Residential Development
- Parcels by Community Asset Sector
- Residential Development

**Data Sources**  
 City boundary and parcels (2025) from Skagit County;  
 urban growth areas from the Washington State  
 Department of Ecology.

**Legend - Boundaries**

- Burlington City Boundary
- Burlington Urban Growth Area  
(County Jurisdiction)

**Figure B-4**  
**Community Assets:**  
**Residential Development**  
**Sector**  
 City of Burlington, WA

# Appendix C

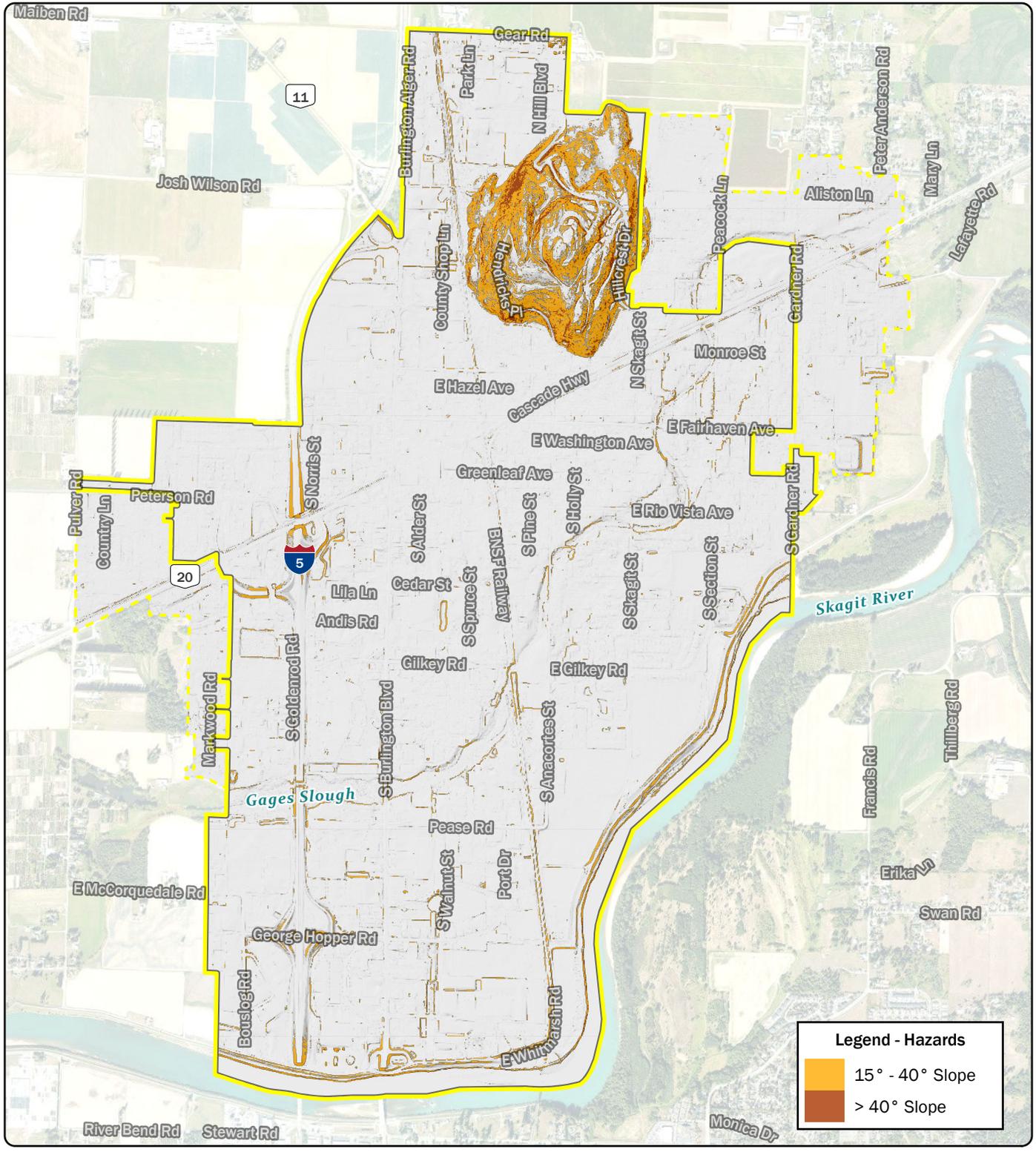
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## Climate-Induced Hazard Maps



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**Legend - Hazards**

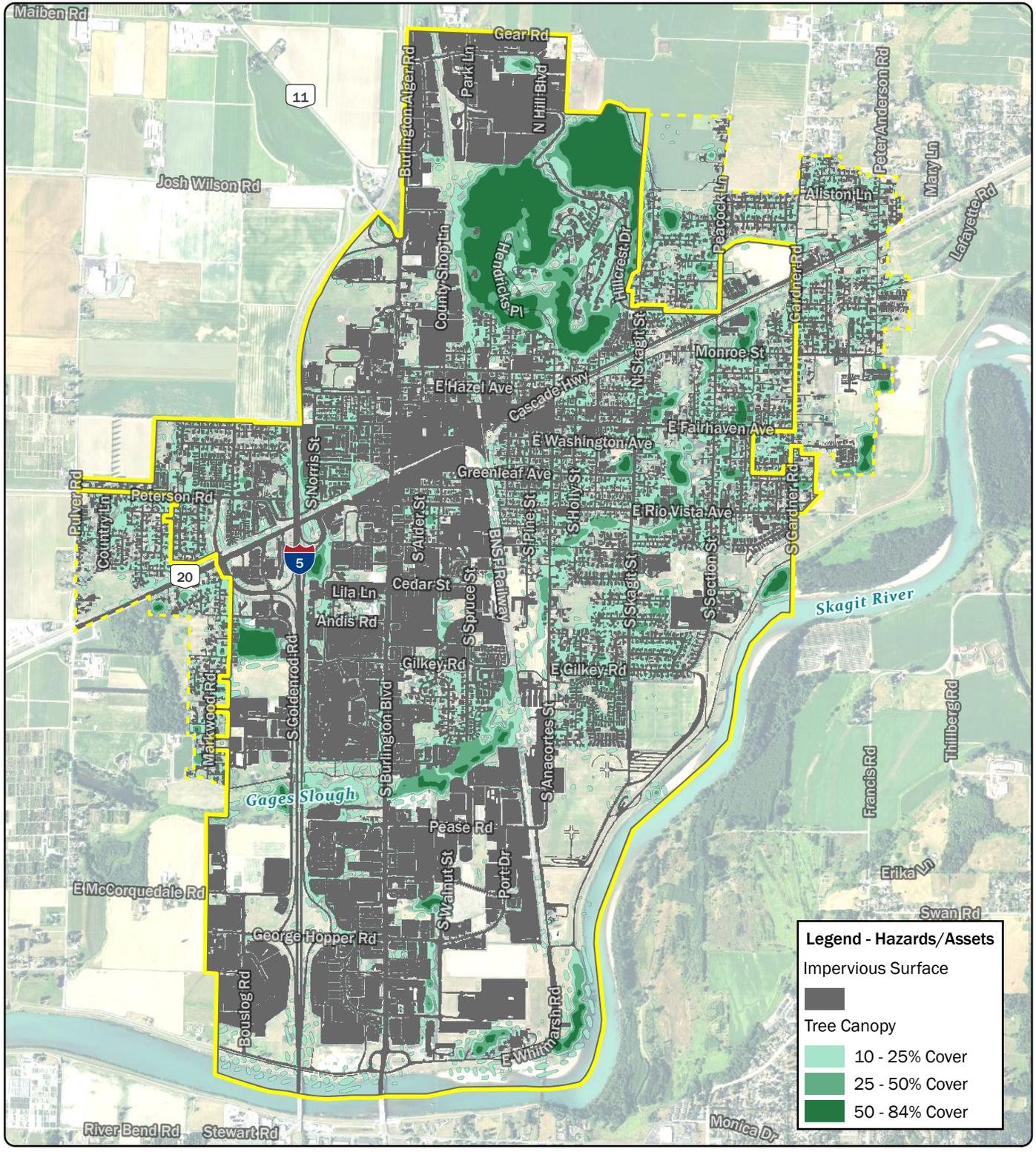
- 15° - 40° Slope
- > 40° Slope

**Data Sources**  
 Lidar topographic data (2017) from the Washington Department of Natural Resources; city boundary (2025) from Skagit County; urban growth areas from the Washington State Department of Ecology.

**Legend - Boundaries**

- Burlington City Boundary
- Burlington Urban Growth Area (County Jurisdiction)

**Figure C-2**  
**Steep Slopes**  
 City of Burlington, WA



**Legend - Hazards/Assets**

Impervious Surface

Tree Canopy

- 10 - 25% Cover
- 25 - 50% Cover
- 50 - 84% Cover

**Legend - Boundaries**

- Burlington City Boundary
- Burlington Urban Growth Area (County Jurisdiction)

**Figure C-3**  
**Urban Heat Factors**  
 City of Burlington, WA

**Data Sources**  
 Tree canopy (2021) from the U.S. Geological Survey; impervious surfaces (2021) from the National Oceanic and Atmospheric Administration; city boundary (2025) from Skagit County; urban growth areas from the Washington State Department of Ecology.

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0 0.5  
  
 Miles

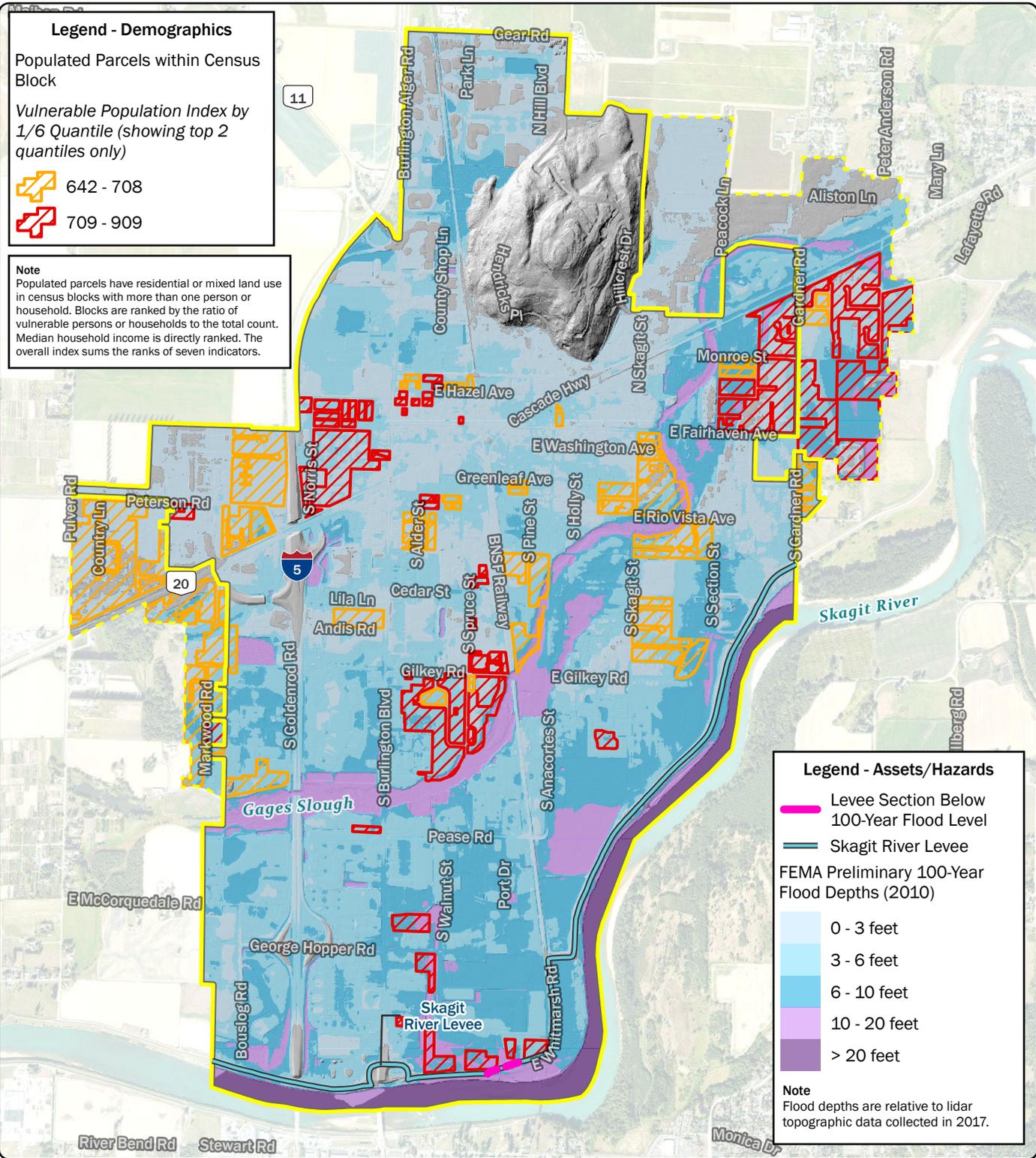
## Appendix D

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### Overlay Maps of Vulnerable Populations and Climate-Induced Hazards



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**Legend - Demographics**

Populated Parcels within Census Block

Vulnerable Population Index by 1/6 Quantile (showing top 2 quantiles only)

- 642 - 708
- 709 - 909

**Note**

Populated parcels have residential or mixed land use in census blocks with more than one person or household. Blocks are ranked by the ratio of vulnerable persons or households to the total count. Median household income is directly ranked. The overall index sums the ranks of seven indicators.

**Legend - Assets/Hazards**

- Levee Section Below 100-Year Flood Level
- Skagit River Levee

FEMA Preliminary 100-Year Flood Depths (2010)

- 0 - 3 feet
- 3 - 6 feet
- 6 - 10 feet
- 10 - 20 feet
- > 20 feet

**Note**

Flood depths are relative to lidar topographic data collected in 2017.

**Data Sources**

Demographic data from Esri and the 2022 American Community Survey (5-Year); flood elevations (2010) from data preliminarily published, but not adopted, by the Federal Emergency Management Agency; lidar topographic data (2017) from the Washington Department of Natural Resources; city boundary (2025) from Skagit County; urban growth areas from the Washington State Department of Ecology.

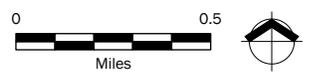
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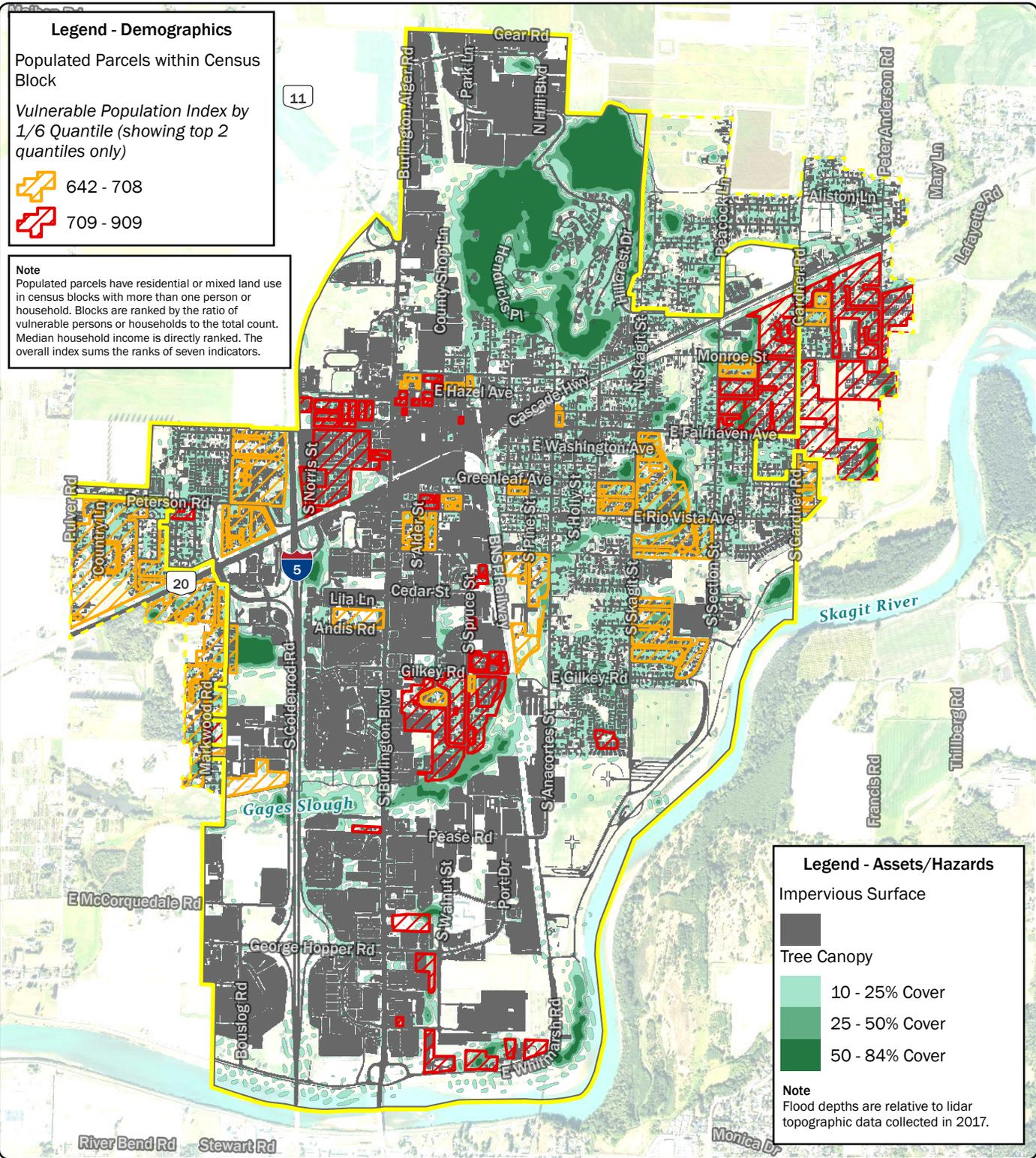
- Burlington City Boundary
- Burlington Urban Growth Area
- (County Jurisdiction)

**Figure D-1**  
**Most Vulnerable Populations and Flooding Depths**  
 City of Burlington, WA

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**Legend - Demographics**

Populated Parcels within Census Block

Vulnerable Population Index by 1/6 Quantile (showing top 2 quantiles only)

- 642 - 708
- 709 - 909

**Note**  
 Populated parcels have residential or mixed land use in census blocks with more than one person or household. Blocks are ranked by the ratio of vulnerable persons or households to the total count. Median household income is directly ranked. The overall index sums the ranks of seven indicators.

**Legend - Assets/Hazards**

Impervious Surface

Tree Canopy

- 10 - 25% Cover
- 25 - 50% Cover
- 50 - 84% Cover

**Note**  
 Flood depths are relative to lidar topographic data collected in 2017.

**Data Sources**  
 Demographic data from Esri and the 2022 American Community Survey (5-Year); tree canopy (2021) from the U.S. Geological Survey; impervious surfaces (2021) from the National Oceanic and Atmospheric Administration; city boundary (2025) from Skagit County; urban growth areas from the Washington State Department of Ecology.

**Legend - Boundaries**

- Burlington City Boundary
- Burlington Urban Growth Area (County Jurisdiction)

**Figure D-2**  
**Most Vulnerable Populations and Urban Heat Factors**  
 City of Burlington, WA