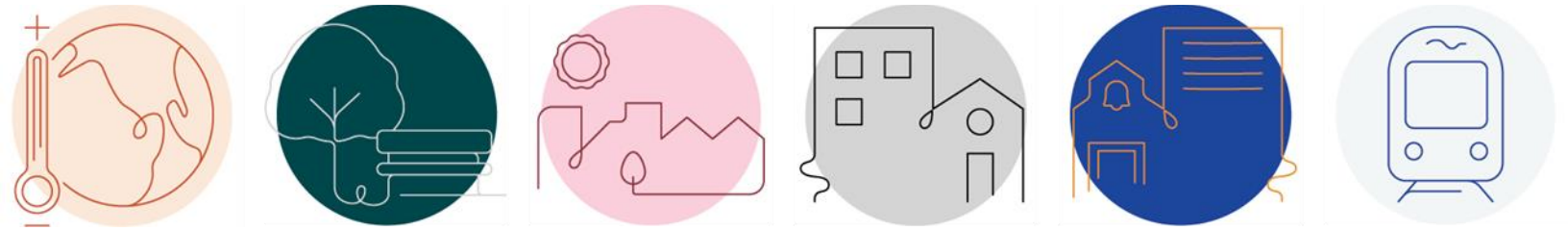
3.12 Utilities



Seattle City Light. Source: City of Seattle, 2023.

This section evaluates the potential impacts to utilities that may result from the five alternatives. Utilities evaluated in this section include the public water system, the wastewater and drainage system, and the electrical system.

Thresholds of significance utilized in this impact analysis include:

- Impacts that would be inconsistent with plans for future utility improvements, development, or growth.
- Impacts that would require major unplanned capital improvements for the utility to serve new development.

3.12.1 Affected Environment

Citywide

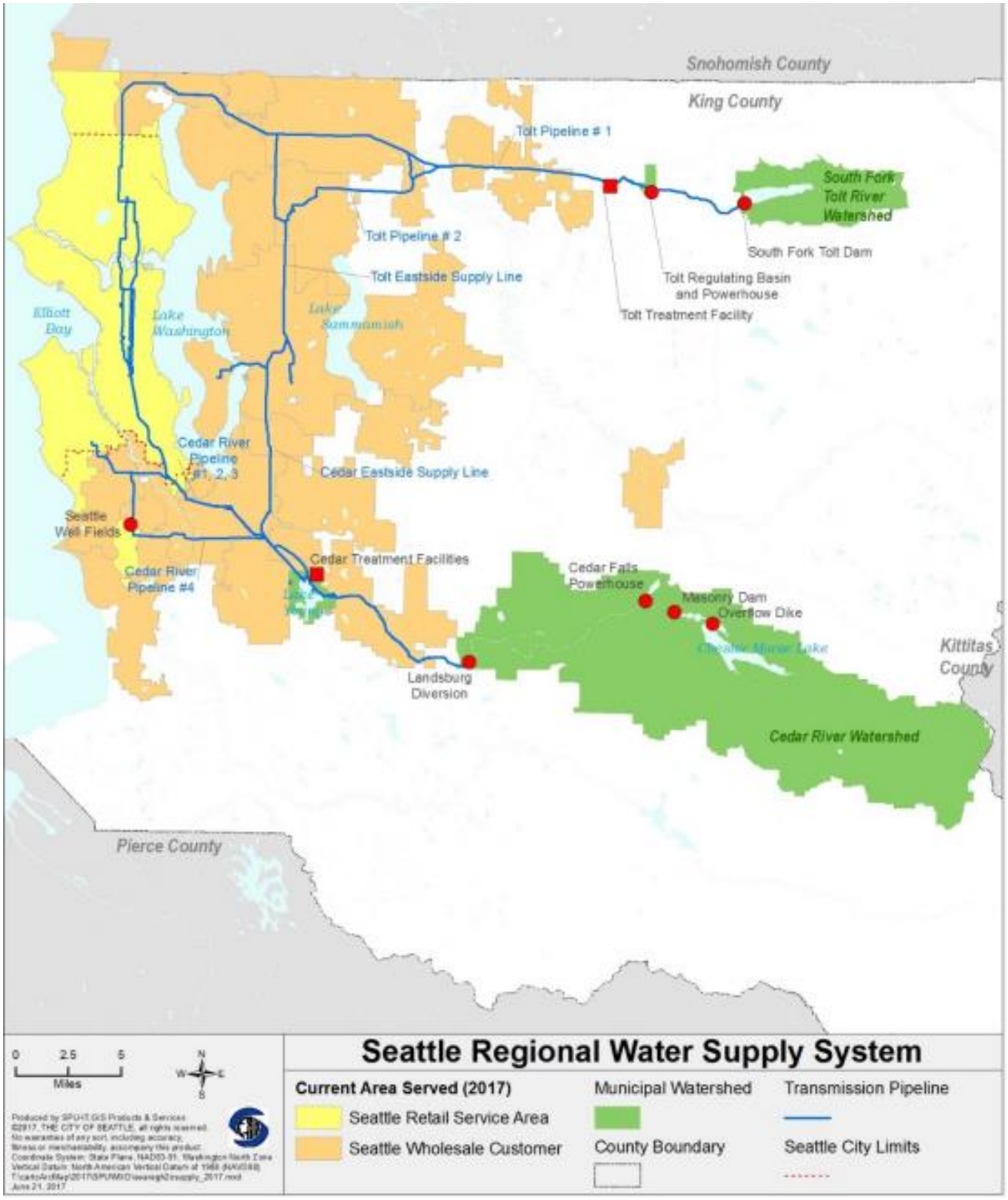
Water

Seattle Public Utilities (SPU) provides drinking water to approximately 1.5 million people living in Seattle and surrounding communities in western King County and portions of southern Snohomish County. The city's water supply comes primarily from surface water reservoirs on the Cedar River, which supplies 60 to 70%, and South Fork Tolt River, which supplies the remainder. SPU also manages a small wellfield that can be used to supplement the surface water sources if needed (SPU 2019a).

A roughly equal amount of water is provided to retail and wholesale customers through approximately 1,820 miles of transmission and distribution lines, as shown in **Exhibit 3.12-1**. SPU's water system has an estimated yield of 172 million gallons per day (mgd), although actual consumption has been much less and declining over time, with per capita consumption 44% less in 2019 than in 1990. Over the past five years, total consumption has averaged about 121 mgd (SPU 2019a).

SPU does not have any planned efforts to increase water supply prior to 2060. Despite an anticipated household growth rate of 18% in its retail service area and 29% in its full and partial wholesale customers between 2016 and 2040, SPU anticipates that total demand is forecast to remain relatively flat due to continued efforts to conserve water and changes to its wholesale water customers (SPU 2018). Current capital investments for SPU include those for maintenance of existing infrastructure including dams, watermain rehabilitation in the distribution system, seismic improvements, and ensuring the water system's resiliency under climate change.

Exhibit 3.12-1. Seattle Regional Water Supply System



Source: SPU, 2019a.

Wastewater & Drainage

SPU manages wastewater and drainage systems in Seattle, which include the combined sewer system, the sanitary sewer system, and the stormwater drainage system. The City contains three different types of areas: the combined sewer area (with only combined sewer systems), separated sewer areas (with sanitary sewer and stormwater drainage systems), and partially separated sewer areas (with sanitary sewer and stormwater drainage systems, where some rainwater still goes to the sanitary sewer), each covering about one-third of the city as shown in **Exhibit 3.12-2**. The King County Wastewater Treatment Division operates the West Point treatment plant—one of the County's three regional wastewater treatment plants—in addition to four combined sewer overflow (CSO) treatment facilities within the city of Seattle (King County 2022) and the wastewater trunkline system that serves Seattle. The majority of wastewater collected from within Seattle is treated at the West Point plant, which is supported by the Brightwater plant near Woodinville if needed (King County 2023a, King County 2023b).

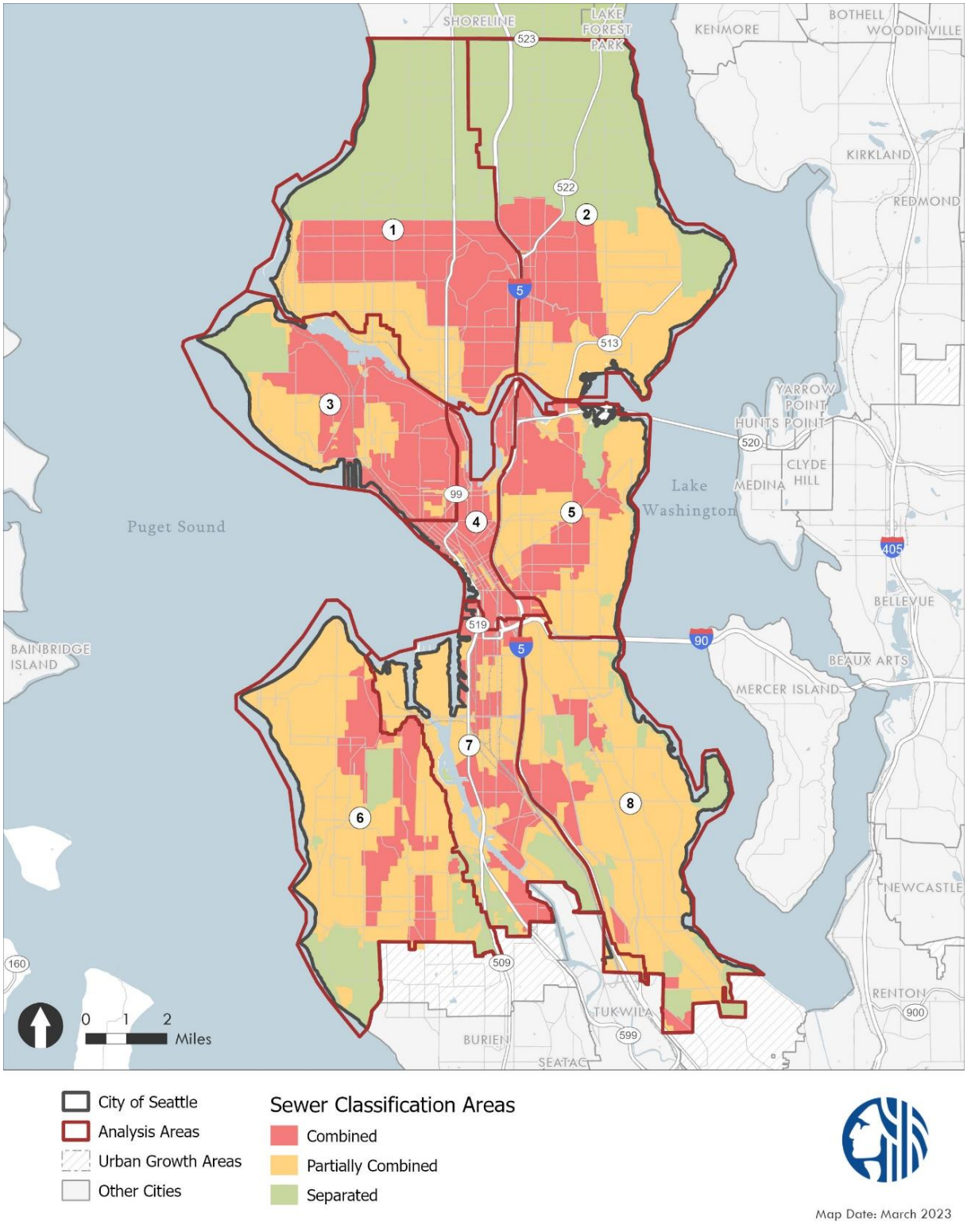
The combined sewer system is the oldest system conveying wastewater and drainage in Seattle, with infrastructure 100 years old or more in places (SPU 2023a). The combined sewer system collects wastewater from residents and businesses along with stormwater runoff from rooftops, yards, and streets into the same pipes, where it is then conveyed to the treatment plant. During periods of heavy rain, the system can overflow into waterbodies such as Lake Washington and Elliott Bay. While CSOs prevent wastewater treatment plants from being overwhelmed and prevent the wastewater system from backing up into roads and buildings, they contribute pollutants to receiving waterbodies. This degrades water quality, which impacts the aquatic life and habitat within these waterbodies and inhibits recreational opportunities.

In the separated sewer system wastewater from homes and businesses is collected through a separate set of pipes than stormwater. Wastewater is sent to the treatment plant while drainage collected from rooftops, yards, and streets is conveyed to waterbodies. Pollutants picked up by stormwater from rooftops and streets can impact water quality and the aquatic life in receiving waterbodies.

In the partially separated sewer system, stormwater runoff from the rooftops of older construction is collected along with wastewater from homes and businesses and conveyed through the wastewater system to the treatment plant. As in the separated system, stormwater runoff from yards, streets, and new development is conveyed to waterbodies.

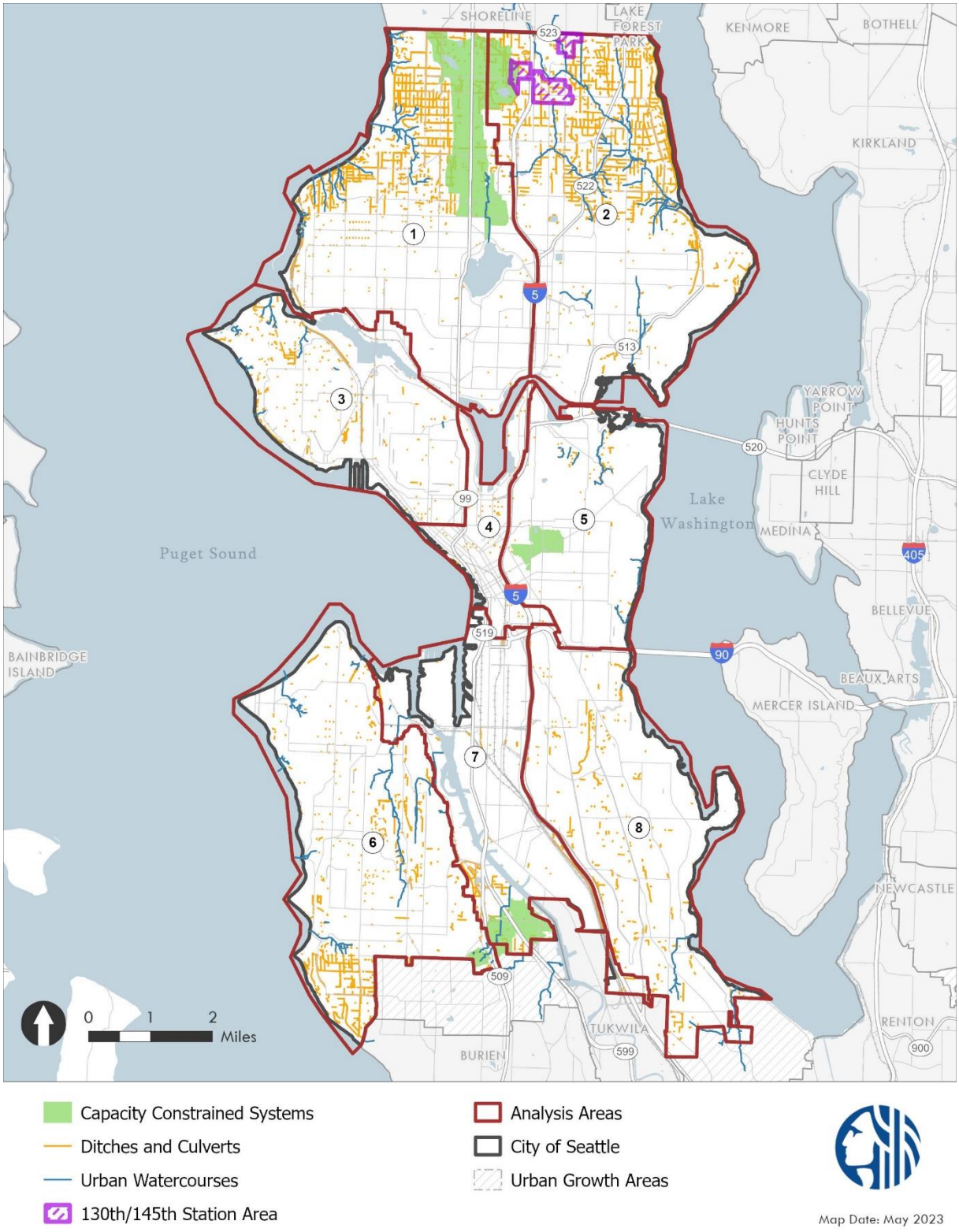
While the vast majority of SPU's drainage system is piped, Seattle has areas that are served by a predominantly 'informal' drainage system, particularly north of 85th Street and in the southwest corner of Seattle. These areas include blocks with no, or only limited drainage infrastructure and several miles of ditch and culvert systems. According to Seattle's Stormwater Code (Seattle Municipal Code [SMC] Title 22, Subtitle VIII) ditch and culvert systems are considered capacity constrained, meaning they have inadequate capacity for existing and anticipated stormwater loads. **Exhibit 3.12-3** shows the wastewater and drainage systems considered capacity constrained.

Exhibit 3.12-2. Drainage Areas by Type



Source: City of Seattle GIS, 2023; Parametrix, 2023.

Exhibit 3.12-3. Capacity Constrained Wastewater and Drainage Systems



Source: City of Seattle GIS, 2023; Parametrix, 2023.

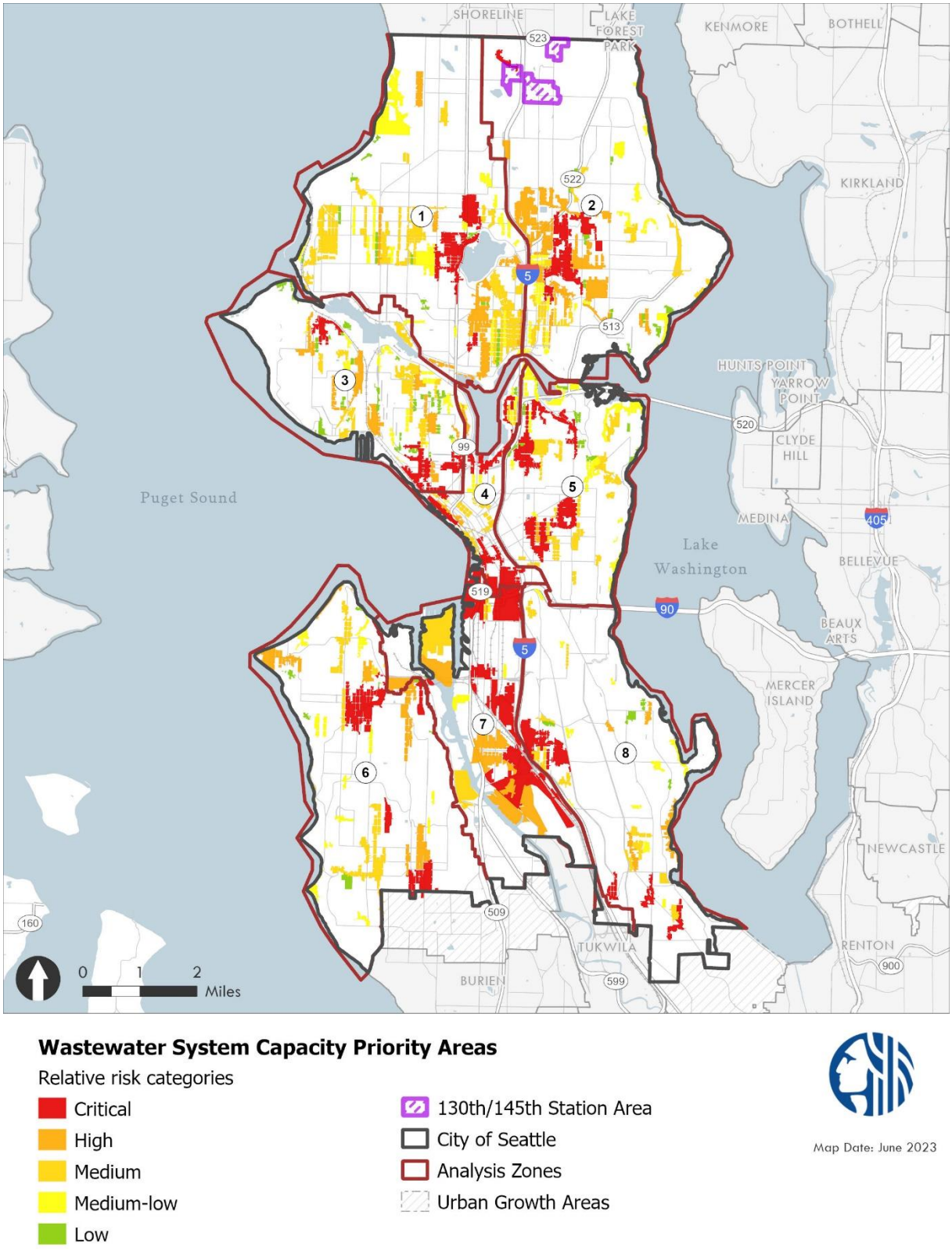
Development must meet certain requirements for flow control and possibly treatment depending on the characteristics of the project and the type of system to which it discharges or conveys runoff. Development within the combined sewer area is subject to flow control requirements, while projects within creek basins, discharging to wetlands, or conveying runoff through ditch and culvert systems are subject to both flow control and water quality treatment requirements.

In 2019 SPU published a Wastewater System Analysis (WWSA) that identifies areas at risk due to limited wastewater system capacity, which can cause sewer overflows through maintenance holes or backups into homes or businesses (SPU 2019b). In 2020, SPU completed a Drainage Systems Analysis (DSA) that identified areas at greatest risk from limited drainage system capacity, which could cause flooding in the right-of-way or onto private property (SPU 2020). These analyses simulated SPU's wastewater and drainage system performance under different design storms that represented differing amounts of rainfall in a 24-hour period and calculated risks based on the likelihood and consequences of flooding and sewer overflows, as well as areas of racial and socioeconomic disparity. The WWSA and DSA both used the best available growth and climate change projections at the time to assess how the identified risks might be impacted in the future.

The WWSA and DSA were developed to assess risks associated with system capacity citywide in order to prioritize SPU investments in sewer and drainage capacity improvements in the future through the Shape Our Water planning effort. They were not developed to inform development decisions. Both WWSA and DSA used modeling to simulate system performance at the citywide scale and risk areas identified have not necessarily been confirmed by real-world instances of flooding, sewer overflows, or sewer back-ups. The WWSA and DSA both used conservative assumptions to identify risks with the assumption that additional ground-truthing would be necessary before making decisions on specific capital improvements. This approach may have resulted in an overprediction of areas at risk due to sewer and drainage capacity. **Exhibit 3.12-4** shows areas with higher risk due to limited wastewater system capacity**. Exhibit 3.12-5** shows areas with higher risk due to limited drainage system capacity.

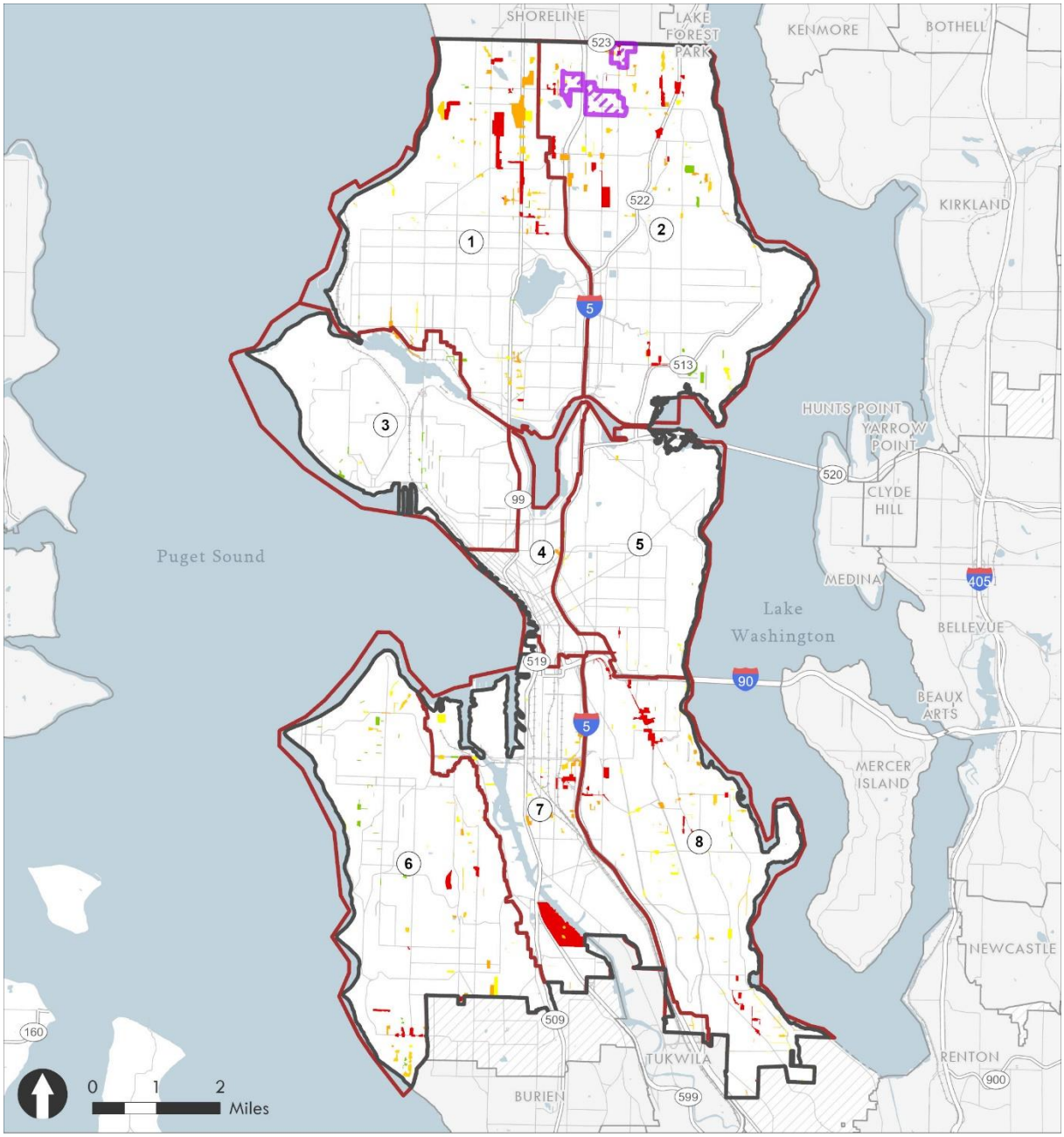
In addition, the WWSA and DSA modeled sewer and drainage system capacity under future conditions for the 2035 planning horizon and ran simulations to evaluate the potential changes in flooding, sewer overflows, and sewer back-ups caused by changes in impervious cover, stormwater code compliance, sea level rise, and more frequent and extreme rainfall events. The WWSA found that "Citywide, the percent of surcharged pipe length increased slightly from 30% under existing conditions to 33% under future conditions for the 5-yr, 24-hour storm. Simulated MH [maintenance hole] flooding increased to a lesser degree from 6% under existing conditions to 7% under future conditions (SPU 2019b)." The DSA found that "Redevelopment can result in additional impervious surface areas which can increase peak flows and affect conveyance capacity. Due to the City's stormwater code requirements, new or replaced impervious surface areas associated with development may require flow control which mitigate the increased flows and sometimes decrease existing flows (SPU 2020)."

Exhibit 3.12-4. Wastewater System Capacity Priority Areas



Source: SPU, 2019b; Parametrix, 2023.

Exhibit 3.12-5. Drainage System Capacity Priority Areas



Drainage System Capacity Priority Areas

Relative risk category

- critical
- high
- medium
- medium-low
- low

- 130th/145th Station Area
- City of Seattle
- Analysis Zones
- Urban Growth Areas

Map Date: June 2023

Source: SPU, 2020; Parametrix, 2023.

SPU's major capital investments currently include several projects to restore creeks, reduce flooding, improve sewer capacity, increase green stormwater infrastructure, and reduce CSOs. SPU's largest CSO control project is the Ship Canal Water Quality Project, which is being done in partnership with King County, and will prevent an average of 75 million gallons of polluted stormwater and sewage from entering waterways each year (SPU 2023b). SPU is also currently developing a plan for Seattle's water future, called Shape Our Water: A 50-year Plan for Seattle's Water Resilience.

Also in 2019, King County published the Treatment Plant Flows and Loadings Study, which evaluates the capacity of its wastewater treatment plants in terms of handling overall volume of wastewater and stormwater flow in addition to the amount of organic and solids load (King County 2019). In its evaluation, the County used population estimates and projections based on 2013 PSRC forecasts, adjusted for the higher growth rate the region experienced between 2010 and 2016. Based on the results, the West Point treatment plant is projected to be able to handle maximum month flow until 2050 but is already reaching capacity for maximum month loadings. In addition, the County will need to optimize treatment plant operations and ultimately invest in technical modifications to comply with the Puget Sound Nutrient General Permit, which became effective in January 2022. This may put further constraints on treatment plant capacity.

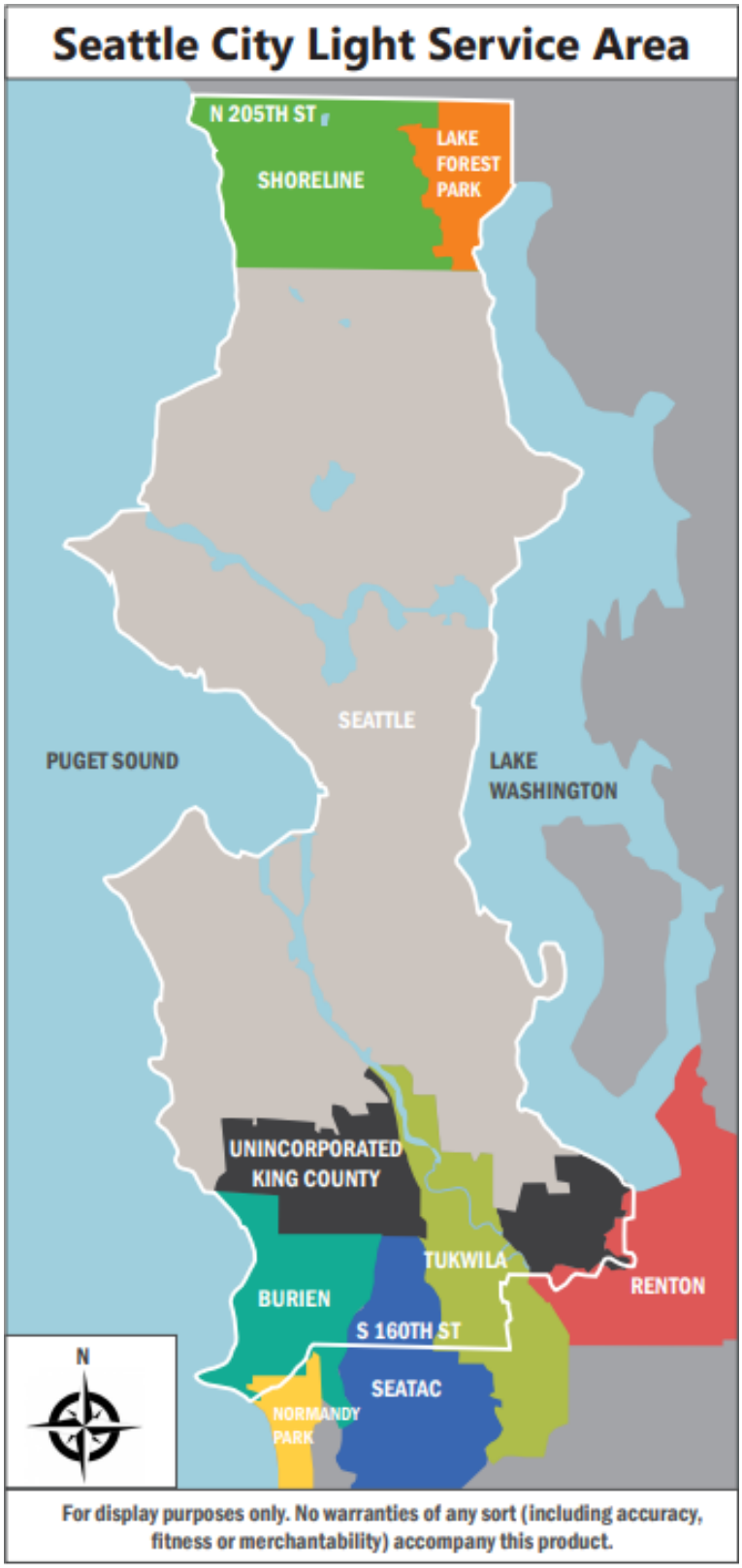
King County has capital projects underway at the West Point treatment plant to improve the reliability of power supply, replace and upgrade the raw sewage pump system, and construct seismic upgrades. King County has completed a number of CSO control projects in Seattle in recent years, and in addition to the Ship Canal Water Quality Project in Seattle, is working on a new CSO treatment facility in Georgetown and a 1.25-million-gallon storage facility for wastewater and stormwater in South Park. The County is also undergoing an effort to improve the capacity of the Thornton Creek sewer pipe, evaluating alternatives to reduce the infiltration and inflow of groundwater and stormwater into the pipe to reduce the risk of overflows and water quality impacts in the Thornton Creek basin.

Electricity

Seattle City Light (SCL) provides electrical power to homes and businesses in Seattle in addition to customers in communities north and south of the city. **Exhibit 3.12-6** shows the SCL service area. In 2020, SCL provided over 8.6 million megawatt-hours of power to over 425,000 residential customers and over 50,000 commercial and industrial customers (SCL 2021). A significant portion of SCL's power is generated by the utility's own hydroelectric facilities, namely the Ross, Gorge, and Diablo dams on the Skagit River north of Seattle and the Boundary Dam on the Pend Oreille River in northeast Washington. The rest of the power is purchased through other sources, including over a third of power needs from the Bonneville Power Administration (SCL 2021).

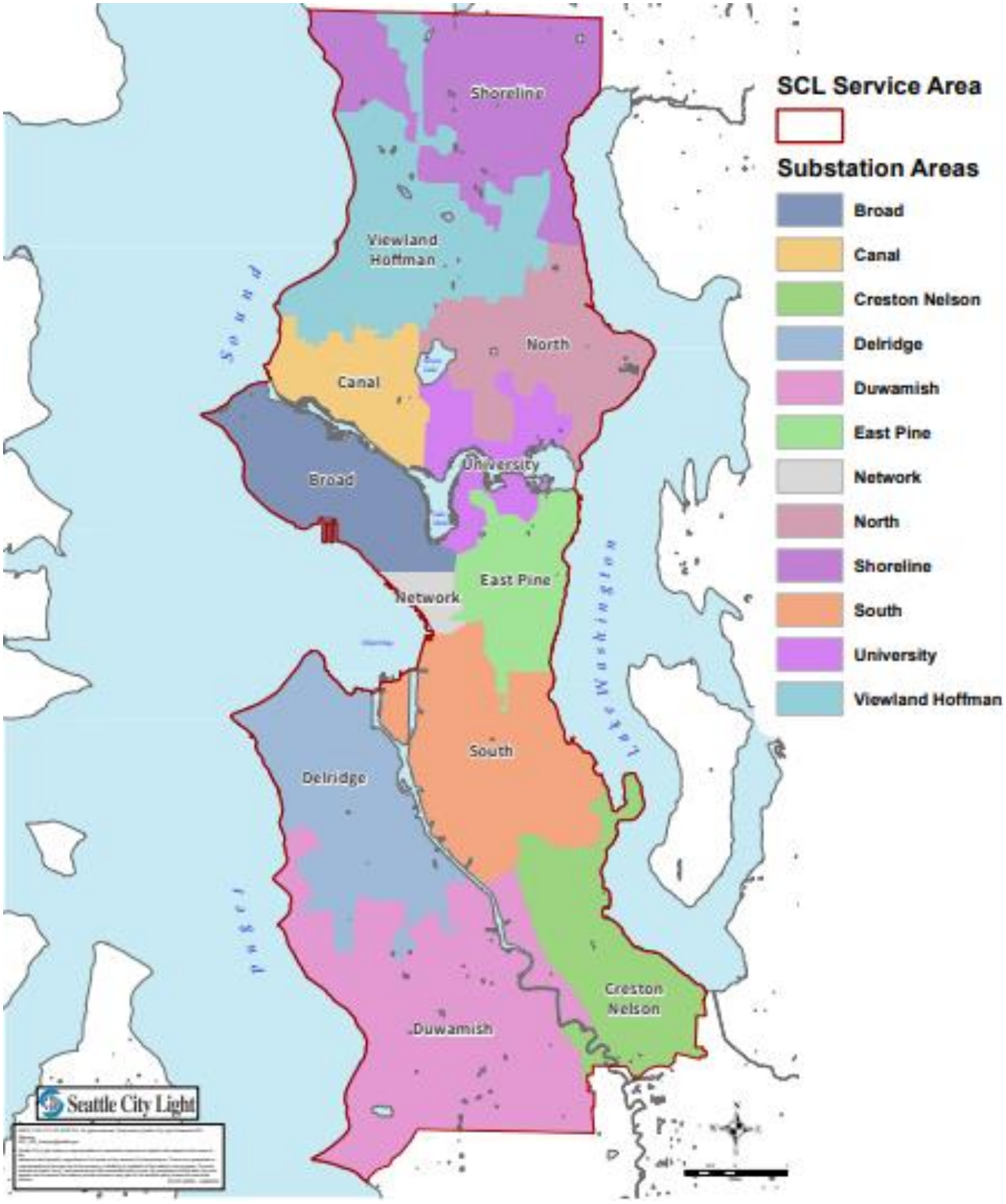
Within Seattle, SCL operates 12 substations—the newest being the Denny Substation built in 2018—that distribute power throughout the city, as shown in **Exhibit 3.12-7**. These substations lower the voltage of electricity from the high-voltage 115- and 230-kilovolt transmission lines before transferring it to the overhead and underground neighborhood distribution lines. In all, SCL manages over 2,300 miles of distribution circuit (SCL 2021). There is also a small but growing number of decentralized energy production sources, such as private solar panel arrays on residential or commercial buildings. These arrays can help supplement electrical power from SCL's system and, where large enough, can contribute electrical power back into the system.

Exhibit 3.12-6. Seattle City Light Service Area



Source: SCL, 2021.

Exhibit 3.12-7. Seattle City Light Substation Service Areas



Source: SCL, 2021.

SCL conducted an assessment in 2022 to examine the high-level impacts of electrification of buildings, transportation, and commercial and industrial applications within its service area in addition to population and commercial growth. The Seattle City Light Electrification Assessment (SCL 2022a) analyzed the impacts of electrification, such as the adoption of electric vehicles and building heating and cooling systems, under three different electrification scenarios: a Moderate Market Advancement scenario where electrification occurs based on past trajectories, a Rapid Market Advancement scenario consistent with the goals and policies of plans such as the Seattle Climate Action Plan, and the Full Adoption of Electrification Technologies scenario where all technologies would be fully electric by 2030, consistent with Seattle's Green New Deal. Each scenario included the addition of 65,000 housing units and over 69 million square feet of commercial development over the study period (SCL 2023a).

As shown in **Exhibit 3.12-8**, under all scenarios, the percent of energy use by residential and commercial uses drops relative to industrial and, particularly, transportation uses. This suggests that the adoption of electrification technologies poses a greater concern to system capacity than population growth. The study concluded that, throughout the year, SCL's electrical system has capacity available to accommodate electrification efforts—approximately 22 Terawatt hours (TWh)—although peak load demand could exceed the capacity of portions of the grid during certain times of the year as electrification efforts advance. For example, the study found that under the Full Adoption scenario winter and summer peak loads would exceed the existing system capacity in 2030 without mitigating strategies or technologies to reduce peak demand (SCL 2022a).

Exhibit 3.12-8. Comparison of Electrical Use Under Electrification Scenarios

End Use	Year 2020 Baseline TWh1 / % of Total	Year 2042 Moderate Market Advancement TWh / % of Total	Year 2042 Rapid Market Advancement TWh / % of Total	Year 2042 Full Adoption[2] TWh / % of Total
Commercial	4.52 / 49.5%	5.85 / 44.5%	6.10 / 37.6%	6.48 / 32.8%
Industrial	0.90 / 9.8%	1.38 / 10.5%	1.72 / 10.6%	2.98 / 15.1%
Residential	3.68 / 40.2%	4.89 / 37.2%	5.14 / 31.6%	5.65 / 28.6%
Transportation	0.04 / 0.5%	1.03 / 7.9%	3.28 / 20.2%	4.63 / 23.4%
Total TWh	**9.15 / 100%**	**13.16 / 100%**	**16.25 / 100%**	**19.74 / 100%**

Notes: 1) TWh = Terawatt hours; 2) In the Electrification Assessment report the Full Adoption scenario was analyzed between 2030 and 2042, assuming full electrification begins in 2030, and not compared against the 2020 baseline.
Source: SCL, 2022a.

In 2005, SCL became the first electric utility in the country to become carbon neutral and has maintained its carbon neutral status ever since. SCL continues to invest in energy conservation efforts. These include grid modernization technologies such as microgrids, automation, and demand response. SCL is also investing in public and private charging stations and working

with partner agencies to provide infrastructure and incentives for the electrification of public transit, commercial and government fleets, and personal modes of transportation (SCL 2023b).

Analysis Areas

The presence and nature of utility facilities is primarily consistent between the EIS planning areas, particularly for water and electricity. The primary differentiators for utilities between areas concerns wastewater and drainage systems, which are highlighted below.

Area 1: NW Seattle

Area 1 includes combined, separated, and partially separated wastewater and drainage systems. The northern portion of Area 1 contains a large proportion of streets with informal drainage systems and includes large areas served by ditch and culvert systems, including the capacity constrained Densmore drainage basin in which there are several under capacity drainage ditches and pipes. Short segments of capacity constrained drainage ditches are located in the Ballard and Fremont neighborhoods as well. There are some areas with medium to high risk due to wastewater system capacity with some areas identified as critical risk on the northeast side of Green Lake.

Area 1 is generally covered by the Viewland Hoffman and Canal SCL substation areas.

Area 2: NE Seattle

Area 2 includes combined, separated, and partially separated wastewater and drainage systems. The northern portion of Area 2 includes the greatest proportion of streets with informal drainage systems and areas served by ditch and culvert systems, particularly within the Thornton Creek watershed, in which there are a number of under capacity drainage ditches and pipes (see **Exhibit 3.1-7 Regulated Stream and Lake Watersheds** in **Section 3.1 Earth & Water Quality**). There are some areas with medium, high, and critical risk due to wastewater system capacity mostly within the southwest quadrant of Area 2.

Area 2 is generally covered by the Viewland Hoffman, North, and University SCL substation areas.

130th/145th Study Area

The 130th/145th Study Area is within the Thornton Creek watershed and partially within the Densmore drainage basin, which is considered capacity constrained. In addition, there are numerous streets within the study area with ditch and culvert systems, also considered capacity constrained. This area is indicated as very low risk due to wastewater system capacity.

The 130th/145th Study Area is covered by the Viewland Hoffman substation area.

Area 3: Queen Anne/Magnolia

Area 3 includes the Ballard Interbay Northend Manufacturing Industrial Center. It is primarily served by a combined wastewater and drainage system, with smaller areas served by partially separated and separated systems in the southern area of the Magnolia neighborhood and Discovery Park, respectively. Most streets are served by formal drainage systems, and there are very few drainage pipes listed as under capacity. There are some areas indicated as medium to high risk due to wastewater system capacity throughout the Area 3, with some areas indicated as critical risk within the Lower Queen Anne neighborhood.

Area 3 is covered by the Broad SCL substation area.

Area 4: Downtown/Lake Union

Area 4 includes the Downtown and South Lake Union neighborhoods that include some of the city's most densely populated areas. Wastewater and stormwater in Area 4 is conveyed almost wholly through the combined system, though there are small areas where stormwater is conveyed through the partially separated system. There are areas with medium to high risk due to wastewater system capacity throughout, with the Pioneer Square and International District neighborhoods indicated as critical risk.

Area 4 is generally covered by the Network, Broad, University SCL substation areas.

Area 5: Capitol Hill/Central District

Area 5 is served by both combined and partially separated wastewater and drainage systems, with the area including the Washington Park Arboretum served by a separated system. Nearly all streets are served by a formal drainage system, and there are very few drainage pipes listed as under capacity. The area is primarily indicated as very low risk due to wastewater system capacity except for the Madison Valley and areas in the northeast quadrant of the area, which are indicated as critical risk.

Area 5 is generally covered by the East Pine and University SCL substation areas.

Area 6: West Seattle

Area 6 in West Seattle is served primarily by a partially separated wastewater and drainage system, with smaller areas served by combined and separated systems. There is a small area within the southwestern portion of the area streets that is served by an informal drainage system, including ditch and culvert systems; this area contains drainage ditches listed as under capacity. There are short segments of under capacity drainage pipes located sparsely throughout the area. The area is primarily very low risk due to wastewater system capacity, with some medium and high risk areas, and critical risk areas in the West Seattle Junction and Delridge neighborhoods.

Area 6 is covered by the Delridge and Duwamish SCL substation areas.

Area 7: Duwamish

Area 7 includes the Duwamish Manufacturing Industrial Center. It is served both combined and partially separated wastewater and drainage systems, with smaller areas served by separated systems. It has a small proportion of streets served by a ditch and culvert system, particularly in the southwestern portion of the area. There are small concentrations of under capacity drainage pipes in the north-central and southern portions of the area. Approximately half of the area is indicated as medium, high, and critical risk due to wastewater system capacity.

Area 7 is covered by the South SCL substation area.

Area 8: SE Seattle

Area 8 is served primarily by a partially separated wastewater and drainage system, with smaller portions of the area served by combined or separated systems, including Seward Park. Most streets are served by formal drainage systems. There are under capacity drainage pipes concentrated along Rainier Avenue S in the northern end of the area, and generally in the southern end. The area is indicated primarily as very low risk due to wastewater system capacity, with a critical risk area indicated in the Beacon Hill neighborhood.

Area 8 is generally covered by the South and Creston Nelson SCL substation areas.

3.12.2 Impacts

Impacts Common to All Alternatives

Seattle would experience population and job growth under all the alternatives, which would result in an increase in demand for utility services. While the alternatives have different housing targets—job targets are the same under each alternative—the impacts to utilities as a result of the increased demand would be similar, as described below.

Water

None of the alternatives are anticipated to adversely impact water supply. As stated in **Section 3.12.1 Affected Environment**, SPU does not have any planned efforts to increase water supply during the 20-year planning horizon for the comprehensive plan. As reported in its Official Yield Estimate and Demand Forecast, SPU forecasts that future demand will remain relatively flat well below the available water supply beyond 2060 despite anticipated population and employment growth, due to continued efforts to conserve water and planned reductions in service to its wholesale water customers (SPU 2018, 2019a).

SPU currently has a forecasted surplus capacity between 35 and 40 MGD. Although all the alternatives project 80,000 to 120,000 more households by 2044 (approximately 40,000 to

80,000 more households than the estimates that factor into SPU's demand forecasts), the increase represents a modest increase to the nearly 620,000 households that SPU estimates serving regionally by 2040 (SPU 2018). The overall estimated yield of SPU's drinking water system is anticipated to support this higher growth rate through the planning period.

Individual housing and business developments would need to ensure adequate water supply for drinking water and fire suppression, which could require improvements or upgrades to the existing water distribution system and construction of new service connections where existing infrastructure is undersized. There could be variations in the extent to which water system infrastructure would need to be upgraded or added under each alternative depending on the age, extent, size, and condition of the existing infrastructure and the type of development being planned. For example, a greater degree of utility improvements may be required in urban neighborhood areas for multifamily development than in urban centers.

Wastewater & Drainage

All alternatives would result in greater demands on wastewater and drainage collection systems through a combination of population growth, water consumption, and the amount of impervious surface as a result of new development. The amount and location of increased demand, and any impacts as a result, would vary by alternative.

Development under all the alternatives would occur in areas with wastewater and, to a lesser extent, drainage capacity constraint risks as shown in **Exhibit 3.12-4** and **Exhibit 3.12-5**. All alternatives include shares of household and employment growth in regional centers and urban centers, some of which coincide with the high and critical risk areas for wastewater. This is due in part to the fact that SPU assigned a higher risk score to these areas because a sewer back-up or overflow would have a greater impact in denser areas. However, population growth alone is not likely to exacerbate capacity constraints. As stated in **Section 3.12.1 Affected Environment**, the WWSA found that the extent of surcharged wastewater pipe length would increase only slightly under future conditions, which considered effects from both climate change and population growth.

The drainage capacity constraint risk areas are generally not concentrated within regional or urban centers and, for the most part, are outside the areas targeted for the highest concentrations of growth. As with the WWSA, the DSA considered both population growth (through new development) and climate change. As stated in Affected Environment, while impervious surfaces from development can increase peak flows and affect conveyance capacity, these impacts could be mitigated by the City's stormwater code requirements for flow control.

As mentioned in Affected Environment, the West Point treatment plant is already approaching its capacity for maximum month loading (King County 2019). Treatment plant loading rates would continue to increase with population growth under all alternatives; however, the treatment plant may reach maximum month loading capacity under the action a~~A~~lternatives ~~2~~

~~through 5~~ sooner than it would under Alternative 1, No Action, due to their higher growth targets.

None of the alternatives are anticipated to adversely impact wastewater or drainage conveyance systems significantly. King County and SPU have several projects underway to improve the operation and reliability of the wastewater and drainage collection and treatment systems for anticipated future conditions, including climate change. SPU has major capital projects underway to reduce flooding, sewer back-ups, and CSO events. Major King County capital projects include those to reduce CSO events and to improve the operations and reliability of the West Point treatment plant. Over time, these projects will increase the capacity of the wastewater and drainage systems and alleviate the risk of sewer back-ups and flooding in high and critical risk areas.

Individual development projects would need to comply with building and utility codes to connect to the city's sewer and drainage systems. In addition, development projects would need to comply with the Seattle Stormwater Code and Stormwater Manual, which include requirements for stormwater flow control and treatment, including onsite management such as green stormwater infrastructure where feasible depending on development and soil conditions. Complying with these requirements helps mitigate the impacts of development on the City's wastewater and drainage systems and in some cases can result in improvements to wastewater and stormwater management through upgrades to existing sewer and drainage infrastructure and construction of new facilities where existing infrastructure is undersized or nonexistent.

While there could be variations in the extent to which wastewater and drainage infrastructure would need to be upgraded or added under each alternative depending on the extent and location of additional population growth and development, the nature of the impact between alternatives would generally be the same.

Electricity

All alternatives would result in increased demands on the electrical system due to population and job growth but are not anticipated to have adverse impacts on the electrical system. SCL currently anticipates a modest baseline demand growth of 0.5% per year between 2022 and 2032, which factors in economic growth and electrification of transportation and buildings. A rapid electrification scenario would increase demand by 32% over the baseline during that same period (SCL 2022b). While the action a~~A~~lternatives ~~2 through 5~~ target greater household increases than factored into SCL's Electrification Assessment, population growth is less of a consideration for load capacity than electrification of transportation and building systems. For either scenario, SCL will seek to increase energy supply through sustainable and resilient energy resources such as wind and solar while implementing customer demand management and energy efficiency programs (SCL 2022b).

As with the other utilities, development would need to connect to the city's power grid. This could require minor improvements or upgrades to existing electrical infrastructure and construction of new service connections where existing infrastructure is undersized or

nonexistent. While there could be variations in the extent to which electrical infrastructure would need to be upgraded or added under each alternative, the nature of the impact between alternatives would be the same.

130th/145th Station Areas

The nature of impacts to water, wastewater, and electricity would be the same as described above in **Impacts Common to All Alternatives**. The 130th/145th Station area is within the Thornton Creek watershed and partially within the Densmore stormwater basin, which is capacity constrained, and includes many blocks with an informal drainage system, including some ditch and culvert systems. Increases in impervious surface due to new development could increase peak flows and potentially affect conveyance capacity. Development in this area would be subject to more stringent stormwater management requirements to avoid adversely affecting conveyance capacity and to protect water quality. These requirements could include flow control and treatment or the construction of formal stormwater drainage facilities if none are present.

Equity & Climate Vulnerability Considerations

Utility infrastructure is vulnerable to the impacts of climate change in a variety of ways.

Seattle's water supply comes from the Cedar and Tolt Rivers, which rely on winter snowpack and precipitation. Lower winter snowpacks due to drought and changes to precipitation patterns would reduce water recharge to these rivers. Even with these risks from climate change, the City is expected to have sufficient water to meet future demand; however, periods of prolonged drought could affect water supply during the dry summer and fall months.

The City's wastewater and drainage systems are vulnerable to sea level rise that could inundate conveyance pipes and facilities, particularly those facilities that lie within the 100-year floodplain. These facilities include CSO and drainage mainlines, pumps, and the West Point treatment plant. Impacts from sea level rise could be exacerbated by more frequent and extreme precipitation events could increase the potential for sewer back-ups, causing flooding and water quality impacts through CSO events.

Seattle's electrical power relies on hydroelectric sources, which rely on water supplies vulnerable to reduced winter snowpacks and drought. Warmer average temperatures and more frequent extreme heat days lead to greater average and peak demand and can overwhelm electrical supply and distribution systems. More frequent and extreme storm events can damage transmission lines and cause power outages.

The effects of climate change have disparate impacts on both populations and locations within Seattle, particularly for socially and economically vulnerable populations. These impacts can be worse for sensitive groups living in areas more susceptible to climate change, such as those areas more prone to flooding or those that experience greater heat island effects. The Seattle Climate Vulnerability Assessment identifies the International District, Duwamish Valley, South Park, Georgetown, SODO, and Rainier Valley as neighborhoods with sensitive populations that

are vulnerable to flooding and extreme heat events (City of Seattle 2023). Except for the International District, these neighborhoods coincide with Areas 7 and 8. These areas experience a very small to modest share of new households under all alternatives, ranging between 1.9% to 3.0% for Area 7 and 7.9% to 11.6% for Area 8.

The City of Seattle and King County are working to address these vulnerabilities. In addition to capital improvements to protect and reinforce existing infrastructure, SPU, King County, and SCL have projects and programs in place to proactively adapt their respective facilities. These include constructing additional underground storage for combined wastewater flows, incentivizing water and power conservation to reduce demand, and promoting renewable energy and distributed power sources, such as residential solar panels, to bolster supply.

New construction contemplated by the plan alternatives has the possibility of improving climate resiliency by replacing or upgrading aging infrastructure. For example, while new development can result in a greater amount of impervious surface that could add greater stormwater flows to capacity constrained systems, it can also result in on-site stormwater management facilities, including green stormwater infrastructure, as well as upgrades to public wastewater and drainage infrastructure.

In addition, new construction is subject to current development codes, which results in greater energy and water efficiency than in older development and would result in overall less electrical and water demand per capita. However, as buildings and transportation become more electrified—also a strategy to address climate change—more overall demand will be put on SCL's electrical system.

Impacts of Alternative 1: No Action

Under Alternative 1, No Action, growth would continue as planned under the 2035 Comprehensive Plan. Residential growth would be directed primarily to ~~regional~~ existing urban centers and ~~urban centers~~villages. Employment would follow the same pattern, in addition to being directed to manufacturing and industrial centers. As the City has been planning for and directing growth to these areas, there would be no adverse impacts to utilities.

130th/145th Station Areas

Impacts to utilities would be the same as described above for the 130th/145th Station Areas under **Impacts Common to All Alternatives**. Development in this area would be subject to more stringent stormwater management requirements, which could include flow control and treatment, to avoid adversely affecting conveyance capacity and to protect water quality.

Equity & Climate Vulnerability Considerations

Alternative 1 directs approximately 8,500 households to Areas 7 and 8, primarily to existing urban villages~~centers~~ in Area 8. These areas include neighborhoods that have vulnerable

populations and are more susceptible to climate change impacts such as flooding and heat island effects. Growth in these areas may require a greater degree of investment in improved drainage and electrical utilities to overcome these vulnerabilities.

Impacts of Alternative 2: Focused

Under Alternative 2, growth would be directed to areas of focused growth, or neighborhood centers, in addition to the regional and ~~regional~~ urban centers (urban centers and urban villages under the current plan) as described under Alternative 1, No Action. Alternative 2 targets 100,000 new housing units, 20,000 households above Alternative 1, No Action. This alternative would result in more intense growth in areas that are currently less developed, such as in areas zoned as Neighborhood Residential.

Utility infrastructure within regional and ~~regional~~ urban centers would be expected to accommodate planned growth; however, focused and denser development within neighborhood center locations would likely require utility upgrades or expansion, particularly for stormwater management in Areas 1 and 2, which would accommodate the greatest amount of growth outside the Downtown Regional Center. Improvements could include on-site stormwater management, construction of green stormwater infrastructure, and new and upgraded drainage systems in association with development.

Areas 1 and 2 are characterized by single-family development and have extensive informal drainage systems, including ditch and culvert systems, particularly within the Piper and Thornton Creek watersheds (**Exhibit 3.12-3**). Development in Areas 1 and 2 could add stress to drainage systems that are already capacity constrained, including within the capacity constrained Densmore basin, beyond that of Alternative 1, No Action. These constraints could limit housing development where requirements for flow control or treatment prove too costly or are physically infeasible.

130th/145th Station Areas

The 130th/145th Station Area under Alternative 2 would consist of three neighborhood centers with more intense combination of residential and commercial development than under Alternative 1, No Action, including over 260 more jobs and over 2.6 times the number of housing units. This would lead to greater demand on utilities than under Alternative 1, along with a greater need for potential utility improvements within the area, particularly related to stormwater management in an area designated as capacity constrained.

Equity & Climate Vulnerability Considerations

Alternative 2 adds over 10,000 households in Areas 7 and 8, primarily in ~~regional~~ urban centers and a limited number of neighborhood centers. These areas include neighborhoods that have vulnerable populations and are more susceptible to climate change impacts such as flooding

and heat island effects. Growth in these areas may require a greater degree of investment in improved drainage and electrical utilities to overcome these vulnerabilities.

Impacts of Alternative 3: Broad

Under Alternative 3, growth would be directed to new housing types throughout urban neighborhood areas, in addition to the regional and urban centers as described under Alternative 1, No Action. As with Alternative 2, Alternative 3 targets 100,000 new housing units, 20,000 households above Alternative 1, No Action. The addition of multifamily homes of various sizes—duplexes up to sixplexes—would likely require construction of new water and electrical service connections and potential upgrades to wastewater and drainage facilities to accommodate greater population and development density, particularly in areas characterized by large-lot single-family zones. These upgrades could be beneficial when replacing outdated or undersized facilities.

Under Alternative 3 a large proportion (nearly 38%) of growth would be within Areas 1 and 2, due to the extent of designated urban neighborhood land within those areas. As described above, development in these areas could add stress to drainage systems that are already capacity constrained, beyond that of Alternative 1, No Action, and Alternative 2 Focused. These constraints could limit housing development where flow control or treatment prove too costly or are physically infeasible. This concern would apply to other areas of the city with informal drainage systems, such as in the southwest corner of Area 6.

Equity & Climate Vulnerability Considerations

Alternative 3 adds over 12,000 households in Areas 7 and 8, primarily in ~~regional~~ urban centers and urban neighborhoods in Area 8. These areas include neighborhoods that have vulnerable populations and are more susceptible to climate change impacts such as flooding and heat island effects. Growth in these areas may require a greater degree of investment in improved drainage and electrical utilities to overcome these vulnerabilities.

Impacts of Alternative 4: Corridor

Alternative 4 would allow for a variety of housing types along transportation corridors in addition to directing growth to regional and regional centers. As with Alternatives 2 and 3, it targets 100,000 new housing units, 20,000 households above Alternative 1, No Action. Under this scenario, Area ~~1~~ 2 receives the greatest amount of growth outside the Downtown Regional Center.

As under Alternative 3 Broad, the addition of multifamily homes of various sizes—duplexes up to sixplexes—would likely require new water and electrical service connections and potential upgrades to wastewater and drainage facilities to accommodate greater population and

development density. Benefits from new development related to utility improvements would be concentrated along corridors, but not as focused as under Alternative 2.

Alternative 4 ~~has the largest~~also has a large share of population growth (over 38%) within Areas 1 and 2 ~~as compared to the other alternatives~~. As described above, development in these areas could add stress to drainage systems that are already capacity constrained. The areal extent of potential development within these areas would be greater than Alternatives 1 and 2 but less than under Alternative 3, as it would be focused along corridors. These constraints could hamper growth where requirements for flow control or treatment prove too costly or are physically infeasible. This concern would apply to other areas of the city with informal drainage systems, such as in the southwest corner of Area 6.

Equity & Climate Vulnerability Considerations

Alternative 4 adds nearly 12,000 households in Areas 7 and 8, primarily in ~~regional~~ urban centers and along corridors in Area 8. These areas include neighborhoods that have vulnerable populations and are more susceptible to climate change impacts such as flooding and heat island effects. Growth in these areas may require a greater degree of investment in improved drainage and electrical utilities to overcome these vulnerabilities.

Impacts of Alternative 5: Combined

Under Alternative 5, growth would be targeted within existing and expanded regional centers and urban centers, within neighborhood centers, and within expanded housing options along corridors and throughout urban neighborhoods. Alternative 5 targets 120,000 new housing units, 40,000 units above Alternative 1, No Action, which would lead to ~~the greatest~~a greater demand on utilities as compared to ~~the other alternatives~~Alternatives 1 through 4. Similar to the other alternatives, Areas 1 and 2 would accommodate the greatest amount of growth, over 37%.

The addition of 40,000 more housing units over the course of the planning period would likely exacerbate risks due to wastewater and drainage system capacity without improvements to those existing systems. However, as described for the other alternatives, development under this scenario would require improvements and upgrades to existing utilities and construction of new facilities to accommodate the increased density, which could offset the impact of increased growth.

The addition of 120,000 total housing units throughout the city may run into greater constraints than under ~~the other alternatives~~Alternatives 1 through 4 if necessary utility improvements prove too costly or physically infeasible to support new development within capacity constrained drainage basins, areas served by informal drainage systems, or within creek basins. For example, as discussed above, development in the northern portions of Areas 1 and 2 could add stress to drainage systems that are already capacity constrained and would be subject to more stringent stormwater management requirements for flow control and

treatment. These constraints may limit the overall number of households that could be developed in those areas.

130th/145th Station Areas

The 130th/145th Station Area under Alternative 5 would consist of an urban center on both sides of I-5 around the Sound Transit light rail station and a neighborhood center at NE 145th Street. This includes over 1,000 jobs and over 2,700 housing units and would result in a more intense combination of residential and commercial development than under Alternatives 1 or 2 over a larger area. Demand on utilities would be greater than under Alternatives 1 and 2. While new development has the benefit of improving utility infrastructure, this development would occur within a capacity constrained stormwater basin, which may be a constraint on the extent of new development and resulting increase in impervious surface if stormwater cannot be managed on site or through improved conveyance infrastructure.

Equity & Climate Vulnerability Considerations

Alternative 5 adds approximately 17,500 households in Areas 7 and 8, primarily in ~~regional~~ urban center and urban neighborhood areas in Area 8. These areas include neighborhoods that have vulnerable populations and are more susceptible to climate change impacts such as flooding and heat island effects. Growth in these areas may require a greater degree of investment in improved drainage and electrical utilities to overcome these vulnerabilities.

Impacts of Preferred Alternative

Note: The impacts analysis for the Preferred Alternative was added since the Draft EIS.

Growth patterns under the Preferred Alternative would be similar to Alternative 5, as it includes the same target of 120,000 new housing units. As a result, it would lead to a similar demand on utilities as Alternative 5 and a greater demand as compared to Alternatives 1 through 4.

As with Alternative 5, the addition of 40,000 more housing units over the course of the planning period would likely exacerbate risks due to wastewater and drainage system capacity. However, as described for the other alternatives, development under this scenario would require improvements and upgrades to existing utilities and construction of new facilities to accommodate the increased density, which could offset the impact of increased growth.

Growth under the Preferred Alternative may run into similar constraints as Alternative 5 if utility improvements prove too costly or physically infeasible to support new development within capacity constrained drainage basins, areas served by informal drainage systems, or within creek basins. Of all the alternatives, the Preferred Alternative would direct the greatest share of growth (41%) to Areas 1 and 2, which could add stress to drainage systems that are already capacity constrained and would be subject to more stringent stormwater management

requirements for flow control and treatment. These constraints may limit the overall number of households that could be developed in those areas.

130th/145th Station Area

As with Alternative 5, the 130th/145th Station Area under the Preferred Alternative would consist of an urban center on both sides of I-5 around the Sound Transit light rail station and a neighborhood center at NE 145th Street. However, it would include approximately 650 jobs and 2,200 housing units, less than Alternative 5 and over a slightly smaller extent. However, as described for Alternative 5, this development would occur within a capacity constrained stormwater basin, which may be a constraint on the extent of new development and resulting increase in impervious surface if stormwater cannot be managed on site or through improved conveyance infrastructure.

Equity & Climate Vulnerability Considerations

The Preferred Alternative adds approximately 12,300 households in Areas 7 and 8, primarily in urban center and urban neighborhood areas in Area 8. These areas include neighborhoods that have vulnerable populations and are more susceptible to climate change impacts such as flooding and heat island effects. Growth in these areas may require a greater degree of investment in improved drainage and electrical utilities to overcome these vulnerabilities.

3.12.3 Mitigation Measures

Incorporated Plan Features

None of the alternatives described in **Chapter 2** of this EIS include plan features that explicitly address utilities. However, the Comprehensive Plan includes a Utilities Element that lists policies and goals to ensure safe, reliable, and equitable service and growth throughout the city; protect water quality; and encourage energy efficiency and renewable resources. In addition, the City is adopting a climate element that would include greenhouse gas reduction measures and climate resilience measures.

Regulations & Commitments

Drinking Water

Federal

- Safe Drinking Water Act, 42 USC 300 et seq., Chapter 6A, administered by the U.S. Environmental Protection Agency

State

- Water Systems, WAC Title 246, Chapters 290-296, administered by the Washington State Department of Health

Local

- Utilities, SMC Title 21, Subtitle I – Water, administered by SPU
- Building and Construction Codes, SMC Title 22, includes plumbing and fire codes, administered by SDCI
- City of Seattle Standard Specifications for Road, Bridge, and Municipal Construction

Wastewater & Combined Sewer

Federal

- National Environmental Policy Act United States Code (USC) 4321 et seq.
- Clean Water Act, 33 United States Code (USC) 1251 et seq., including Section 402 – National Pollutant Discharge Elimination System (NPDES)

State

- State Environmental Policy Act RCW Title 43.21C; WAC 197-11
- Washington State Department of Ecology, WAC Title 173, Chapters 200-270, which includes administration of the NPDES program, discharge and effluent standards, the waste discharge general permit program, construction of wastewater treatment plants, and construction and operation of combined sewer overflow reduction facilities
- NPDES Wastewater Discharge Permit program, administered by the Washington State Department of Ecology
- Wastewater Collection System Consent Decree, administered by the Washington State Department of Ecology and U.S. Environmental Protection Agency

Local

- Metropolitan Functions, King County Code (KCC) Title 28, sections of which pertain to the County's functions for establishing and operating the regional wastewater treatment system.
- Utilities, SMC Title 21, Subtitle II – Sewers, administered by SPU
- Building and Construction Codes, SMC Title 22, includes plumbing code, administered by SPU
- Side sewer permit program, administered by SPU
- City of Seattle Standard Specifications for Road, Bridge, and Municipal Construction

Stormwater

Federal

- Clean Water Act, 33 USC 1251 et seq., including Section 402 – National Pollutant Discharge Elimination System
- Endangered Species Act, 16 USC 1531 et seq.

State

- National Pollutant Discharge Elimination System (NPDES) Western Washington Phase I Municipal Stormwater General Permit, administered by the Washington State Department of Ecology
- NPDES Industrial Stormwater General Permit, administered by the Washington State Department of Ecology
- Stormwater Management Manual for Western Washington, administered by the Washington State Department of Ecology
- Washington State Hydraulic Code, WAC Title 220, Chapter 660, administered by the Washington Department of Fish and Wildlife

Local

- Building and Construction Codes, SMC Title 22, Subtitle VIII – Stormwater Code, administered by SDCI and SPU
- Seattle Stormwater Manual
- City of Seattle Standard Specifications for Road, Bridge, and Municipal Construction

Electrical

Federal

- National Electrical Code, as adopted by the National Fire Protection Association

State

- 2019 Washington State Clean Energy Transformation Act, amending portions of RCW Titles 19 (Business Regulations – Miscellaneous), 43 (State Government – Executive), 80 (Public Utilities), and 82 (Excise Taxes) to commit Washington to an electricity supply free of greenhouse gas emissions by 2045.
- Washington State Energy Code, WAC Title 51, Chapters 11C and 11R

Local

- Utilities, SMC Title 21, Subtitle IV – Lighting and Power, administered by SCL
- City of Seattle Standard Specifications for Road, Bridge, and Municipal Construction

Other Potential Mitigation Measures

While each alternative has the potential to impact utilities through increased demand, none of these impacts are identified as significant adverse impacts. King County, SPU, and SCL regularly plan and adapt to changing growth patterns and are currently engaged in efforts to improve wastewater and drainage system capacity, reduce water consumption and electrical demand, and increase the resiliency of their utility systems against the impacts of climate change. City codes regulating construction and future utility investments will continue to ensure new development addresses any service or capacity constraints.

3.12.4 Significant Unavoidable Adverse Impacts

~~There would be n~~No significant unavoidable adverse impacts to utilities are anticipated under any of the alternatives as a result of the City's Comprehensive Plan update. Population and job growth under all alternatives would increase demand on the City's water, wastewater, drainage, and electrical systems and, for the action alternatives, exceed the planned growth anticipated in the utilities' planning forecasts. However, the utilities are anticipated to accommodate this growth through a combination of existing and future anticipated supply, demand management, and upgrades to existing infrastructure and facilities to improve capacity, operation, and reliability.

In areas considered capacity constrained for stormwater runoff, such as those areas with informal ditch and culvert systems, development would be subject to more stringent stormwater management requirements to avoid adversely affecting conveyance capacity and protect water quality. These requirements could require construction of formal drainage facilities to treat and manage the flow of stormwater as well.

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