

DRAFT MOBILITY & LAND USE ACTIONS

BELLEVUE ENVIRONMENTAL STEWARDSHIP PLAN

INTRODUCTION

This document summarizes the current list of proposed actions for the Mobility and Land Use focus area of the Environmental Stewardship Plan. These actions have been developed by a team of city staff and consultants and build on the City’s work to date to increase mobility options and plan for transit oriented development. The Environmental Stewardship plan will include actions to be implemented over a five year period, in the following five focus areas: climate change, energy, mobility and land use, natural systems, and waste.

This document outlines a suite of actions to advance progress toward achieving the following climate, mobility, and land use goals and targets:

Focus Area	Goal	2030 Target	2050 Target
Climate Change	Reduce Bellevue’s greenhouse gas emissions and prepare and adapt to ongoing climate change impacts.	Reduce Bellevue’s communitywide greenhouse gas emissions 50% by 2030, compared to a 2011 baseline.	Reduce Bellevue’s communitywide greenhouse gas emissions 80% by 2050, compared to a 2011 baseline.
Mobility & Land Use	Minimize the environmental impacts of transportation and development in Bellevue by focusing development in growth centers and providing all residents with access to a variety of mobility options.	<ul style="list-style-type: none"> • Achieve a 65% commute-trip drive-alone rate for residents and people working in Bellevue by 2030. • Strive to have 25% electric vehicles registered in Bellevue by 2030. • Reduce per capita vehicle miles travelled (VMT) by at least 20% by 2030, compared to a 2011 baseline. • Support transit oriented development and strive to achieve 70% of jobs and 50% of housing 	<ul style="list-style-type: none"> • Achieve a 45% commute-trip drive-alone rate for residents and people working in Bellevue by 2050. • Strive to have 100% electric vehicles registered in Bellevue by 2050. • Reduce per capita vehicle miles travelled (VMT) by 50% by 2050, compared to a 2011 baseline. • Support transit oriented development and strive to achieve 85% of jobs and 65% of housing located within a ¼ mile of a frequent transit network stop (15-

Focus Area	Goal	2030 Target	2050 Target
		located with a ¼ mile of a frequent transit network stop (15-minute headway or less) by 2030.	minute headway or less) by 2050.

This report includes a summary of the scope and intent of individual actions along with the results of the impact analysis performed by the Cascadia Consulting team.

DRAFT ACTIONS

This section provides a brief description of the scope and intent of each of the actions currently proposed for the Environmental Stewardship Plan. The actions are organized around the following strategies: expanding use of multi-modal transportation options, increase transit-oriented development, increasing availability of clean fuels, and accelerating adoption of electric vehicles.

1. **Transportation impact fees:** Consider expanding the Transportation Impact fee program to support construction of projects to improve walking and biking, in addition to increasing capacity for motorized vehicles.

An impact fee is intended to offset or mitigate the anticipated adverse impacts of most types of new development. In Bellevue, transportation impact fees are assessed as a condition of development approval on a forecast per trip basis. The existing system is based on a level-of-service standard that accounts for vehicle trips only. A multimodal; approach to transportation impact fees would account for the trips generated for all modes – walk, bike, transit, and drive. An expanded transportation impact fee program would include a project list for all modes and an allocation of resources from private development that would pay a proportionate share of the cost to build those projects.

2. **Mobility Implementation Plan:** Develop a Mobility Implementation Plan that explores opportunities to decrease per capita vehicle miles traveled through prioritization and investments to support transit and non-motorized modes. Comprehensive Plan policy TR-37 provides direction to *“Develop and utilize a citywide Transportation Master Plan to identify and prioritize the implementation of transportation system improvements.”*

Many of the fundamental components exist for a Bellevue Transportation Master Plan (now called a Mobility Implementation Plan). For instance, the Transit Master Plan, the Pedestrian

and Bicycle Transportation Plan, and the recommended Multimodal Level-of-Service Metrics, Standards and Guidelines create a strong foundation for a Mobility Implementation Plan (MIP). Current Bellevue policy and ongoing planning and implementation are additional components that would be integrated within a MIP, including: Complete Streets; Vision Zero; Transportation Demand Management; Transportation Facility Plan; smart mobility; Environmental Stewardship Initiative; and curbside management, plus the plans of regional mobility partners including Eastlink; STride; RapidRide; and the I-405 Master Plan.

3. **Ambitious Transportation Strategy Study:** Explore ambitious transportation strategies such as speed and reliability improvements for transit, accelerated completion of the pedestrian and bicycle network (see below), and curbside management, to support the availability and accessibility of mobility options.

In the effort to provide mobility options that are attractive alternatives to driving alone, Bellevue will implement projects in the Transit Master Plan and in the Pedestrian and Bicycle Transportation Plan as resources allow. Curbside management is an ongoing endeavor to adaptively manage the use of the curbside – particularly in Downtown Bellevue and in other commercial/mixed-use areas- for uses and activities such as passenger loading, freight pick-up and drop-off, and for transit, bicycle, and HOV traffic. To the extent that these transportation strategies support and enhance the availability and accessibility of mobility options, the use of private automobiles may decrease, with a commensurate reduction on the per capita vehicle miles traveled.

4. **Accelerate Implementation of the Pedestrian and Bicycle Transportation Plan:** Increase accessibility of travel routes for people walking and bicycling through accelerating implementation of projects identified and prioritized in the Pedestrian and Bicycle Transportation Plan and the standards and guidelines recommended in the 2017 report on Multimodal Level-of-Service Standards and Guidelines.

A long list of projects that will add or improve facilities for people walking and bicycling is adopted in the Pedestrian and Bicycle Transportation Plan. The Ped/Bike Plan calls for completing two north-south and two east-west priority bicycle corridors (by 2019), as well as many projects to connect schools, parks, shopping, employment, transit and other destinations. To accelerate the rate of construction toward achieving system completeness will require additional funds. Bellevue pursues grant funding opportunities to supplement local funds. There are additional funding mechanisms that Bellevue may explore/employ, including expanding the Transportation impact fee program to fund stand-alone projects in the Pedestrian and Bicycle Transportation Plan.

5. **Commute Trip Reduction:** Continue the Commute Trip Reduction program for employers and study the impact of COVID-19 on future commuting patterns and associated multi-modal mobility needs.

The Commute Trip Reduction program in Bellevue provides tools, guidance and incentives for employers to make efforts to reduce the rate of employees driving alone. Success in this endeavor will be a lower rate of driving alone and a lower per capita vehicle miles traveled. COVID-19 has demonstrated that working from home is a reasonable alternative for many people compared to working in the office. Commute Trip Reduction can utilize lessons learned to modify the program to support the commute trip not taken.

The following land use, clean vehicle, and clean fuel actions would be led Community Development or the City Manager's Office and would involve Transportation and other departments.

6. **Growth Center Parking study:** Study the impact of light rail on the demand for commuter and residential parking in buildings near transit stations and consider modifying the minimum parking requirements to let the market determine the appropriate amount of parking needed for new development.

As parking demand may evolve due to increased telecommuting in the coming years and with the opening of Eastlink light rail, the demand for parking should be evaluated. Bellevue currently has minimum and maximum parking requirements for all new commercial and multi-family residential buildings. Underground parking is a major cost in new construction, and in order to both increase affordability and encourage use of alternative mobility options, transitioning to a more market driven approach to determining parking needs could help achieve citywide goals for reducing vehicle trips, preserving housing affordability, and preserving commercial space affordability for small businesses.

7. **Leverage Frequent Transit Network Service:** Identify locations along the frequent transit network to consider for additional housing, employment, and recreation opportunities.

In order to achieve the Sustainable Bellevue plan goals to have the majority of households and jobs within a ¼ mile of the frequent transit network, the majority of all growth will be directed to the city's growth centers. The major comprehensive plan update will also consider the need and opportunities for additional growth in targeted areas along the frequent transit network, to continue to support transit oriented development in other parts of the city which are well-served by transit.

8. **EV readiness:** Introduce electric vehicle charging readiness requirements for new commercial, multi-family, and single-family buildings to exceed the state building code requirement.

Ensuring adequate electric vehicle (EV) infrastructure is a key strategy in overcoming “range anxiety” and reducing barriers to EV adoption. Cities can help accelerate EV adoption through requirements in building codes, to plan for the long-term demand of electric vehicle charging infrastructure.

The updated state building code set to go into effect by July 1, 2021 includes provisions to require pre-wiring for electric vehicle charging in 10% of parking spots and electrical capacity for EV charging for up to 20% of parking spots, for garages with more than 20 spots. This action would increase the pre-wiring and electrical capacity requirements to align with other neighboring jurisdictions, to ensure that Bellevue’s new buildings have the necessary infrastructure in place to serve the demands of EV drivers in many years to come.

9. **EV infrastructure:** Provide incentives for EV charging infrastructure for existing buildings.

Existing buildings which do not have the wiring or electrical capacity in their garages to install EV charging infrastructure, face multiple barriers to providing EV charging equipment. This action will review existing incentives available from Puget Sound Energy, the state, or other sources and seek to either help building owners and tenants access these incentives or provide additional incentives to accelerate the installation of EV charging infrastructure in multi-family and commercial buildings.

10. **Clean Fuel Standard:** Support a regional or statewide Clean Fuel Standard to reduce emissions from transportation fuels and support funding for clean fuels.

Achieving Bellevue’s greenhouse emissions reduction goals will involve a combination of mobility and energy related strategies to reduce trips, encourage cleaner vehicles, and transition to cleaner fuels. Both the Puget Sound Clean Air Agency and the WA State Legislature have considered various versions of a clean fuel standard, similar to clean fuel standards in place in other Western States. A Clean Fuel Standard would help to reduce the emissions associated with transportation fossil fuels and would provide incentives for the provision of cleaner fuels, such as electric vehicle charging infrastructure.

Developing policy language related to a proposed Clean Fuel Standard would be part of Bellevue’s annual Legislative Agenda process, led by the City Manager’s Office.

IMPACT ANALYSIS

This document estimates variables and outcomes associated with identified actions in the Environmental Stewardship Plan (ESP). Essentially, the analysis assessed the potential of ESI Strategic Plan implementation to meet established targets. This estimation is visualized in a “wedge analysis” that depicts a high-level estimate of how much the actions will collectively contribute towards meeting the city’s communitywide goals and targets.

This section includes a wedge analysis for the following two targets:

Climate Change

- Total greenhouse gas emissions (MTCO₂e)

Mobility & Land Use

- Vehicle miles traveled (VMT) (per capita)

METHODOLOGY

This analysis assessed the following four primary scenarios:

- 1. Business-As-Usual (BAU):** An estimate of how the metric would change over time without the influence of external or internal policies or programs. Population and job growth are the key drivers of business-as-usual projections.
- 2. External Factors:** The influence of policies external to Bellevue—such as state renewable portfolio standards and federal / state fuel efficiency standards—on Bellevue’s projected GHG emissions. These are denoted in **solid** in the wedge graphics.
- 3. ESP Actions:** The estimated impact of priority actions slated for inclusion in the Environmental Stewardship Plan. These are denoted in **patterned** in the wedge graphics.
- 4. Additional Needed Actions:** The estimated impact of additional actions that would be needed to meet the ESP’s long-term targets. These are denoted in **grey** in the wedge graphics.

The analysis was conducted to 2050—the long-term target year for communitywide sustainability goals, including the greenhouse gas emission reduction target.

CONSIDERATIONS

Considerations when outlining assumptions for a carbon wedge analysis include:

- **Data availability:** You may have heard the phrase, “garbage in, garbage out.” This phrase is true for wedge analyses. The outputs of the model are only as precise and accurate as its inputs. This means that, where possible, the use of locally precise and accurate data is preferred. However, in many cases, local data are not available. In that case, data from the national level or from other regions are considered in combination with input from local experts.
- **Uncertainty:** Modeling strategy and action potential can be challenged by uncertainty in the cause-effect relationship of actions. For example, what is the emission reduction outcome of an action that calls for the introduction of a rebate for home energy audits? This value is contingent on many factors:
 - Outreach: How many households will know about the program?
 - Buy-in: Of those households that know about the program, how many will sign up?
 - Behavior Change: Of those that sign up, how many will install efficiency measures?
 - Measure Efficacy: Of those that install measures, what measures will they install? How effective will those measures be?

This wedge analysis does not attempt to assign answers to each of these questions. Instead, this analysis is meant to provide a high-level estimate of potential outcomes from ESP implementation. It is assumed that more detailed action evaluation would be performed upon implementation of the action.

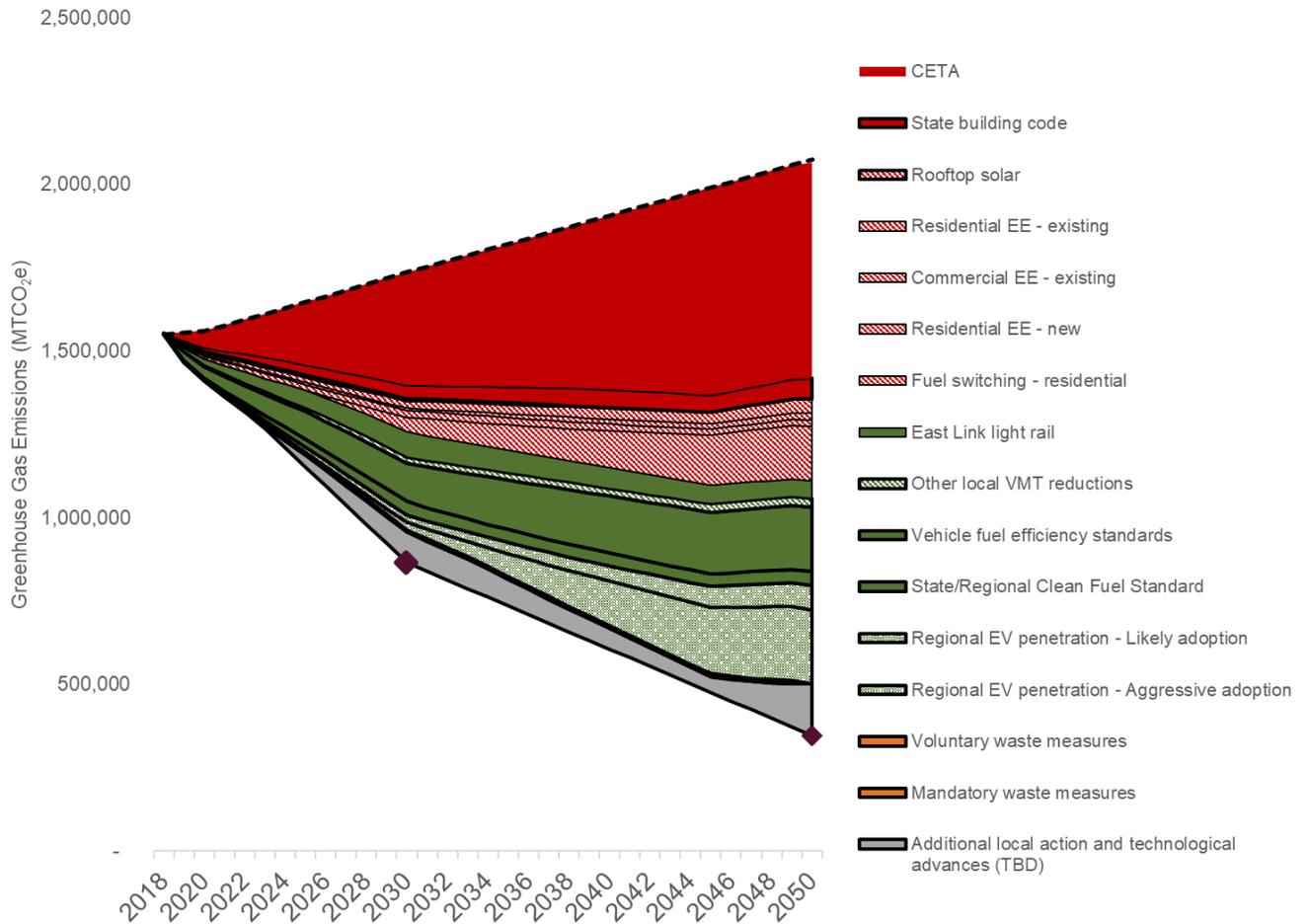
FINDINGS OVERVIEW

Climate Change

	Communitywide GHG Emissions (MTCO ₂ e)	
	2030	2050
Target (diamonds)	865,425 (50% reduction)	346,170 (80% reduction)
Planned	956,758 (45% reduction)	501,357 (71% reduction)

The following graph illustrates the impact of primarily buildings and transportation / land use related strategies for reducing greenhouse gas emissions.

Bellevue Communitywide Emissions Reduction Analysis



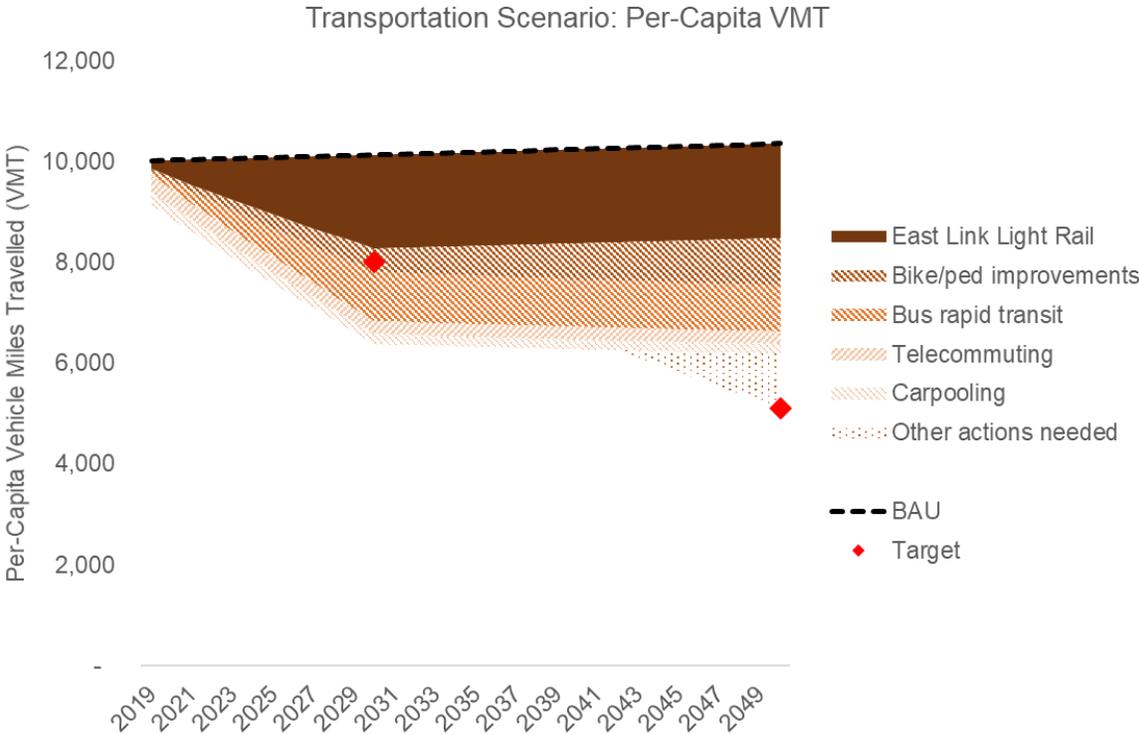
This initial draft of the wedge analysis illustrates that clean energy, energy efficiency, fuel economy, electric vehicles, clean fuels, and VMT reductions will be essential for meeting the proposed emissions reduction targets. Further analysis is needed to identify additional actions for achieving the 2030 and 2050 goals. The actions outlined for this 2020 Environmental Stewardship Plan will help to lay the foundation, but these strategies will need to be expanded or built upon in order to achieve the short and long-term reduction goals.

This analysis is built on research and assumptions from regional transportation emissions studies and when no regional information is available, using other national reports and studies, as noted in the following sections. The intent is to model the potential impact of various strategies, to understand the cumulative impact of the proposed actions.

Mobility and Land Use

The following table and graph illustrates the impact of key multi-modal strategies to support the achievement of the per capita VMT reduction goal.

	Per-Capita Vehicle Miles Travelled (VMT)	
	2030	2050
Target (diamonds)	8,012 (20% reduction)	5,113 (50% reduction)
Planned	6,386 (36% reduction)	6,204 (38% reduction)



This graph illustrates that East Link will have a significant impact in reducing VMT and supporting the achievement of the 2030 per capita VMT reduction goal of

APPENDIX: ASSUMPTIONS OVERVIEW

Drive-Alone Rate / per-capita VMT

Business As Usual Forecast/External Assumptions:

#	Scope	Element	Assumptions
2.1.1	Community	Historical trips by mode	<ul style="list-style-type: none"> Resident drive alone rate data obtained from American Community Survey 5-year average (65.9% for 2011-2015, and 64.6% for 2013-2017). Worker drive alone rate data obtained from American Community Survey 5-year average (73.4% for 2011-2015, and 72.1% for 2013-2017).
2.1.2	Community	Forecasted trips by mode	<ul style="list-style-type: none"> Assumes changes in regional trips per capita are as projected by the Puget Sound Regional Council (PSRC), The Regional Transportation Plan.
2.1.3	Community	Forecasted VMT by mode	<ul style="list-style-type: none"> Assumes changes in VMT per capita are as projected by the Puget Sound Regional Council (PSRC), The Regional Transportation Plan.

Strategy Assumptions:

Action	Action Description	Assumptions
Transportation impact fees	Consider expanding the Transportation Impact fee program to support construction of projects to improve walking and biking, in addition to increasing capacity for motorized vehicles.	<p>Transit Service Expansion:</p> <ul style="list-style-type: none"> East Link Light Rail expected to reduce VMT by 20% by 2030.¹
Growth Center Parking study	Study the impact of light rail on the demand for commuter and residential parking in buildings near transit stations and consider modifying the minimum parking requirements to let the market determine the appropriate amount of parking needed for new development.	<p>Expanding bus rapid transit (BRT):²</p> <ul style="list-style-type: none"> Assume 1% increase in ridership for every 1% increase in service variable (frequency, hours, miles, etc.). Assume 50% increase in service by 2050, resulting in 50% increase in ridership.

¹

https://www.soundtransit.org/sites/default/files/documents/pdf/projects/eastlink/eis_2011/04_chapter3_transportation.pdf.

² A literature review commissioned by the California Air Resources Board found that a 1 percent increase in service frequency will lead to a ridership increase of approximately 0.5 percent (elasticity of 0.5); a 1 percent increase in service hours or miles increases ridership by around 0.7 percent; and a 1 percent decrease in fares will lead to a 0.4 percent increase in transit ridership. However, these elasticity estimates are dependent upon city attributes such as city size, transit type, and income of transit users. Source: https://www.arb.ca.gov/cc/sb375/policies/transitservice/transit_brief.pdf.

Action	Action Description	Assumptions
Mobility Implementation Plan	Develop a Mobility Implementation Plan that explores opportunities to decrease per capita vehicle miles traveled through prioritization and investments to support transit and non-motorized modes.	<ul style="list-style-type: none"> Assume % transit trips doubles (from ~25% to ~50% of commuting trips), therefore reducing drive-alone trips (passenger VMT) by about 25% (but likely less due to available literature³, so maybe closer to 15%). <p>Bike Infrastructure:</p> <ul style="list-style-type: none"> 50% increase in bicycle infrastructure by 2050 results in 15% increase in number of bike trips. 5% reduction in VMT by 2050⁴ <p>Pedestrian Improvement:</p> <p>50% increase in the pedestrian environment by 2050 resulting in the following passenger VMT reduction:</p> <ul style="list-style-type: none"> 2% by 2030 5% by 2050⁵ <p>Telecommuting:</p> <ul style="list-style-type: none"> Assume 50% of Bellevue passenger VMT is for commuting.⁶ Assumes 30% of Bellevue commuters have jobs that allow telecommuting. Assume 25% reduction in commuting passenger VMT for those who can telecommute. <p>Carpooling:</p> <ul style="list-style-type: none"> 3% passenger vehicle VMT reduced through carpooling.
Ambitious Transportation Strategy Study	Explore ambitious transportation strategies such as speed and reliability improvements for transit, accelerated completion of the pedestrian and bicycle network (see Action #36), and curbside management, to support the availability and accessibility of mobility options.	
Accelerate implementation of the Pedestrian and - Bicycle Transportation Plan	Increase accessibility of travel routes for people walking and bicycling through accelerating implementation of projects identified and prioritized in the Pedestrian and Bicycle Transportation Plan and the standards and guidelines recommended in the 2017 report on Multimodal Level-of-Service Standards and Guidelines.	
Leverage Frequent Transit Network Service	Identify locations along the frequent transit network to consider for additional housing, employment, and recreation opportunities.	
Commute Trip Reduction	Continue the Commute Trip Reduction program for employers and study the impact of COVID-19 on future commuting patterns and associated multi-modal mobility needs.	

³ The transit service CARB study cited above notes that increased ridership doesn't always lead to a proportionate reduction in passenger vehicle trips. For example, a study in Eugene, OR found that 16% of riders previous drove or were driven.

⁴ A literature review by the California Air Resources Board found studies associating a <1% increase in bicycle commuting with additional bike infrastructure (0.35% increase in % commuting by bicycle per 1% increase in bicycle infrastructure). Promotional programs were demonstrated to have a larger impact on increasing bike share miles ranging from a 100%-445% increase after programs were implemented. https://www.arb.ca.gov/cc/sb375/policies/bicycling/bicycling_brief.pdf

⁵ Bellevue's [current Bike/Ped Plan](#) calls for 90 and 20 miles of sidewalk and trail facility improvements, respectively. A literature review commissioned by the California Air Resources Board noted a study based in Portland, OR that found a 1 percent increase in the quality of the pedestrian environment was associated with a 0.19 percent decrease in VMT. Overall, improving the pedestrian environment on its own has only small effects on VMT—likely smaller than the 5-10% reduction reported based on Portland's experience, which may not transfer to Bellevue.

⁶ Federal Highway Administration estimates that 28% of household VMT is for commuting. Assume that Bellevue is higher than this U.S. average.

Action	Action Description	Assumptions
EV readiness	Introduce electric vehicle charging readiness requirements for new commercial, multi-family, and single-family buildings to exceed the state building code requirement.	<ul style="list-style-type: none"> • “Likely” passenger EV adoption as projected by PSRC “likely” scenario, 20% by 2040 (BGHGForecast-03-03). Assumes linear growth between projected years. • “Aggressive” passenger EV adoption as projected by King County (25% by 2031 and 100% by 2050). • Federal vehicle fuel economy wedge reflects EIA projections “reference” case (includes CAFÉ standards, and then steady thereafter). • Clean Fuels Standard assumes 10% reduction in vehicle fuel carbon intensity by 10% (other 10% assumed to be achieved through EVs—see assumptions above). • Introducing charging infrastructure can increase fleet-wide electrified mileage by 8% by 2050⁷
EV infrastructure	Provide incentives for EV charging infrastructure for existing buildings.	
Clean Fuel Standard	Support a regional or statewide Clean Fuel Standard to reduce emissions from transportation fuels and support funding for clean fuels.	<ul style="list-style-type: none"> • Estimated based on impact of proposed state Clean Fuel Standard.

Greenhouse Gas Emissions Forecast Variables

Other Business-As-Usual Assumptions:

#	Forecast Variable	Assumptions
0.1.1	Bellevue population between 2011-2050	<ul style="list-style-type: none"> • Assumes linear growth between predicted years; growth after 2035 reflects 2030-2035 annual growth. • Assumes population grows at a rate anticipated by the City of Bellevue, equivalent to about a 1% increase per year (BGHGForecast-01-01 DaytimePopulation_2017_0306).
0.1.2	Number of households in Bellevue between 2011-2050	<ul style="list-style-type: none"> • Assumes the number of households grow proportionally to population (that is, household size remains constant). • Historical values from Washington State OFM (BGHGForecast-01-02 ofm_april1_postcensal_estimates).

⁷ Levinson, Rebecca and Todd H. West (2018). Impact of public electric vehicle charging infrastructure. *Journal of Transportation Research Part D: Transport and Environment*. <https://www.sciencedirect.com/science/article/pii/S136192091630757X>

#	Forecast Variable	Assumptions
0.1.3	Number of jobs in Bellevue between 2011-2050	<ul style="list-style-type: none"> Assumes population grows at a rate anticipated by the City of Bellevue, equivalent to about a 1.7% increase per year (BGHGForecast-01-01 DaytimePopulation_2017_0306). Assumes linear growth between predicted years; growth after 2035 reflects 2030-2035 annual growth (BGHGForecast-01-01 DaytimePopulation_2017_0306).
0.1.4	Commercial square footage in Bellevue between 2011-2050	<ul style="list-style-type: none"> Assumes the growth in commercial square footage mirrors anticipated job growth as predicted by the City of Bellevue, equivalent to a 1.7% increase per year.
0.1.5	Transportation trips by mode	<ul style="list-style-type: none"> Assumes changes in regional VMT and trips by mode are as projected by the Puget Sound Regional Council (PSRC) (BGHGForecast-03-01 PSRC RTP Appendix K; BGHGForecast-03-02 VMT Projections for Bellevue).
0.1.6	Electric vehicle penetration to 2050	<ul style="list-style-type: none"> Assumes changes in regional EV penetration are as projected by the Puget Sound Regional Council's (PSRC) likely scenario (BGHGForecast-03-03), which predicts 20% penetration by 2040. Assumes linear growth between predicted years; growth after 2040 reflects 2018-2040 annual growth.
0.1.7	Puget Sound Energy (PSE) emissions factors for 2011-2050	<ul style="list-style-type: none"> Actual emissions factors for 2011-2017 obtained from PSE GHG inventories. Projected emissions factors for 2018-2050 based on PSE Integrated Resource Plan CO₂ emissions for Base portfolio. Projections provided out to 2037, linear trend assumed after 2037 (BESI-40-04).
0.1.8	Vehicle emissions factors, by VMT, for 2011-2050.	<ul style="list-style-type: none"> Actual emissions factors for 2011-2016 obtained from PSRC and downscaled to Bellevue (BGHG-40-01). Projected emissions factors for 2017-2050 based on PSRC likely scenario (BGHGForecast-03-03), which predicts an average MPG of passenger vehicles to be 40, a 5% reduction in heavy-duty vehicle GHG, and a 10% reduction in the carbon intensity of fuels by 2040. Assumes linear growth between predicted years; growth after 2040 reflects 2018-2040 annual growth.