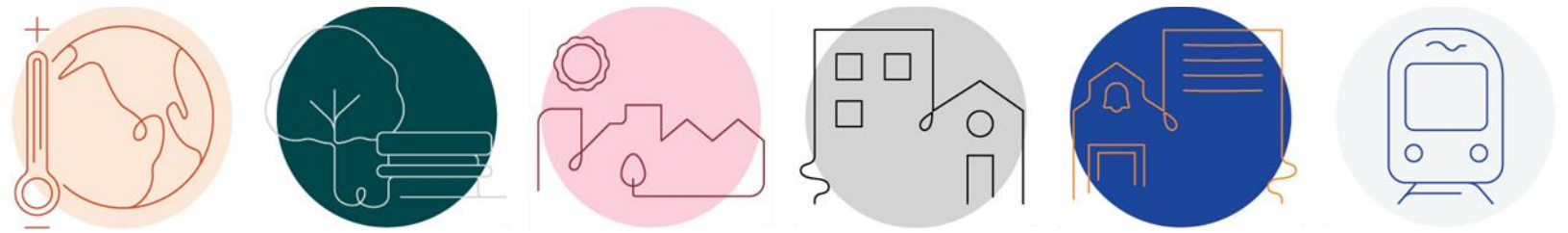
3.4 Energy & Natural Resources



Source: City of Seattle, 2023.

This section addresses the affected environment, impacts to the environment, mitigation measures, and significant unavoidable adverse impacts related to energy and other natural resources for the One Seattle Comprehensive Plan Update.

Thresholds of significance utilized in this impact analysis include:

- Energy usage in excess of projected supply availability.
- Conflict with energy policies adopted by the City of Seattle.

3.4.1 Affected Environment

This section characterizes the affected environment with respect to energy and natural resources for the City of Seattle, beginning with a summary of the major regulations relating to energy and a review of existing energy resources.

Current Policy & Regulatory Framework

Federal

National Energy Conservation Policy Act

The National Energy Conservation Policy Act serves as the underlying authority for federal energy management goals and requirements. Signed into law in 1975, it has been regularly updated and amended by subsequent laws and regulations. Pursuant to the Act, the National Highway Traffic Safety Administration is responsible for establishing additional vehicle standards. In 2012, new fuel economy standards for passenger cars and light trucks were approved for model years 2017 through 2021 (77 Federal Register [FR] §§62624–63200). Fuel economy is determined based on each manufacturer's average fuel economy for the fleet of vehicles available for sale in the United States.

Energy Policy Act of 2005

The Energy Policy Act of 2005 seeks to reduce reliance on non-renewable energy resources and provide incentives to reduce current demand on these resources. For example, under this Act, consumers and businesses can obtain federal tax credits for purchasing fuel-efficient appliances and products, including buying hybrid vehicles, building energy-efficient buildings, and improving the energy efficiency of commercial buildings. Additionally, tax credits are available for the installation of qualified fuel cells, stationary microturbine power plants, and solar power equipment.

Regional Plans & Regulations

The Pacific Northwest Electric Power Planning and Conservation Act (Northwest Power Act) (16 U.S. Code [U.S.C.] Chapter 12H; Public Law No. 96-501) was passed in 1980 and amended in 1996-97. The intent of the law is to promote and support:

- Conservation and efficiency in the use of electrical power
- Development of renewable resources within the Pacific Northwest
- Adequate, efficient, economical, and reliable power supplies for the region
- Orderly planning for regional power systems
- Development of regional plans and programs related to energy conservation, renewable resources; and protection, mitigation, and enhancement of fish and wildlife resources

This law includes specific requirements for utilities to undertake energy conservation programs, pay for mitigation of impacts caused by power transmission and distribution, and develop renewable resources as part of their overall resource mix. It also established the Northwest Power Planning Council (NPPC) as the regional planning agency for Idaho, Montana, Oregon, and Washington. The NPPC goals, as defined by the Northwest Power Act, are to work cooperatively with the states to manage the hydroelectric generating capacity and natural resources of the Columbia River Basin as well as other regional energy systems.

The NPPC's energy planning for the region is guided by the *Northwest Conservation and Electric Power Plan*, now in its eighth revision, which was updated in 2021 (NPCC, 2022). The plan includes detailed recommendations and strategies for furthering already active conservation programs by state and local governments, for ensuring research and development (as well as implementation and funding) of renewable energy resources, and for protecting the environment from impacts associated with electric power generation.

State Regulations

The Washington State Energy Code (Chapter 19.27A RCW) was adopted in 1990. Its intent was to establish building standards that bring about the common use of energy-efficient building methods and to assure that such methods remain economically feasible and affordable. In 2009, the State Legislature adopted the Climate Pollution Reduction and Energy Efficiency Act which requires the adoption of state energy codes that incrementally move towards achieving the seventy percent reduction from a 2006 baseline in annual net energy consumption for buildings by 2031.

The energy code is designed to require new buildings to meet a specified level of energy efficiency while allowing flexibility in building design, construction, and heating equipment efficiencies within that framework. As required by state law, each update is designed to impose more stringent standards to reduce energy consumption in buildings. ~~The standards of the energy code primarily dictate requirements for building insulation and in a 2022 update, now include the use of all-electric space and water heating in new commercial and multifamily construction.~~The 2021 Washington State Energy Code went into effect in 2024.

Washington State Clean Buildings Performance Standard (CBPS): The legislature passed clean building laws in 2019 (HB 1257) and 2022 (SB 5722) to create an energy performance standard for non-residential buildings larger than 50,000 square feet and require energy management planning, operations and maintenance and tracking energy use over time for non-residential buildings larger than 20,000 square feet and multifamily buildings over 50,000 square feet.

Local Regulations & Policies

City of Seattle Energy Code

Seattle's building and energy codes include energy-efficiency standards for residential and nonresidential buildings. ~~Similar to~~Closely modeled on state regulations, these standards also dictate requirements for the building ~~insulation~~ envelope, Heating, Ventilation and Air Conditioning (HVAC) systems, water heating, lighting, and metering.~~and fuel efficiency for heat sources.~~ Under state law, all local jurisdictions must adopt the requirements of the Washington State Energy Code for residential buildings but may impose ~~, although the code allows for local standards to prevail if they are more restrictive than the state standards~~more stringent standards for nonresidential buildings.

The 2021 ~~update to the 2018~~ Seattle ~~Building~~ Energy Code ~~is effective beginning~~went into effect ~~July 1~~November 15, ~~2023~~2024. The 2021 update largely matches the 2021 Washington State Energy Code, including adoption of the new "fossil fuel compliance path." Some updates to the nonresidential Energy Code provide greater efficiency than both the 2018 Seattle Energy Code and the 2021 Washington State Energy code. Other updates provide greater flexibility for existing buildings.~~Updates apply to commercial and large multifamily buildings (4+ stories) and include the elimination of gas and most electric resistance space heating systems, eliminates gas water heating in large multifamily buildings and hotels, improves building exteriors to improve energy efficiency and comfort, creates more opportunity for solar power, and requires electrical infrastructure necessary for future conversion of any gas appliances in multifamily buildings (City of Seattle, 2021).~~

Seattle Climate Action Plan

The 2013 Seattle Climate Action plan laid groundwork for buildings emissions targets for 2030 (City of Seattle, 2013). This included target distinctions between building types. Commercial buildings have a goal of 45% reduction in CO_2e emissions and a 10% reduction in energy use by 2030 as compared to 2008 baseline emissions. Residential buildings have similar goals, with a 32% reduction in CO_2e and 20% reduction in energy use by 2030. For both combined commercial and residential, greenhouse gas intensity, measured in $MTCO_2e$ per British Thermal Unit (BTU) have a reduction target of 25% by 2030. For multifamily residential and commercial buildings, there is also the target for 50% of permitted new construction projects achieve one of the following green building standards by 2025: Living Building Challenge, Built Green, LEED, Evergreen Sustainable Development Standard, or Passive House.

The 2018 updated climate action strategy offered additional measures, such as the goal of buildings to be carbon neutral by 2050 (City of Seattle, 2018). The Seattle City Council also enacted the Green New Deal Resolution which calls for a Seattle free of climate pollutants by 2030 (City of Seattle, 2022). See **Section 3.2 Air Quality & GHG Emissions** for more detail.

Building Tune-Ups

A key piece of the Seattle Climate Action Plan is the Tune-Ups legislation (Seattle Municipal Code 22.930), adopted March 2016. Through building tune-ups, energy and water performance can be optimized by identifying low- or no-cost actions related to building operations and maintenance. Examples of operation tune-ups to an existing building include changes to thermostat set points or adjusting lighting or irrigation schedules. Tune-ups also review HVAC, lighting, and water systems to identify needed maintenance, cleaning, or repairs. On average, building tune-ups can generate 10 to 15% savings in energy costs (City of Seattle, 2023). Tune-ups are required every five years for commercial buildings 50,000 square feet or larger.

Building Emissions Performance Standards

Existing buildings over 20,000 square feet must meet building performance standards (BPS) over time to improve energy efficiency and reduce climate impacts. Seattle has recently enacted legislation to create a Building Emissions Performance Standard (BEPS)for existing commercial and multifamily buildings larger than 20,000 square feet (City of Seattle, 2023). This Building Emissions Performance Standard (BEPS) includes standard greenhouse gas intensity targets (GHGITs) for different building activity types (e.g., office, retail, multifamily) for each compliance interval until net-zero emissions targets in 2050 (City of Seattle, 2023). The BEPS sets required GHGITs through 2035 and provisional targets from 2036-2050 to enable owners to plan, while allowing the later targets to be revised, if needed, by future rules updates.

Energy Benchmarking

Buildings account for more than one third of Seattle's core greenhouse gas emissions (City of Seattle, 2023). Owners of non-residential and multifamily buildings (20,000 square feet or larger) are required to track energy performance and report annually to the City of Seattle pursuant to Seattle's Energy Benchmarking Law (Seattle Municipal Code 22.920). Through this tracking and reporting program, inefficiencies and opportunities to reduce energy waste and emissions are highlighted. Other benefits of benchmarking include:

- Shows how buildings are used—and wasting—energy.
- Helps businesses and consumers make more informed decisions that take energy costs into account when buying or renting property.
- Lowers energy costs, reduces greenhouse gas impacts, and creating jobs in the energy services and construction trades.
- Establishes energy performance ranges for Seattle building types based on their reported energy use.

- Allows the City of Seattle to track its energy reduction goals and target incentive dollars by market sector.

Regional Availability of Energy

Transportation Energy

Refined petroleum products such as gasoline and diesel are used primarily for transportation purposes. Approximately 54% of petroleum resources delivered to the State of Washington refineries are from domestic crude oil (primarily Alaska) and approximately 30% is imported from Canada with Canadian supplies making up for declines in supply from Alaska (Washington Department of Commerce, 2013). The production and pricing of petroleum products is driven by global demand and consumption. Unpredictable events such as the state of the global financial system, political turmoil, and refinery and pipeline accidents can affect production and pricing.

Seattle City Light

Seattle City Light (SCL) is one of the nation's largest municipally owned utilities serving more than 420,000 homes and 49,000 businesses throughout Seattle, Shoreline, Lake Forest Park, Burien, Renton, Tukwila, SeaTac, Normandy Park, and Unincorporated King County (Seattle City Light, 2023a).

SCL owns seven hydroelectric facilities in Washington and delivers electricity through a network of approximately 2,330 miles of distribution circuit and 16 major substations (Seattle City Light, 2023b). Power resources consist of 90% hydropower with approximately half of which is supplied by facilities owned by Seattle City Light. The remaining is purchased from the Bonneville Power Administration (BPA) (Seattle City Light, 2022). The Integrated Resource Plan (IRP) anticipates baseline load forecasts for the next 10 years to be an increase of approximately 0.5% per year. A rapid electrification scenario was considered, based on the Electric Power Research Institute's 2022 Electrification Assessment, which has the load increase by 32% compared to the baseline scenario. To account for this, a top portfolio plan of new resource additions was created. Long term demand during summer peaks when hydroelectric resources run low is met through solar energy from eastern Washington and Oregon.

The 2022 IRP also outlines the need to pursue acquisition of additional resources such as local commercial or community solar projects that will diversify sources of weather-dependent generation and transmission uncertainty, offshore and Montana wind in the 2030s with winter peaking generation profiles to help meet expected increases in seasonal demand and demand response programs, which will help the utility manage short-term peaks in electricity demand.

Anticipated increases in winter peak demands due to electrification (reduced use of natural gas for heating) combined with an increasing frequency of weather extremes associated with climate

change additional resources such as batteries, hydrogen, geothermal, small modular/advanced nuclear, etc., could be considered to maintain current levels of grid reliability.

Puget Sound Energy

Puget Sound Energy (PSE) is Washington state's oldest local energy company and serves approximately 900,000 natural gas customers in 6 counties (PSE, 2023b). These include parts of King (not Enumclaw), Kittitas (not Ellensburg), Lewis, Pierce, Snohomish, and Thurston counties.

PSE controls its gas-supply costs by acquiring gas, under contract, from a variety of gas producers and suppliers across the western United States and Canada. About half the gas is obtained from producers and marketers in British Columbia and Alberta, and the rest comes from Rocky Mountain states. Once PSE takes possession of the gas, it is distributed to customers through more than 26,000 miles of gas mains and service lines (PSE, 2023a).

Energy Usage

Building Energy

Energy usage is typically quantified using Btu. Development within the City of Seattle under all alternatives will primarily be comprised of commercial, industrial, and residential. Energy consumption of these land use types is by the energy use intensity (EUI), which is defined as a building's energy use as a function of its size or other characteristics and is measured by thousand Btu per square foot (kBtu/sf). The lower the EUI, the better the energy performance of a building. As discussed above, owners of non-residential and multifamily buildings (20,000 square feet or larger) are required to track energy performance and report annually to the City of Seattle pursuant to Seattle's Energy Benchmarking Law (Seattle Municipal Code 22.920). **Exhibit 3.4-1** lists the average~~median~~ EUI by land use type based on 202~~0~~3 benchmarking data.

Exhibit 3.4-1. Energy Usage by Land Use, Excluding Single Family

Land Use Type	Building EUI (kBTU/sf)
~~Laboratory~~	~~197.2~~
~~Hospital~~	~~191.8~~
~~Supermarket/Grocery Store~~	~~183.6~~
~~Restaurant~~	~~150.8~~
~~Medical Office~~	~~73.9~~
~~College/University~~	~~73.4~~
~~Other~~	~~62.7~~
~~Mixed Use Property~~	~~56.3~~
~~Hotel~~	~~48.7~~
~~High-Rise Multifamily~~	~~44.6~~

Land Use Type	Building EUI (kBTU/sf)
~~Large Office~~	~~43.2~~
~~Retail Store~~	~~43.2~~
~~Small- and Mid-Sized Office~~	~~42~~
~~Refrigerated Warehouse~~	~~37.8~~
~~Residence Hall/Dormitory~~	~~35.7~~
~~Mid-Rise Multifamily~~	~~33.1~~
~~K-12 School~~	~~32.9~~
~~Low-Rise Multifamily~~	~~29.8~~
~~Worship Facility~~	~~29.8~~
~~Non-Refrigerated Warehouse~~	~~29.2~~
~~Distribution Center~~	~~24.5~~
~~Self-Storage Facility~~	~~11.8~~
Data Center	780.5
Supermarket/Grocery Store	230.7
Restaurant	205.3
Laboratory	203.2
Urgent Care/Clinic/Other Outpatient	194.5
Hospital	177.0
Mixed Use Property	116.0
Medical Office	109.3
Wholesale Club/Supercenter	101.3
College/University	86.9
Strip Mall	81.8
Enclosed Mall	79.2
Office	75.9
Hotel	75.0
Library	69.3
Manufacturing/Industrial Plant	67.5
K-12 School	55.3
Distribution Center	51.9
Residence Hall/Dormitory	49.5
Multifamily Housing	44.9
Refrigerated Warehouse	44.8
Worship Facility	36.1
Non-Refrigerated Warehouse	35.9
Self-Storage Facility	18.9

Source: City of Seattle, 2023~~0~~.

Total energy usage in Washington was 1,571.4~~779.4~~ trillion Btu in 202~~0~~2 (U.S. EIA, 2024~~20~~). Electricity and natural gas in Washington are generally consumed by stationary users such as residences, commercial, and industrial facilities, whereas petroleum consumption is generally accounted for by transportation-related energy use. The electricity and natural gas consumption attributable to the State is provided by the U.S. Energy Information Administration (U.S. EIA) data. In the year 202~~0~~2, Washington State consumed approximately ~~1,779~~310 trillion btu of electricity (U.S. EIA, 2024~~0a~~) and approximately 351~~39~~ trillion btu of natural gas (U.S. EIA, 2024~~3~~).

Automotive Fuel

Automotive fuel consumption for all on-road transportation in the State of Washington provided by the U.S. Energy Information Administration (U.S. EIA) data. According to the U.S. EIA, the State of Washington consumed approximately 258.2 trillion Btu of motor gasoline, 150 trillion Btu of diesel, 0.1 trillion Btu of natural gas (for motor fuel), and 20.3 trillion Btu of fuel ethanol in 2020 (U.S. EIA, 2020a and U.S. EIA, 2023).

Federal programs are mandating improved fuel economy for passenger cars and light trucks. Transportation-related emissions in 2044 would be lower as compared to existing conditions due to improvements in fuel economy. The National Highway Traffic and Safety Administration (NHTSA) is responsible for establishing vehicle standards and for revising existing standards. Compliance with Federal fuel economy standards is not determined for each individual vehicle model. Rather, compliance is determined based on each manufacturer's average fuel economy for the portion of their vehicles produced for sale in the United States. On March 31, 2022, the NHTSA finalized their Corporate Average Fuel Economy (CAFÉ) standards for model years 2024 to 2026. The final rule requires an industry-wide fuel average of approximately 49 miles per gallon (mpg) for passenger cars and light trucks in model year 2026 by increasing fuel efficiency by 8% annually for model years 2024 and 2025 and 10% for model year 2026 (NHTSA, 2023).

Washington State adopted a new rule in December 2022 that requires new ZEV sales of passenger cars, light-duty trucks, and medium-duty vehicles to 100% starting in 2035. ZEVs do not require diesel, gasoline, natural gas, or ethanol. Progress toward 100% ZEV sales in 2035 would increase the rate of registration of ZEVs in Seattle, resulting in reduced automotive fuel consumption and the need for charging infrastructure.

3.4.2 Impacts

Impacts Common to All Alternatives

Construction Impacts

Future growth under any alternative would result in development of new residential, retail, light industrial, office, and commercial use. Construction of future development within the City would result in the consumption of energy in two general forms: (1) the fuel energy consumed by construction vehicles and equipment; and (2) bound energy in construction materials, such as asphalt, steel, concrete, pipes, and manufactured or processed materials such as lumber and glass.

Fossil fuels for construction vehicles and other energy-consuming equipment would be used. Fuel energy consumed during construction would be temporary in nature and would not represent a significant demand on energy resources. Some incidental energy conservation would occur during construction through compliance with engine emissions standards implemented by the United States Environmental Protection Agency (EPA).

Substantial reductions in energy inputs for construction materials can be achieved by selecting building materials composed of recycled materials that require substantially less energy to produce than non-recycled materials. The incremental increase in the use of energy bound in construction materials would not substantially increase demand for energy compared to overall local and regional demand for construction materials. It is reasonable to assume that production of building materials would employ all reasonable energy conservation practices in the interest of minimizing the cost of doing business.

Operational Impacts

Transportation Energy Demand

As discussed in **Section 3.2 Air Quality & GHG Emissions**, mobile emissions were estimated using the EPA's Motor Vehicle Emission Simulator (MOVES) model. The MOVES model defaults include assumptions for vehicle fuel type including gasoline, diesel, compressed natural gas (CNG), and ethanol. Projected vehicle miles traveled (VMT) by passenger vehicles, trucks, and buses were used to estimate annual transportation energy usage.

A mix of land uses is associated with reduced VMT (WSDOT, 2013). Diversity in land uses combined with increased density within an urban area can lead to shorter trip distances and greater use of walking, as well as the reduced need for vehicle ownership. Accessibility to a variety of trip purposes, as in mixed use developments, may induce additional trips; however, these trips are shorter and are more likely to be made by walking than trips in areas where mixed land uses are not available. Travel demand models include findings about projected VMT in future years for various classes of vehicles (e.g., cars, trucks, buses). The model generally

assumes continuation of current economic and demographic trends, with minor shifts toward shorter trips and more trips made by modes other than automobile travel. Improvements in fuel efficiency combined with reductions in VMT would contribute to reductions in transportation fuel demand on a per capita basis.

Exhibit 3.4-2 summarizes VMT associated with each alternative. See **Exhibit 3.4-3** for a comparison of annual fuel usage for existing, Alternative 1, Alternative 2, Alternative 3, ~~and~~ Alternative 5, and the Preferred Alternative in units of trillion British Thermal Units (Btu). The difference between Existing and Alternative 1 (No Action) is the increase in annual vehicle miles traveled over the 20-year planning horizon.

Exhibit 3.4-2. Annual Vehicle Miles Traveled by Alternative

	Existing	Alt. 1	Alt. 2	Alt. 3	Alt. 4*	Alt. 5	Preferred
Cars	20,332,000	22,213,000	22,532,000	22,382,000	22,532,000	22,920,000	22,969,000
Trucks	1,871,300	2,144,100	2,166,900	2,211,100	2,166,900	2,202,100	2,247,800
Buses	68,930	77,150	77,140	77,140	77,140	77,140	77,140
Total VMT**	**22,272,230**	**24,434,250**	**24,776,040**	**24,670,240**	**24,776,040**	**25,199,240**	**25,293,940**

Note: The Preferred Alternative was added to this exhibit since the Draft EIS—no edits were made to Alternatives 1–5.
* Traffic data is not available for Alternative 4 because the projected VMT would fall between Alternative 2 and Alternative 3. For purposes of the analysis, it has been assumed that Alternative 4 VMT is equivalent to Alternative 2, which is higher than Alternative 3.
VMT in **Section 1.6.10 and **Section 3.10 Transportation** excludes buses.
Source: Fehr & Peers, 2024~~3~~.

Exhibit 3.4-3. Annual Transportation Fuel Usage (Trillion Btu)

	Existing	Alt. 1	Alt. 2	Alt. 3	Alt. 4*	Alt. 5	Preferred**
Gasoline	0.3471	0.34	0.35	0.35	0.35	0.36	0.36
Diesel	0.0141	0.02	0.02	0.02	0.02	0.02	0.02
CNG	0.0001	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
Ethanol	0.0006	0.0006	0.0006	0.0006	0.0006	0.0007	0.0007

Note: The Preferred Alternative was added to this exhibit since the Draft EIS—no edits were made to Alternatives 1–5.
* Traffic data is not available for Alternative 4 because the projected VMT would fall between Alternative 2 and Alternative 3. For purposes of the analysis, it has been assumed that Alternative 4 VMT is equivalent to Alternative 2, which is higher than Alternative 3.
** Growth under Alternative 5 and the Preferred Alternative would be the same. The difference in the allocation of growth results in differing trip patterns and VMT. VMT under the Preferred Alternative would be approximately 0.38% greater than Alternative 5. Preferred Alternative fuel usage estimates have been estimated by increasing Alternative 5 fuel usage by 0.38%.
Source: Kimley-Horn, 2024~~3~~.

Building Energy Demand

Increases in development would increase population and employment in the City of Seattle and would increase energy consumption. Development within the City of Seattle under all alternatives

will primarily be comprised of commercial, industrial, and residential. All new development or redevelopment would be designed and constructed to meet the applicable state and City building and energy conservative code requirements which would reduce energy consumption as compared to prior structures which likely used more energy consumption on a pro rata basis. A mixture of newer and older development would likely be more energy efficient than existing development, based on changes to building codes, innovations in building and technologies, and compliance with City energy conservation measures such as regular building tune-ups.

Residential energy demand for each alternative has been estimated based on EIA annual end-use consumption data for various housing types in the western United States (U.S. EIA, 2015).

~~All-electric space and water heating is required by the 2022 Washington Energy Code. According to household end-use consumption data, approximately 13% of natural gas consumption in residential uses is for purposes other than space and water heating (U.S. EIA, 2015).~~ Natural gas consumption from new building square footage due to ~~target~~ growth under each alternative is summarized in **Exhibit 3.4-5.** See **Appendix E** for detailed calculations and assumptions.

Non-residential consumption has been estimated based on 2020 data on building energy benchmarking for industrial and commercial uses (all non-industrial uses have been assumed to be commercial) (City of Seattle, 2020). Based on benchmark data, it is assumed that commercial uses would consume approximately 47.1 kBtu/SF of electricity and 16.6 kBtu/SF of natural gas and industrial uses would consume approximately 20.8 kBtu/SF of electricity and 10.4 kBtu/SF of natural gas. Estimated increases in electricity usage from new building square footage due to ~~target~~ growth under each alternative is summarized in **Exhibit 3.4-4**. Compared to existing energy per capita energy usage of 0.0002 trillion Btu electricity and 0.00004 trillion Btu natural gas per capita in the State, per capita energy demand of all alternatives would be lower.[21] See **Appendix E** for detailed calculations and assumptions.

Exhibit 3.4-4. Increase in Building Energy Demand—Electricity (trillion Btu)

	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Preferred
Residential	1.29	1.58	1.64	1.61	1.91	2.08
Commercial	1.56	1.56	1.56	1.56	1.56	1.56
Industrial	0.37	0.37	0.37	0.37	0.37	0.37
Total Demand	3.22	3.51	3.58	3.54	3.84	4.01
Percent of Statewide Consumption	0.18%	0.20%	0.20%	0.20%	0.22%	0.23%
Per Capita Electricity Demand*	**0.000020**	**0.000017**	**0.000017**	**0.000017**	**0.000016**	**0.000016**

Note: The Preferred Alternative was added to this exhibit since the Draft EIS—no edits were made to Alternatives 1–5.
* Per capita demand based on projected population increase.
Source: Kimley-Horn, 2024~~3~~.

[21] Statewide per capita energy demand calculated based on U.S. EIA consumption data (2020) and 2020 Census population estimates.

Exhibit 3.4-5. Building Energy Demand—Natural Gas (trillion Btu)

	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Preferred
Residential	~~0.17~~1.29	~~0.21~~1.58	~~0.21~~1.64	~~0.21~~1.61	~~0.25~~1.91	2.04
Commercial	0.55	0.55	0.55	0.55	0.55	0.55
Industrial	0.18	0.18	0.18	0.18	0.18	0.18
Total Demand	~~0.90~~2.02	~~0.94~~2.32	~~0.95~~2.38	~~0.94~~2.34	~~0.98~~2.65	2.77
Percent of Statewide Consumption	0.27%	0.28%	0.28%	0.28%	0.29%	0.29%
Per Capita Natural Gas Demand*	**0.0000~~055~~ 123**	**0.0000113 ~~046~~**	**0.0000116 ~~046~~**	**0.0000114 ~~046~~**	**0.0000108 ~~040~~**	**0.0000113**

Note: The Preferred Alternative was added to this exhibit since the Draft EIS—edits to Alternatives 1–5 are shown in tracks.
* Per capita demand based on projected population increase.
Source: Kimley-Horn, 2024~~3~~.

All future development would be required to adhere to energy efficiency standards combined with increased efficiency through performance requirements of the 2022 Washington Energy Code and 2018 Seattle Energy Code ~~fostered by the Climate Action Plan and all-electric space and water heating required by the 2022 Washington Energy Code~~.

Equity & Climate Vulnerability Considerations

Based on the City's Climate Change Vulnerability Assessment (2023), the effect of climate change on buildings and energy and the community include energy supply disruptions, electricity transmission damage and interruptions, and energy demand increases. Some highlights of potential effects include:

- Seattle has a relatively higher percentage of households without air conditioning (46%), and the lack of cooling capacity could affect residents particularly in older buildings. As new buildings are constructed, measures to promote building and site design that promote passive cooling may be appropriate. All alternatives have this potential to address cooling needs with Alternative 1 having lower numbers of dwellings than Alternatives 2-4 and Alternative 5 the most.
- Extreme heat events will create increased energy demand for cooling while decreasing capacity and efficiency of energy systems as transmission lines and substations are stressed.
  - Energy demand from buildings is lowest under Alternative 1 and greatest under the Preferred Alternative ~~5~~ due to the range of housing growth estimated 80,000 to 120,000 new units. **Exhibit 3.4-4** and **Exhibit 3.4-5.** Among Alternatives 2 through 4 with the same growth of 100,000 new dwellings but different patterns and types of housing, Alternatives 2 and 4 have lower building energy demand with more compact housing types in neighborhood centers and corridors compared to Alternative 3 with more distributed housing in urban neighborhoods.

- The Climate Change Vulnerability Assessment notes that energy systems in south Seattle are most likely to be affected because this area is more prone to urban heat islands and the impacts of extreme heat. Under all alternatives, there is a potential to modify urban heat islands through the addition or reduction of tree canopy additions. Alternatives 5 and 3 have higher residential growth planned in Area 8 than Alternatives 1, 2, and 4 and the Preferred Alternative. See **Section 3.3 Plants & Animals**.

- Businesses would be subject to increasing costs for insurance, energy, and materials. Small businesses are more vulnerable to climate change impacts than larger businesses. Businesses would be affected by lost labor hours due to extreme heat events. There may be additional burden on some small businesses that may experience brown outs or demand-driven energy price increase. Downtown in Area 4 has the highest number of small businesses presently. While housing growth in Area 4 is the same across the alternatives the action alternatives assume 15% of jobs would be distributed in proportion to residential growth which would increase retail and services jobs to serve the neighborhoods likely in the form of small businesses. Climate vulnerability strategies to address small businesses could support existing and new businesses in all areas.

Impacts of Alternative 1: No Action

Under Alternative 1 future growth would continue based on continuation of the 2035 Comprehensive Plan, with a target housing growth of 80,000 dwelling units for the planning horizon to 2044. New housing would consist primarily of rental apartments concentrated in existing mixed-use areas. Approximately 46% of housing growth would occur within urban centers, approximately 18% would occur within residential urban villages, approximately 16% would occur within hub urban villages, approximately 3% would occur in manufacturing industrial and maritime industrial areas, and the remaining 17% of growth would occur outside designated villages.

Construction Energy Use

As discussed above, construction of future development would result in the consumption of energy in two general forms: (1) the fuel energy consumed by construction vehicles and equipment; and (2) bound energy in construction materials. Implementation of the project is considered a non-project action. Energy demand associated with future development cannot be determined on a program level as construction activities are project-specific. Therefore, a comparative discussion of construction energy consumption is based on projected housing units demolished and target housing growth under each of the alternatives. Alternative 1 would result in the least amount of demolished housing units and the lowest ~~target~~ growth compared to all other alternatives. Therefore, energy consumption associated with construction vehicles and construction materials would likely be the lowest among all alternatives.

Operational Energy Use

Transportation Energy Use

As shown in **Exhibit 3.4-2**, growth associated with Alternative 1 would generate approximately 24.4 million VMT for cars and trucks and approximately 77,000 VMT for buses. Based on model outputs, Alternative 1 would require 0.34 trillion Btu of gasoline, 0.02 trillion Btu of diesel, 0.0002 trillion Btu of natural gas, and 0.0006 Btu of ethanol to accommodate projected citywide VMT.

As shown in **Exhibit 3.4-6,** implementation of Alternative 1 would result in a reduction in gasoline and ethanol fuel consumption and an increase in diesel and CNG consumption with regards to transportation fuel compared to existing conditions. Although Alternative 1 would result in an increase in VMT when compared to existing conditions, reductions in fuel consumption are largely due to improvements in fuel efficiency standards and increase electrification. In addition, net fuel consumption associated with Alternative 1 growth would constitute less than 1% of statewide fuel consumption. Therefore, increases in transportation energy associated with Alternative 1 implementation would not result in consumption of energy in excess of projected supply availability.

Exhibit 3.4-6. Net Annual Transportation Fuel Usage—Alternative 1 (Trillion Btu)

	Existing	Alternative 1	Net Change in Fuel Consumption	% of Statewide (2020) Consumption
Gasoline	0.3471	0.3381	-0.0090	-0.003%
Diesel	0.0141	0.0202	0.0065	0.004%
CNG	0.0001	0.0002	0.0001	0.448%
Ethanol	0.0006	0.0006	-0.0013	-0.006%

Source: Kimley-Horn, 2023

Building Energy Use

As discussed above, a total of 310~~1,779.4~~ trillion Btu of electricity was consumed statewide in 202~~0~~2. A total of 3.22 trillion Btu per year will be required to serve the target housing and employment growth under Alternative 1 on an annual basis. This constitutes approximately 1.04~~0.18~~% of statewide usage in 2022~~0~~, which is nominal compared to existing statewide demand. Therefore, increases in electricity consumption associated with Alternative 1 implementation would not result in consumption of energy in excess of supply availability and would result in a less than moderate impact.

As discussed above, a total of 351~~39.3~~ trillion Btu of natural gas was consumed statewide in 202~~0~~2. A total of 2.02~~0.90~~ trillion Btu per year will be required to serve the target housing and employment growth under Alternative 1. This constitutes approximately 0.58~~27~~% of statewide usage, which is nominal compared to existing statewide demand. Therefore, increases in natural gas consumption associated with Alternative 1 implementation would not result in

consumption of energy in excess of supply availability and would result in a less than moderate impact.

130th/145th Station Area

Under Alternative 1, zoning designations would be retained within the 130th/145th Station Area and no new areas will be designated for mixed-use or higher density than exists under existing conditions. The future light rail station at 130th would be developed in an area that would allow three-story single-purpose residential development and four- to eight-story multifamily in the land surrounding the future 145th BRT Station. Implementation of Alternative 1 assumes a growth potential of 840 housing units and 716 jobs, requiring approximately 0.02 trillion Btu of electricity and 0.005 trillion Btu of natural gas per year. This constitutes approximately 0.001% and 0.005~~1~~% of statewide electricity and natural gas usage, respectively. Therefore, impacts on supply availability related to existing conditions would be nominal.

Impacts of Alternative 2: Focused

Under Alternative 2, areas of focused growth called neighborhood centers would create more housing around shops and services, allowing for a wide range of housing types. The target housing growth under this alternative is 100,000 dwelling units. Approximately 37% of housing growth would occur within regional centers, approximately 24% would occur within neighborhood centers, 15% would occur within residential urban center, 13% would occur within hub urban center, 2% would occur within manufacturing industrial and maritime industrial, and 9% would occur outside designated villages.

Construction Energy Use

Alternative 2 would result in a greater number of demolished housing units compared to Alternative 1 and less than Alternatives 3, 4, and 5 and the Preferred Alternative. Alternative 2 would result in greater ~~target~~ growth compared to Alternative 1, the same as Alternatives 3 and 4, and less than Alternative 5 and the Preferred Alternative. Therefore, energy consumption associated with construction vehicles and construction materials under Alternative 2 would likely be greater than Alternative 1 and lower than Alternatives 3, 4, and 5 and the Preferred Alternative.

Operational Energy Use

Transportation Energy Use

As shown in **Exhibit 3.4-2**, growth associated with Alternative 2 would generate approximately 24.7 million VMT for cars and trucks and approximately 77,000 VMT for buses. Based on model outputs, Alternative 2 would require 0.35 trillion Btu of gasoline, 0.02 trillion Btu of diesel,

0.0002 trillion Btu of natural gas, and 0.0006 Btu of ethanol to accommodate projected VMT. Demand for Alternative 2 would be slightly higher than Alternative 1.

As shown in **Exhibit 3.4-7,** implementation of Alternative 2 would result in a reduction in ethanol fuel consumption and an increase in gasoline, diesel, and CNG consumption compared to existing conditions. Although Alternative 2 would result in an increase in VMT when compared to existing conditions and Alternative 1, increases in fuel consumption compared to Alternative 1 would be similar largely due to improvements in fuel efficiency standards and increase electrification. In addition, net fuel consumption associated with Alternative 2 growth would constitute less than 1% of statewide fuel consumption. Therefore, increases in transportation energy associated with Alternative 2 implementation would not result in consumption of energy in excess of projected supply availability.

Exhibit 3.4-7. Net Annual Transportation Fuel Usage—Alternative 2 (Trillion Btu)

	Existing	Alternative 2	Net Change in Fuel Consumption	% of Statewide (2020) Consumption
Gasoline	0.3471	0.3478	0.0007	0.0003%
Diesel	0.0141	0.0207	0.0065	0.004%
CNG	0.0001	0.0002	0.00005	0.464%
Ethanol	0.0006	0.0006	-0.0013	-0.008%

Source: Kimley-Horn, 2023.

Building Energy Use

As discussed above, a total of 310~~1,779.4~~ trillion Btu of electricity was consumed statewide in 2022~~0~~. A total of 3.51 trillion Btu per year will be required to serve the target housing and employment growth under Alternative 2. This constitutes approximately 1.13~~0.20~~% of statewide usage, which is nominal compared to existing demand. Although growth ~~targets~~ between Alternative 2, 3, and 4 would be the same, variations in housing unit type are associated with differing consumption factors. Although impacts on supply availability related to Alternative 2 would be slightly higher than Alternative 1, increases in electricity consumption associated with Alternative 2 implementation would not result in consumption of energy in excess of supply availability and would result in a less than moderate impact.

As discussed above, a total of 351~~339.3~~ trillion Btu of natural gas was consumed statewide in 202~~0~~2. A total of 2.32~~0.94~~ trillion Btu per year will be required to serve the target housing and employment growth under Alternative 2. This constitutes approximately 0.66~~28~~% of statewide usage, which although slightly greater than Alternative 1, is nominal compared to existing demand. Therefore, increases in natural gas consumption associated with Alternative 2 implementation would not result in consumption of energy in excess of supply availability and would result in a less than moderate impact.

130th/145th Station Area

Under Alternative 2, changes in land use designations focus on addressing transit-oriented developments, designating the station areas as neighborhood centers. Growth would be clustered in small mixed-use nodes near transit, resulting in denser and taller buildings with heights of up to 80 feet. The Station Area's share of the Alternative 2 housing growth ~~target~~ is approximately 2.2%.

Implementation of Alternative 2 assumes a growth potential of 2,208 housing units and 979 jobs, requiring approximately 0.05 trillion Btu of electricity and 0.043~~09~~ trillion Btu per year of natural gas. This constitutes approximately 0.016~~03~~% and 0.012~~03~~% of statewide electricity and natural gas usage, respectively, which are more than double the requirements of Alternative 1. However, impacts on supply availability in comparison with existing conditions would be nominal.

Impacts of Alternative 3: Broad

Under Alternative 3, a wider range of low-scale housing options in urban neighborhood areas would be allowed, expanding housing choices and allowing housing options near existing parks and other amenities. The target housing growth under this alternative is 100,000 dwelling units. Approximately 37% of housing growth would occur within regional centers, approximately 22% would occur within urban neighborhood areas, 15% would occur within residential urban centers, 13% would occur within hub urban centers, 2% would occur within manufacturing industrial and maritime industrial areas, and 11% would occur outside of designated villages.

Construction Energy Use

Alternative 3 would result in the greatest number of demolished units when compared to all other alternatives except for the Preferred Alternative. Alternative 3 would result in greater ~~target~~ growth compared to Alternative 1, the same as Alternative 2 and 4, and less than Alternative 5 and the Preferred Alternative. Although Alternative 3 would result in 763 greater demolished units than Alternative 5, ~~target~~ growth for Alternative 3 includes 20,000 fewer units. Therefore, energy consumption associated with construction vehicles and construction materials under Alternative 3 would likely be greater than Alternative 1, 2, and 4, and lower than Alternative 5 and the Preferred Alternative.

Operational Energy Use

Transportation Energy Use

As shown in **Exhibit 3.4-2**, growth associated with Alternative 3 would generate approximately 24.6 million VMT for cars and trucks and approximately 77,000 VMT for buses. Based on model outputs, Alternative 2 would require 0.35 trillion Btu of gasoline, 0.02 trillion Btu of diesel, 0.0002 trillion Btu of natural gas, and 0.0006 Btu of ethanol to accommodate projected VMT.

Demand for Alternative 3 would be similar to Alternative 2 for all fuel types and slightly higher than demand under Alternative 1.

As shown in **Exhibit 3.4-8,** implementation of Alternative 3 would result in a reduction in ethanol fuel consumption and an increase in gasoline, diesel, and CNG consumption compared to existing conditions. Although Alternative 3 would result in greater VMT when compared to existing conditions and Alternative 1 and lower VMT when compared to Alternative 2, increases in fuel consumption compared to Alternative 1 and 2 would be similar largely due to improvements in fuel efficiency standards and increase electrification. In addition, net fuel consumption associated with Alternative 3 growth would constitute less than 1% of statewide fuel consumption. Therefore, increases in transportation energy associated with Alternative 3 implementation would not result in consumption of energy in excess of projected supply availability.

Exhibit 3.4-8. Net Annual Transportation Fuel Usage—Alternative 3 (Trillion Btu)

	Existing	Alternative 3	Net Change in Fuel Consumption	% of Statewide (2020) Consumption
Gasoline	0.3471	0.3477	0.0006	0.0003%
Diesel	0.0141	0.0207	0.0065	0.0044%
CNG	0.0001	0.0002	0.00005	0.4644%
Ethanol	0.0006	0.0006	-0.0013	-0.0063%

Source: Kimley-Horn, 2023.

Building Energy Use

As discussed above, a total of 310~~1,779.4~~ trillion Btu of electricity was consumed statewide in 2022~~0~~. A total of 3.58 trillion Btu per year will be required to serve the target housing and employment growth under Alternative 3. This constitutes approximately 1.15~~0.20~~% of statewide usage, which is nominal compared to existing demand. Although growth ~~targets~~ between Alternatives 2, 3, and 4 would be the same, variations in housing unit type are associated with differing consumption factors. As growth for Alternative 3 would be lower than Alternative 5 and the Preferred Alternative, electricity consumption associated with Alternative 3 would be lower. Although impacts on supply availability related to Alternative 3 would be slightly higher than Alternatives 1, 2, and 4, increases in electricity consumption would not result in consumption of energy in excess of supply availability and would result in a less than moderate impact.

As discussed above, a total of 351~~39.3~~ trillion Btu of natural gas was consumed statewide in 2022~~0~~. A total of 2.38~~0.95~~ trillion Btu per year will be required to serve the target and employment growth under Alternative 3. This constitutes approximately 0.68~~28~~% of statewide usage, which is nominal compared to existing demand. Although impacts on supply availability related to Alternative 3 would be slightly higher than Alternatives 1, 2, and 4, increases in

natural gas consumption would not result in consumption of energy in excess of supply availability and would result in a less than moderate impact.

130th/145th Station Area

The station area plan would not be implemented under Alternative 3; the area would grow based on the applicable citywide place types.

Impacts of Alternative 4: Corridor

Alternative 4 would accommodate a wider range of housing options only in corridors to focus growth near transit and amenities. The target housing growth under this alternative is 100,000 dwelling units. Approximately 37% of housing growth would occur within regional centers, approximately 21% would occur within urban neighborhood-corridor areas, 15% would be within residential urban centers, 13% would be within hub urban centers, 2% would be within manufacturing industrial and maritime industrial areas, and 12% would be outside of designated villages.

Construction Energy Use

Alternative 4 would result in the demolition of a greater number of housing units than Alternative 1 and 2 and less than Alternatives 3 and 5 and the Preferred Alternative. Alternative 4 would result in greater ~~target~~ growth compared to Alternative 1, the same as Alternatives 2 and 3, and less than Alternative 5 and the Preferred Alternative. Therefore, energy consumption associated with construction vehicles and construction materials under Alternative 4 would likely be greater than Alternatives 1 and 2 and lower than Alternatives 3 and 5 and the Preferred Alternative.

Operational Energy Use

Transportation Energy Use

As discussed above, VMT data was not generated for Alternative 4. Growth ~~targets~~ under Alternative 2, 3, and 4 are the same with respect to the number of housing units and jobs. Therefore, it has been assumed that VMT for Alternative 4 would generally be between VMT of Alternative 2 and 3. Demand for Alternative 2 and Alternative 3 would be similar for all fuel types except ethanol. Ethanol demand under Alternative 3 would be slightly higher than Alternative 2. Impacts on supply availability related to Alternative 4 would be similar to Alternative 2 and Alternative 3.

Building Energy Use

As discussed above, a total of 310~~1,779.4~~ trillion Btu of electricity was consumed statewide in 2022~~0~~. A total of 3.54 trillion Btu per year will be required to serve the target housing and employment growth under Alternative 4. This constitutes approximately 1.14~~0.20~~% of statewide usage, which is nominal compared to existing demand. Demand associated with Alternative 4 would be less than Alternatives 3 and 5 and the Preferred Alternative, the same as Alternative 2, and greater than Alternative 1. Although impacts on supply availability related to Alternative 4 would be slightly higher than Alternative 1, increases in electricity consumption would not result in consumption of energy in excess of supply availability and would result in a less than moderate impact.

As discussed above, a total of 351~~39.3~~ trillion Btu of natural gas was consumed statewide in 202~~0~~2. A total of 2.34~~0.94~~ trillion Btu per year will be required to serve the target housing and employment growth under Alternative 4. This constitutes approximately 0.67~~.28~~% of statewide usage, which is nominal compared to existing demand. Demand associated with Alternative 4 would be less than Alternatives 3 and 5 and the Preferred Alternative, the same as Alternative 2, and greater than Alternative 1. Although impacts on supply availability related to Alternative 4 would be slightly higher than Alternative 1, increases in natural gas consumption would not result in consumption of energy in excess of supply availability and would result in a less than moderate impact.

130th/145th Station Area

The station area plan would not be implemented under Alternative 4; the area would grow based on the applicable citywide place types.

Impacts of Alternative 5: Combined

Alternative 5 and the Preferred Alternative anticipate~~s~~ the largest increases in supply and diversity of housing units within the City. In addition to the growth strategies of Alternatives 2, 3, and 4, Alternative 5 and the Preferred Alternative would promote a greater range of rental and ownership housing and address past underproduction of housing and rising housing costs. The ~~target~~ studied housing growth under this alternative is 120,000 dwelling units. While most housing would continue to be in regional centers (36% of housing growth) and urban centers (19% of housing growth), the combined growth in neighborhood centers and urban neighborhood–corridors would be substantial (24%).

Construction Energy Use

Alternative 5 would result in a greater number of demolished units than Alternative 1, 2, and 4 and less than Alternative 3 and the Preferred Alternative. Alternative 5 would result in the greatest ~~target~~ studied growth compared to all other alternatives and would be the same as the Preferred Alternative. Therefore, energy consumption associated with construction vehicles and

construction materials under Alternative 5 would likely be the greater~~est out of all five alternatives~~ than Alternatives 1 through 4 and less than the Preferred Alternative.

Operational Energy Use

Transportation Energy Use

As shown in **Exhibit 3.4-2**, growth associated with Alternative 5 would generate approximately 25.1 million VMT for cars and trucks and approximately 77,000 VMT for buses. Based on model outputs, Alternative 5~~2~~ would require 0.359~~6~~ trillion Btu of gasoline, 0.0212 trillion Btu of diesel, 0.00016~~2~~ trillion Btu of natural gas, and 0.0067 Btu of ethanol to accommodate projected VMT. ~~Out of all five alternatives, d~~Demand for all fuel types ~~would be the greatest~~ under Alternative 5 would be greater than Alternatives 1, 2, 3, and 4 and slightly lower than the Preferred Alternative.

As shown in **Exhibit 3.4-9,** implementation of Alternative 5 would result in a reduction in ethanol fuel consumption and an increase in gasoline, diesel, and CNG consumption compared to existing conditions. As Alternative 5 would result in greater VMT when compared to existing conditions and ~~all other a~~Alternatives 1 through 4, increases in fuel consumption would be slightly higher largely due to improvements in fuel efficiency standards, increase electrification, and increased densities resulting in reduced VMT per capita. In addition, net fuel consumption associated with Alternative 5 growth would constitute less than 1% of statewide fuel consumption. Therefore, increases in transportation energy associated with Alternative 5 implementation would not result in consumption of energy in excess of projected supply availability.

Exhibit 3.4-9. Net Annual Transportation Fuel Usage—Alternative 5~~3~~ (Trillion Btu)

	Existing	Alternative 5	Net Change in Fuel Consumption	% of Statewide (2020) Consumption
Gasoline	0.3471	0.3596	0.0125	0.0048%
Diesel	0.0141	0.0212	0.0071	0.0047%
CNG	0.0001	0.0002	0.00005	0.4734%
Ethanol	0.0006	0.0007	-0.0013	-0.0064%

Source: Kimley-Horn, 2023.

Building Energy Use

As discussed above, a total of 310~~1,779.4~~ trillion Btu of electricity was consumed statewide in 2022~~0~~. A total of 3.84 trillion Btu per year will be required to serve the target housing and employment growth under Alternative 5. This constitutes approximately 1.24~~0.22~~% of statewide usage, which is nominal compared to existing demand. Although impacts on supply availability related to Alternative 5 would be greater than Alternatives 1 through 4, increases in

electricity consumption associated with Alternative 5 implementation would not result in consumption of energy in excess of supply availability and would result in a less than moderate impact.

As discussed above, a total of 3513~~9.3~~ trillion Btu of natural gas was consumed statewide in 2020~~2~~. A total of 02.65~~,98~~ trillion Btu per year will be required to serve the target housing and employment growth under Alternative 5. This constitutes approximately 0.75~~29~~% of statewide usage, which is nominal compared to existing demand. ~~a~~Although impacts on supply availability related to Alternative 5 would be greater than Alternatives 1 through 4, increases in natural gas consumption associated with Alternative 5 implementation would not result in consumption of energy in excess of supply availability and would result in less than moderate impact.

130th/145th Station Area

Under Alternative 5, an urban centers designation on both the west and east sides of the 130th Station Area would merge with an existing commercial node to expand residential mixed use near the station. Growth would be accommodated in more mixed-use buildings, providing greater housing types in buildings with heights of up to 95 feet. The Station Area's share of the Alternative 5 housing growth ~~target~~ is approximately 2.2%.

Implementation of Alternative 5 assumes a growth potential of 2,703 housing units and 1,004 jobs, requiring approximately 0.05 trillion Btu of electricity and 0.046~~1~~ trillion Btu of natural gas per year. This constitutes approximately 0.017~~03~~% and 0.013~~03~~% of statewide electricity and natural gas usage, respectively. Energy requirements under this alternative would be slightly higher than Alternative 2 and impacts on supply availability in comparison with Alternative 2 would be nominal.

Impacts of Preferred Alternative

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

The Preferred Alternative anticipates an increase in supply and diversity of housing across Seattle similar to Alternative 5. It includes the strategies for encouraging housing growth in the other action alternatives plus some additional changes to existing center boundaries and changes to place type designations beyond Alternative 5. Like Alternative 5, the Preferred Alternative anticipates the largest increase in supply of housing units within the City. As with Alternative 5, the target housing growth under this alternative is 120,000 dwelling units.

Construction Energy Use

The Preferred Alternative would result in the greatest number of demolished units compared to all other alternatives. The Preferred Alternative would result in the greatest growth, along with Alternative 5, compared to all other alternatives. Therefore, energy consumption associated with construction vehicles and construction materials under the Preferred

Alternative would likely be the greatest of all alternatives due to the higher number of demolished units.

Operational Energy Use

Transportation Energy Use

As shown in **Exhibit 3.4-2**, growth associated with the Preferred Alternative would generate approximately 25.2 million VMT for cars and trucks and approximately 77,000 VMT for buses. Growth under Alternative 5 and the Preferred Alternative would be the same. The difference in the allocation of growth results in differing trip patterns and VMT. VMT under the Preferred Alternative would be approximately 0.38% greater than Alternative 5. Preferred Alternative fuel usage have been estimated by increasing Alternative 5 fuel usage by 0.38%. Based Alternative 5 model outputs, the Preferred Alternative would require 0.36 trillion Btu of gasoline, 0.0213 trillion Btu of diesel, 0.00016 trillion Btu of natural gas, and 0.00067 Btu of ethanol to accommodate projected VMT. Out of all alternatives, demand for all fuel types would be the greatest under the Preferred Alternative.

As shown in **Exhibit 3.4-10,** implementation of the Preferred Alternative would result in a reduction in ethanol fuel consumption and an increase in gasoline, diesel, and CNG consumption compared to existing conditions. As the Preferred Alternative would result in greater VMT when compared to existing conditions and all other alternatives, increases in fuel consumption would be slightly higher largely due to improvements in fuel efficiency standards, increase electrification, and increased densities resulting in reduced VMT per capita. In addition, net fuel consumption associated with the Preferred Alternative growth would constitute less than 1% of statewide fuel consumption. Therefore, increases in transportation energy associated with the Preferred Alternative implementation would not result in consumption of energy in excess of projected supply availability.

Exhibit 3.4-10. Net Annual Transportation Fuel Usage—Preferred (Trillion Btu)

	Existing	Preferred Alternative	Net Change in Fuel Consumption	% of Statewide (2020) Consumption
Gasoline	0.3471	0.3609	0.0138	0.0054%
Diesel	0.0141	0.0213	0.0071	0.0048%
CNG	0.0001	0.0002	0.00005	0.4797%
Ethanol	0.0006	0.0007	-0.0013	-0.0064%

Source: Kimley-Horn, 2024.

Building Energy Use

As discussed above, a total of 310 trillion Btu of electricity was consumed statewide in 2022. A total of 4.01 trillion Btu per year will be required to serve the target housing and employment growth under the Preferred Alternative. This constitutes approximately 1.29% of statewide

usage, which is nominal compared to existing demand. Although impacts on supply availability related to the Preferred Alternative would be greater than all other alternatives, increases in electricity consumption associated with Preferred Alternative implementation would not result in consumption of energy in excess of supply availability and would result in a less than moderate impact.

As discussed above, a total of 351 trillion Btu of natural gas was consumed statewide in 2022. A total of 2.77 trillion Btu per year will be required to serve the target housing and employment growth under the Preferred Alternative. This constitutes approximately 0.79% of statewide usage, which is nominal compared to existing demand. Although impacts on supply availability related to the Preferred Alternative would be greater than all other alternatives, increases in natural gas consumption associated with Preferred Alternative implementation would not result in consumption of energy in excess of supply availability and would result in less than moderate impact.

130th/145th Station Area

Under the Preferred Alternative, similar to Alternative 5, an urban centers designation on both the west and east sides of the 130th Station Area would merge with an existing commercial node to expand residential mixed use near the station. Growth would be accommodated in more mixed-use buildings, providing greater housing types in buildings with heights of up to 85 feet. The Station Area's share of the Preferred Alternative housing growth is approximately 1.8%.

Implementation of the Preferred Alternative assumes a growth potential of 2,152 housing units and 658 jobs, requiring approximately 0.05 trillion Btu of electricity and 0.045 trillion Btu of natural gas per year. This constitutes approximately 0.017% and 0.013% of statewide electricity and natural gas usage, respectively. Energy requirements under this alternative would be slightly lower than Alternative 2 and impacts on supply availability in comparison with Alternative 2 would be similar.

3.4.3 Mitigation Measures

Incorporated Plan Features

- Land Use and Transportation: Diversity in land uses combined with increased density within an urban area can lead to shorter trip distances and greater reliance on walking or mass transit trips, as well as the reduced need for vehicle ownership. Regardless of which alternative is chosen, implementation of the Seattle Comprehensive Plan would result in increased housing options and densities that, together with additional transit options would reduce VMT.
- Climate Element: The action alternatives would result in a new One Seattle Comprehensive Plan including a new Climate Element addressing greenhouse gas emission reductions through VMT reductions and building energy use reductions, and a climate resilience sub-

element addressing adaptation to climate change such as building retrofits and design to provide for cooling and energy demand reduction.

Regulations & Commitments

- ~~The City of Seattle Building Energy Code eliminates the use of fossil fuels like gas and electric resistance from most water heating and space heating systems in new construction and substantial alterations for commercial and multifamily uses.~~ The City of Seattle Energy Code regulates the energy-use features of new and remodeled buildings.
- Seattle's Energy Benchmarking Law (Seattle Municipal Code 22.290) requires the owners of non-residential and multifamily buildings (20,000 square feet or larger) to track and report (annually) energy performance.
- Compliance with the Seattle Building Tune-Ups Ordinance (Seattle Municipal Code 22.930) aims to optimize energy and water performance by identifying low- or no-cost actions related to building operations and maintenance, generating approximately 10-15% energy savings.
- Building Emissions Performance Standards (BEPS) ~~(currently under development as of March 2023)~~ sets ~~energy and/or~~ emissions targets for existing and future buildings over 20,000 square feet that the buildings must meet over time to improve energy efficiency and reduce climate impacts. ~~Seattle Mayor Harrell directed the Office of Sustainability and Environment to develop legislation for carbon-based performance standards for existing commercial and multifamily buildings 20,000 sq. ft or larger. Included in this was a plan to transition all city owned buildings off fossil fuels by 2035. This proposed~~ The Building Emissions Performance Standard (BEPS) complements the CBPS and builds on the City's existing Energy Benchmarking and Building Tune-Up programs. ~~includes standard greenhouse gas intensity targets (GHGITs) for 21 building activity types (e.g., office, retail, multifamily) for each compliance interval until net-zero emissions targets in 2050 (City of Seattle, 2023). The BEPS proposal sets required GHGITs through 2035 and provisional targets from 2036 – 2050 to enable owners to plan, while allowing the later targets to be revised, if needed, by future rules updates. All future development would be required to adhere to energy efficiency standards combined with increased efficiency through performance requirements fostered by the Climate Action Plan and all-electric space and water heating required by the Washington Energy Code.~~

Other Potential Mitigation Measures

Strategies that could be further integrated into plans and programs include encouraging:

- Installation of solar (photovoltaic) and other local generating technologies would reduce demand on energy supplied from public generating and distribution facilities.
- Implementation of sustainable requirements including the construction and operation of LEED-compliant (or similar ranking system) buildings which would reduce the increase required in power systems.

- The use of passive systems and modern power saving units would reduce the use of power in building heating and cooling.
- Use of alternative forms of energy could be included in larger developments where installation is cost effective.
- Implementation of conservation efforts and renewable energy sources to conserve electricity in new developments, including energy efficient equipment (i.e., light bulbs, appliances, and heating and air conditioning), and could reduce energy consumption.

3.4.4 Significant Unavoidable Adverse Impacts

No significant unavoidable adverse impacts on energy are anticipated. The development capacities proposed under all alternatives would increase overall energy consumption. This is mitigated by applying energy codes to new development and VMT measures for building and transportation energy usage. Adherence to energy efficiency measures would ensure that future development would not result in the consumption of energy resources in excess of projected supply availability.

Average annual transportation fuel consumption would increase under all alternatives when compared to existing conditions by less than 1% due to the increase in total VMT associated with projected growth. However, with increased average vehicle fuel efficiency and providing the infrastructure and opportunity for people living and working in the City of Seattle to access alternative transportation modes, action alternatives would not result in the consumption of energy resources in excess of projected supply and would not conflict with energy policies adopted by the City of Seattle.

Since average annual energy use per capita is expected to decrease, the action alternatives would not conflict with energy policies adopted by the City of Seattle.

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