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Appendix 10.1 - Resolutions Adopting Common Targets to Reduce Communitywide Greenhouse Gas Emissions

RESOLUTION NO. 15644

A RESOLUTION BY THE THURSTON COUNTY BOARD OF COUNTY COMMISSIONERS ADOPTING COMMON TARGETS TO REDUCE COMMUNITY-WIDE GREENHOUSE GAS EMISSIONS THAT CONTRIBUTE TO GLOBAL CLIMATE CHANGE.

WHEREAS, a growing body of scientific evidence shows that carbon dioxide and other greenhouse gas emissions from human activities are accelerating global climate change and resulting in local impacts, including sea-level rise, ocean acidification, and more frequent and intense heavy precipitation events, floods, droughts, and wildfires; and

WHEREAS, the Intergovernmental Panel on Climate Change (IPCC) concludes that the United States and other industrialized countries need to reduce emissions in the range of 80-95 percent from 1990 levels by 2050 to stabilize atmospheric concentrations of carbon dioxide and other heat-trapping gases at 450 parts per million; and

WHEREAS, the IPCC concludes that hitting the stabilization target will likely keep the global average temperature from rising 2° Celsius above pre-industrial levels by the end of this century and thus avoid more severe climate impacts; and

WHEREAS, the United Nations Framework Convention on Climate Change's "Paris Agreement," which the United States and other nations brokered in late 2015, includes the 2°C target; and

WHEREAS, Thurston County and the Thurston Thrives partnership for community health improvement are greatly concerned about the economic, public health, and environmental impacts of climate change on all communities in the Thurston County region; and

WHEREAS, Thurston County in 2010 adopted a resolution which committed the County to reduce its greenhouse gas emissions from county government operations; and

WHEREAS, the *Sustainable Thurston* Plan by Thurston Regional Planning Council in 2013, and subsequently adopted by the County and cities, sets a goal for the Thurston County region to move toward carbon-neutrality, recommends supporting emissions-reduction targets through 2050, and identifies the creation of a regional climate action plan as a first action step; and

WHEREAS, Thurston County and other communities in the Thurston region have taken action to reduce their municipal operations' emissions but agree that further action is needed to reduce community-wide emissions; and

WHEREAS, Thurston County, Lacey, Olympia and Tumwater policymakers signed an interlocal agreement in April 2018 to complete Phase 1 of a regional climate mitigation plan. Phase 1 of the plan will identify common, community-wide emissions-reduction targets which

will be used in Phase 2, which will develop an implementation strategy and timeline for each jurisdiction to meet said targets; and

WHEREAS, a Phase 1 project team of staff members from each jurisdiction concludes that the Thurston County region must reduce community-wide greenhouse gas emissions 45 percent below 2015 levels by 2030 and 85 percent below 2015 levels by 2050 to ensure that local communities do their part to keep the global average temperature from rising more than 2°C.

NOW, THEREFORE, in consideration of information contained herein, the Thurston County Board of County Commissioners affirms it will pursue the Phase 1 project team's recommendations to reduce communitywide greenhouse gas emissions 45 percent below 2015 levels by the year 2030 and 85 percent below 2015 levels by the year 2050.

ADOPTED: July 31, 2018

ATTEST:

Clerk of the Board

APPROVED AS TO FORM:

JON TUNHEIM
PROSECUTING ATTORNEY

Elizabeth Petrich, Deputy Prosecuting Attorney

BOARD OF COUNTY COMMISSIONERS
Thurston County, Washington

Bud Blake, Chair

John Hutchings, Vice Chair

Gary Edwards, Commissioner

RESOLUTION 1062

CITY OF LACEY

A RESOLUTION ADOPTING COMMON TARGETS TO REDUCE COMMUNITYWIDE GREENHOUSE GAS EMISSIONS THAT CONTRIBUTE TO GLOBAL CLIMATE CHANGE.

WHEREAS, a growing body of scientific evidence shows that carbon dioxide and other greenhouse gas emissions from human activities are accelerating global climate change and resulting in local impacts, including sea-level rise, ocean acidification, and more frequent and intense heavy precipitation events, floods, droughts, and wildfires; and

WHEREAS, the Intergovernmental Panel on Climate Change (IPCC) concludes that the United States and other industrialized countries need to reduce emissions in the range of 80-95 percent from 1990 levels by 2050 to stabilize atmospheric concentrations of carbon dioxide and other heat-trapping gases at 450 parts per million; and

WHEREAS, the Intergovernmental Panel on Climate Change (IPCC) concludes that hitting the stabilization target will likely keep the global average temperature from rising 2° Celsius above pre-industrial levels by the end of this century and thus avoid more severe climate impacts; and

WHEREAS, the United Nations Framework Convention on Climate Change's "Paris Agreement," which the United States and other nations brokered in late 2015, includes the 2°C target; and

WHEREAS, the City of Lacey is greatly concerned about the economic, public health, and environmental impacts of climate change on all communities in the Thurston County region; and

WHEREAS, the City of Lacey in 2016 adopted the Carbon Reduction and Resiliency Plan, which committed the City to reduce its greenhouse gas emissions from municipal operations to 15% below 2005 levels by 2020; and

WHEREAS, the City of Lacey and other communities in the Thurston Region have taken strong action to reduce their municipal operations' emissions and agree that further action is needed to reduce communitywide emissions; and

WHEREAS, Thurston County, Tumwater, Lacey and Olympia policymakers signed an interlocal agreement in April 2018 to complete Phase 1 of a Regional Climate Mitigation Plan that would recommend common, communitywide emissions-reduction targets to guide Phase 2 of the plan; and

WHEREAS, a project team of staff members from each jurisdiction concludes that the Thurston County region must reduce communitywide greenhouse gas emissions 45 percent below 2015 levels by 2030 and 85 percent below 2015 levels by 2050 to ensure that local communities do their part to keep the global average temperature from rising more than 2°C.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF LACEY, WASHINGTON, that in consideration of the information contained in the above recitals, the City of Lacey affirms it will pursue the recommended emissions-reduction targets.

PASSED BY THE CITY COUNCIL OF THE CITY OF LACEY, WASHINGTON, this 12 day of July, 2018.

CITY COUNCIL

BY: _____
Mayor

Attest:

_____
City Clerk

Approved as to form:

_____
City Attorney

RESOLUTION NO. _____

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF OLYMPIA, WASHINGTON, ADOPTING COMMON TARGETS TO REDUCE COMMUNITY-WIDE GREENHOUSE GAS EMISSIONS THAT CONTRIBUTE TO GLOBAL CLIMATE CHANGE AND APPROVING AN INTERLOCAL AGREEMENT BETWEEN THE CITY OF OLYMPIA, CITY OF LACEY, CITY OF TUMWATER, THURSTON REGIONAL PLANNING COUNCIL AND THURSTON COUNTY FOR DEVELOPMENT OF A REGIONAL CLIMATE MITIGATION PLAN

WHEREAS, the cities of Olympia, Lacey, and Tumwater, Thurston County and the Thurston Regional Planning Council (the Parties) believe that greenhouse gas emissions accelerate climate change and result in such impacts as reduced snowpack, ocean acidification, sea level rise, increased flooding, summer droughts, loss of habitat, and increased forest fires; and

WHEREAS, the Parties are greatly concerned over these economic, public health, and environmental impacts of climate change on the Thurston County region and their respective communities and jurisdictions; and

WHEREAS, the Parties have been taking action over many years to reduce their municipal greenhouse gas emissions and believe further action is needed to reduce their community-wide emissions; and

WHEREAS, the City of Olympia has adopted into its Comprehensive Plan goal GN8: Community sources of emissions of carbon dioxide and other climate-changing greenhouse gases are identified, monitored and reduced; and

WHEREAS, the *Sustainable Thurston Plan*, adopted by the Thurston Regional Planning Council (TRPC) in 2013 and subsequently accepted by the Parties, sets a goal for the Thurston County region to move toward carbon-neutrality and recommends supporting emissions reduction targets through 2050, and identifies the creation of a regional climate action plan as a first action step; and

WHEREAS, a regional climate action plan consists of two parts: (1) the emissions reducing mitigation plan referenced in the proposed Interlocal Agreement for Regional Climate Mitigation Planning; and (2) the *Thurston Climate Adaption Plan* adopted by TRPC in January 2018. The latter document includes ninety-one (91) adaptation actions to help the region prepare for and adjust to climate impacts; and

WHEREAS, the Parties believe a regional climate mitigation plan would be more efficient and effective than individual climate mitigation plans; and

WHEREAS, RCW 39.34.010 permits local governmental units to make the most efficient use of their powers by enabling them to cooperate with other localities on a basis of mutual advantage and thereby to provide services and facilities in a manner and pursuant to forms of governmental organization that will accord best with geographic, economic, population and other factors influencing the needs and development of local communities; and

WHEREAS, pursuant to RCW 39.34.080, each party is authorized to contract with any one or more other public agencies to perform any governmental service, activity, or undertaking which each public agency entering into the contract is authorized by law to perform; provided, that such contract shall be authorized by the governing body of each party to the contract and shall set forth its purposes, powers, rights, objectives and responsibilities of the contracting parties; and

WHEREAS, in the spring of 2018, the Parties executed Phase 1 of a Regional Mitigation Plan that assessed their greenhouse gas emissions and efforts to reduce them, as well as recommended that each jurisdiction adopt a resolution with a common emissions baseline and science-based targets to guide the Plan's Phase 2 by reducing community-wide emissions 45% below 2015 levels by 2030 and 85% below 2015 levels by 2050; and

WHEREAS, the Parties wish to execute Phase 2 of the two-phased planning process to create the *Regional Climate Mitigation Plan* and develop implementation strategies to be administered by each party;

NOW, THEREFORE, THE OLYMPIA CITY COUNCIL DOES HEREBY RESOLVE as follows:

1. In consideration of the information contained herein, the City of Olympia will pursue the recommended targets to reduce community-wide greenhouse gas emissions 45 percent below 2015 levels by 2030, and 85 percent below 2015 levels by 2050.

2. The Olympia City Council hereby approves the form of Interlocal Agreement between the City of Olympia, City of Lacey, City of Tumwater, Thurston Regional Planning Council, and Thurston County, and the terms and conditions contained therein.

3. The City Manager is directed and authorized to execute on behalf of the City of Olympia the Interlocal Agreement for a *Regional Climate Mitigation Plan* and to make any minor modifications as may be required and are consistent with the intent of the attached Interlocal Agreement, or to correct any scrivener's errors.

PASSED BY THE OLYMPIA CITY COUNCIL this _____day of _____ 2018.

_____
MAYOR

ATTEST:

_____
CITY CLERK

APPROVED AS TO FORM:

_____
CITY ATTORNEY

RESOLUTION NO. R2018-015

A RESOLUTION of the City Council of the City of Tumwater, Washington adopting common targets to reduce communitywide greenhouse gas emissions that contribute to global climate change.

WHEREAS, a growing body of scientific evidence shows that carbon dioxide and other greenhouse gas emissions from human activities are accelerating global climate change and resulting in local impacts, including sea-level rise, ocean acidification, and more frequent and intense heavy precipitation events, floods, droughts, and wildfires; and

WHEREAS, the Intergovernmental Panel on Climate Change (IPCC) concluded that the United States and other industrialized countries need to reduce emissions in the range of 80-95 percent from 1990 levels by 2050 to stabilize atmospheric concentrations of carbon dioxide and other heat-trapping gases at 450 parts per million; and

WHEREAS, the IPCC concluded that meeting the stabilization target will likely keep the global average temperature from rising 2° Celsius above pre-industrial levels by the end of this century and thus avoid more severe climate impacts; and

WHEREAS, the United Nations Framework Convention on Climate Change's "Paris Agreement," which the United States and other nations brokered in late 2015, includes the 2°C target; and

WHEREAS, the City of Tumwater is greatly concerned about the economic, public health, and environmental impacts of climate change on all communities in the Thurston County region; and

WHEREAS, the City of Tumwater in 2008 adopted a Climate Action Plan, which committed the City to reduce its greenhouse gas emissions from municipal operations 7% below 2000 levels by 2012 and to keep them there beyond 2020; and

WHEREAS, the City of Tumwater and other communities in the Thurston Region have taken strong action to reduce their municipal operations' emissions but all agree that further action is needed to reduce communitywide emissions; and

WHEREAS, the policymakers of Thurston County and the Cities of Tumwater, Lacey and Olympia signed an interlocal agreement in April 2018 to complete Phase 1 of a Regional Climate Mitigation Plan that would recommend

common, communitywide emissions-reduction targets to guide Phase 2 of the plan; and

WHEREAS, a project team of staff members from each jurisdiction concludes that the Thurston County region must reduce communitywide greenhouse gas emissions 45 percent below 2015 levels by 2030 and 85 percent below 2015 levels by 2050 to ensure that local communities do their part to keep the global average temperature from rising more than 2°C; and

WHEREAS, the City Council's General Government Committee reviewed the proposed Resolution in a briefing on June 5, 2018; and

WHEREAS, the City Council discussed the proposed Resolution in a work session on June 12, 2018; and

WHEREAS, on June 19, 2018 the City Council considered the Resolution; and

WHEREAS, the City Council finds that the provisions of this Resolution are in the best interest of and protect the health, safety, and welfare of the citizens of the City.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF TUMWATER AS FOLLOWS:

Section 1. Adoption. The City of Tumwater affirms it will pursue the recommended emissions-reduction targets via the development and implementation of the Regional Climate Mitigation Plan.

Section 2. Ratification. Any act consistent with the authority and prior to the effective date of this Resolution is hereby ratified and affirmed.

Section 3. Severability. The provisions of this Resolution are declared separate and severable. The invalidity of any clause, sentence, paragraph, subdivision, section, or portion of this Resolution or the invalidity of the application thereof to any person or circumstance, shall not affect the validity of the remainder of the Resolution, or the validity of its application to other persons or circumstances.

Section 4. Effective Date. This Resolution shall become effective immediately upon adoption and signature as provided by law.

RESOLVED this 19 day of June, 2018.

CITY OF TUMWATER

Pete Kmet

Pete Kmet, Mayor

ATTEST:

Melody Valiant

Melody Valiant, City Clerk

APPROVED AS TO FORM:

Karen Kirkpatrick

Karen Kirkpatrick, City Attorney

Appendix 10.2 - 2018 Greenhouse Gas Emissions Inventory

Greenhouse Gas Inventory Report for Calendar Years 2015 – 2018 Final Report

Thurston County, Washington

June 2020

Thurston Climate Action Team

Prepared by the Thurston Climate Action Team

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Acknowledgements

This report was developed as a result of Thurston Climate Action Team's (TCAT's) Greenhouse Gas (GHG) Inventory project. Tom Crawford, TCAT President, led the effort on behalf of TCAT, and recruited Dave Bradley, retired from the Department of Ecology, to work on the project.

Tom Crawford is one of the founders of TCAT and has served on TCAT's board since 2009. He holds a bachelor's degree in philosophy from Gonzaga University, and a Master's in Education (M. Ed.) from Eastern Washington University. Tom's background includes work with local and state governments nationwide to improve processes and automated systems, and with Native American communities throughout the Pacific Northwest on community development and educational projects.

Dave Bradley worked for the Department of Ecology for thirty years as a toxicologist and manager in the Toxics Cleanup, Air Quality and the Shorelands and Environmental Assistance Programs. Prior to joining Ecology, Dave worked in Washington DC for an environmental risk assessment consulting firm and the Ralph Nader organization. He holds an undergraduate degree in environmental engineering and a Master's in Toxicology, both from the University of Michigan.

We are grateful to the following individuals for their contributions of data and review comments:

- Michael Ambrogi, Senior GIS Specialist, Thurston Regional Planning Council;
- Michael Burnham, former Senior Planner, Thurston Regional Planning Council;
- Thad Curtz, retired Professor, The Evergreen State College;
- Roel Hammerschlag, Hammerschlag, LLC;
- Andrea Martin, Senior Associate, Cascadia Consulting Group;
- Stephanie Meyn, Climate Protection Program Manager, Port of Seattle;
- Allison Osterberg, Senior Planner, Thurston Regional Planning Council;
- Britain Richardson, Associate, Cascadia Consulting Group;
- Amanda Romero, Solid Waste Planner, Thurston County Public Works;
- Wendy Steffensen, Environmental Project Manager, LOTT Clean Water Alliance;
- Veena Tabbutt, Deputy Director, Thurston Regional Planning Council.

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Executive Summary

Lacey, Olympia, Tumwater and Thurston County are preparing a regional climate mitigation plan. Each jurisdiction has adopted the following regional greenhouse gas (GHG)[1] emission reduction targets:

- 45% reduction below 2015 levels by 2030, and
- 85% below 2015 levels by 2050.

A community's ability to take effective action on climate change depends on having information on GHG emissions. . An inventory enables communities to understand the relative importance of different sources and measure progress on achieving emission reduction targets. Consequently, developing a GHG inventory is a key component of effective climate mitigation strategies

The Thurston Climate Action Team (TCAT) prepared this report in order to provide updated[2] information on GHG emissions that will enable regional decision makers to make informed choices about measures to reduce the region's GHG footprint. TCAT compiled data about emission sources for the 2010 - 2018 time period and estimated GHG emissions for those years using internationally-accepted methods for preparing community emission inventories. Emission estimates for the 2015 – 2018 time period are presented in this report.

Key findings from TCAT's estimates of greenhouse gas emissions in 2018 include:

- The Thurston region's 2018 carbon footprint was 3,070,839 metric tons reported as carbon dioxide equivalents (MTCO2e). The built environment and transportation sectors were the two largest emission sectors and together contributed 92% of the Thurston region's overall carbon footprint in 2018. (See Figure ES-1).
- The three largest emission sources in 2018 were residential buildings (32%), passenger vehicles (27%) and commercial buildings (22%) (See Figure ES-2).
- Emissions in 2018 were about 7% higher than emissions during the baseline year (2015) that is being used to evaluate regional climate mitigation efforts (See Figure ES-3). Several factors contributed to the increase in estimated emissions: (1) increased population; (2) colder winter temperatures; (3) increased solid waste volumes.
- Per capita emissions in 2018 (10.9 MTCO2e/person) were about 2% higher than the per capita emissions in 2015 (See Figure ES-4).
- Emissions and per capita emissions in 2018 were about 3% and 4% lower, respectively, relative to 2017. This reversed the trend during the 2015 – 2017 period when emissions and per capita emissions increased by 10% and 6%, respectively.
- Achieving the Thurston region's climate goals will require annual emission reductions that are much larger than the annual reductions achieved between 2010 and 2018.

[1] Greenhouse gases (GHGs) are natural and industrial gases that trap heat and warm the Earth's surface.

[2] In August 2018, the Thurston Climate Action Team (TCAT) published a community-based-GHG emission inventory for calendar years 2010 through 2016 (TCAT 2018). The August 2018 document expanded on an earlier TCAT report published in 2014 (TCAT 2014).

Figure ES-1: Sectors of greenhouse gas emissions in Thurston Region in 2018 (% Contribution).

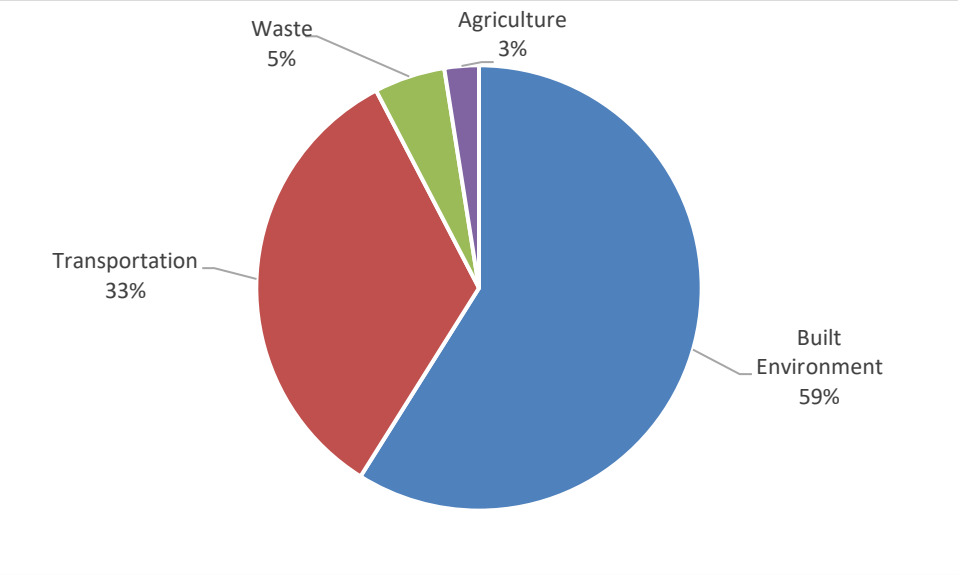


Figure ES–2: Sources of GHG Emissions in the Thurston Region in 2018 (% Contribution)

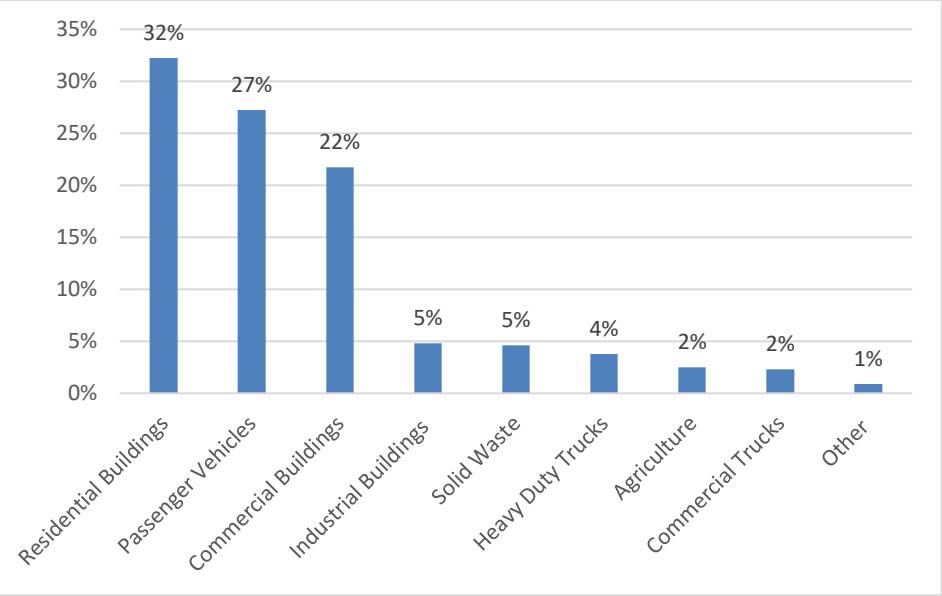


Figure ES-3. Thurston County greenhouse gas emissions (2015 emissions = 100%).

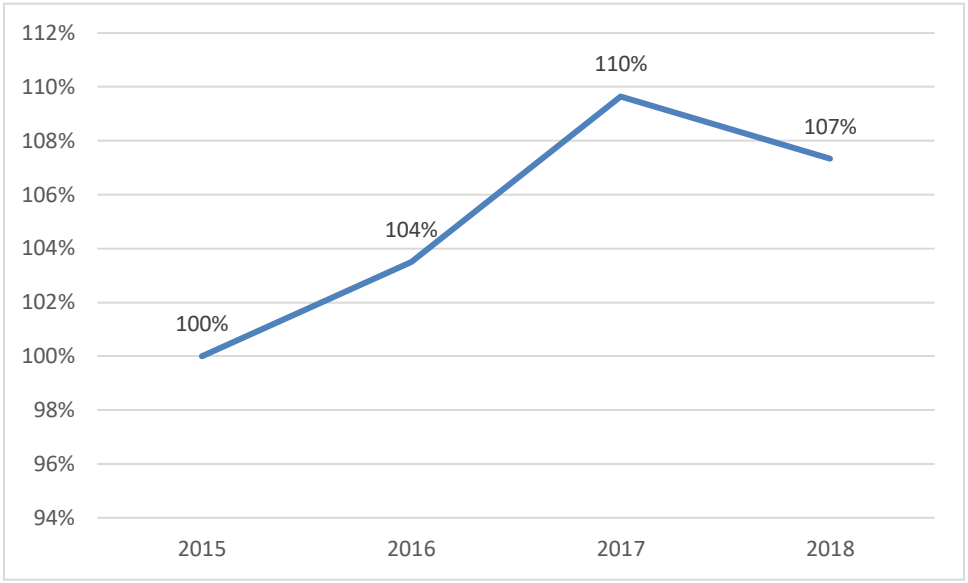
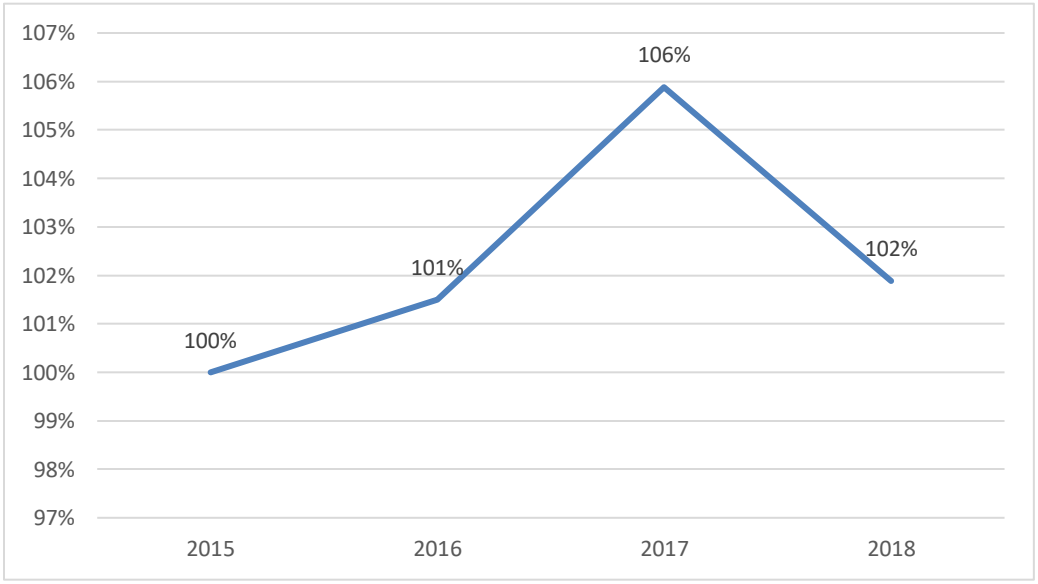


Figure ES-4. Thurston County per capita greenhouse gas emissions (2015 emissions = 100%).



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Acronyms

EIA	United States Energy Information Association
EPA	United States Environmental Protection Agency
CO_2e	Carbon dioxide equivalents
GHG	Greenhouse gas, limited to CO_2, CH_4, N_2O, and fugitive gases in this inventory
kWh	Kilowatt hours
LPG	Liquefied petroleum gas
$MTCO_2e$	Metric Tons of Carbon dioxide equivalents
MOVES	Motor Vehicle Emission Simulator model, a model developed by U.S. EPA to quantify emissions from mobile sources
NONROAD	A tool developed by U.S. EPA to quantify non-road mobile emissions
PSE	Puget Sound Energy
TCR	The Climate Registry
TCAT	Thurston Climate Action Team
TRPC	Thurston Regional Planning Council
USDA	United States Department of Agriculture
WARM	Waste Reduction Model, a model developed by EPA to quantify solid waste emissions
WSDOT	Washington Department of Transportation
VMT	Vehicle Miles Traveled

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Introduction

What is the purpose of this report?

Effective action on climate change requires information on GHG emissions and sources. An inventory enables communities to understand the relative importance of different sources and measure progress on achieving emission reduction targets. Consequently, a GHG inventory is a key component of a well-designed climate mitigation strategy.

The Thurston Climate Action Team (TCAT) prepared this report in order to provide updated information on GHG emissions in the Thurston region. The updated information will enable regional decision makers to make informed choices about measures to reduce the region's GHG footprint. TCAT compiled data about emission sources for 2010 through 2018 and estimated GHG emissions for those years using internationally-accepted methods for preparing community emission inventories. Emission estimates for the 2015 – 2018 time period are presented in this report.

What are the regional GHG emission reduction goals?

Lacey, Olympia, Tumwater and Thurston County are preparing a regional climate mitigation plan. Each jurisdiction has adopted the following regional emission reduction targets (TRPC, 2020f):

- 45% reduction below 2015 levels by 2030, and
- 85% below 2015 levels by 2050.

The local governments selected calendar year 2015 as the baseline year for measuring progress on climate mitigation efforts. While calendar year 1990 has traditionally been used to measure progress on emission reduction efforts, local officials concluded that the local information on 2015 emission levels is more reliable than the local emission information available for calendar year 1990.

What data and methods were used to prepare this inventory?

This report provides a geographic-plus inventory that estimates GHG emissions associated with activities occurring within the Thurston region "plus" emissions associated with producing the electricity used in the community, even though that electricity is generated outside the Thurston region. This inventory also includes emissions associated with the transportation and disposal of solid waste generated by residents and businesses even though local solid waste is currently disposed at a landfill located outside Thurston County.

TCAT prepared this inventory in accordance with the requirements and procedures established by the U.S. Community Protocol for Accounting and Reporting Greenhouse Gas Emissions (US Protocol) prepared by the International Council of Local Environmental Initiatives (ICLEI 2013a). This protocol was supplemented by the more recent 'Global Protocol for Community-Scale Greenhouse Gas Emissions Inventories' prepared by the World Resource Institute (WRI), C40 Cities and ICLEI (WRI et al, 2014). The US and Global protocols provide internationally-accepted methods that enable comparisons with emission inventories prepared by other cities and counties.

The US and Global Protocols establish a four-step process for estimating GHG emissions:

1. Identify relevant source categories: This inventory quantifies emissions that result from community activities, regardless of whether those emissions occur within the county boundaries. For example, emissions from building energy include emissions from the combustion of heating fuels (natural gas, wood, fuel oil, and LPG) and emissions associated with the electricity used in the county. Fuel combustion emissions occur within the county, while the emissions associated with generating the electricity used in Thurston County occur outside the county.

2. Obtain activity data for source categories. The US and Global Protocols use information on electricity and natural gas use, vehicle miles traveled and other activity measures to develop GHG emission estimates. TCAT worked with a wide variety of organizations and individuals to obtain the activity data used to prepare emission estimates. In particular, the Thurston Regional Planning Council (TRPC) compiles a wide range of data that they obtain from other organizations that were used to estimate emissions. For example, TRPC obtains annual information on electricity and natural gas consumption in Thurston County from Puget Sound Energy.

3. Identify appropriate emission factors. The US and Global Protocols provide standard emission factors for converting activity data into GHG emission estimates. TCAT supplemented the default emission factors with information from (1) the Puget Sound Energy annual emission inventory reports, (2) the United States GHG inventory reports, (3) waste composition information from Thurston County Solid Waste and (4) energy use and fuel efficiency information compiled by US Energy Information Administration (EIA) and Department of Transportation (USDOT).

4. Calculate GHG emissions. TCAT used the web-based ClearPath Community-Scale Emissions Management Software (ICLEI, 2019) to calculate GHG emissions. Emissions of individual GHGs were converted to metric tons of carbon dioxide equivalents[3] (MTCO2e) using current global warming potential (GWP) values.[4]

How do the methods used to prepare this report differ from those used to prepare the August 2018 report?

While TCAT generally used the same internationally accepted methods to prepare this report and the report completed in August 2018, there are some important differences in individual methods, data sources and assumptions.

1. Clearpath Software: TCAT used the updated version of the web-based ClearPath Community-Scale Emissions Management Software (ICLEI, 2019) to estimate GHG emissions. Most of the calculation methods were not significantly changed in the updated software, but changes to the solid waste module resulted in much higher emission estimates relative to the earlier software. TCAT also used the updated software to recalculate emission estimates for earlier years (2010 – 2017) when preparing this report.

2. Sector Groupings. TCAT revised the general sector groupings in order to integrate new emission sources in a way that is consistent with the general categories specified in the Global Protocol for Community Scale Greenhouse Gas Emission Inventories (WRI et al. 2014). The four source groupings used in this report are:
   - Built Environment[5] includes residential, commercial and industrial buildings and outdoor lighting;
   - Transportation includes on-road vehicles (passenger vehicles, commercial trucks and heavy-duty trucks) and certain off-road vehicles;
   - Waste includes solid waste management, composting, wastewater treatment and on-site septic systems;

[3] In this report, GHG emissions are expressed in terms of metric tons of carbon dioxide equivalent or "MTCO2e". The unit "CO2e" represents an amount of a GHG whose impact has been standardized to that of one unit mass of carbon dioxide (CO2), based on the global warming potential (GWP) of the gas.

[4] The Global Warming Potential (GWP) published by the International Panel on Climate Change (IPCC) in 2013 were used to prepare this report.

[5] The Global Protocol (WRI et al, 2014) and the Clearpath Software (ICLEI, 2019) use the term "Stationary Energy for this category, but ICLEI USA continued to use "Built Environment" in the 2017 King County Emission inventory.

- Agriculture includes agricultural livestock (enteric fermentation and manure management) and agricultural soil management.

3. Emission Sources: TCAT has included several source categories in this report that were not included in previous reports (TCAT, 2014 and 2018). TCAT added these sources in response to review comments and an examination of inventories prepared by other communities. Table 1 below summarizes GHG source categories that were included in the August 2018 report and the sources included in this inventory update. TCAT prepared emission estimates for the additional sources for calendar years 2010 through 2018 using consistent methods and data sources.

Table 1. Comparison of Activities Included in the TCAT 2018 and the 2020 Update Reports.

	2018 Report	2020 Update
Built Environment		
Residential buildings (electricity, natural gas, fuel oil, LPG and wood)	✓	✓
Commercial buildings (electricity and natural gas)	✓	✓
Industrial buildings (electricity and natural gas)	✓	✓
Outdoor lighting (electricity)	✓	✓
Transportation		
On-road vehicles	✓	✓
Miscellaneous off-road vehicles and equipment		✓
Waste		
Methane from landfills	✓	✓
Solid waste processing	✓	✓
Solid waste transport	✓	✓
Composting		✓
LOTT – Digester gas	✓	✓
LOTT – Methanol use	✓	✓
LOTT - Effluent		✓
LOTT - Process		✓
Septic Tanks		✓
Agriculture		
Livestock (enteric fermentation)	✓	✓
Livestock (manure management)		✓
Agricultural soils management		✓

4. Vehicle Miles Traveled: TCAT used annual VMT estimates prepared by the TRPC to prepare emission estimates for on-road vehicles (passenger vehicles, commercial trucks and heavy-duty trucks). The August 2018 report was prepared using VMT estimates that included mileage for vehicles traveling through the county on I-5 or other routes (through-traffic).

When preparing this report, TCAT used adjusted VMT values (TRPC, 2020e) that exclude vehicle miles attributable to through-traffic because local emission reduction strategies are unlikely to have meaningful impact on through-traffic emissions. Table 1 illustrates that excluding through-traffic from the VMT resulted in a 12% reduction in the overall VMT used to estimate GHG emissions with higher percentage reductions for heavy-duty

trucks, light trucks and medium trucks.[6] TCAT also used the adjusted VMT values to recalculate on-road transportation emission estimates for the 2010 – 2017 period.

Table 2: Example of Adjustments to VMT Estimates (2018 Calendar Year)

	Total VMT	Through Traffic	Adjusted VMT	% Difference
Passenger Vehicles	2,321,331,650	223,364,144	2,097,967,506	-10%
Light Trucks	42,030,606	10,683,948	31,346,657	-25%
Medium Trucks	41,946,460	7,788,662	34,157,798	-19%
Heavy Duty Trucks	124,118,143	53,836,718	70,281,426	-43%
All Vehicles	2,529,426,859	295,673,472	2,233,753,387	-12%

Organization of the Report

The remainder of this report is organized into the following sections:

- Overview of the 2018 Thurston County Inventory: This chapter summarizes emission estimates and trends.
- Results of the 2018 Thurston County Inventory: This chapter provides information on the following sectors:
  - Built Environment: This section describes emissions from residential, commercial and industrial buildings and outdoor lighting;
  - Transportation: This section describes emissions from on-road vehicles (passenger vehicles, commercial trucks, and heavy-duty vehicles) and off-road vehicles and equipment;
  - Waste: This section describes emissions from solid waste management, composting, wastewater treatment plants and on-site septic systems; and
  - Agriculture: This section describes emissions from agricultural livestock (enteric fermentation and manure management), and agricultural soil management.
- Other Sources not Included in This Report. This chapter summarizes information on other emission sources and consumption-based emission estimates.
- Conclusion: This chapter summarizes the overall findings and provides a brief discussion on implications for future progress and action planning.
- References: This section provides citations for the documents and information used to prepare this report.

6 Estimated emissions associated with through-traffic in 2018 were about 200,000 MTCO2e.

Overview of the 2018 Thurston County Inventory

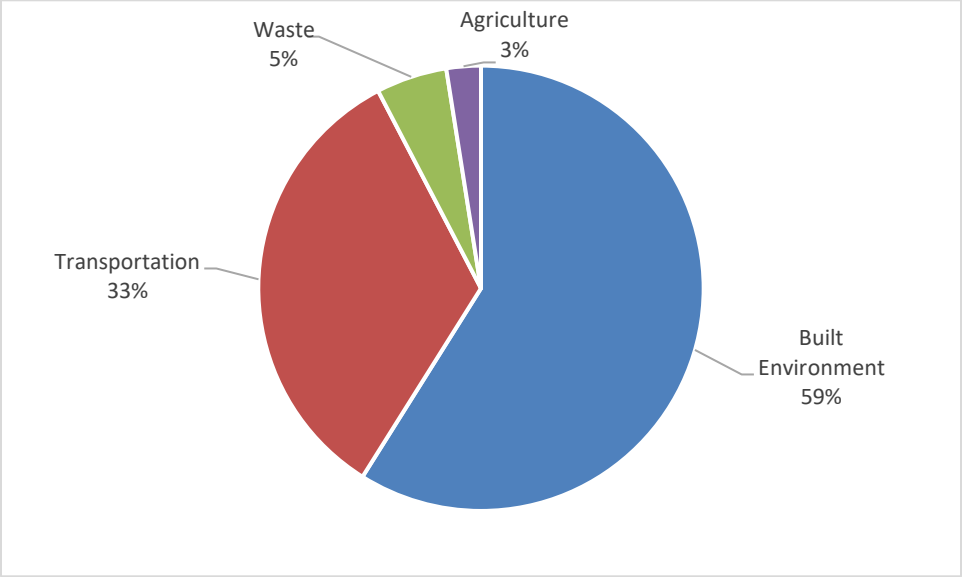
This section summarizes (1) the Thurston County's 2018 GHG emission inventory results, (2) how the County's emissions changed between 2015 and 2018 and (3) how the County's emissions compare with emissions in other areas. More detailed information on emissions from individual sectors is provided in the next chapter.

What was the Thurston region's carbon footprint in 2018?

The Thurston region's 2018 carbon footprint was 3,070,839 metric tons reported as carbon dioxide equivalents (MTCO2e). Per capita emissions in 2018 were 10.9 MTCO2e/person.

The built environment and transportation sectors were the two largest emission sectors and together contributed 92% of the Thurston region's carbon footprint in 2018. (See Figure 1 and Table 2).

Figure 1. Sectors of GHG emissions in the Thurston Region in 2018 (% Contribution).



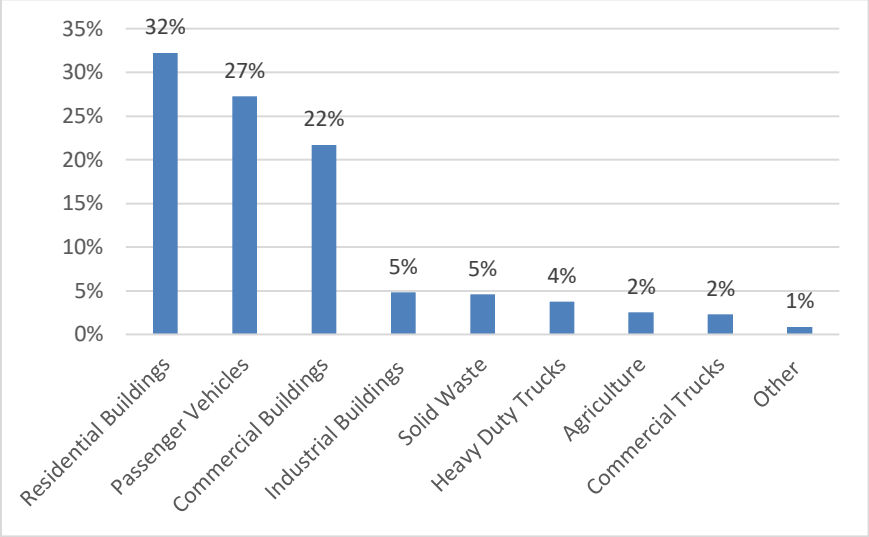
Activities taking place in the region can generate GHG emissions both inside and outside the region's boundaries. The Global Protocol includes three categories or "scopes" for classifying emissions.

- *Scope 1* emissions represented 48% of total emissions in 2018. Scope 1 emissions are GHG emissions from sources located within the county. The US and Global Protocols identify a wide range of Scope 1 emission sources. Many of the Scope 1 emissions in those two documents are included in this report. Scope 1 emissions in this report include: (1) natural gas and other fuels burned in homes and businesses, (2) on-road and off-road vehicles, (3) agricultural livestock, agricultural soil management, and (4) wastewater treatment facilities, septic systems and composting.
- *Scope 2* emissions represented 39% of total emissions in 2018. Scope 2 emissions are GHG emissions from the Thurston region's use of grid-supplied electricity even though the electricity is generated outside the region.
- *Scope 3* emissions represented 13% of total emissions in 2018. Scope 3 emissions include GHG emissions that occur outside the region as a result of activities that occur within the region. The US and Global Protocols identify a wide range of Scope 3 emission sources for cities. Many of the Scope 3 activities identified in those two

documents are included in this report. Scope 3 emissions included in this report are emissions associated with (1) the disposal of solid waste at the Roosevelt Landfill in eastern Washington, (2) electricity transmission and distribution losses and (3) upstream emissions associated with producing natural gas and other home heating fuels and emissions associated with producing the coal and natural gas used to generate electricity. [7]

The three largest emission sources in 2018 were residential buildings (32%), passenger vehicles (27%) and commercial buildings (22%) (See Figure 2 below and Table 4 at the end of this chapter).

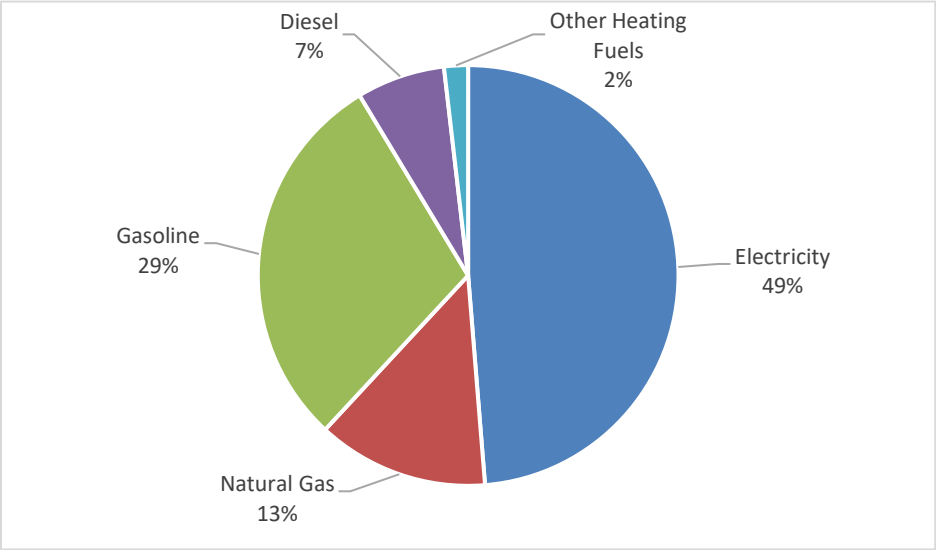
Figure 2. Sources of GHG emissions in the Thurston Region in 2018 **(% Contribution).**



[7] Scope 3 emissions share some characteristics with consumption-based emissions. For example, an estimate of the consumption-based emissions associated with on-road vehicles includes emissions associated with producing, driving and disposing vehicles. The emissions associated with producing and disposing vehicles would generally be considered Scope 3 activities since they occur outside the county. Emissions associated with driving vehicles within Thurston County would be classified as Scope 1 activities. TCAT developed preliminary estimates for Thurston County consumption-based emissions for calendar year 2015. These estimates are presented later in this document for information purposes-only.

Energy-related activities were the primary sources of GHG emissions in Thurston County and accounted for about 92% of the County's GHG emissions in 2018. The generation, distribution and use of electricity was the largest contributor (48%) to energy-related emissions in 2018 (Figure 3).

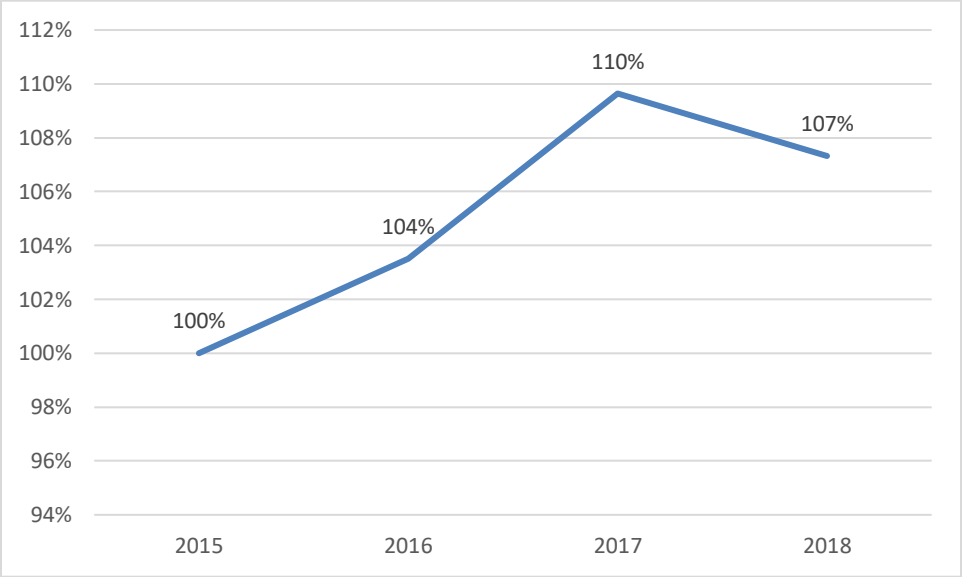
Figure 3: Percentage of Energy-Related Emissions in 2018



How did greenhouse gas emissions change between 2015 and 2018?

Emissions in 2018 were about 7% higher than emissions during the baseline year (2015) being used to evaluate regional climate mitigation efforts (See Figure 4). Several factors contributed to the increase in estimated emissions: (1) increased population; (2) colder winter temperatures; (3) increased solid waste volumes.

Figure 4. Thurston County greenhouse gas emissions (2015 emissions = 100%).



Per capita emissions in 2018 were 10.9 MTCO2e/person. Per capita emissions in 2018 were slightly above (about 2%) the per capita emissions in 2015 (See Figure 5).

Figure 5. Thurston County per capita greenhouse gas emissions (2015 emissions = 100%).

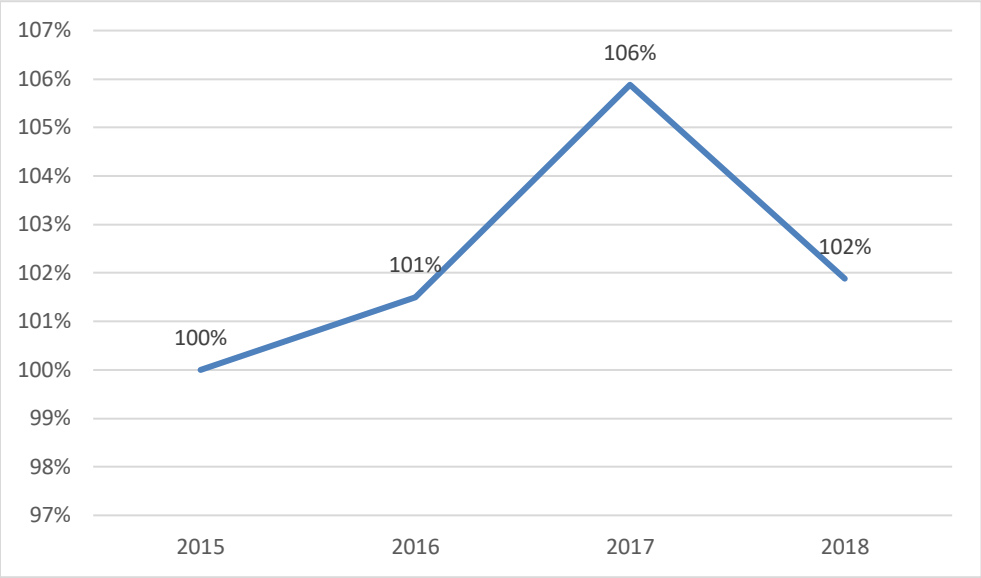


Table 3 summarizes emission changes for various source categories between 2015 and 2018:

- Emissions from most source categories increased between 2015 and 2018. Emission increases range from about 1% to almost 100%.
- The most notable exception was outdoor lighting (included in the "Other" source category in Table 3) where emissions fell by 34% between 2015 and 2018.

Table 3: Change in Emissions Between 2015 and 2018.

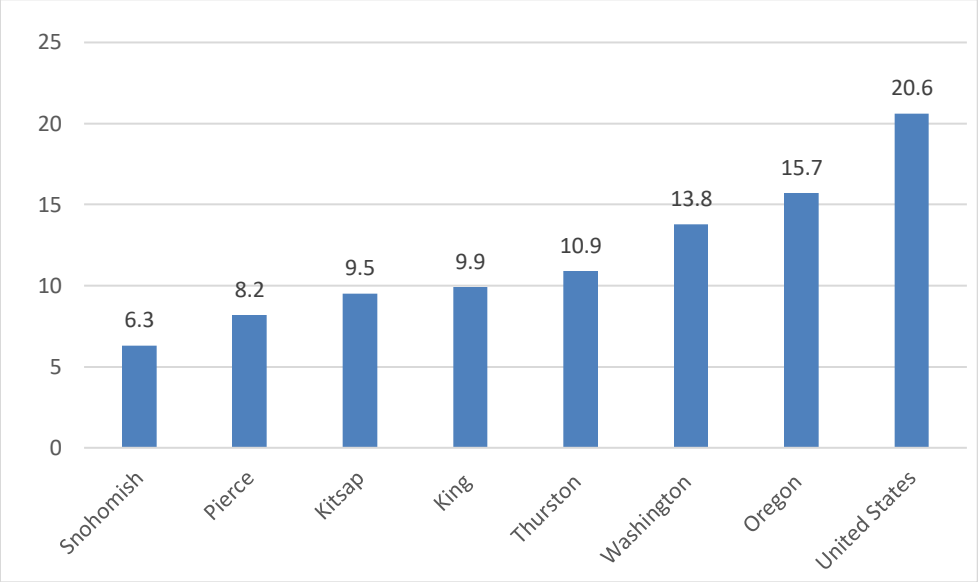
	2015	2018	Change	% Change
Residential Buildings	932,260	990,403	58,143	6.2%
Passenger Vehicles	816,656	835,984	19,328	2.4%
Commercial Buildings	632,719	666,361	33,642	5.3%
Industrial Buildings	74,247	147,582	73,334	98.8%
Solid Waste	120,446	141,160	20,714	17.2%
Heavy Duty Trucks	113,088	115,503	2,415	2.1%
Agriculture	76,904	76,762	-141	-0.2%
Commercial Trucks	69,400	69,967	567	0.8%
Other	29,500	27,117	-2,383	-8.1%
TOTAL	2,865,220	3,070,839	205,619	7.2%

How did GHG Emissions in Thurston County Compare with Emissions in Other Areas in 2015[8]?

The Puget Sound Clean Air Agency (PSCAA) published a GHG inventory for the four counties within their jurisdiction (King, Kitsap, Pierce and Snohomish counties) for calendar year 2015 (PSCAA, 2018). Per capita emissions in Thurston County are generally higher than the per capita emission estimates reported for these four counties (See Figure 5). In general, these counties have higher population densities and more multi-family homes that tend to produce lower per capita building and transportation emissions. These counties also have cleaner sources of electricity (lower emissions of greenhouse gases per kilowatt-hour) where a larger share of electricity is produced from hydropower and wind.

While the 2015 per capita GHG emissions in the County were higher than the four PSCAA counties, the County's per capita emissions were below the 2015 per capita emissions for Washington (Ecology, 2019), Oregon (DEQ, 2019) and the United States (EPA, 2020a) (See Figure 5).[9]

Figure 6: Comparison of 2015 Per Capita Emissions (MTCO2e/resident)

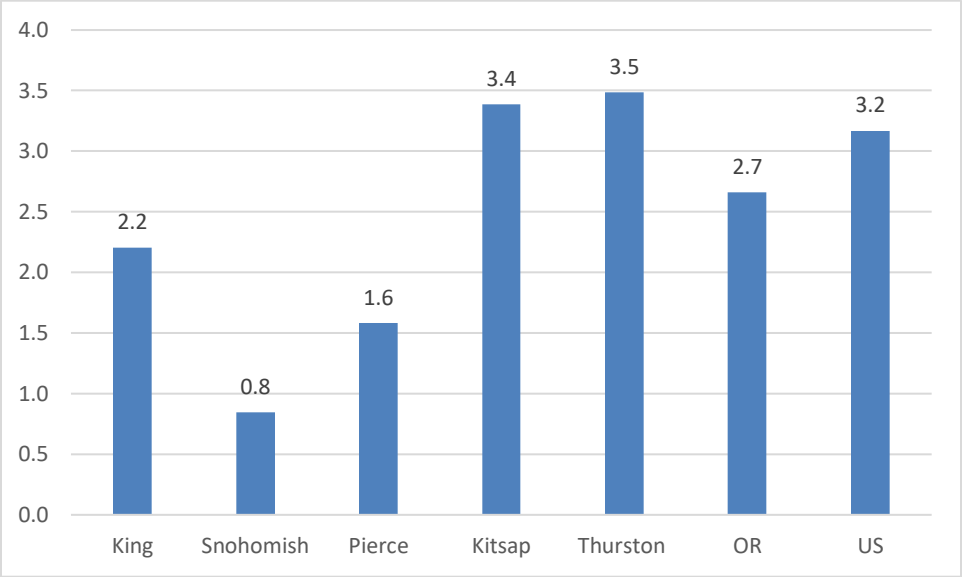


Comparisons based on total emissions can be misleading since there are variations in the range of sources included in different inventories. To address this issue, TCAT compared per capita emissions for individual sectors (Figures 7 and 8). Thurston County residential emissions are higher than other areas which is largely related to the higher carbon intensity associated with the electricity used in the County relative to the electricity in other areas. Puget Sound Energy is continuing efforts to use more renewable energy sources to produce electricity and, over the next decade, this should lower the carbon intensity of electricity used in Thurston County.

[8] The year 2015 was selected because (1) PSCAA published a GHG inventory for the four counties within their jurisdiction for calendar year 2015 and (2) 2015 is the latest year where emission estimates are available for Washington, Oregon and the United States.

[9] The state and federal emission estimates were developed using slightly different methodologies than the methods used to prepare the Thurston region estimates.

Figure 7: Comparison of 2015 Per Capita Residential Building Emissions (MTCO2e/resident)



On-road transportation emissions followed a pattern similar to total emissions. The 2015 on-road per capita GHG emissions in Thurston County were higher than the four PSCAA counties, but lower than the 2015 per capita on-road transportation emissions in Washington, Oregon and the United States.

Figure 8: Comparison of 2015 Per Capita On-Road Vehicle Emissions (MTCO2e/resident)

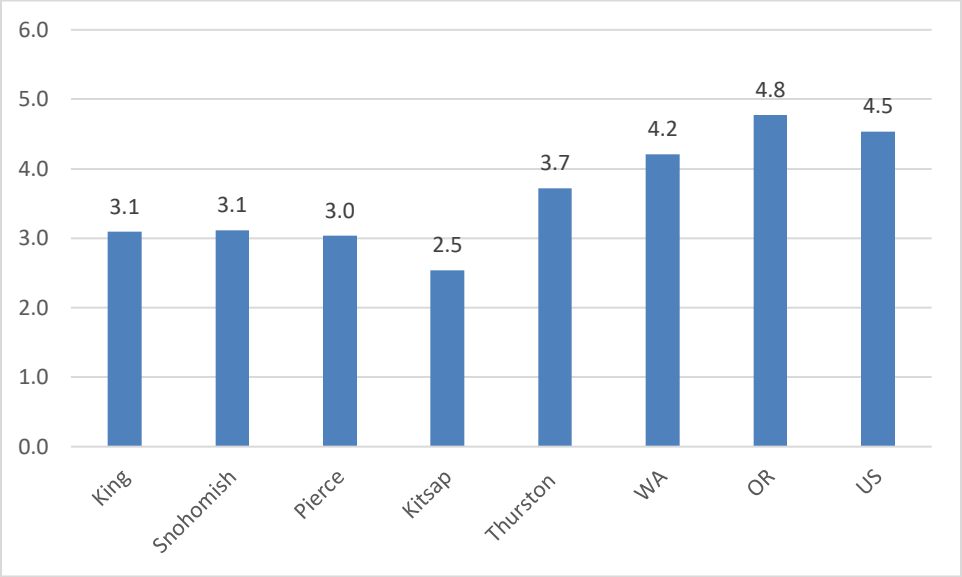


Table 4 presents the information used to prepare the charts and figure presented in this chapter and discussed in greater detail in subsequent chapters on individual emission sectors.

Table 4: GHG Emissions by Sector (MTCO2e)

	2015	2018	% Change
Built Environment	1,647,372	1,809,710	9.9%
Residential	932,260	990,403	6.2%
Electricity	702,178	714,260	1.7%
Natural Gas	187,693	223,877	19.3%
Other Heating Fuels	42,390	52,266	23.3%
Commercial	632,719	666,361	5.3%
Electricity	537,234	549,079	2.2%
Natural Gas	95,485	117,283	22.8%
Industrial	74,247	147,582	98.8%
Electricity	67,627	114,399	69.2%
Natural Gas	6,620	33,182	401.2%
Outdoor Lighting	8,145	5,365	-34.1%
Electricity	8,145	5,365	-34.1%
Transportation	**999,929**	**1,026,303**	**2.2%**
On-road vehicles	**995,144**	**1,021,454**	**2.2%**
Passenger Vehicles	816,656	835,984	2.4%
Commercial Trucks	69,400	69,967	0.8%
Heavy Duty Trucks	113,088	115,503	2.1%
Off-road vehicles	**4,805**	**4,849**	**0.9%**
Waste	**136,996**	**158,063**	**15.4%**
Solid waste	**120,446**	**141,160**	**17.2%**
Wastewater	**16,550**	**16,903**	**2.1%**
Agriculture	**76,904**	**76,762**	**-0.2%**
Enteric Fermentation	**36,879**	**36,480**	**-1.1%**
Manure Management	**38,540**	**38,573**	**0.1%**
Agricultural Soil Management	**1,485**	**1,709**	**15.1%**
TOTAL Emissions	**2,865,220**	**3,070,839**	**7.2%**

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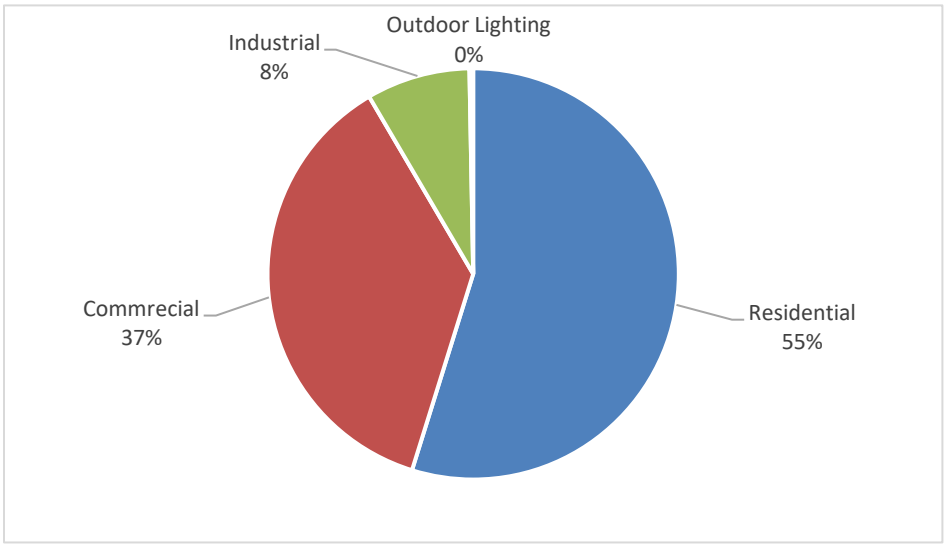
Results of the 2018 Thurston County Inventory

Built Environment

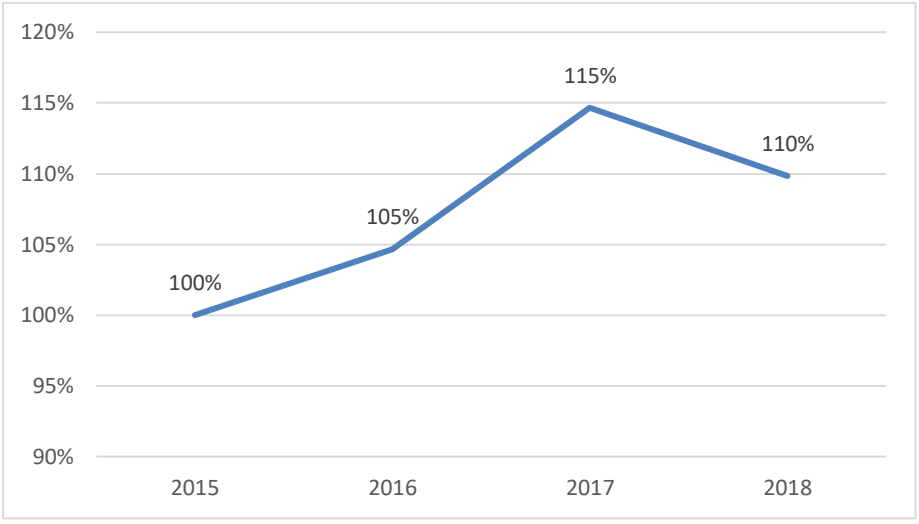
Stationary energy used for residential, commercial and industrial buildings and outdoor lighting accounted for the largest portion of the Thurston region's carbon footprint (59%) with 1,809,710 MTCO2e in 2018. Residential buildings were responsible for 55% of built environment emissions (32% of total emissions).

Figure 9: Distribution of Built Environment emissions in 2018 (% of Built Environment emissions)



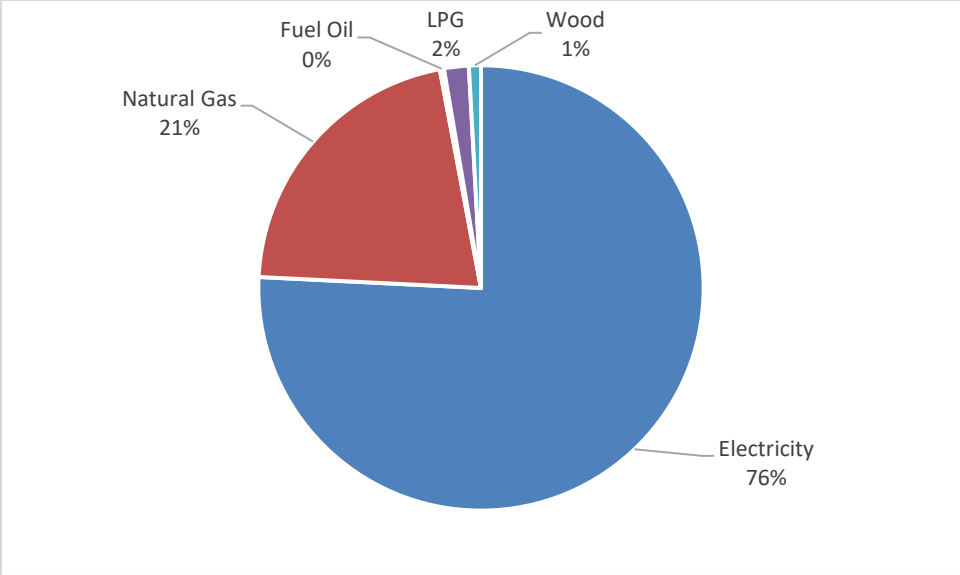
Total built environment emissions in 2018 were 10% higher than emissions in 2015 (See Figure 10). Per-capita built environment emissions were about 4% higher than per-capita emissions in 2015.

Figure 10: Trend in Built Environment Emissions (expressed as % of 2015 emissions)



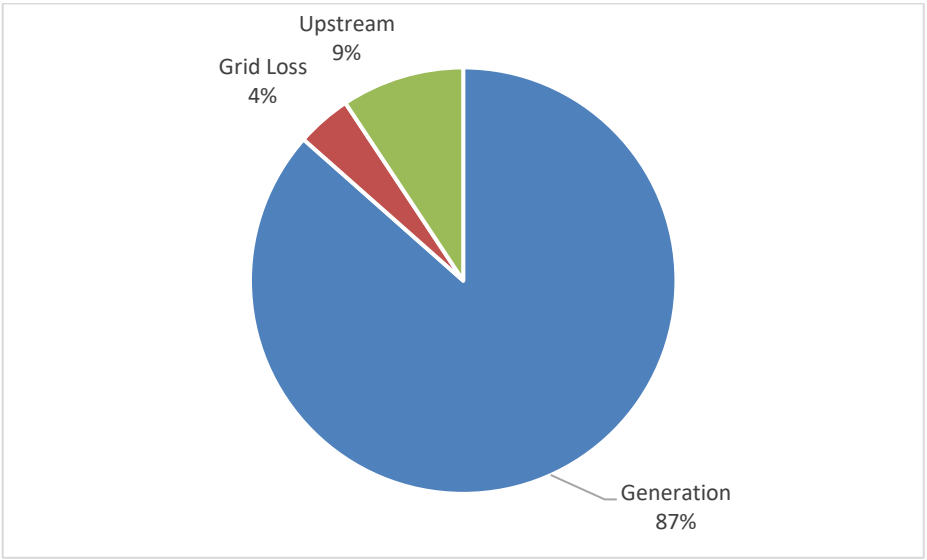
In 2018, the use of electricity accounted for the largest portion of built environment emissions (about 76%), followed by natural gas (about 21%). The use of other residential heating fuels (fuel oil, LPG and wood) represented a small part (almost 3%) of built environment emissions in 2018 (See Figure 11)

Figure 11: Distribution of Energy Sources Associated with Built Environment Emissions



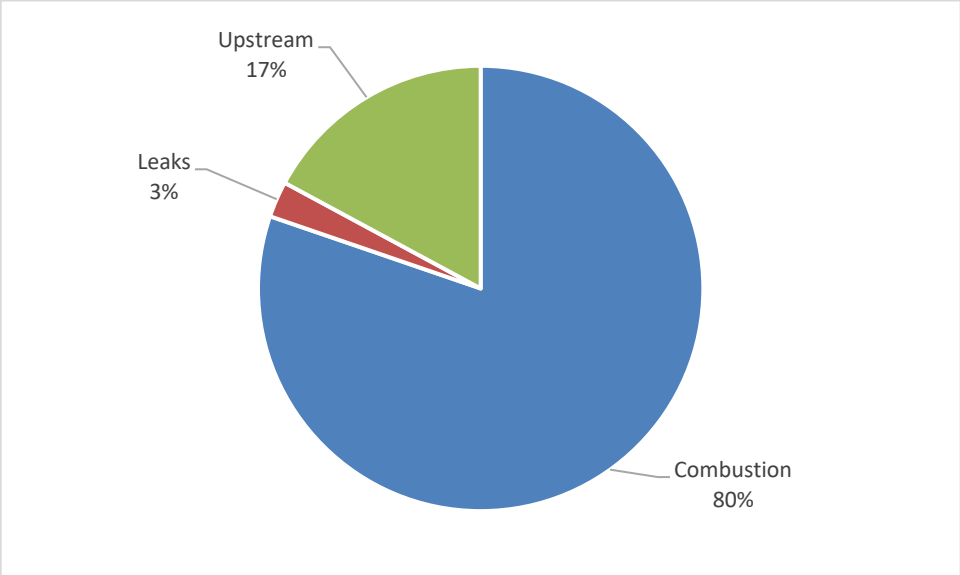
Emissions from electricity include three components: (1) emissions associated with the generation of the electricity used by Thurston residents and businesses, (2) emissions associated with electricity losses during transmission and distribution; and (3) emissions that occur during the production of the fuels used to generate electricity (upstream emissions). As shown in Figure 12, emissions associated with electricity generation are the largest portion of electricity emissions (87%).

Figure 12: Sources of Emissions Associated With Electricity Production, Transmission and Use (2018)



Natural gas emissions also include three components: (1) emissions from direct combustion; (2) emissions due to leaks during the transmission and distribution of natural gas; and (3) upstream emissions that occur during the production of natural gas. As shown in Figure 13, emissions resulting from the direct combustion of natural gas represents 80% of natural gas emissions in 2018.

Figure 13: Sources of Emissions Associated with Natural Gas Combustion, Leaks and Production (2018)



The Thurston region's electricity is also connected to the regional grid. As recommended in the U.S. Community Protocol, TCAT compared the utility-specific emission estimates with the regional grid. In general, the average emission intensity for the Northwest Power Pool (NWPP) regional grid is about 40% lower than the PSE emission intensity. [10] Table 5 illustrates that the emissions associated with the electricity provided by PSE to Thurston County customers is higher (about 500,000 MTCO2e) than the emissions that would occur if PSE's mix of fuel sources matched that of the full NWPP regional grid. In other words, the mix of fuel sources used by PSE to generate electricity contains a higher percentage of coal and natural gas than the average mix of fuel sources used throughout the NWPP region.

Table 5: Comparison of 2018 GHG Emissions From Electricity Generated by Puget Sound Energy and the NWPP Regional Grid (MTCO2e).

	Puget Sound Energy	NWPP Regional Grid
Generation	1,196,752	736,122
Transmission/Distribution Losses	57,444	35,334
Upstream	128,907	101,175
Total Electricity	1,383,102	872,631

[10] in the most recent eGRID publication (EPA, 2020c), the emission intensity for the NWPP regional grid is 643 lbs CO2e/MWh. This is about 40% lower than the PSE emission intensity for electricity provided to PSE customers in 2018 (1030 lbs CO2e/MWh) (PSE, 2019).

Residential Buildings

Residential buildings were the largest source of built environment emissions in 2018 with 990,403 MTCO2e (representing 55% of built environment emissions and 32% of total emissions). Electricity was the largest contributor to residential building emissions (72%) followed by natural gas (23%) and other heating fuels (5%)

Emissions from residential buildings in 2018 were about 6% higher than emissions in 2015. Per-capita emissions were about 1% higher. Factors contributing to the increase in emissions from residential buildings include:

- Growth: The county's population increased from 267,400 to 281,700 people between 2015 and 2018 (5.3% growth). Energy consumption for electricity (Kwh/customer) remained essentially unchanged. Energy consumption for natural gas (therms/customer) increased by 13%.
- Weather-Related Demand. 2018 was generally colder than 2015 with about 11% more Heating Degree Days.[11]

Table 6: Emissions from Residential Buildings (MTCO2e).

	2015	2018	% Change
Electricity	702,178	714,260	1.7%
Natural Gas	187,693	223,877	19.3%
Other Heating Fuels	42,390	52,266	23.3%
Residential	932,260	990,403	6.2%

Commercial Buildings

Commercial buildings were the second largest source of built environment emissions in 2018 with 666,361 MTCO2e (representing 37% of built environment emissions and 22% of total emissions). Emissions associated with the use of electricity represented about 82% of emissions from commercial buildings.

Emissions from commercial buildings in 2018 were about 5% higher than emissions in 2015. The factors contributing to the increase in emissions from commercial buildings are likely similar to those for residential buildings, but are probably more variable given the variability in the numbers, types and sizes of commercial buildings.[12]

[11] Heating degree day (HDD) is a measurement designed to quantify the demand for energy to heat a building. This measure reflects the assumption that when the outside temperature is 65°F, people don't need to heat their homes in order to be comfortable. For example, a temperature of 60 degrees would represent 5 HDDs. Building heating energy demands are considered to be proportional to heating degree days. Conversely, building cooling needs (fans, air conditioning and dehumidifiers) are considered to be proportional to cooling degree days (CDD). Building cooling needs are expected to increase as average temperatures increase and a higher % of homes are built with air conditioning.

[12] While the number of commercial customers increased for both electricity (4.5%) and natural gas (4.1%) between 2015 and 2018, energy consumption per customer also increased for both energy sources (electricity (1%) and natural gas (18%)).

Table 7: Emissions from Commercial Buildings (MTCO2e).

	2015	2018	% Change
Electricity	537,234	549,079	2.2%
Natural Gas	95,485	117,283	22.8%
Commercial	632,719	666,361	5.3%

Industrial Buildings

Industrial buildings were the third largest source of built environment emissions in 2018 with 147,582 MTCO2e (representing 8% of built environment emissions and about 5% of total emissions). Emissions associated with the use of electricity represented about 77% of emissions from commercial buildings.

Emissions from industrial buildings in 2018 were almost 100% higher than 2015 emissions. Emissions associated with electricity and natural gas increased by about 70% and 400%, respectively.

Table 8: Emissions from Industrial Buildings (MTCO2e).

	2015	2018	% Change
Total Electricity	67,627	114,399	69.2%
Total Natural Gas	6,620	33,182	401.2%
Industrial	74,247	147,582	98.8%

Industrial emission estimates are limited to emissions associated with the use of electricity and natural gas at industrial buildings in Thurston County (as reported by Puget Sound Energy). These estimates do not include any process emissions released by local industrial facilities. Thurston County has no industrial process facilities that are large enough to be subject to greenhouse gas reporting requirements under state and federal GHG reporting rules.

Outdoor Lighting

Outdoor lighting accounted for a very small portion (0.4%) of stationary energy emissions in 2018 (5,365 MTCO2e), but represents one of the bright spots in emission reduction efforts.

Emissions from outdoor lighting in 2018 were 34% lower than emissions in 2015. Most of the observed decline can be explained by greater use of LED bulbs for outdoor lighting.

The decline in emissions occurred despite a 7% increase in the number of outdoor lighting customers between 2015 (612 customers) and 2018 (657 customers).

Until 2015, the increase in the number of outdoor lighting customers masked steady improvements in lighting efficiency. The energy efficiency impacts of using LED lighting for streetlights can be seen by tracking energy use for the universe of lights existing at the beginning of 2015. A recent review of electricity bills indicates that the electricity needed for the Tumwater streetlights in place at the beginning of 2015 fell by 45% between 2015 and 2019 as a result of the City's energy conservation measures.

Information Used to Estimate Built Environment Greenhouse Gas Emissions

TCAT estimated the emissions associated with the use of electricity by using information provided by Puget Sound Energy on the number of customers and annual amounts of electricity used for residential, commercial and industrial buildings and outdoor lighting (TRPC, 2020d) and the carbon intensity values published in the annual emission reports prepared by Puget Sound Energy (PSE, 2011 – 2019). Emissions associated with grid loss were estimated using information on the annual amounts of electricity used in the Thurston region and electricity transmission and distribution loss published by EPA (EPA, 2020b). Upstream emissions associated with electricity use were estimated using information on the annual amounts of electricity used in the Thurston region, fuel mix information compiled by the Washington Department of Commerce (WDOC, 2019) and the default emission factors for coal and natural gas production included in the Clearpath guidance for the built environment (ICLEI, 2013b).

TCAT estimated the emissions associated with the use of natural gas by using information provided by Puget Sound Energy on the number of customers and annual amounts of natural gas used for residential, commercial and industrial buildings (TRPC, 2020d). Emissions associated with leaks during natural gas distribution and upstream emissions were estimated using information on the annual amounts of natural gas and the default emission factors included in the Clearpath software model.

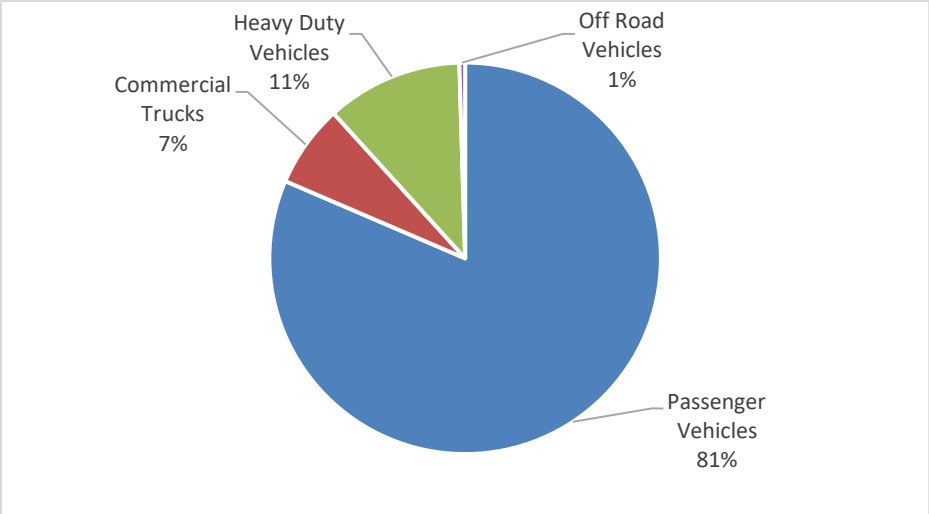
TCAT estimated the emissions associated with the use of other residential heating fuels (fuel oil, LPG and wood) by using residential energy consumption estimates for Washington State published by the United States Energy Information Administration (EIA, 2020) for years 2010 through 2017. Estimates for statewide energy consumption in 2018 for various fuel types were estimated using the data for the 2010 – 2017 time period and the EXCEL forecasting tools (ETS.Linear). Statewide energy consumption was used to estimate energy consumption for Thurston County by using information from the US Census Bureau on the number of households in Thurston County and Washington State using different types of heating fuels during the 2010 – 2018 time period (Census Bureau, 2020a). Upstream emissions were estimated using the default emission factors included in the Clearpath software model.

There are varying degrees of uncertainty associated with the methods, data and assumptions used to prepare GHG emission estimates for the built environment. In general, there is a low amount of uncertainty surrounding the estimates for natural gas and electricity use because of the high confidence in the information about electricity use, natural gas use and emission factors reported by Puget Sound Energy. This contrasts with the emission estimates for other residential heating fuels (i.e., fuel oil, LPG and wood) where there is a large amount of uncertainty because those estimates required numerous assumptions and extrapolations from statewide and national data.

Transportation

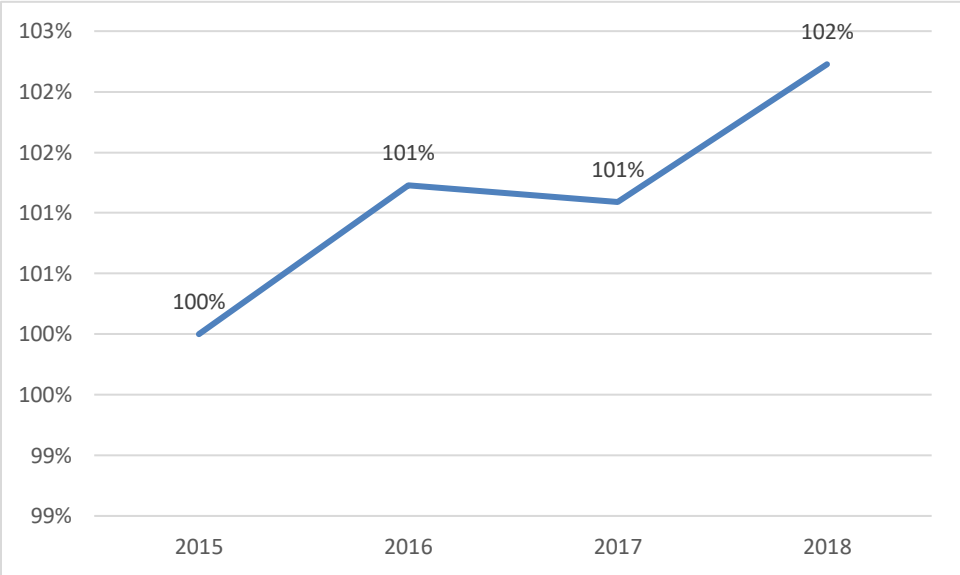
Transportation (passenger vehicles, commercial trucks, heavy duty-trucks and certain off-road vehicles) accounted for the second largest portion of Thurston County's carbon footprint (33%) with an estimated 1,026,303 MTCO2e in 2018. Passenger vehicles were the largest source of transportation emissions (81%).

Figure 14: Distribution of Transportation Emissions in 2018 (expressed as a percentage of total transportation emissions)



Transportation emissions in 2018 were about 3% higher than transportation emissions in 2015. Per-capita emissions were about 3% lower than per-capita emissions in 2015.

Figure 15: Trend in Transportation Emissions (expressed as % of 2015 emissions)



Passenger Vehicles

Passenger vehicles were the largest contributor to transportation emissions (81%) in 2018. About 98% of passenger vehicle emissions are associated with gasoline-powered vehicles. Emissions from passenger vehicles in 2018 were about 2% higher than emissions in 2015. Per-capita emissions were about 3% lower than per-capita emissions in 2015.

Table 9: Emissions from Passenger Vehicles (MTCO2e)

	2015	2018	% Change
PV - Gasoline	803,107	822,022	2.4%
PV - Diesel	13,549	13,962	3.0%
Passenger Vehicles	816,656	835,984	2.4%

Heavy Duty Vehicles

Heavy duty vehicles were the second largest contributor to transportation emissions (11%) in 2018. Almost 90% of heavy-duty vehicle emissions are associated with diesel-powered vehicles. Emissions from heavy duty vehicles in 2018 were about 6% higher than emissions in 2015. Per-capita emissions in 2018 were slightly higher (0.5%) than per-capita emissions in 2015.

Table 10: Emissions from Heavy Duty Vehicles (MTCO2e and MTCO2e/resident)

	2015	2018	% Change
HDT Vehicles - Gasoline	12,469	13,007	4.3%
HDT Vehicles – Diesel	100,619	102,496	1.9%
Heavy Duty Vehicles	113,088	115,503	2.1%

Commercial Trucks

Commercial trucks were the third largest contributor to transportation emissions (7%) in 2018. Emissions from commercial trucks in 2018 were about 1% higher than emissions in 2015. Per-capita emissions were about 4% lower than per-capita emissions in 2015.

Table 11: Emissions from Commercial Trucks (MTCO2e)

	2015	2018	% Change
Commercial Trucks	**69,400**	**69,967**	**0.8%**

Off-Road Vehicles and Equipment

Off-road vehicles and equipment were the smallest contributor to transportation emissions with 4,839 MTCO2e in 2018 (representing about 1% of transportation emissions and 0.3% of total emissions). Emissions from off-road vehicles in 2018 were about 1% higher than emissions in 2015. Per-capita emissions were about 4% lower than per-capita emissions in 2015.

Table 12: Emissions from Off-Road Vehicles (MTCO2e)

	2015	2018	% Change
Agriculture	214	205	-4%
Commercial	379	420	11%
Construction	2,605	2,511	-4%
Industrial	354	412	16%
Lawn/Garden	1,110	1,153	4%
Recreational	143	149	5%
Off Road TOTAL	4,805	4,849	1%

Information Used to Estimate Transportation Greenhouse Gas Emissions

TCAT estimated on-road transportation emissions by using the vehicle miles traveled (VMT) and vehicle fleet mix values (adjusted to exclude through-traffic) that were provided by the Thurston Regional Planning Council (TRPC, 2020e) and updated default emission factors published in the Clearpath model. The percentages of VMT for passenger vehicles, light-duty trucks and heavy-duty vehicles associated with gasoline and diesel-powered vehicles were estimated using national VMT distributions published by EPA (2020b).

Emissions from off-road vehicles and equipment for the 2015 – 2018 time period were developed using the EPA MOVEs software (EPA, 2018c). Estimates for the 2010 – 2014 time period were estimated using the 2015 – 2018 MOVES estimates and EPA estimates on Washington off-road emissions for the 2010 – 2017 time period (EPA, 2019b).

In general, there is a moderate amount of uncertainty surrounding on-road transportation emissions. EPA calculated a 95 percent confidence interval for on-road transportation emissions of -7% (lower bound) to +7% (upper bound). In other words, EPA calculated that there is a 2.5% chance that actual on-road transportation emissions are more than 7% lower than EPA's estimates and that there is a 2.5% chance that actual emissions are more than 7% higher than EPA's estimates. There are additional uncertainties associated with extrapolating the national data (such as fuel efficiency) to the Thurston region. It is unclear whether use of national data will over- or under-estimate the Thurston region's emissions.

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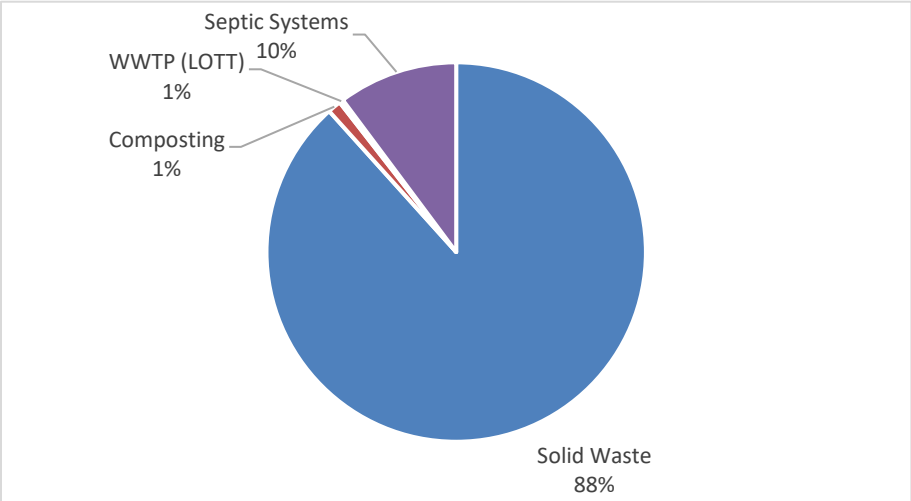
Waste

Emissions from solid waste, composting, wastewater treatment and septic tanks represented about 5% of the Thurston region's carbon footprint with an estimated 158,063 MTCO2e in 2018 (0.57 MTCO2e/resident). About 88% of waste-related emissions in 2018 were associated with managing the solid waste generated by Thurston County residents, businesses and governments.

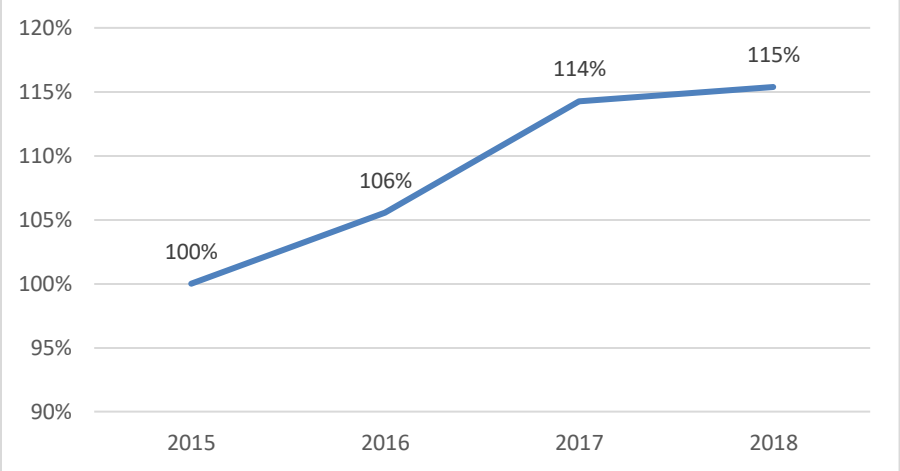
Estimated emissions associated with solid waste and wastewater management do not include emissions associated with the electricity and natural gas used in those operations. The electricity and natural gas for these operations are included in the overall community electricity and natural gas emission estimates for the Thurston region.

Figure 16: Distribution of waste and wastewater emissions in 2018 (%).



Waste-related emissions in 2018 were about 15% higher than waste-related emissions in 2015. Per-capita emissions were about 11% higher than per-capita emissions in 2015.

Figure 17: Waste Emissions (as percentage of 2015 emissions)



Solid Waste

Solid waste generated by Thurston County residents and businesses is collected and transported to the Roosevelt Regional Landfill in Oregon. Methane released during waste decomposition represented about 96% of solid waste emissions in 2018.

Table 13. Solid waste emissions (MTCO2e).

Solid Waste Management	2015	2018	% Change
Landfill emissions	113,402	132,988	17%
Process emissions	2,770	3,249	17%
Transportation Emissions	2,607	3,085	18%
Total	**118,779**	**139,322**	**17%**

Solid waste-related emissions increased by 17% between 2015 and 2018, while per capita emissions increased by 13% during the four-year period. This is largely due to the substantial increase in solid waste volumes. Factors contributing to the increased waste volumes include:

- Population: Thurston County's population increased by about 5% between 2015 and 2018.
- Reduced recycling opportunities: Recycled waste volumes have declined recently as the market for recycled materials has grown smaller.
- Economic conditions: Combined landfill and recycled waste volumes have increased during the 2015 – 2018 period along with the strong economic growth in Washington and the Thurston region.

Composting

Composting accounted for a very small portion (about 1%) of waste emissions in 2018 (1,838 MTCO2e). Emissions from composting activities in 2018 were about 10% higher than emissions in 2015.

Budd Inlet Treatment Facility

TCAT estimated that wastewater treatment operations at the Budd Inlet facility[13] emitted 538 MTCO2e in 2018. Emissions from the operation of the main wastewater treatment facility within the represented less than 1% of waste related emissions in 2018. Emissions from treatment operations include: (1) process emissions; (2) emissions from effluent discharges; (3) onsite gas digesters; and (4) the use of methanol to biologically treat waste.

Estimated treatment emissions do not include emissions associated with the electricity and natural gas used at wastewater treatment and conveyance operations. The emissions associated with the electricity and natural gas used for wastewater treatment operations are included in the overall community electricity and natural gas emission estimates for the Thurston region

Estimated GHG emissions increased by 19% between 2015 and 2018 while per capitate emissions increased by 15%. Most of the difference can be attributed to an increased customer base and higher nitrogen loading, although the latter falls well within the range of nitrogen loadings during the 2010 – 2017 time period.

[13] The Lacey Olympia Tumwater Thurston (LOTT) Clean Water Alliance Budd Inlet Treatment Plant.

Table 14: Emissions from Budd Inlet Wastewater Treatment Plant (MTCO2e)

LOTT - Budd Inlet	2015	2018	% Change
Process	162	216	33%
Digester	11	11	0%
Methanol	117	95	-19%
Effluent	162	216	33%
Total	452	538	19%

On-Site Septic Systems

Septic tanks collect wastewater on site and process it in underground tanks. Conditions in the tank are anaerobic where microorganisms produce methane gas as they biodegrade the soluble organic waste. Some of the methane produced during this degradation escapes from the septic systems into the atmosphere.

The Thurston County Health Department estimated that there were 54,172 and 53,000 on-site septic systems in Thurston County in 2015 and 2019, respectively. TCAT estimated the numbers of septic systems in 2016 and 2018 by linearly extrapolating between 2015 and 2109.

TCAT estimated that 16,635 MTCO2e were released from on-site septic tanks in 2018. This represents a small (about 2%) increase over emissions in 2015. This increase is virtually identical to the population growth in unincorporated Thurston County (2.1%) between 2015 and 2018.

Information Used to Estimate Waste Greenhouse Gas Emissions

TCAT estimated solid waste emissions by using the information on annual solid waste volumes provided by Thurston County Solid Waste (Romero, 2019 and 2020), information on solid waste characteristics published by Green Solutions, LLC, (2014), and default emission factors included in the updated Clearpath software model (ICLEI, 2019). When using the Clearpath software to estimate methane emissions from solid waste disposed at the Roosevelt Regional Landfill, TCAT assumed a "Typical" landfill gas collection scenario for 2010 and 2011 and an "Aggressive" landfill gas collection scenario for the 2012-2018 time period.

TCAT estimated composting emissions by using the information on annual organic waste collected provided by Thurston County Solid Waste (Romero, 2019 and 2020) and default emission factors included in the updated Clearpath software model.

There is a moderate amount of uncertainty surrounding solid waste management emission estimates. EPA calculated a 95 percent confidence interval for methane emissions from landfills of -9% to +9%. In other words, EPA calculated that there was a 2.5% chance that actual methane emissions are more than 9% lower than EPA's estimates and that there is a 2.5% chance that actual methane emissions are more than 9% higher than EPA's estimates.

TCAT estimated treatment-related emissions from the Budd Inlet Treatment Facility using information on the average daily digester gas production and fraction of methane in the digester gas provided by LOTT (Steffenson, 2019b), information on annual methanol use provided by LOTT (Steffenson 2019b), number of people served by LOTT (Steffensen 2019a), nitrogen loadings to Budd Inlet (Steffensen 2019c) and default emission factors included in the Clearpath software model.

There is a moderate amount of uncertainty surrounding wastewater emission estimates for the Budd Inlet Treatment Facility. EPA calculated a 95 percent confidence interval for methane emissions from landfills of -9% to +9%. In other words, EPA calculated that there was a 2.5% chance that actual methane emissions are more than 9% lower than EPA's estimates and that there is a 2.5% chance that actual methane emissions are more than 9% higher than EPA's estimates.

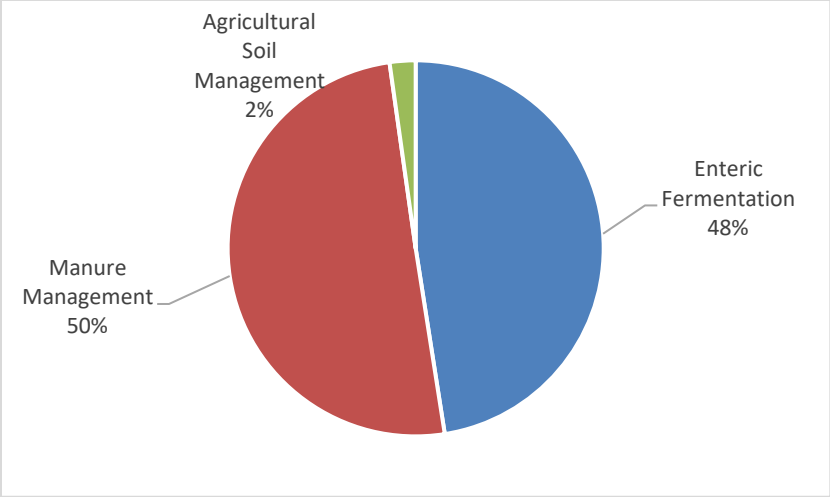
TCAT estimated emissions from on-site septic systems using information on the number of on-site systems provided by the Thurston County Health Department (PHSSD/EHD 2016) and standard emission factors contained in the Clearpath software model. There is a moderate to high amount of uncertainty associated with these estimates due to questions on the applicability of default emission factors.

Agriculture

Agricultural activities resulted in the release of an estimated 76,762 MTCO2e in 2018 which represented about 3% of Thurston County's carbon footprint. Emissions from enteric fermentation and manure management represented 48% and 50%, respectively, of estimated agriculture emissions in 2018.

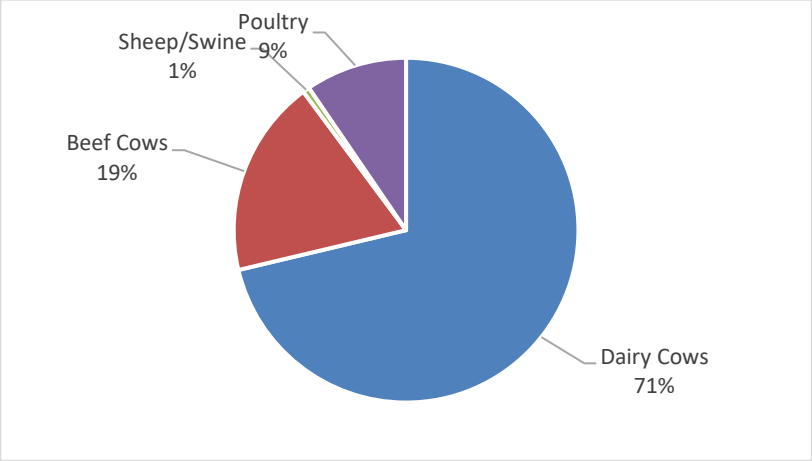
Estimated agriculture emission estimates do not include emissions associated with the electricity and natural gas used at agricultural facilities. These emissions associated with the electricity and natural gas used during agricultural operations are included in the overall community electricity and natural gas emission estimates.

Figure 18: Distribution of Emissions by Activity in 2018 (expressed as a % of Agriculture emissions).



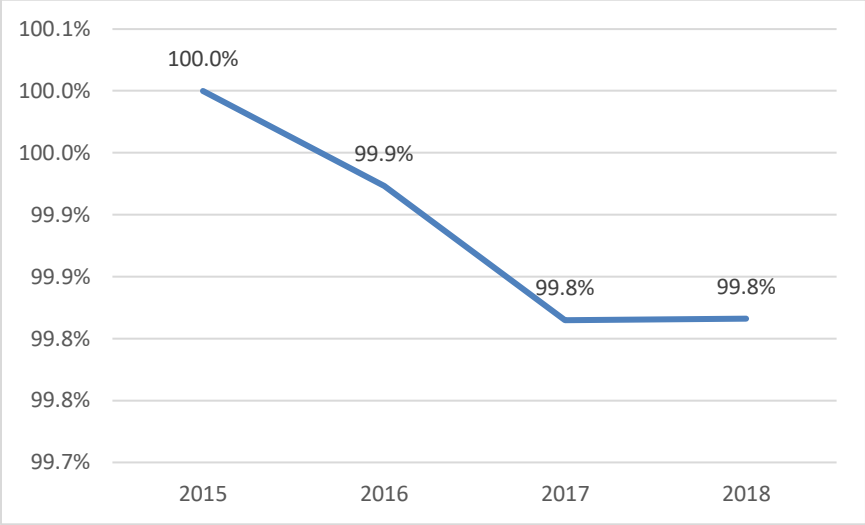
Activities associated with dairy farming contributed almost 66% of the emissions associated with agriculture.

Figure 19: Distribution of Emissions by Livestock in 2018 (expressed as a % of Agriculture emissions).



Emissions associated with agricultural activities remained largely unchanged between 2012 and 2017 when the two most recent agricultural census reports were published by the US Department of Agriculture. Per capita emissions in 2017 were about 5% lower than per capita emissions in 2015.

Figure 20: Trend in Agriculture Emissions in 2018 (expressed as a % of 2015 Agriculture Emissions).



Enteric Fermentation

Raising livestock can result in a large amount of greenhouse gas emissions since ruminants such as cows generate large amounts of methane as they digest their food. Enteric fermentation was the second largest contributor to AFOLU emissions (48%) in 2018. Emissions from dairy cows and beef cows represented about 61% and 37%, respectively, of enteric fermentation emissions in 2018. Emissions in 2018 were essentially the same as emissions in 2015.

Table 15: Enteric Fermentation Emissions ($MTCO_2e$).

Enteric Fermentation	2015	2018	% 2018 Emissions	% Change
Dairy Cows	22,375	22,425	61%	0.2%
Beef Cows	14,084	13,642	37%	-3.1%
Swine	27	27	0%	0.0%
Sheep	393	386	1%	-1.7%
Total	36,879	36,480	100%	-1.1%

Manure Management

Manure management was the largest contributor to agricultural emissions (50%) in 2018. Emissions from manure management operations for dairy cows and poultry represented about 81% and 19%, respectively, of emissions from manure management in 2018. Emissions in 2018 were essentially the same as emissions in 2015.

Table 16: Manure Management Emissions (MTCO2e).

Manure Management	2015	2018	% 2018 Emissions	% Change
Dairy Cows	31,019	31,079	81%	0.2%
Beef Cows	308	280	1%	-9.1%
Swine	61	61	<1%	0.0%
Poultry	7,152	7,153	19%	0.0%
Total	38,540	38,573	100%	0.1%

Agricultural Soil Management

GHG emissions occur during nitrous oxide runoff and volatilization in row-crop systems. Agricultural soil management represented about 2% of agriculture emissions with 1,709 MTCO2e in 2018. Emissions from agricultural soils increased by about 15% between 2015 and 2018.

Table 17: Change in Agricultural Soil Management

	2015	2018	% Change
Soil management	1,485	1,709	15.1%

Information Used to Estimate Agriculture Greenhouse Gas Emissions

TCAT estimated agricultural livestock emissions by using information on the number of livestock and amount of agricultural lands (acres) in Thurston County published by the US Department of Agriculture (USDA, 2014 and 2019), Washington-specific emission factors published by the Environmental Protection Agency (EPA, 2019a), statewide manure management practices published by EPA (2019a) and default emission factors in the Clearpath software model.

There is a moderate–to-large amount of uncertainty surrounding agricultural livestock emissions. EPA (2017a) calculated a 95 percent confidence interval for methane emissions from enteric fermentation of -11% and 18%, respectively. In other words, EPA calculated that there was a 2.5% chance that actual methane emissions are more than 11% lower than EPA's estimates and that there is a 2.5% chance that actual methane emissions are more than 18% higher than EPA's estimates.

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Emission Sources Not Included in the Inventory

When preparing the August 2018 inventory report (TCAT, 2018), TCAT developed preliminary GHG emission estimates for several additional sources and/or categories that were ultimately not included in Thurston County Inventory. Some of these estimates were updated for 2017. In the earlier report, TCAT also developed preliminary estimates for a consumption-based emission inventory that provides an alternative approach for characterizing the County's carbon footprint. Information on other emission sources and consumption-based emission estimates are presented below.

Other Emission Sources

TCAT included preliminary GHG emission estimates for several additional sources and/or categories in the August 2018 report that were ultimately not included in the Thurston County Inventory. Local agencies may want to consider including some of these categories in future inventory efforts if they determine that tracking progress for additional sources would support community emission reduction strategies. These additional sources and categories are summarized in Table 18 and briefly discussed in the paragraphs below.

The following paragraphs provide additional background information on these source categories:

- Refrigerants and Fire Suppressants. Refrigerators and fire suppression equipment are important sources of hydrofluorocarbons (HFCs). HFCs are thousands of times more potent than carbon dioxide and are now subject to international requirements.[14] TCAT estimated the amount of HFCs released in Thurston County during the 2010 – 2018 time period by scaling the national emission estimates to Thurston County based on relative population sizes. Annual GHG emissions (MTCO2e) were estimated using the most current Global Warming Potential (GWP) values included in the Clearpath software model. TCAT decided not to include these estimates in the Thurston County inventory because local data on refrigerant and fire suppressant use are not readily available and there are limited opportunities for local government intervention to reduce these emissions.
- Residential and Business Air Travel. TCAT estimated that air travel by Thurston County residents was associated with 137,423 MTCO2e in 2017. These estimates were developed using fuel consumption data and passenger surveys for Sea Tac International Airport (Meyn, 2019). TCAT decided not to include air travel emissions because they are largely unaffected by local government actions.
- Other Transportation Sources. TCAT developed preliminary estimates for several other transportation sources: (1) Olympia Airport; (2) ships and boats; and (3) railroads. TCAT decided not to include these estimates because of data and method uncertainties, relatively small contributions to overall county GHG emission estimates and limited opportunities for local government actions (rail transportation).
    - Olympia Airport. TCAT prepared preliminary emissions estimates using information on jet fuel and aviation gas deliveries provided by the Port of Olympia (Liebel, 2017). In 2016, estimated airport emissions were 2,750 MTCO2e.
    - Recreational and Harbor Vessels. TCAT prepared preliminary emissions estimates using information from

[14] In October 2016, negotiators from 197 nations signed an agreement to amend the Montreal Protocol in Kigali, Rwanda. Under the Kigali agreement, these countries are expected to reduce the manufacture and use of hydrofluorocarbons (HFCs) by roughly 80-85% from their respective baselines, before 2045. This phase down is expected to slow the global average temperature rise by up to 0.5° C by 2100.

the Puget Sound Maritime Air Forum Air Emissions inventory (PSMAF, 2012 and 2017).[15]

- Rail Transportation. TCAT prepared preliminary emissions estimates using information from the Washington Department of Ecology (Ecology, 2018) and the US EPA (2019). In 2017, estimated railroad emissions were 28,730 MTCO2e. Freight rail was the largest contributor to railroad emissions in Thurston County (90%).

- Emissions Associated with Producing Transportation Fuels. TCAT developed preliminary estimates on the amount of GHGs emitted during the production of the gasoline and diesel fuel used in Thurston County's cars and trucks. The ICLEI (2013a) guidance estimates that fuel production emissions are equivalent to about 25% of the GHG emissions associated with the combustion of gasoline and diesel fuel.[16] These types of emissions are typically included in consumption-based emission inventories (see below). TCAT elected not to include these emissions in the Thurston County inventory in order to maintain consistency and comparability with the initial TCAT inventory and geographic-plus inventories prepared by other jurisdictions. (e.g., Seattle, Tacoma, Bellingham).

- Land Clearing: TCAT develop preliminary estimates on the emissions associated with clearing land for residential property development. Estimated annual emissions ranged from about 9,000 to 20,000 MTCO2e during the 2010 – 2018 time period. TCAT elected not to include these emissions in the Thurston County inventory because of uncertainties with (1) using national information on average lot sizes to characterize lot sizes in Thurston County; (2) uncertainties on using information from King County on forest canopy to Thurston County where there is a higher percentage of prairie lands.

- Other Wastewater Treatment Plants: There are several small wastewater treatment plants in Thurston County. TCAT reviewed the Department of Ecology's permit database to identify permitted facilities and developed a preliminary emission estimate for these facilities (77 MTCO2e) using available information on the total population served by these small plants. TCAT elected not to include these emissions in the Thurston County inventory because of (1) limited information on treatment processes; (2) uncertainties on the current populations served by these facilities; and (3) the estimated emissions represent an extremely small percentage of overall County emissions.

[15] The PSMAF inventory provides emission estimates for recreational vessels and harbor vessels. TCAT extrapolated the 2011 PSMAF estimates to other years using information on United States recreational vessel GHG emissions (EPA, 2017, Table A-118) and United States ships and non-recreational boats GHG emissions (EPA, 2017, Table -119).

[16] This approach is consistent with the methods used to estimate the overall emissions associated with electricity consumption. These methods include emissions associated with producing the fuels (e.g., coal and natural gas) that are used to produce the electricity used in Thurston County.

Table 18: Summary of Preliminary Emission Estimates for Source Categories Not Included in the Thurston County Geographic Plus Inventory

Category	MTCO2e[17]	Basis for Preliminary Estimate	Reasons for Not Including
Refrigerants and Fire Suppressants	100,000 -110,000	Used information on US emissions from the 2018 US GHG Inventory adjusted for population size.	Lack of local data and limited role for local government intervention.
Residential and Business Air Travel	96,000 – 140,000	ICLEI Equations TR.6.B.1 and TR.6.D.1 using fuel consumption data and passenger surveys provided by the Port of Seattle.	Limited role for local government intervention.
Olympia Airport	2,400 – 3,000	ICLEI Equation TR.6.B.1 using jet fuel and aviation gas data provided by the Port of Olympia.	Limited role for local government intervention and small % of county emissions.
Ships and Boats	4,000 – 5,000	PSMAF emission estimates for 2011 and 2016 extrapolated to other years using EPA national data.	Limited data, large uncertainty in estimates and small % of county emissions.
Railroads	28,700 – 31,000	Clearpath software using WDOE (2018) data on gallons of fuel used in county by passenger and freight trains in 2014 with extrapolation to other years using EPA national data.	Limited county-specific data and role for local government intervention.
Emissions From Producing Gasoline and Diesel Fuel	236,000 – 257,000	ICLEI Equation TR.9.1 using on-road transportation emission estimates for Thurston County	Comparability/Consistency with other local GHG inventories.
Land Clearing	9,000 – 20,000	Clearpath software using information on residential construction permits, national data on lot size and King County information on forest canopy.	Uncertainties associated with the applicability of national and King County data.
Other Wastewater Treatment Plants	77	ICLEI Equations WW. 7 and WW.12a using WDOE permits to estimate population served by smaller WWTPs.	Large uncertainties and small % of county emissions.

[17] Range of annual emission estimates for the 2010 – 2018 time period.

Consumption-Based Emission Inventory Estimates

Consumption-based emissions inventories (CBEIs) provide an alternate approach for characterizing a community's carbon footprint. CBEIs provide estimates of the global greenhouse gas emissions that result during the complete life cycle of goods and services consumed in a particular community or geographic area. This includes emissions during pre-purchase activities,[18] use[19] and post-consumer disposal.[20] For example, emissions associated with a household car includes emissions associated with manufacturing the car, producing the steel, aluminum and other materials used in manufacturing the car, transporting the finished car to dealerships, vehicle use, production of the gasoline and diesel fuels used when driving the car and final disposal of the car.

These types of inventories are based on several key premises:

- Purchase and consumption of goods and services is the primary cause of emissions.
- A full accounting of a community's climate impact needs to consider the total life-cycle emissions from cradle (the production phase) to grave (post-consumer disposal).
- Many of the emissions associated with producing the goods and services purchased and consumed in a community occur outside the community, but these emissions have the same effect on the global climate as emissions that physically originate within the community.

Several state and local communities have developed CBEIs:

- The Oregon Department of Environmental Quality has developed methods for estimating consumption-based emissions that they have used to develop a CBEI for the State of Oregon (DEQ, 2018).
- Several Oregon cities have used the information compiled by DEQ to incorporate consumption-based emission estimates into their local GHG inventories.
- King County has developed methods for estimating consumption-based emissions and used those methods to develop a CBEI for calendar year 2015 (Cascadia and Hammerschlag, 2017).
- The Washington Department of Ecology (Morris et al., 2007) has developed a tool that can be used to estimate consumption-based emission estimates for Washington State. Ecology used the tool to develop consumption-

[18] "Pre-purchase" includes most emissions prior to the point of purchase, including supply chain, supply chain transport, and final assembly and production. For services (including health care), pre-purchase emissions include all emissions associated with providing the service.

[19] "Use" includes the life-cycle emissions of fuels and electricity used to power lights, electronics, appliances, and personal vehicles, as well as trace emissions from refrigerants and vehicle lubricants.

[20] "Post-consumer disposal" includes the emissions from landfilling and incineration of purchased goods.

based estimates for 2005 through 2011.

TCAT developed a preliminary CBEI for the Thurston County for calendar year 2015 using information from the Oregon DEQ reports. The preliminary estimate includes emissions from households and governments, but not business capital and investments.[21]

- Thurston County Households. TCAT estimated that consumption by Thurston County households produced 4,882,000 MTCO2e in 2015.[22] Over two-thirds of household consumption-based emissions are associated with the following five categories: Vehicles and parts (22.6 %); Food and beverages (15.3%); Appliances (12.4%); Services (12.1%); and Healthcare (8.4%).
- Government: TCAT estimated that consumption by Thurston County governments produced 610,000 MTCO2e in 2015.[23]

Characterizing a community's total carbon footprint is not simply a matter of adding the CBEI with the geographic - plus inventory contained in this report. Oregon DEQ found that there is considerable overlap between the emission estimates prepared using a sector or geographic-plus approach and consumption-based emission estimates. Specifically, they estimated that Oregon's sector-based emissions and consumption-based emissions in 2015 were about 63 and 89 million MTCO2e, respectively. The two inventories shared about 38 million MTCO2e in common.[24] Consequently, simply adding together the two estimates would have overestimated the combined statewide GHG emissions by 33%.

Several Oregon cities (cities of Ashland, Corvallis and Lake Oswego) have used the information compiled by DEQ to incorporate consumption-based emission estimates into their local GHG inventories. For example, the city of Ashland estimated that consumption-based emissions associated with the residential consumption of goods and food represented almost 37% of Ashland's GHG footprint during calendar year 2015.

A consumption-based emission inventory could provide a valuable tool for local governments seeking to understand the global implications and tradeoffs associated with different control strategies. For example, when replacing older vehicles with newer more fuel-efficient ones, potential buyers should consider the global emissions associated with manufacturing a new vehicle as well as the reduced energy consumption and emissions during vehicle use.

TCAT decided not to include the preliminary CBEI estimates in the Thurston County inventory because (1) lack of readily available local data needed to estimate consumption-based emissions in Thurston County (2) uncertainties in extrapolating information from other consumption-based emission inventories (particularly for government and

[21] TCAT did not develop a preliminary CBEI for business capital/investment because of the uncertainties associated with extrapolating the Oregon business capital/investment estimates to the Thurston region.

[22] TCAT developed the preliminary CBEI for households using the following information: (1) Average per-household consumption-based greenhouse gas emissions (MTCO2e/HH) by income category was obtained from Table B-4 in ODEQ (2018b); (2) Information on the number of Thurston County households by income category in calendar year 2015 was obtained from the US Census Bureau (2018); (3) Household greenhouse gas emissions were estimated for each income category by multiplying the per household emissions in Table B-4 by the total number of Thurston County households in that income category; and (4) Total household greenhouse gas emissions were estimated by summing emission estimates for all income categories.

[23] TCAT developed the preliminary CBEI for governments by assuming that the relationship between government and household emissions (e.g., government emissions represent 12.5% (1/8) of household emissions) is the same for the Thurston region and the State of Oregon. This relationship is similar to ratio of government and household emissions observed in King County (13.3%). This may underestimate government consumption-based emissions in the Thurston region given that the percentage of the overall workforce represented by government employees is much higher in Thurston County (31% of Thurston County's employed population is classified as government workers by the US Census Bureau) than the State of Oregon (16.2%) and King County (12.4%).

[24] Emissions common to both inventories include emissions from household and government use of energy and waste disposal.

business capital/investment) and (3) concerns about overlaps with the source categories included in the Thurston County inventory that could lead to double-counting emissions.

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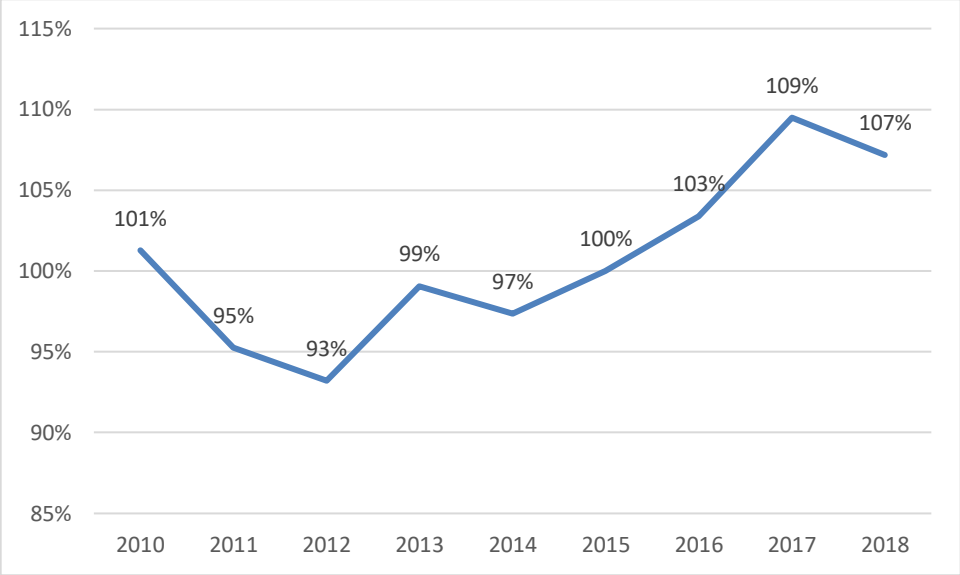
Conclusions

Lacey, Olympia, Tumwater and Thurston County are preparing a regional climate mitigation plan. As part of this effort, each jurisdiction has adopted common regional climate mitigation targets (TRPC, 2020f):

- 45% reduction below 2015 levels by 2030, and
- 85% below 2015 levels by 2050.

TCAT found that Thurston County was able to make meaningful progress on reducing emissions when emissions between 2010 and 2012 fell by about 8% (average annual decline of about 4% per year). That progress was reversed during the subsequent five years when emissions rose by about 17% (average annual increase of more than 3% per year) before declining by about 3% in 2018. Regional emissions were about 7% higher in 2018 than emissions in 2015 (the baseline year for evaluating progress on achieving the region's climate mitigation goals).

Figure 20: Thurston County greenhouse gas emissions (2015 emissions = 100%).



Achieving the Thurston region's climate goals will require larger annual emission reductions than those achieved between 2010 and 2012. Reducing emissions by 85% below 2015 levels by 2050 will require average annual reductions of about 6%/year.[25] In other words, achieving the emission reduction targets for 2050 (85% below 2015 levels) will require that emissions are reduced by 6% every year between 2020 and 2050.

Achieving the annual emissions reductions needed to meet the 2035 and 2050 goals will require substantial changes to the region's energy sources, transportation and building energy consumption. One note of optimism is that implementation of existing state and federal laws could produce significant emission reductions in the Thurston region. For example, the Washington Clean Energy Transformation Act was signed into law on May 7, 2019. The new law requires electric utilities

[25] TCAT used a simple exponential model to estimate the annual emission reductions needed to achieve the regional climate mitigation goals. Using a linear model, annual reductions of about 93,000 MTCO2e/year. This represents about a 2.8% reduction in 2020 and over 20%/year as we approach 2050.

to provide electricity that is generated with a 100% non-emitting and renewable resources by 2045.[26] Full implementation of the new law will result in significant reductions the Thurston region's GHG footprint over the next three decades given that emissions associated with the generation, distribution and use of electricity contributed over 40% of the region's emissions in 2018.

[26] The new law established a series of deadlines for achieving the 100% renewable goal. Specifically, electric utilities must: (1) Eliminate coal-fired resources from the electric power supply by 2025; (2) achieve a carbon neutral energy supply by 2030 (with at least 80% non-emitting and renewable resources); and (3) achieve a carbon-free energy supply by 2045 (100% non-emitting and renewable resources).

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Appendix 10.3 - Communitywide Actions List

Thurston Climate Mitigation Plan
Climate Actions Menu

As of: **7/2/2020**

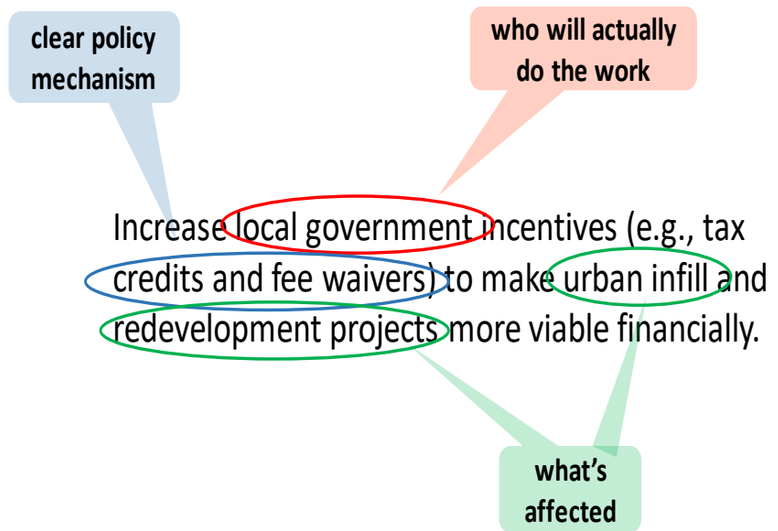
KEY	
B	Buildings & Energy actions
T	Transportation & Land Use actions
W	Water & Waste actions
A	Agriculture & Forests actions
G	Cross-cutting actions
Action ID#	Unique identifier for each strategy and action
short name	1-3 word description of action
description	1-2 sentences describing action - see box for example of a well-defined action description. Additional details beyond 1-2 sentences can be included in "other notes"
source	person/entity that suggested or plan that provided the action
date added	The date that the action was added to the menu
implementor	agency or organization that could lead the action
potential partner	agency or organization that could participate in implementing the action
target stakeholders	groups affected by the action
opportunities	existing programs, partnerships, funding sources, legislation, regulations, or other resources that exist to support the action
barriers	potential obstacles to implementing the action, such as regulation, lack of expertise, lack of will, knowledge gaps, etc. Cost will be considered at a later step in the process, and should not be listed as a barrier at this stage.

This list of strategies and actions was developed by Thurston Regional Planning Council and Cascadia Consulting Group, with input from the Sector Focus Groups and Climate Advisory Workgroup of the Thurston Climate Mitigation Plan.

Example of a well-defined climate action

T1.1 urban infill

(source: Adaptation Plan action G-12)



B Focus Area: BUILDINGS & ENERGY

Strategies:

B.1: Reduce energy use in residential buildings.
B.2: Reduce energy use in existing commercial/industrial buildings.
B.3: Reduce energy use across building types.
B.4: Reduce energy use in new or redevelopment.
B.5: Increase the production of local renewable energy.
B.6: Convert to cleaner fuel sources.
B.7: Address building and energy goals across sectors.

Action ID#	short name	description	source	date added	implementor	potential partners	target stakeholders	opportunities	barriers
B.1: Reduce energy use in residential buildings.									
B1.1	residential energy performance ratings	Require energy performance ratings and disclosures for homes at time of sale, lease, or rent so that owners, tenants, and prospective buyers are informed before making purchasing or rental decisions.	Cascadia Consulting	Aug. '19	State and Local government	Realtors	realtors; home owners; low-income; rural communities	Emphasize benefits like higher resale value and lower maintence costs for property owners/ landlords.	
B1.2	residential energy audits	Develop and adopt policies that require residential properties to undertake an energy audit at the time of sale or during a substantial remodel. Work with financial institutions to develop mortgage products that incorporate audited energy efficiency recommendations.	Adaptation Plan	Jan '19	State and Local government	remodeling professionals, PSE, energy auditors, real estate professionals	realtors; home owners; low-income; rural communities	Review similar policy applied in Berkeley, CA and Portland, OR A potential model for Thurston County: The nonprofit Enhabit (enhabit.org), which grew out of a City effort, works with homeowners and partners to score home energy efficiency and advise on upgrades.	What is the percentage turnover of residential homes in the region annually? People who are already interested in this program are participating. What education and outreach? Short-term home owners are harder to convince to make investments in property.
B1.3	residential energy retrofit program	Partner with energy audit providers and loan providers to establish and market residential energy efficiency and weatherization retrofit programs, with a focus on low-income residents, low-interest loans, and post audit follow-through.	Cascadia Consulting	Aug. '19	Non-profit	energy auditors	Realtors; home owners; renewable energy companies; small business; lenders	Review/bring back Thurston Energy - a program that was once run by the Economic Development Council (EDC) providing free or subsidized energy efficiency audits and offering free or subsidized retrofits	
B1.4	rental housing EE incentives	Provide property tax breaks for landlords who install energy conservation measures in rental housing.	Cascadia Consulting/B Focus Group #1	Aug. '19	Local/state government	Landlords, property managers, renters	Realtors; landlords, property managers, renters		
B1.5	property tax credit	Create a property tax credit for property owners who participate in energy efficiency.	B Focus Group #1	Sep-19	Local/state government				
B1.6	rental housing EE baseline	Pass an ordinance to require rental units to meet baseline levels of energy efficiency and make more stringent over time.	Cascadia Consulting	Aug. '19	Local government	Landlords, property managers, renters	low-income communities; landlords, property managers, renters		PSE: Washington recently implemented a new building code and we now have one of the most progressive in the country. I'm concerned that, anything that increases the cost of housing amidst a housing crisis is going to be both counter-productive and nearly impossible to implement.
B1.7	residential utility outreach	Expand utility outreach to residential electricity customers about the benefits of clean and efficient energy technologies/practices and available rebates and bill credits for efficient appliances and equipment. Focus on neighborhoods with older buildings and create group packages for efficiency upgrades, if possible.	Adaptation Plan	Jan '19	PSE	Local government, equipment vendors, remodeling contractors, non profits	residents	Community action campaign	How do we get people to participate in programs/ offers that already exist?
B1.8	landlord education	Educate landlords on options and benefits for improved energy efficiency.	B Focus Group #1	Sep-19	Local government	nonprofit, property management companies			
B.2: Reduce energy use in existing commercial/industrial buildings.									
B2.1	commercial energy benchmarking & disclosure	Require energy performance ratings for commercial structures be disclosed so that owners, tenants, and prospective buyers are informed before making purchasing or rental decisions.	Cascadia Consulting	Aug. '19	state and Local government		realtors (commercial)		
B2.2	commercial energy audits	Develop and adopt policies that require commercial properties to undertake an energy audit at the time of sale or during a substantial remodel.	Adaptation Plan	Jan '19	State and Local government		construction companies/ contractors; realtors (commercial)	Review similar policy applied in Berkeley, CA	
B2.3	LED lighting	Install LED lighting in public-sector buildings and infrastructure (e.g., street lights, traffic signals).	TRPC	Note 1	Local government				
B2.4	commercial lights-out	Introduce a "lights-out" policy that encourages businesses to turn off their signs and other lights at night when they are closed.	Lacey CR2 plan	Jan '19	Local government				
B2.5	commercial utility outreach	Expand utility outreach to commercial power customers about the benefits of clean and efficient energy technologies and practices.	Adaptation Plan	Jan '19	PSE			Incentives and penalties associated with House Bill 12587 (2019 Session) - $1/square foot penalty after 2026 when requirement kicks in	If EE and conservation are successful, utilities operators business model affected. Need to plan for potential obsolescence of utility companies and implications
B2.6	cool roofs	Create an incentive program for the installation of reflective roofs on commercial buildings to reduce building energy consumption and the urban heat island effect.	Adaptation Plan	Jan '19	Local government			See Denver, CO program: https://www.denvergov.org/content/denvergov/en/denver-development-services/commercial-projects/green-roof-initiative.html Incentives and penalities associated with House Bill 12587 (2019 Session) - $1/square foot penalty after 2026 when requirement kicks in.	
B2.7	commercial utility rebates	Offer additional utility rebates or bill credits to encourage businesses to buy and install energy-efficient appliances and equipment.	Adaptation Plan	Jan '19	PSE			Incentives and penalities associated with House Bill 12587 (2019 Session) - $1/square foot penalty after 2026 when requirement kicks in	Upfront investment needed, no cash to follow through with offers.
B2.8	performance standard	Set energy efficiency performance standards for commercial buildings with gross floor areas smaller than 50,000 square feet.	B Focus Group #1	Sep-19	Local government		construction companies/ contractors; realtors (commercial)		Could this be done on a local level, or would it need to be done through State Building Code Council? PSE: Washington recently implemented a new building code and we now have one of the most progressive in the country. I'm concerned that, anything that increases the cost of housing amidst a housing crisis is going to be both counter-productive and nearly impossible to implement.
B2.9	municipal building retrofits	Continue to identify and implement priority energy efficiency improvements in municipal buildings.	CAW	Oct-19	Local government				
B2.10	energy project grants	Secure grant funding for high-profile, innovative energy efficiency and/or technology projects on commercial buildings in the county.	CAW	Oct-19	Commercial property owners				
B.3: Reduce energy use across building types.									
B3.1	energy education	Provide educational resources and technical assistance to industry professionals, building owners and managers on all aspects of energy efficient building design, retrofits, and operations for new and existing buildings.	CAW	Oct-19	Local government	Nonprofits, colleges			

B3.2	efficiency rebate	Adopt "energy efficiency as a service" utility rebate model to direct energy savings to building owners who bear the costs of energy efficiency retrofits.	CAW	Oct-19	UTC, PSE				
B3.3	PACE	Assess whether PACE is still desirable and, if so, how local and state policymakers could pursue a legislative solution or state constitutional amendment to develop a PACE program.	TRPC-ST Plan	Jan '19	State government				
B3.4	exemplary buildings	Create a Zero-Energy Building Challenge by partnering with public, private, non-profit and faith-based organizations. Facilitate rapid deployment and public awareness of high-profile demonstration buildings.	CAW	Oct-19	Local government	Public and private organizations			
B3.5	green building tracking	Develop data methodology to monitor use and impacts of green building incentives, to inform future incentives and develop recommendations for policy or programs.	CAW	Oct-19	TRPC				
B.4: Reduce energy use in new or redevelopment.									
B4.1	green construction code	Adopt the International Green Construction Code (IgCC).	TRPC	Note 1	State government	local government, building code inspectors, OMB			
B4.2	green building tracking	Develop data methodology to monitor use and impacts of green building incentives, to inform future incentives and develop recommendations for policy or programs.	Adaptation Plan	Jan '19	TRPC			Mandate energy efficent performance standards at point of sale (carrot & stick) Develop ways to regulate and require implementation then reward and incentivize participation	Adapatation of the existing building code, motivations for participants? Landlords- split incentives between owner and renter? New buildings are not reflecting these goals/ outcomes. E.g. no solar, no energy efficency shift.
B4.3	commercial EE recognition	Create program that recognizes energy efficiency leadership in new construction.	B Focus Group #1	Sep-19	Local government		construction companies/ contractors	Brussels, Belgium exemplary building program/initiative	
B4.4	green municipal buildings	Require that new local government facilities (e.g., the new Olympia City Hall and LOTT building) demonstrate green building technologies and practices.	TRPC	Jan '19	Local government		construction companies/ contractors	provide education though city and state implementation, and lead by example.The proposed new Thurston County courthouse is a good opportunity. Making the proposed facility a living laboratory would be consistent with TC Resolution 14395, passed in 2010.	
B4.5	grid-connected appliances	Require smart appliances in new construction, especially water heaters that control timing of demand.	TRPC	Jan '19	Local government		construction companies/ contractors; realtors	Review existing programs in Seattle and Shoreline	Need to differentiate between strategies for residential and strategies for commerical.
B4.6	multifamily submetering	Require submetering for new multifamily buildings so residents can track energy use.	B Focus Group #1	Sep-19	Local government		construction companies/ contractors	Could operate similar to Open Space tax program	
B4.7	multifamily energy measures	Develop and advertise a business case financial model for multi-family developers to take energy efficiency and renewable energy measures.	CAW	Oct-19	Local government		construction companies/ contractors	See Shift Zero Policy Toolkit	
B4.9	permit counter technical assistance	Hire or contract with dedicated green building specialists to provide technical assistance through the permitting and development process.	Rich Hoey	Aug '19	Local government		construction companies/ contractors; realtors	Review existing program in Tacoma	
B4.11	grid-connected appliances	Require smart appliances in new construction, especially water heaters that control timing of demand.	B Focus Group #1	Sep-19	Local government		construction companies/ contractors; realtors		
B4.12	multifamily submetering	Require submetering for new multifamily buildings so residents can track energy use.	B Focus Group #1	Sep-19	Local government		construction companies/ contractors		
B4.13	multifamily energy measures	Develop and advertise a business case financial model for multi-family developers to take energy efficiency and renewable energy measures.	CAW	Oct-19	Local government		construction companies/ contractors		
B4.14	state building code	Advocate for stricter energy efficiency requirements in state building code.	CAW	Oct-19	Local government		construction companies/ contractors		
B.5: Increase the production of local renewable energy.									
B5.1	clean energy bonds/levy	Sell municipal bonds or create a local tax levy for local clean energy projects.		Note 1	Local government			www.cleanenergyfinance.org; See Portland Clean Energy Fund	
B5.2	feed-in tariffs	Offer feed-in tariffs to incentivize solar projects.		Jan '19	State				
B5.3	municipal building solar	Install solar photovoltaics on all available and feasible municipal sites, including building rooftops, city hall, schools, police and fire stations, community centers, municipal water pump sites, and transit depots.	Cascadia Consulting	Aug '19	Local government			Olympia's McAllister well site could be a location to consider	
B5.4	net metering production incentive	Increase incentive ratio for connecting residential solar from 1:1 to 2:1.	Thurston Thrives/B Focus Group #1	Jan '19	State, UTC	PSE	renewable energy companies	Program currently exists through PSE - is there a way to expand it or increase incentives?	
B5.5	solSmart	Pursue SolSmart designations and adopt solar friendly practices.	Rich Hoey	Aug '19	Local government	Olympia Community Solar			
B5.6	utility-scale renewables	Promote Thurston County as a location to build more utility-scale renewable energy projects such as solar and wind farms. Support locally owned/operated renewable energy companies.	Adaptation Plan	Jan '19	Local government	Chamber of Commerce, EDC	renewable energy companies	Community energy authority/ community agragate modeling? This provides momentum and reduces costs through bulk procurement. Community action plan. PSE - There IS a requirment to move towards EE standards	Need-opportunity conundrum > Highest need for energy comes when there is no solar available, and wind is typically low at night = highest period of need. Must make incentives related to the value of the property and cost of upgrades.
B5.7	electric infrastructure for renewables	Expand and retrofit the region's energy distribution, monitoring, and storage infrastructure to support more on-site renewable energy generation.	Adaptation Plan	Jan '19	PSE; UTC?		renewable energy companies		
B5.8	solar-ready	Amend local development code to require solar-ready construction for all building types.	B Focus Group #1	Sep-19	Local government		renewable energy companies; construction companies/ contractors	See City of Lacey's adopted code.	
B5.9	on-bill financing	Provide additional utility incentives such as on-bill financing to support energy efficiency and renewable energy investments on buildings.	Adaptation Plan	Jan '19	PSE				Cart before the horse- people are excited about incentives but infrstructure is not workable. Need to fix existing problems before incentives of energy use reduction can be implemented.
B5.10	group purchasing	Develop/support a city-sponsored group solar purchasing program.	CAW	Oct-19	Local government, community solar company	SPARK NW, Olympia Community Solar	renewable energy companies		
B5.11	solar zoning	Review and amend zoning and development regulations where necessary to allow utility or community solar generation facilities less than 20 megawatts.	CAW	Oct-19	Local government		renewable energy companies	Brussels, Belgium exemplary building program/initiative	
B5.12	neighborhood grants	Fund the creation of low barrier grant opportunities for neighborhood clean energy and energy efficiency projects.	CAW	Oct-19	Local government	PSE	renewable energy companies; low income communities; rural communities	provide education though city and state implementation, and lead by example.The proposed new Thurston County courthouse is a good opportunity. Making the proposed facility a living laboratory would be consistent with TC Resolution 14395, passed in 2010.	
B5.13	shore power	Develop shore power to improve air quality, reduce GHG emissions, improve local economy by serving the growing needs of local boat and ship customers.	T Focus Group #1	Sep-19	Port of Olympia			Review existing programs in Seattle and Shoreline	Need to differentiate between strategies for residential and strategies for commerical.
B.6: Convert to cleaner fuel sources.									
B6.1	natural gas to electric appliances	Educate business owners and residents on the options for electric appliances and the benefit of pairing electrification with the installation of renewable energy.	Cascadia Consulting/B Focus Group #1	Aug '19	Local government				

B6.2	electric appliances in new construction	Update municipal code to require electric appliances in new construction.	Cascadia Consulting	Aug '19	Local government		construction companies/ contractors;		
B6.3	heat pumps	Investigate options and costs for using geothermal heat pumps for heating and cooling.	Lacey CR2 plan	Note 1	Local government				
B6.4	natural gas ban	Ban all new natural gas connections in new buildings.	CAW	Oct-19	Local government		construction companies/ contractors		
B6.5	natural gas fee	Create a utility fee for natural gas use.	CAW	Oct-19	PSE, UTC?		low-income communities	Use to fund electrification or other programs.	
B6.6	demand pricing	Adjust fee scale to charge higher rates during high use times of day.	B Focus Group #1	Sep-19	State, UTC	PSE	low-income communities		
B6.7	utility advocacy	Add as a high priority to municipality's legislative agenda - State and Utilities and Transportation Commission in implementing SB 5116, which requires a shift to clean electricity.	CAW	Oct-19	Local government				
B6.8	Clean energy	Local government adopt and communicate policy statements and positions with the State Electeds that call for rapid conversion to clean energy in the power supply that serves Thurston County.			Local government	Solar Installers of Washington (WASEIA)			
B.7: Address building and energy goals across sectors.									
B7.1	workforce development	Create and support opportunities to link clean energy companies with vocational training facilities.	TRPC-ST Plan	Jan '19	Worksource; local governments	PacMountain (Chamber of Commerce)	renewable energy companies; workforce development		
B7.2	public power	Transition to a publicly owned power utility district.	Public Survey		PUD			Greater local control over power infrastructure and decisions	Large start-up and transition costs to purchase and develop power infrastructure. Undercuts PSE's ability to meet statewide energy goals.
B7.3	climate impact fee	Evaluate and, if feasible, implement a regional climate impact fee on new development to fund regional climate mitigation projects and programs.			Local government		construction companies/ contractors		
B7.4	embodied carbon	Create incentives to increase the use of less carbon intensive building materials (mass timber, reduced concrete).	B Focus Group #1	Sep-19	Local government		construction companies/ contractors		

T Focus Area: TRANSPORTATION & LAND USE

Strategies:

T1: Set land use policies that increase urban density to support efficient transportation networks.
T2: Increase efficiency of the transportation system.
T3: Increase the adoption of electric vehicles, and the infrastructure to support electric vehicles.
T4: Increase the use of public transit.
T5: Increase use of active forms of travel and more efficient commuting modes.
T6: Support regional mass transportation connections.

Action ID#	short name	description	source	date added	implementor	potential partners	target stakeholders	opportunities	barriers
T1: Set land use policies that increase urban density to support efficient transportation networks.									
T1.1	coordinated long term planning- future infill	Coordinate long-term plans with transit agencies to project where increased density would support more transit corridors. Then change zoning/density that would support new transit corridors and variety of household incomes. Promote long-term equity and healthy communities by developing incentives such as density bonuses for development where a percentage of the units will be permanently affordable for household incomes.			Local government/ transit agencies	TRPC	low income	`	
T1.2	middle-density housing	Reevaluate and change zoning as needed to allow for a range of housing types to promote social economic integration of housing near the region's urban centers or moderate-density zones. Promote long-term equity and healthy communities by developing incentives such as density bonuses for development where a percentage of the units will be permanently affordable for household incomes that can no longer afford to live in these areas.	TRPC	Note 1	Local government		Construction companies/ contractors; low-income communities		First/ last mile
T1.3	Eco districts	Identify potential Eco districts to advance innovative district-scale urban development, sustainability, and neighborhood equity. Then make necessary code/zoning changes to support their development and set ambitious performance outcomes to ensure their long-term success.	Thurston Thrives	Jan '19	Local government		Construction companies/ contractors	Current pilot project in downtown Olympia: http://ecodistrict.fertileground.org/	
T1.4	20-minute neighborhoods	Increase the number of 20-minute neighborhoods (walkable environment, destinations that support a range of basic living needs and a residential density). Identify key infrastructure components needed to grow the number of 20-minute neighborhoods, then change zoning and codes if needed and coordinate with other jurisdictions to make public investments where necessary.	Cascadia Consulting	Aug '19	Local government		Construction companies/ contractors; rural communities; low-income communities; communities of color		
T1.6	climate-aware UGB	Amend county wide planning policies to require analysis of climate impacts, the costs to mitigate those impacts, and the costs to ensure efficient transit (e.g., public transit services) to inform future Urban Growth Area expansions and Annexations of current UGA. Then weigh those costs and impacts with opportunities and investment needed to accommodate people and business within annexed areas and approved UGAs.	T Focus Group #1	Sep-19	TRPC/UGM Subcommittee	Cities, County	rural communities		
T1.9	ADUs	Amend development codes to allow for attached and detached ADU's in urban residential areas.	T Focus Group #1	Sep-19	Local government				
T1.10	Multifamily Tax Exemption (MFTE)	Expand Multifamily Tax Exemption Programs to increase residential development where services exist, and consider extending exemption timeframes.	T Focus Group #1	Sep-19	Local government		construction companies/ contractors; realtors; low-income communities; communities of color		
T1.11	land use efficiency	Set integrated goals to consider network efficiency in land use decisions, including how density in certain areas supports transit, increases efficiency of utility service, and other support facilities. Consider VMT in identifying locations for large employment facilities.	T Focus Group #1	Sep-19	TRPC		rural communities	see comment	

T1.12	corridor-centered development	Increase residential and mixed use development along designated transit corridors with monetary incentives such as tax incentives and improved fee structures. Determine impact fees and connection charges that, if reduced or waived, would generate denser development where transit and other services already exist.	T Focus Group #1	Sep-19	Local government		construction companies/ contractors; realtors; low-income communities; rural communities	Create tax incentives	
T1.13	downtown development	Work with developers and investors to identify barriers to new investment and reinvestment projects of residential and commercial in urban centers. Then develop and implement policy changes and incentive programs in response.	T Focus Group #1	Sep-19	Local government		construction companies/ contractors; realtors		
T1.14	development VMT caps	Require caps on VMT or vehicle trips for development on Olympia's Capitol Campus and other public development near clustered government offices.	T Focus Group #1	Sep-19	State	Olympia, Tumwater, Lacey	rural communities; low-income communities; communities of color	Leverage city location	
T1.15	land use emissions	Revaluate emissions tracking data for land use to ensure accuracy and tracking changes and to inform future regulatory policy in land use.	Cascadia Consulting	Aug '19	TRPC			Review King County's approach to including in their inventory.	
T2: Increase efficiency of the transportation system.									
T2.1	traffic analysis	Incorporate greenhouse gas emissions calculations into traffic impact analyses to identify land use proposals that have the potential to generate a substantial positive impact on the region.	TRPC-ST Plan	Jan '19	Local government				
T2.2	congestion mitigation	Develop congestion mitigation programs to increase transportation efficiency, reduce delay, and reduce emissions such as signalization coordination improvements along with application of speed harmonization techniques (ex. reevaluate speed limits, roundabouts vs signalized intersection, street connectivity). Added benefits are decrease idling time (pollution) and improve fuel efficiency (cost savings to driver).	Cascadia Consulting	Aug '19	Local government			see comment	
T2.3	reduce idling	Work with the State and/or region to enacted legislation to minimize vehicle idling for GHG reductions, improved air quality and increased fuel efficiency. Coordinate with public agencies and private companies that transport people and materials to develop and enact internal policies that reduce idle time.	Thurston Thrives	Jan '19	Association of Washington Cities			see comment Work with local businesses such as gas stations, grocery pick up, and drive thru's to educate, sign and promote voluntary idle reduction programs for customers. Motivate private entities by showing a potential reduction in fuel expense. Improve air quality for vulnerable populations such as children (school bus) and disabled/elderly (paratransit).	Hard to enforce. See comment
T2.3	transportation efficiency service	Create and fund a transportation efficiency service for local residents that gives an assessment of a households current transportation costs, shows cost saving potential by using cleaner forms of transportation, connection with vendors and financing as needed, and follows to see if changes were adopted by household.	TCAT	1-Oct	Local governments		low-income communities; rural communities/those who work outside; realtors;		
T2.4	vehicle efficiency outreach	Develop educational campaigns about benefits (reduced GHG emission, increase fuel efficiency, safety) of properly inflated tires, including signage at gas stations and local businesses and partnering with schools.	Cascadia Consulting	Aug '19	Local government				
T2.7	carpooling	Work regionally to increase the HOV and HOT lanes available during peak times for car shares and carpools to reduce single occupancy trips.	Lacey CR2 plan/T Focus Group #1	Jan '19	TRPC, DOT	local governments,	rural communities; those who work outside		Coordinating multipul partners. Addition of lanes increase more hard scape.
T2.8	reduced parking requirements	Reduce the cost of development by reducing parking requirements for new residential and mixed use development along transit corridors and in urban centers. Could allow substitution of care share programs.	Cascadia Consulting	Aug '19	Local government				
T2.9	congestion pricing	Explore congestion pricing between Thurston and Pierce counties along I-5 during peak hours to improve mobility by reducing traffic congestion, reduce greenhouse gas emissions, and create a more equitable transportation system. Target revenues to projects that enhance system efficiency.	TRPC-ST Plan	Jan '19	TRPC, DOT			Learn from Seattle who has published a phase one report on their congestion pricing study.	
T2.12	Eco driving education	Include awareness of fuel economy through driving techniques in curriculum for new drivers to reduce GHG emissions and develop long term habits.	T Focus Group #1	Sep-19	State Department of Licensing				
T2.15	TMAs	Mitigate traffic congestion and reduce GHGs by providing government grant dollars to Transportation Management Associations (TMAs) to provide membership-controlled transportation services in a range of areas including regional or city-wide service, along a specific corridor, or central business districts.	T Focus Group #1	Sep-19	Local government (public/private partnership)			Examples in other communities (Lloyd district example in Portland). Provides service that are not currently being met by existing transportation agencies. Commute Trip Reduction (CTR) may provide the framework.	
T2.16	Internal policy - decrease idle time	Coordinate with public agencies and private companies that transport people and materials to develop and enact internal policies that reduce idle time.			Local government				
T2.17	teleworking/flex work	Government agencies increase opportunities for employee teleworking options and staggering work days to reduce employees driving during peak traffic times.			Local and state government		workforce development	CTR programs	
T3: Increase the adoption of electric vehicles, and the infrastructure to support electric vehicles.									
T3.1	EV parking new construction	Require large commercial and residential buildings to dedicate a percentage of parking spots for electric vehicle charging.	TRPC (CALGreen)	Jan '19	Local government		construction companies/ contractors		
T3.2	free EV parking	Allow free parking for all electric vehicles at local government buildings and in city centers to encourage the adoption of all electric vehicles. Increase cost of parking for Non-EV vehicles.	Clean Technica and Greenway	Jan '19	Local government				
T3.3	solar parking lots	Work with utilities to develop installation of solar panels over surface parking spaces and structured parking garages to produce green energy for electric vehicles.	Thurston Thrives	Jan '19	Local government	PSE	renewable energy companies		

T3.4	EV charging retrofit	Partner with business and utilities to develop incentives and streamlined process to install EV charging infrastructure at large government and commercial facilities with low public transit and high personal vehicle utilization to access (e.g., the Great Wolf Lodge, St. Martins Pavilion, IT transit stations, rural gov buildings/services).	TRPC	Jan '19	Local government	Private installer			
T3.5	EV ready building code	Require all new residential construction be built EV ready. Create a simple and consistent residential charging station permitting process to reduce costs and time to development.	TRPC (CALGreen)	Jan '19	Local government		construction companies/ contractors; renewable energy companies; realtors	CALGreen drafted a model code, adapted from Lancaster, CA's municipal code. Model code: http://www.opr.ca.gov/docs/Example_Building_Codes.docx	
T3.7	EV integration	Reevaluate regulations and make necessary changes to ensure charging stations are able to be permitted in locations where they are needed.	TRPC-ST Plan	Jan '19	Local government			Several jurisdictions -- including Lacey (LMC Ch. 16.73) and Rainier (RMC Ch. 18.40) -- stipulate which zoning designations (including residential) allow electric vehicle charging stations. EV charging stations are permitted but not required.	
T3.8	public building EV infrastructure	Require new public facilities (buildings, park-and-rides, trailheads) have EV infrastructure. Ensure that the infrastructure is adequate to meet the growing number of electric vehicles.	TRPC-ST Plan	Jan '19	Local government		construction companies/ contractors; renewable energy companies		
T3.10	convert to EV fleets	Set policies and timetable for electrification of municipal and other governmental fleets. Require replacement of public fleets with cleaner, energy-efficient vehicles to reduce long term fuel costs, improve air quality and reduce greenhouse gas emissions.	Rich Hoey	Aug '19	Local government			see comment	
T3.11	EV education	Partner with environmental and other agencies to increase consumer awareness about EV options and incentives for use and purchase.	T Focus Group #1	Sep-19	Local government				
T3.12	gas station colocation	Require all new gas stations install EV stations and that current gas stations have low barriers (permitting, expense) to installing EV stations.	T Focus Group #1	Sep-19	Local government				
T3.14	EV mass purchase discounts	Create a group purchase program for residents to get deep discounts on EVs, other fuel efficient and alternative fuel vehicles.	CAW	Oct-19	Local government (public/private partnership)		low-income communities; rural communities/those who work outside		
T3.15	EV purchase incentives	Partner with car sale and lease dealerships to provide incentives for purchase of electric vehicles by Thurston County residents. Pilot with those neighborhoods, individuals with greatest VMT potential.	CAW	Oct-19	Local government (public/private partnership)				
T4: Increase the use of public transit.									
T4.1	increase transit	Increase local public transit routes/frequency with a focus on expanding transit service before and after traditional business hours and on weekends.	Thurston Thrives/ T Focus Group #1	Jan '19	Intercity Transit		low-income communities; rural communities/those who work outside; communities of color;	see comment	
T4.2	bus rapid transit	Expand rapid transit (ex. add transit only lanes in UGA or add express bus connections between South Sound cities), then develop funding mechanisms.	Rich Hoey/T Focus Group #1	Aug '19	Intercity Transit		low-income communities; rural communities/those who work outside; communities of color;		
T4.3	rural transit	Identify and implement first/last mile solutions for rural ridership (engage rural home owners associations for representation and feedback). Present this plan to TRPC with direction to explore pilot programs and secure funding sources.	Public comment/ T Focus Group #1	Aug '19	TRPC/RT		low-income communities; rural communities/those who work outside; communities of color;	Ruby Ride	
T4.4	fareless system/youth ride free	Develop a fareless system for public transit.	Rich Hoey	Aug '19	Intercity Transit		low-income communities		
T4.5	Sound Transit in Thurston County	Work with State Legislators and Governor's Office to identify opportunities and funding to expand Sound Transit to Thurston County.	TCAP	Jan '19	State				
T4.7	public transit ease	Create a partnership of transit providers and agree to a common goal of having an integrated navigation and payment system. Then work together to make an action plan.	Cascadia Consulting	Aug '19	TRPC				
T4.8	alternative fuel buses	Transition area transit services to 100% renewable energy.	Cascadia Consulting	Aug '19	Intercity Transit/IT		renewable energy companies		
T4.9	fed-compliant alternatives analysis	Work with the State partners and elected officials to understand future plans for mass transit. Secure funding in the State budget to conduct an alternatives analysis to determine what types of high capacity transit the region may be able to support in the future what funding mechanisms are available.	TRPC-ST Plan	Jan '19	TRPC				
T4.10	rider education/benefits	Maintain and expand a regional online page that lists all the mode shift education efforts and employer benefits opportunties (Thurston Here-To-There). Include a comments section for suggestions to further transit education and ridership.	T Focus Group #1	Sep-19	TRPC			- Cost of trip -> trip changing	
T4.13	park & ride	Work with transit providers to explore expansion of park & rides and park & pools.	T Focus Group #1	Sep-19	Intercity Transit				
T4.14	transit & schools	Work with school and transit providers to understand if there is a likely partnership to coordinate routes with transit start and top times.	T Focus Group #1	Sep-19	Intercity Transit				
T4.15	promote transit benefits	Work with employers and transit agencies to develop ways to incentivize employee ridership (ex. rebates for employees who give up use of employer parking facilities).			TRPC		workforce development		
T5: Increase use of active forms of travel and more efficient commuting modes.									
T5.1	walk/bike infrastructure	Coordinate cities of Thurston Counties Master Bicycle and Pedestrian plans into a large regional plan to expand walking and biking infrastructure, including separated and protected opportunities. Coordinate efforts to maximize funding mechanisms and opportunities.	Thurston Thrives	Jan '19	TRPC		rural communities/those who work outside		
T5.2	barriers to transportation alternatives	Develop a regional inventory to identify gaps in connectivity for safe cycling and walking. Then develop a strategy to prioritize projects and a plan for funding.	Cascadia Consulting	Aug '19	TRPC				
T5.3	biking to work	Require municipal and large employers to provide a shower and/or changing area for employees to facilitate biking to work, and secure/dry bike parking. Provide financial incentives for employer-sponsored bicycle programs.	Cascadia Consulting	Aug '19	Local government				

T5.4	school drop-off alternative modes	Maintain and expand a walking/biking incentive program with safety education for families.	Cascadia Consulting	Aug '19	School Districts	Intercity Transit	low-income communities; rural communities/those who work outside		
T5.6	park & pool	Require covered and safe bike storage at carpooling and pick up locations.	T Focus Group #1	Sep-19	Local governments				
T5.7	urban bikeshare	Pilot and, if successful, implement a bike/scooter share program.	TRPC	Jan '19	Capitol City Bikes? / private third-party				
T5.11	car-free zones	Reevaluate long term plans and update to prioritize pedestrians and people riding bikes. Set goals for mode shift and plans on how to achieve those goals like developing car-free corridors in commercial and mixed use areas to encourage mode shift.	T Focus Group #1	Sep-19	Local government		low-income communities; rural communities/those who work outside; communities of color		
T5.12	bike/transit	Coordinate a meeting with bicycle advocacy groups and transit agencies to explore barriers (ex. limited bike storage on bus). Prioritize solutions and develop plan to reduce barriers.	T Focus Group #1	Sep-19	TRPC	Local governments, advocacy groups	communities of color; low-income communities		
T5.13	telecommuting infrastructure	Develop grants and provide financial resources for installation of infrastructure necessary to support telecommuting.	G Focus Group #1	Sep-19	Local government/TRPC				
T6: Support regional mass transportation connections.									
T6.1	Olympia-Seattle rail	Update plans to prioritize commuter rail connection between Olympia and Seattle. Work with State partners to develop a plan and find other partners that have similar vision to coordinate with.	T Focus Group #1	Sep-19	State?				
T6.2	Olympia ferry service	Provide ferry service between Olympia and Seattle. Work with State partners to develop a plan and work with other partners that have similar vision.	T Focus Group #1	Sep-19	Washington State?				

W Focus Area: WATER & WASTE

Strategies:

W1: Increase the efficiency of water infrastructure + wastewater
W2: Reduce water consumption
W3: Reduce emissions from wastewater treatment operations
W4: Divert more solid waste from landfills
W5: Generate energy from waste sources
W6: Reduce consumption of carbon-intensive goods and services
W7: Reduce emissions of solid waste operations

Action ID#	short name	description	source	date added	implementor	potential partners	target stakeholders	opportunities	barriers
W1: Increase the efficiency of water infrastructure + wastewater									
W1.1	municipal energy efficiency	Conduct efficiency improvements to municipal water and sewage treatment systems. Prioritize components that consume the most energy and have high GHG emissions.	Adaptation Plan	Jan '19	Local government, PSE, LOTT, Thurston PUD, (Lead depends on system operator)			Olympia has completed an energy audit of its water infrastructure - tracks water loss and has looked at motor efficiency. Currently buys Green Power through PSE. LOTT has also conducted an energy audit, and is making investments in efficiency upgrades (see note).	energy audit
W1.2	public water systems	Prioritize efficiency improvements to public water systems (Group A and Group B). Prioritize components that consume the most energy and have high GHG emissions.	TRPC	Aug-19	Thurston PUD, Lacey, Olympia, Tumwater			Streamflow Restoration funding	New pumps aren't always more efficient Need to ensure redundancy, so will need a traditional backup, even if switch to solar or other renewable power (could use rechargeable batteries as a power source)
W1.3	rural wells	Provide a low interest loan program to encourage the use of efficient technology when permitting wells to serve new rural development.	TRPC		Thurston County		lenders; construction companies/ contractors		
W1.4	gravity sewer	Study the energy efficiency and cost impacts of gravity sewers versus STEP systems. As needed, introduce programs, regulations, and/or incentive programs.	WW Focus Group Meeting #1	Aug '19	Lacey, Olympia, Tumwater			gravity effluent easier to treat	
W1.5	lifecycle costs	Assess the energy use or energy savings of wastewater-related projects, and other lifecycle costs. Make analysis available to decision-makers.	WW Focus Group Meeting #1	Aug '19	Local government, Thurston PUD, LOTT			LOTT does this already.	
W2: Reduce water consumption									
W2.1	municipal water ordinance	Develop a mandatory municipal water conservation ordinance.	Lacey CR2 plan	Jan '19	Local government		construction companies/ contractors		
W2.2	water audits	Conduct water audits of city and county facilities to determine prioritization of capital improvements.	Ashland Climate & Energy Action Plan	Aug '19	Local government				Look at plumbing fixtures in municipal buildings
W2.3	water conservation outreach	Expand water conservation outreach and incentive programs for residents and businesses through new funding sources (ex. grants) and partnerships.	Ashland Climate & Energy Action Plan	Aug '19	Local government			Low return on investment.	
W2.4	permitting	Review and update building code to ensure most efficient water practices and technologies are applied to new development.	TRPC	Aug '19	Local government		construction companies/ contractors	Challenging for commercial b/c tenant changes.	
W2.5	rural conservation	Provide technical assistance for rural "exempt" wells to conserve water.	Art Starry, Thurston County Environmental Health	Aug '19	Thurston County, TCD		rural communities		
W2.6	agricultural water use	Evaluate agricultural water use and develop a program to buy back or reclaim excess capacity.	Art Starry, Thurston County Environmental Health	Aug '19	Local government		farmers/ ranchers		
W2.7	low-water landscaping	Require water landscaping conservation practices for new development.	Art Starry, Thurston County Environmental Health/WW Focus Group Meeting #1	Aug '19	Local government		construction companies/ contractors		
W2.8	integrated incentives	Integrate City incentives for water and wastewater reductions with other aligned incentive programs (ex. PSE rebates for washing machines and dishwater energy savings) to encourage broader usage and conservation.	Thad Curtz	Sept '19	Local government				
W2.9	tiered rates	Study effectiveness and strategies for conservation with tiered rating structures for water and sewer, and if proven, apply new rate structures.	Thad Curtz	Sept '19	Local government		Most (all?) utilities		

W2.10	water reuse	Develop a water reuse program for water conservation on site. Provide technical assistance and incentives, such as free rain barrels, to gather water and use on site (e.g., rain barrels for irrigation).	WW Focus Group Meeting #1	Aug '19	LOTT, local government				
W2.10b	reclaimed water	Expand the use of reclaimed water, especially where needed for irrigation.			LOTT				
W2.11	watering schedule	Institute mandatory watering schedule that limits irrigation to certain days.	WW Focus Group Meeting #1	Aug '19	Local government		farmers/ ranchers; rural communities; realtors	Lacey has a current program	
W2.12	high users	Identify greatest water users and provide targeted technical outreach and support to reduce water consumption.	WW Focus Group Meeting #1	Aug '19	Local government, LOTT				
W2.13	combined sewer	Separate combined sewer and stormwater system. Start with feasibility study and follow through on findings.	WW Focus Group Meeting #1	Aug '19	Olympia, LOTT				Extra infrastructure
W2.15	renter incentives	Develop and offer incentives for water conservation targeted to renters and multifamily residential units.	WW Focus Group Meeting #1	Aug '19	Local government		construction companies/ contractors; realtors		
W2.16	metering	Use metering to inform water consumers about their use compared to others on their utility bill. Provide technical assistance and education to higher users on ways to conserve water and improve household/business efficiencies.	WW Focus Group Meeting #1	Aug '19	Local government				
W2.17	gray water use	Require use of gray water in new residential and commercial buildings. Start with feasibility study and change building codes based on results.	CAW	Oct '19	Local government	DOH			Would require DOH approval.
W2.18	HOA watering outreach	Provide education and technical assistance to HOAs related to revising covenants that may be causing increase water consumption and/or prohibiting energy savings (ex. lawns must be irrigated and green, no water barrels).	Public Survey		Local government		realtors		
W2.19	well conversion to public systems	Provide technical assistance to rural "exempt" well owners to convert to public water systems when service connections are available.			Thurston County, PUD		farmers/ ranchers; rural communities		
W3: Reduce emissions from wastewater treatment operations									
W3.1	nitrous oxide capture	Research and implement nitrous oxide mitigation strategies and strategies to avoid or reduce nitrous oxide emissions. Present findings and cost vs benefits analysis to policy makers to determine what changes should be made.	WW Focus Group Meeting #1	Aug '19	LOTT				
W3.2	methane capture	Capture methane from wastewater operations and use to generate power to run systems. Begin by researching cost-effective methods and identifying funding sources to implement.	WW Focus Group Meeting #1	Aug '19	LOTT				
W3.3	hydrogen power	Investigate and determine if hydrogen power is a cost effective alternative energy source for operations, including technical vehicles, or for distribution and if so, identify funding source to implement.	WW Focus Group Meeting #1	Aug '19	LOTT				
W4: Divert more solid waste from landfills									
W4.1	residential composting	Expand residential programs for composting and recycling food waste.	Thurston Thrives	Jan '19	Local government			TC waste is being converted into renewable natural gas (RNG)	Expensive to construct, and hard to find available space. Air quality implications to burning waste, what are emissions in burning?
W4.2	commercial composting	Expand commercial programs for composting food waste. Start by identifying funding and partners.	WW Focus Group Meeting #1	Aug '19	Local government			Thurston County Restaurant Rescue program	
W4.4	waste audits	Provide waste audits for business owners and education on practices that decrease waste (ex. compost, recycling, reuse).	Cascadia Consulting	Aug '19	Local government				
W4.5	gleaning	Expand gleaning programs and recovery and use of edible yet unwanted foods from restaurants, grocery stores, and schools.	Thurston Thrives/AF Focus Group #1	Jan '19	Thurston County Food Bank				
W4.7	deconstruction ordinance	Develop a building deconstruction ordinance, with requirements for deconstruction, reporting, inspections, and compliance tools.	Thad Curtz	Sept '19	Local government		construction companies/ contractors	Examples at: https://sustainableconsumption.usdn.org/initiatives-list/encouraging-and-mandating-building-deconstruction Also Portland's ordinance at: https://www.portlandoregon.gov/bps/68520	
W4.8	fruit teams	Partner with food banks and neighborhoods to harvest fruit from urban fruit trees.	Thad Curtz	Sept '19	Food Bank		food banks	Portland's Fruit Tree Project (https://www.portlandfruit.org/) or Seattle's City Fruit (https://www.cityfruit.org/join-us/about-us)	
W4.9	organics collection	Require food waste pickup at residential and commercial buildings to reduce landfill methane. Compliment with an ordinance that restricts compostables from going into the garbage and has a fining structure to enforce.	Thad Curtz	Sept '19	Local government		food bank; realtors	Seattle has an existing program. "Seattle Municipal Code (SMC) sections 21.36.082 and 21.36.083 require that residents and businesses do not put food scraps, compostable paper, yard waste, and recyclables in their garbage. .... Seattle Public Utilities (SPU) gives warning notices for garbage containers that contain recyclables or compostables. For each warning, the property will receive a tag on the container and a notice will be mailed to the account. After 2 warnings, properties may receive a $50 fee on their waste bill for recyclables in the garbage.	
W4.10	waste less food program	Expand the TC Public Works "Waste Less Food" program.			Thurston County				Increasing education/outreach and programming drives up consumer rates, which decentivizes participation
W4.11	regional recycling	Conduct an analysis of how a regional recycling facility could build local markets for recyclable materials. Develop a cost vs benefits analysis and present to policy makers.	WW Focus Group #1	Aug '19	Thurston County, EDC,			Longview Paper Mill - takes all mixed grade paper	
W5: Generate energy from waste sources									
W5.1	waste-to-energy	Research the opportunities to generate additional energy from waste products (e.g., woody biomass and sewage) in Thurston County to reduce fossil fuel consumption and present to policy makers for consideration.	Adaptation Plan	Jan '19	Colleges, WSUx		renewable energy companies (?)	TC waste is being converted into renewable natural gas (RNG)	Expensive to construct, and hard to find available space. Air quality implications to burning waste, what are emissions in burning?
W5.2	heat exchange	Research the feasibility of heat exchange potential of embedded energy in wastewater and/or reclaimed water and present to policy makers for consideration.	Rich Hoey	Aug '19	LOTT			Similar to district heating idea.	
W5.3	kinetic energy	Research the feasibility of utilizing kinetic energy from transport of water and wastewater through piping networks and present to policy makers for consideration.	Art Starry, Thurston County Environmental Health	Aug '19	Thurston County				
W5.4	FOG waste	Research feasibility of program to digest Food, Oils, and Grease (FOG) and/or commercial food waste at LOTT to recover energy and increase methane production and present to policy makers for consideration.	Thad Curtz/WW Focus Group #1	Sept '19	LOTT	local restaurants, local schools			

W5.5	dry anaerobic digesters	Evaluate feasibility of a dry anaerobic digester with associated combined heat and power facility to process organics and agricultural waste locally. Present findings to appropriate policy makers for their consideration.	Thad Curtz/WW Focus Group #1	Sept '19	Thurston County		renewable energy companies; farmers/ ranchers		
W6: Reduce consumption of carbon-intensive goods and services									
W6.1	consumption emissions education	Develop an education program about consumption-based emissions and simple ways to track and reduce consumption-based emissions for residents of Thurston County.	Ashland Climate & Energy Action Plan	Jan '19	Local government				
W6.2	meat reduction	Develop awards/recognition programs for restaurants that encourage plant-rich diet that reduce meat consumption.	Thurston Thrives	Jan '19	Local government				
W6.3	collaborative consumption	Develop a awards/recognition programs for "collaborative consumption" community projects like tool libraries and repair cafes, through mini-grant programs to encourage their use and new projects.	Cascadia Consulting	Aug '19	Local government		low-income communities; communities of color; rural communities		
W6.4	environmentally preferable purchasing policy	Local governments require departments, agencies, consultants and contractors to use recycled products whenever possible and not cost prohibitive.	Cascadia Consulting	Aug '19	Local government		construction companies/ contractors		
W6.5	product stewardship	Support state-level product stewardship legislation that requires producers to be involved in end-of- product-life management, either through product design changes (e.g. compostable snack bags), investing in take back programs , or placing a fee on the sale of products to support diversion.	Cascadia Consulting	Aug '19	State government				
W6.6	supply chain	Provide free technical assistance to local businesses in reducing the carbon intensity of their supply chains.	Multnomah County Climate Action Plan		Local government				
W6.7	water fill stations	Require all government-owned water fountains be replaced with water bottle filling stations at end of life and all new construction requires water bottle filling stations.	Cascadia Consulting	Aug '19	Local government				
W6.8	reusable takeout	Amend health code to allow reusable take out containers.	WW Focus Group #1	Aug '19	Department of Health, Local government				
W6.9	single-use ban	Ban single use plastics (e.g. straws, water bottles)	WW Focus Group #1	Aug '19	Local government				consumer behavior
W7: Reduce emissions of solid waste operations									
W7.1	waste route efficiency	Partner with sanitation companies to evaluate the GHG reduction potential of utilizing one side for street pickup and present to policy makers for consideration.	Thad Curtz	Sept '19	Local government			Technology exists: Hybrid trucks and powered by CNG. Currently done by Olympia; is this done by other providers?	
W7.2	waste service areas	Mandate that areas served redundantly by municipalities and private waste collection are eliminated, such as the Tumwater/Olympia border south of the high school, by trading service areas	Thad Curtz	Sept '19	Local government				
W7.3	garbage fleet electrification	Electrify garbage truck fleet. Start by developing plan for municipal and private waste collectors that includes financing options.	Thad Curtz	Sept '19	Local government			Seattle's new BYD EV rear-loader https://arstechnica.com/cars/2019/05/seattle-makes-history-with-electric-garbage-truck/ Volvo EV garbage truck https://www.motorauthority.com/news/1116920_volvo-introduces-electric-delivery-garbage-truck-with-186-mile-range Mack EV garbage truck https://www.greencarreports.com/news/1123352_mack-plans-to-send-electric-trucks-to-the-garbage-dump	

A Focus Area: AGRICULTURE & FORESTS

Strategies:

A1: Reduce emissions from agricultural practices.

A2: Support agricultural practices that sequester carbon.

A3: Support production of less carbon-intensive agricultural products, and local food markets.

A4: Preserve existing trees, forest lands, and open space.

A5: Manage forests to sequester carbon.

A6: Reduce emissions from the urban landscape.

A7: Increase carbon sequestration in marine ecosystems.

Action ID#	short name	description	source	date added	implementor	potential partners	target stakeholders	opportunities	barriers
A1: Reduce emissions from agricultural practices.									
A1.1	manure management	Provide education and incentives (grants, loans, technical assistance) to support manure management that reduces methane and nitrous oxide emissions (ex. covered manure storage facilities, manure application practices).	Cascadia Consulting	Aug '19	TCD, WSUx		Farmers/ranchers; rural communities	Existing outreach program through the Thurston Conservation District	Funding for staff and BMP implementation
A1.2	nutrient management	Provide education and incentives (e.g., grants, loans, technical assistance) reduce nitrous oxide emissions when managing fertilizer.	TRPC	Aug '19	TCD		Farmers/ranchers; rural communities		Funding for staff and BMP implementation
A1.3	waste-to-energy	Conduct a feasibility study on small-scale energy production (ex. capture and combustion of methane, anaerobic digestion, biofuel and biogas production), then identify partners, programs and incentives to develop across TC.	TRPC	Aug '19	WSUx		Farmers/ranchers		
A1.4	water use	Develop an incentive program (e.g., technical assistance) to improve the efficiency of agriculture irrigation systems. Identify grant funding.	TRPC	Aug '19	TCD		Farmers/ranchers; rural communities	Drought grant funding through Washington State Conservation Commission	Funding for staff and BMP implementation
A1.5	BMP audits	Develop and incorporate mandatory sustainability audits into conservation/farm plans. Develop program and identify funding reduce energy use and promote best management practices (BMPs).	Cascadia Consulting/ TRPC	Aug '19	TCD		Farmers/ranchers	Washington State Conservation Commission (WSCC) cost-share; build on existing checklists and processes	Funding for staff and BMP implementation

A1.6	feed additives	Provide education to promote methane-reducing livestock feed additives (ex. seaweed derivatives). Make cost effective by partnering with local vendors and consumers to develop a bulk purchase program.	AF Focus Group #1	Aug '19	TCD		Farmers/ranchers		
A2: Support agricultural practices that sequester carbon.									
A2.1	regenerative agriculture	Expand regenerative agricultural practices (ex. low-till, no-till education programs) among farmers that aim for a "whole farm" approach. Provide education on how to increase organic matter content and water retention in soils within urban and agricultural settings.	TRPC	Aug '19	TCD, WSUx	TESC POP program, St Martins	Farmers/ranchers; rural communities	Pilot programs with incentives for farmers; Expand regenerative Ag training programs at insitutions of higher learning to support a new generation of famers that use regenerative agricultural production practices. Existing Equipment rental programs through TCD	Funding for staff and BMP implementation; financial risk for trying new practices or expanding;
A2.3	biochar	Thurston EDC, Port Authority and TCD partner to explore feasibility of biochar enterprise in Thurston County to promote amending soils with biochar.	TRPC	Aug '19	TCD/EDC/Port Authority		Farmers/ranchers		
A2.4	soil carbon research	Fund/support regional soil carbon sequestration research to encourage adoption of region-specific conservation farming practices that store carbon.	WSU	Jan '19	WSUx		Farmers/ranchers		
A2.5	silvopasture	Develop education programs and incentives to encourage farmers to incorporate tree planting on farms (e.g., silvoculture, silvopasture, agroforestry, tree cropping).	AF Focus Group Meeting #1	Aug '19	TCD		Farmers/ranchers		
A3: Support production of less carbon-intensive agricultural products, and local food markets.									
A3.1	farmland preservation	Support farmland preservation through land use policies and financial incentives (e.g., conservation easements) to maintain production capacity and increase self-sufficiency.	AF Focus Group meeting #1	Aug '19	Thurston County	SSFSN	Farmers/ranchers		Economics that lead to conversion of farmland to development
A3.2	food system assessments	Encourage growth of local markets through market research and assessment of our ability to feed ourselves from regionally-produced foods.	AF Focus Group meeting #1	Aug '19	TESC, WSUx	TEDC, WSUx, Senior Svs South Sound/ SSFSN	Farmers/ranchers		Lack of understanding of current capacity to meet local market needs
A3.3	processing and distribution hub	Develop a hub to process and distribute regionally-grown agricultural products to local markets (including restaurants, supermarkets, jails, schools, colleges, and hospitals).	AF Focus Group meeting #1	Aug '19	TEDC	WSUx, SSFSN Infrastructure/Processing WIT, EDC	Farmers/ranchers	Regional food can be price competitive, existing EDC programs	Distribution is inefficient locally with many small famrs spread out
A3.5	institutional markets	Explore local policy and financial incentives to increase the percentage of regionally produced foods purchased by cafeterias in government and municipal institutions.	AF Focus Group meeting #1	Aug '19	State and Local governments, school districts	EDC	Farmers/ranchers; rural communities	Existing EDC programs, WSDA grants to food banks to purchase and contract with	more research needed
A3.6	SNAP access	Publicize federal nutrition incentive programs that aim to support small and mid-sized farms, such as SNAP, FMPP, LFPP, and FINI grant.	AF Focus Group meeting #1	Aug '19	Local governments	WA-DOH, Olympia FM, WSUx SNAP program	Farmers/ranchers		
A3.7	hemp production	Develop an economic development plan for attracting industrial hemp production as a way to create local jobs and sequester carbon.	Public comment	Aug '19	EDC, local governments		Farmers/ranchers	Soil testing program	
A3.8	woody crops	Provide technical assistance to help residents, businesses, and the agricultural community grow woody perennial crops that help conserve water, store carbon, and provide other ecosystem services.	Adaptation Plan	Jan '19	Residents, agricultural community, TCD		Farmers/ranchers		
A4: Preserve existing trees, forest lands, and open space.									
A4.1	natural area preservation	Identify and establish a range of diverse, stable, long--term funding sources for the acquisition, restoration, and preservation of prime natural areas.	Cascadia Consulting	Aug '19	Thurston County	land trusts, TCD		Many such programs exist: Conservation Futures, FarmLink, CREP, salmon recovery funding, federal grants, etc. TCD forest planting programs	Lack of consistent Conservation Futures funding leaves a gap of local match funding that dampens ability of Thurston County land trusts (CLT, NLT, SSCFLT) to get funding for projects. Any program should be additional or build on existing programs, new program could take away from what limited funding is there.
A4.2	working land preservation	Identify or develop local funding sources for agricultural and forestry conservation easements. This could include creating a system for bundling small monetary contributions to invest in collective conservation easement or land purchases.	Cascadia Consulting	Aug '19	Thurston County	land trusts, TCD	Farmers/ranchers	Voluntary Stewardship Program, Sentinel Landscape Partnership, Regional Conservation Partnership Program	Lack of consistent Conservation Futures funding leaves a gap of local match funding that dampens ability of Thurston County land trusts (CLT, NLT, SSCFLT) to get funding for projects. Difficult to enforce restrictions through successive landowners
A4.3	tree codes	Review and revise local development regulations to require the carbon sequestration value of existing trees be considered in regulatory requirements like site plan review.	TRPC	Aug '19	Local government				
A4.4	clearing limits	Add clearing limits (usually expressed as percentage) for large lot development in county and city zoning codes.	AF Focus Group meeting #1	Aug '19	Local government		Farmers/ranchers; construction companies/ contractors		
A4.5	stream buffers	Update permitting requirements to increase the required stream buffer size to increase carbon sequestration.	AF Focus Group meeting #1	Aug '19	Local government		Farmers/ranchers	collaborate with salmon preservation efforts	
A4.6	code enforcement	Increase monitoring and enforcement of City and County zoning and other regulations that preserve sensitive areas.	AF Focus Group meeting #1	Aug '19	Local government				
A4.7	clustered development	Incentivize cluster development, such as giving a 10-25% density bonus, to preserve more open space.	WSU	Jan '19	Local government		Construction companies/contractors		
A5: Manage forests to sequester carbon.									
A5.1	reforestation & afforestation program	Develop a coordinated reforestation/afforestation program. Begin by identifying priority areas where reforestation and afforestation may have carbon reduction benefits.	Thurston Thrives	Jan '19	Local government, USFS	TCD (Forest RCPP)			
A5.2	community forests	Expand extent of community forests that consider carbon sequestration in their management goals.	TRPC	Aug '19	3rd Party nonprofit, Thurston County			Opportunity to learn from existing Nisqually Community Forest	Require extensive up front work with community to develop vision and plan - funding would be needed for up front costs.
A5.3	long-rotation timber	Mandate that timber companies lengthen the rotation of timber harvesting in Thurston County as part of their permits.	TRPC	Jan '19	Thurston County, DNR	Weyerhauser	Farmers/ranchers		Need to change the way carbon credits are awarded
A5.4	ecosystem services monetization	Expand market-based approaches for ecosystem services such as carbon credit trading.	WSU	Jan '19	TESC				credits must be valuable enough for commercial forester to buy in
A5.5	species mix	As part of an educational/technical assistance program, promote species mixes for reforestation or aforestation that result in high-density carbon sequestration.	AF Focus Group meeting #1		DNR, NW Natural Resource Group				
A5.6	small forester education	Deploy an educational program for smaller foresters to increase understanding of carbon sequestration, emphasizing the better performance of mature rather than young trees.	AF Focus Group meeting #1		NW Natural Resource Group				
A5.7	legislative efforts	Lobby Washington State legislature in support of bills that positively affect carbon balance on state-managed lands.	AF Focus Group meeting #1		Local government, TCAT				

A5.8	slash-to-biochar	Seek grant funding to process slash to biochar and apply in forestry or agricultural settings.	AF Focus Group meeting #1		WSU extension commercial				
A5.9	slash-to-fuel	Seek grant funding to explore the feasibility of utilizing slash as fuel in forestry equipment at scale commercially.	AF Focus Group meeting #1		WSU extension commercial				
A5.10	laminated timber	Increase allowances for laminated timber in building code.	AF Focus Group meeting #1		Local governments				
A5.11	carbon in the CAO	Authorize carbon as a justification for critical areas ordinance protection.	AF Focus Group meeting #1		Thurston County, Department of Commerce				
A6: Reduce emissions from the urban landscape.									
A6.1	low-maintenance landscaping	Provide marketing and education campaign promoting the planting of low-maintenance landscaping to encourage more vegetation and tree canopy.	Adaptation Plan	Jan '19	Local governments	Thurston Conservation District		TCD and other Native Plant Sales	
A6.2	street tree plan	Create a comprehensive street tree plan and/or planting guide that prioritizes goals for carbon sequestration, climate change resiliency, and other equitably distributed co-benefits. Plan should include minimum stocking standards for street trees.	Cascadia Consulting	Aug '19	Local governments	Thurston Conservation District			
A6.3	urban tree canopy incentive program	Develop partnership with organizations that offer financial incentives for expanding tree canopy in exchange for carbon credits purchased by businesses and other institutions.	Adaptation Plan	Jan '19	Local governments	nonprofits, neighborhoods, residents, property owners, K-12, Thurston Conservation District	Construction companies/contractors (?)	City Forest Credits in Seattle (https://www.cityforestcredits.org/) leading an effort to not just get more urban tree cover but create incentives for it. Could be an avenue that municipalities can use to at least make the effort break even? Seattle Free Tree Program Nature Conservancy Tree Planting Grants	
A6.4	tree protection	Revaluate municipal tree protection ordinances based on a review of national best practices.	AF Focus Group meeting #1		Local governments		Construction companies/contractors (?)		
A6.5	municipally-controlled canopy	Maximize tree canopy on City-owned or City-controlled land.	AF Focus Group meeting #1		Local governments				
A6.6	tree-aware zoning	Modify zoning setbacks and similar provisions designed to provide room for and encourage large trees.	AF Focus Group meeting #1		Local governments		Construction companies/contractors		
A6.7	adaptation	Educate City and County staff about low cost ways to adapt infrastructure to conform to the needs of growing trees, rather than removing the trees.	AF Focus Group meeting #1		Local governments				
A6.8	landscape regulation	Modify landscape development code requirements to direct the use of landscaping appropriate to the site that provides shade in summer/ sun in winter.			Local governments		Construction companies/contractors		
A6.9	Tree canopy ordinance	Develop a tree canopy ordinance that establishes a baseline for current urban canopy and sets goals for future canopy to increase cities' resilience. Combine direct cooling value (urban heat island mitigation) with carbon sequestration value when evaluating urban tree management.			Local governments		Construction companies/contractors		Low emission sector and regulatory action so medium to high impact.
A7: Increase carbon sequestration in marine ecosystems.									
A7.1	marine vegetation	Understand current efforts and develop a plan to enhance the protection of marine vegetation such as eelgrass to improve water quality, sequester, and improve fish habitat and survival.	Adaptation Plan	Jan '19	Thurston County, Puget Sound Partnership, DNR	nonprofits, neighborhoods, residents, agricultural community, property owners		Squaxin Island Tribe research/project in Oakland Bay; decisions around Capitol Lake; USGS	
A7.2	blue carbon	Research actions to implement blue carbon programs in Thurston County aimed at sequestering carbon through the conservation and restoration of coastal and marine ecosystems.	Public Survey		Thurston County, Puget Sound Partnership				

G Focus Area: CROSS-CUTTING (GENERAL)

Strategies:

G1: Conduct education and outreach across climate mitigation areas.
G2: Support a green local economy.
G3: Fund climate mitigation actions.
G4: Enhance monitoring and evaluation of climate mitigation measures and outcomes.
G5: Advocate for climate-mitigating state and federal policy.

Action ID#	short name	description	source	date added	implementor	potential partners	target stakeholders	opportunities	barriers
G1: Conduct education and outreach across climate mitigation areas.									
G1.1	educational website	Develop user-friendly website and outreach materials to educate residents of the health and cost benefits of reducing GHG emissions in their lives and homes and resources on how to do it.	Cascadia Consulting	Aug '19	Other community partner				
G1.2	consumption (COMBINE WITH G1.5)	Develop and run community based social marketing program to reduce consumption and inform consumers about options for reducing their carbon footprint.	Thad Curtz	Sept '19	Local governments/other community partner			Lower thermostats, buy more fuel efficient vehicles, buy less plastic containers, allow grass to grow longer or even die, stop washing sidewalks and driveways.	
G1.3	ClimeTime	Coordinate OSPI ClimeTime program with local government to bring youth into the feedback and planning process of developing climate mitigation programs and policy.	G Focus Group #1	Sep-19	OSPI/Local government				
G1.4	Career Connects	Set a target to increase the percentage of green jobs in the Career Connects WA program each year.	G Focus Group #1	Sep-19	State		workforce development		
G1.7	social research (COMBINE WITH G1.2)	Work with higher education institutions to research effective behavior change through marketing and educate. Use this information in developing campaigns to reduce high emissions GHGs.	G Focus Group #1	Sep-19	Higher education/Local government				
G1.9	staff training	Develop climate mitigation practices for government employees at work and require they be implemented. Set outcomes to measure effectiveness.	CAW	Oct-19	Local government				
G2: Support a green local economy.									
G2.1	clean energy economy	Set policy that requires recruitment and retention practices for clean energy economy companies.	TRPC	Jan '19	Local government, EDC		workforce development		
G2.2	sustainable businesses	Develop a green guide for area businesses and build award programs to reward implementation.	Cascadia Consulting	Aug '19	Local government, EDC, Cambers of Commerce				
G2.3	clean economy roundtables	Organize and facilitate roundtables with business leaders focused on clean economy strategies.	Cascadia Consulting	Aug '19	Local government				

G2.4	technical clearinghouse	Have TRPC or another entity function as a clearinghouse for government regulations roadblocks to clean technology development.	G Focus Group #1	Sep-19	TRPC				
G2.5	cleantech park	Develop a "cleantech" business park and provide incentives (tax, utility) for green business that co-locate.			Local government, Port		rural communities		
G2.6	training diversification	Work with the Workforce Training and Education Coordinating Board (WTB) to ensure a wide variety of green jobs is part of the workforce training.	G Focus Group #1	Sep-19	WTB/Local government		workforce development		
G2.7	jobs leadership	Provide technical assistance to local businesses to generate green jobs and practices.	G Focus Group #1	Sep-19	EDC				
G3: Fund climate mitigation actions.									
G3.1	tax benefits	Develop tax incentives for businesses that demonstrate GHG reductions in their production.	G Focus Group #1	Sep-19	Local government				
G3.2	cost-sharing	Develop an Office of Green Building to work with the business sector to partner in sharing costs and expertise.	G Focus Group #1	Sep-19	Local government, EDC				
G3.3	green energy bond	Develop a green energy bond providing a monetary incentive to tackle prominent social issues such as climate change and a movement to renewable sources of energy. Start by researching the feasibility and impact.	G Focus Group #1	Sep-19	Local government			San Diego's- green energy bond? - Could be a model for other public entities for energy retrofits	
G3.4	crowdsourcing	Develop and launch a crowdsourcing platform (like "The Gamechanger") that allows entrepreneurs to submit green proposals for policies and projects for local government and businesses and ideas to influence the future of energy and help to overcome a specific challenge.	G Focus Group #1	Sep-19	private entity				
G4: Enhance monitoring and evaluation of climate mitigation measures and outcomes.									
G4.1	emissions inventory	Prepare and publish an annual emissions inventory that tracks greenhouse gas emissions by jurisdiction and source category. Review and update emissions inventory methodology as necessary to address improvements to data or methodologies, improve consistency, incorporate changes to state or federal policies, or report on issues of local interest.	TCAT	Aug '19	TRPC, TCAT	Thurston County, Lacey, Olympia, Tumwater, TCAT, others		TCAT has been producing regular emissions inventories using a comparable EPA methodology, and has past data entered into ClearPath.	
G4.2	performance measures	Develop community GHG reduction goals and performance measures. Regularly update and publicize for community to track their progress.			Local government, TCPC		low-income communities; communities of color; rural communities		
G4.3	other emission sources and sinks	Expand sources and sectors in future emissions inventories to inform future regulatory policy to reduce GHG emissions. Connected to actions T1.5 and W6.1, and sequestration actions.	Cascadia Consulting, TCAT	Aug '19	TRPC, TCAT			Review Cascadia and TCAT memos for suggestions on examples.	
G4.4	vulnerable populations	Develop a data and monitoring mechanism that is specific to marginalized groups and their needs related to climate change and climate reality (e.g., access to transportation, access to A/C, proximity to cooling centers) and develop a plan to address these vulnerabilities with solutions that help reduce GHG emissions.	Cascadia Consulting	Aug '19	TRPC		communities of color; low-income communities; rural communities		
G4.6	social cost of carbon	Develop and adopt policies that require the use of a "social cost of carbon measure" in zoning, development, construction, and transportation decisions.	TCAT	Oct-19	Local government				
G5: Advocate for climate-mitigating state and federal policy.									
G5.1	UTC presence	Track, monitor and share information about Washington Utilities and Transportation Commission (UTC) meeting and actively recruit residents to give feedback and attend meetings to support bold GHG emission policy.	G Focus Group #1	Sep-19	NGOS				
G5.2	solar-ready building code	Add as a high priority to municipality's legislative agenda - State-level amendments to State building code requiring solar-ready construction. Work with other cities to add this to the Association of Washington Cities (AWC) priorities.	CAW	Oct-19	Local government/AWC		construction companies/ contractors; realtors		
G5.3	net-zero building code	Add as a high priority to municipality's legislative agenda - State Building Council and State Legislature to require net-zero energy use in all new buildings by the 2031 residential code cycle and amendments to State building code each 3-year cycle to meet that goal. Work with other cities to add this to the AWC priorities.	CAW	Oct-19	Local government/AWC		construction companies/ contractors; realtors		
G5.4	utility advocacy	Add as a high priority to municipality's legislative agenda - State and Utilities and Transportation Commission in implementing SB 5116, which requires a shift to clean electricity.	CAW	Oct-19	Local government		construction companies/ contractors; realtors; renewable energy companies		
G5.5	legislative agenda	Prioritize combating climate change in the municipality's legislative agenda each year. Instruct municipal lobbyist to track and report on climate bills, and to advocate for those bills that will help reduce local emissions. Work with other cities to add this to the AWC priorities.	CAW	Oct-19	Local government				
G5.6	Clean energy	Local government adopt and communicate policy statements and positions with the State Electeds that call for rapid conversion to clean energy in the power supply that serves Thurston County.			Local government				

Appendix 10.4 - Multicriteria Analysis

Appendix 10.7

Multicriteria Analysis

May 2020

Overview

The Thurston Climate Mitigation Plan used a multicriteria analysis to prioritize a list of communitywide actions. This analysis applied input from the consultant team, key stakeholders, and technical experts to qualitatively assess how each action could address the goals of this project, including the potential for each action to reduce greenhouse gas emissions.

Background Timeline

- *July – October 2019:* The Climate Advisory Workgroup (CAW) and Steering Committee reviewed various options for criteria, suggested by the consultant team and results of the public survey. The Steering Committee approved four criteria to use for the multicriteria analysis at their October 24 meeting.
- *November – December 2019:* TRPC hosted five focus group meetings, during which participants assigned qualitative scores to all communitywide actions using criteria selected by the Steering Committee.
- *January 2020:* The consultant team used the criteria rankings to develop a Total Priority Score (TPS) for each action. The CAW reviewed the scores (January 16) and the Steering Committee (January 23) approved an approach to weighting different criteria including a boost for actions identified as a high priority by youth.
- *January 23:* The Steering Committee directed staff to develop a list of approximately 50 priority actions, using their Total Priority Score. The Committee asked to see a list that included actions that appear repeatedly when evaluated with different approaches, and that incorporated youth and stakeholder priorities.

Criteria Selection

On October 24, 2019, the Steering Committee approved[1] the following criteria for the multicriteria analysis:

[1] For a detailed description of the Criteria Selection process, see Attachment A.

CRITERIA	DESCRIPTION
GHG reduction potential	The annual quantity of greenhouse gas emissions (GHG) an action will avoid or sequester as of 2030.
Speed of deployment	Minimum time possible between decision to recommend an action, and achievement of the annual GHG reduction potential.
Control	One or more of the four project partners can likely influence the implementing party(ies), or can create the necessary regulatory structure.
Co-benefits ❑ **ecosystem health** ❑ **social equity** ❑ **economic benefit** ❑ **other**	Supports one or more of the regional goals (aside from #9 – carbon neutrality)

Qualitative Assessment

Ranking Methodology

Cascadia Consulting Group and TRPC staff further defined each criteria to create a scoring method using a ranking scale. An action was assigned a rank between 1 and 5 for each of the four criteria, depending on the effectiveness of the action to meet the definition of that criteria. The following tables show the qualitative scoring applied for each criterion:

GHG REDUCTION POTENTIAL: The annual quantity of greenhouse gas emissions (GHG) an action will avoid or sequester as of 2030.

Ranking	Low/High Emissions Sector	Low/High Emissions Subsector	Confidence/Probability of Impact
1	**Low** (e.g., water/waste and land carbon sequestration)	**Low** (e.g., industrial, municipal)	**Low** (voluntary education/outreach; limited ability to scale)
2	**Low** (e.g., water/waste and land carbon sequestration)	**Low/ High** (e.g., industrial, municipal, residential, commercial)	**Medium/High** (monetary incentives, regulation, or capital project; or voluntary with ability to scale)
3	**High** (e.g., transportation/land use and buildings)	**Low** (e.g., industrial, municipal)	**Low/Medium/High**
4	**High** (e.g., transportation/land use and buildings)	**High** (e.g., residential, commercial)	**Low/Medium** (voluntary with monetary incentives or education/outreach with ability to scale)
5	**High** (e.g., transportation/land use and buildings)	**High** (e.g., residential, commercial)	**High** (large-scale capital project or regulation/policy)

CONTROL: One or more of the four project partners can likely influence the implementing party(ies), or can create the necessary regulatory structure.

Ranking	Anticipated Jurisdiction Role
1	Advocate at a non-TCMP entity
2	Voluntary partner with a non-TCMP entity
3	Official partner (e.g., MOU) with non-TCMP entity
4	Funder of non-TCMP entity
5	TCMP entity is implementor or regulator

** If more than one project partner is collaborating on the effort, then move ranking up by 1 level.*

SPEED OF DEPLOYMENT: Minimum time possible between decision to recommend an action, and achievement of the annual GHG reduction potential.

Ranking	Requires legislative action	Technology exists	Funding mechanism exists
1	Yes	No	No
2	Yes	No	Yes
2	Yes	Yes	No
3	Yes	Yes	Yes
4	No	No	Yes
4	No	Yes	No
5	No	Yes	Yes

CO-BENEFITS: Supports one or more of the following regional goals:

- **Ecosystem Health**
- **Social Equity**
- **Economic Benefit**
- **Climate Adaptation**
- **Other Regional Goals**

CO-BENEFIT	DEFINITION – APPLICABLE REGIONAL GOAL OR CONCEPT
Ecosystem health	2. Preserves environmentally sensitive lands, farmlands, forest lands, prairies, and rural lands, and develops compact urban areas; 4. Protects and improves water quality, including groundwater, rivers, streams, lakes and Puget Sound; 8. Ensures that the region's water supply sustains people in perpetuity while

	protecting the environment; 10. Maintains air quality standards;
Social equity	6. Ensures that residents have the resources to meet their daily needs; SE: Increases equal distribution of or access to housing, financial incentives, open space, economic opportunity, or other resources, among disadvantaged or marginalized communities.
Economic benefit	3. Creates a robust economy; 7. Supports a local food system to increase community resilience, health and economic prosperity; 12. Make strategic investments to advance sustainability regionally.
Adaptation value	ADAPT: Supports an action in the 2018 Thurston Climate Adaptation Plan.
Other	1.Creates vibrant centers, corridors and neighborhoods while accommodating growth; 5. Plans and acts toward zero waste in the region; 11. Provide opportunities for everyone in the Thurston Region to learn about and practice sustainability;

	Number of supported co-benefits
1	Supports 0-1 co-benefits
2	Supports 2 co-benefits
3	Supports 3 co-benefits
4	Supports 4 co-benefits
5	Supports 5 co-benefits

Ranking

Sector Focus Groups

In late 2019, TRPC organized a series of five focus group meetings to score communitywide climate mitigation actions based on the criteria determined by the Steering Committee and utilizing the qualitative scoring methods described above. For a detailed summary of the sector focus groups see Attachment B.

The first meeting was a youth and educator focus group hosted by the Olympia School District on November 18, 2019. Student representatives reviewed the full action list and selected a subset of 122 actions they thought would be most relevant to youth and educators. The meeting participants ranked these actions for the “GHG Reduction potential” and “Co-benefits” criteria by asking:

1. How effective do you think this action will be at reducing greenhouse gas emissions?
    - Scale of 1-5, where 1=not at all effective and 5=very effective

2. How effective do you think this action will be at providing other community benefits, other than greenhouse gas reductions? (Such as, benefits for the environment, social equity, economics, or adaptation)
    - Scale of 1-5, where 1=no co-benefits and 5=many co-benefits

Each action was provided a numerical rank by four different people based on the two criteria. Each participant then identified their three highest and three lowest priority actions, irrespective of score, using red and three green stickers. TRPC staff used the scores and stickers to identify a top 20 list of youth and educator priority actions (see Attachment C).

Four meetings with the same general format were held between December 2-4 for subject matter experts in the Buildings and Energy, Transportation and Land Use, Water and Solid Waste, and Agriculture and Forests sectors. Prior to these meetings, the consultant team assigned all actions an initial rank for "GHG Reduction Potential." Participants were asked to review the assigned ranks for "GHG Reduction Potential" and the rationale provided by the consulting team. They then ranked these same actions for "Control" and "Speed of Deployment," using the defined criteria, and provided their rationale. Participants received a handout that specified how to apply qualitative scores. Sector focus group participants were also asked to identify what they believed were the three highest and three lowest priority actions using red and green stickers.

Following these meetings, TRPC staff assigned qualitative scores for the "Co-benefits" criteria. TRPC staff also recorded all participants' low priority/red sticker and high priority/ green sticker selections.

The CAW reviewed the initial criteria rankings at their meeting on January 16, 2020, and provided comments and suggested improvements. Staff presented a revised version of the multicriteria analysis results to the Steering Committee at their meeting on January 23, 2020.

Total Priority Score

The consultant team combined the criteria rankings to develop a "Total Priority Score" for each action. Input from the CAW and public survey suggested that rather than treat each criteria as equally important, individual criteria should be weighted, so that some criteria would be more influential in determining an action's total score.

The Steering Committee reviewed different options for weighting the results of the multicriteria analysis and settled on the following calculation: **GHG Reduction Potential 40%, Control 25%, Speed of Deployment 15%, and Co-benefits 20%**. The Steering Committee requested that a "boost" be given to youth priorities, so an additional 0.1 was added to any action on the top 20 priority actions for youth and educators (listed in Attachment C). The following example provides a breakdown of how weights are applied to calculate the "Total Priority Score:"

Example Total Priority Score Calculation

CRITERIA	EXAMPLE RANK	WEIGHT	WEIGHTED SCORE
GHG reduction potential	5	0.4 (40 percent of total action score)	2.0
Control	3	0.25 (25 percent of total action score)	0.75
speed of deployment	4	0.15 (15 percent of total action score)	0.6
Co-benefits	2	0.20 (20 percent of total action score)	0.4
TOTAL	*	= 1.0 (100 percent of total action score)	**3.6 out of possible 5.0**
YOUTH BOOST	**Y**	**+ 0.1**	**3.7**

The consultant team presented three approaches to use the Total Priority Score to develop a list of priority actions. The following descriptions outline the proposed "Sorted Actions" lists with reference tables provided at the end of this document:

Top TPS scores among all actions:

The "Top 50 overall actions" list includes actions that received the highest Total Priority Scores during the multicriteria analysis. This list prioritizes actions in high emission sectors that received high scores in the weighted "GHG Reduction Potential" criteria (Transportation & Land Use and Buildings & Energy). The "Top 50 overall actions" list is provided at the end of this document for reference (Attachment C).

Top TPS scores for each sector:

The "Top actions by focus area" list includes the top-10 ranked actions across all sectors (Buildings & Energy, Transportation & Land Use, Agriculture & Forestry, Water & Waste, Cross-Cutting). This list prioritizes parity among actions across all sectors whether they were identified as high emission sectors (Transportation & Land Use and Buildings & Energy), or low emission sectors (Agriculture & Forestry and Water & Waste). The "Top actions by focus area" list is provided at the end of this document for reference (Attachment D).

Top TPS scores for each strategy:

The "Top actions by strategy" list includes the top-ranked action for all strategies within each sector. Each sector was assigned strategies based on how the sector specifically addressed climate change mitigation. Similar to "Top actions by focus area" this list prioritizes parity but considers each sector strategy equally as opposed to top sector actions alone. The "Top actions by strategy" list is provided at the end of this document for reference (Attachment E).

Top actions across all three lists:

The "Top actions across all three lists" list ranks all communitywide actions according to their occurrence in each of the three sorting methods identified above. Actions identified in all three sorted lists were ranked highest, followed by actions identified in two of the three sorted lists, actions identified in one of the three sorted lists, and lastly actions that were not identified in any of the three sorted lists. All actions are sub-ordered based on their associated TPS score. The "Top actions across all three lists" list is provided at the end of this document for reference (Attachment F).

All ranked actions list:

The all ranked actions list contains all actions ordered by their final TPS score only. No sorting options mentioned above are applied to this list. The "All ranked actions list" is provided at the end of this document for reference (Attachment H).

- Attachment A: Criteria for Analysis
- Attachment B: Sector Focus Groups Summary
- Attachment C: Youth & Educator Priority Actions
- Attachment D: Top 50 overall actions
- Attachment E: Top actions by focus area
- Attachment F: Top actions by strategy
- Attachment G: Top actions across all three lists
- Attachment H: All ranked actions

Criteria for Analysis

Approved by Steering Committee, October 24, 2019

Approved Criteria

The Thurston Climate Mitigation Plan will include a list of communitywide actions to reduce greenhouse gas emissions in order to meet the adopted emissions reduction target. The full list will be evaluated to help identify the most promising actions by estimating how actions meet certain criteria that represent community values for the plan.

On October 24, 2019, the Steering Committee approved the following criteria to use in the initial analysis of actions:

CRITERIA	DESCRIPTION
GHG REDUCTION POTENTIAL	The annual quantity of greenhouse gas emissions (GHG) an action will avoid or sequester as of 2030.
SPEED OF DEPLOYMENT	Minimum time possible between decision to recommend an action, and achievement of the annual GHG reduction potential.
CONTROL	One or more of the four project partners can likely influence the implementing party(ies), or can create the necessary regulatory structure.
CO-BENEFITS ❑ **ECOSYSTEM HEALTH** ❑ **SOCIAL EQUITY** ❑ **ECONOMIC BENEFIT** ❑ **OTHER**	Supports one or more of the regional goals (aside from #9 – carbon neutrality)

The Workgroup and Steering Committee will use the analysis as one tool in developing a Climate Mitigation Plan, but can also consider other factors to make the strongest plan. The Steering Committee will consider cost at a later stage of the analysis.

Background

Over the summer and fall of 2019, the Workgroup and Steering Committee reviewed various options for criteria, with the goal of narrowing a list of more than 20 potential criteria to no more than five to fit within the project budget and schedule.

- *July 18:* Climate Advisory Workgroup members reviewed an initial list of criteria, and suggested modifications and additional criteria through August 5th.
- *August 29:* The Steering Committee reviewed the draft list of potential criteria and Workgroup input, and provided initial feedback to develop a list of 21 potential criteria.
- *September:* TRPC sent out a survey to Workgroup members to indicate their top preferences for criteria that should be considered in the evaluation. The top five results are indicated with an (X) in the attached table.
- *October 4:* The Workgroup discussed criteria and developed a recommendation on preferred criteria to bring to the Steering Committee, indicated with a plus (+) in the attached table.
- *October 24:* The Steering Committee reviewed the Workgroup's recommendation on criteria, as well as feedback from the public survey, and decided which criteria to develop for the initial analysis of actions, indicated with an asterisk (*) in the attached table.
- *Late fall/winter:* The Workgroup will meet as smaller sector-specific Focus Groups to assign initial, qualitative values of criteria to the action list. The consultant team will develop quantitative values for the highest priority actions.
- *January 2020:* Initial analysis results will be presented to the Steering Committee and Workgroup. Criteria may be adjusted, based on the group's feedback.
- Criteria choices can be reevaluated in the future as the plan is implemented, reviewed, and updated.

candidate criterion	definition	units of measurement	CAW survey	CAW 10/4 Recommendation	Steering Committee 10/24 Decision
GHG reduction potential	The annual quantity of GHG emissions an action will avoid or sequester as of 2030.	metric tons of CO_2-equivalent	X	+	*
speed of deployment	Minimum time possible between decision to recommend an action, and achievement of the annual GHG reduction potential.	years	X	+	*
control	One or more of the four project partners can likely influence the implementing party(ies), or can create the necessary regulatory structure. Absence of legal barriers.	*ordinal criterion*			*
economic benefits	Strengthens local economy, reduces external dependencies, improves community resilience, maximizes benefits without externalizing costs.	*ordinal criterion*	X		* - as part of co-benefits
ecosystem health	Habitat preservation or creation; water quality benefits; water flow benefits.	*nominal criterion*	X		* - as part of co-benefits

Abbreviations & Definitions

Action: a proposed activity that will be evaluated for its ability to contribute to the vision and goals of the TCMP

CAW – Climate Advisory Workgroup

CO_2 – carbon dioxide

FTE – full-time equivalent (*e.g.* a job that employs someone 40 hours/week)

GHG – greenhouse gas

nominal – represented by a set of values or categories with no particular order or rank (*e.g.* Yes, No)

ordinal – represented by a set of values that express order or rank (*e.g.* low, medium, high)

TCMP – Thurston Climate Mitigation Plan

candidate criterion	definition	units of measurement	CAW survey	CAW 10/4 Recommendation	Steering Committee 10/24 Decision
social equity	Increases equal distribution of or access to housing, financial incentives, open space, economic opportunity, or other resources, among disadvantaged or marginalized communities.	*ordinal criterion*		+	* - as part of co-benefits
adaptation value	Degree to which the mitigation action provides adaptation values identified in the Thurston Climate Adaptation Plan.	*ordinal criterion*			* - as part of co-benefits
builds capacity	Does the action help create or strengthen the infrastructure and resources needed to sustain the action into the future?	*nominal criterion*		+	
clean air	Reductions in conventional air pollutants.	*nominal criterion*			
direct cost	Spending required of the implementing entity, in order to achieve the gross GHG reduction potential.	net present value of all spending through Dec. 31 2030			

Abbreviations & Definitions

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ordinal – represented by a set of values that express order or rank (*e.g.* low, medium, high)

TCMP – Thurston Climate Mitigation Plan

candidate criterion	definition	units of measurement	CAW survey	CAW 10/4 Recommendation	Steering Committee 10/24 Decision
educational value for behavior change	Degree to which the action educates residents in ways that inspire them to adopt behaviors that help achieve emissions reduction targets.	*ordinal criterion*		+	
employment	Increases to jobs available in Thurston County.	FTE jobs			
funding resource	Appropriate funds, funders or lenders available for the action as described. May be partial (*e.g.* for only one project stage).	*nominal criterion*			
measurability	A precise GHG reduction can be computed from a quantifiable activity metric.	*ordinal criterion*		+	
nontoxicity	Reductions in toxic emissions.	*nominal criterion*			
political feasibility	Champion agency or organization exists. Community is likely to accept or perform the work needed to complete the action. Absence of opposition.	*ordinal criterion*			

Abbreviations & Definitions

Action: a proposed activity that will be evaluated for its ability to contribute to the vision and goals of the TCMP

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ordinal – represented by a set of values that express order or rank (*e.g.* low, medium, high)

TCMP – Thurston Climate Mitigation Plan

candidate criterion	definition	units of measurement	CAW survey	CAW 10/4 Recommendation	Steering Committee 10/24 Decision
quality of life impacts	Benefits to the health, comfort, and happiness experienced by residents of Thurston County, that are not incorporated in other co-benefits criteria.	*nominal criterion*	X		
readiness	Ease of implementation. Overlaps with **speed of deployment**. Inversely proportional to the number of coordinating parties required for implementation.	*ordinal criterion*		+	
total cost	Direct cost plus any additional spending required by other entities to respond to the action that reduces GHGs. May include financial benefits as well as costs.	net present value of all spending through Dec. 31 2030			
track record	Has the proposed action been proven effective in environments comparable to Thurston County? Is there credible documentation of success for similar actions?	*ordinal criterion*			

Abbreviations & Definitions

Action: a proposed activity that will be evaluated for its ability to contribute to the vision and goals of the TCMP

CAW – Climate Advisory Workgroup

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TCMP – Thurston Climate Mitigation Plan

THURSTON CLIMATE MITIGATION PLAN
Advisory Workgroup

Sector Focus Groups

November/December 2019

Thurston Regional Planning Council organized a series of five Sector Focus Group Meetings between November 18 and December 9 to score communitywide climate mitigation actions based on criteria determined by the Steering Committee.

November 18 – Youth & Educator Focus Group Summary

This meeting was hosted by the Olympia School District. Prior to the meeting, a subset of student representatives reviewed the full action list, and selected a subset of 122 actions that they thought would be most relevant to youth and educators, that were stronger and more useful to discuss. The meeting participants then ranked each action for two criteria:

1. How effective do you think this action will be at reducing greenhouse gas emissions?
    - Scale of 1-5, where 1=not at all effective and 5=very effectve
2. How effective do you think this action will be at providing other community benefits, other than greenhouse gas reductions? (Such as, benefits for the environment, social equity, economics, or adaptation)
    - Scale of 1-5, where 1=no co-benefits and 5=many co-benefits

Each action, and each criteria for each action, was ranked by four different people. The numeric ranks were totaled, and actions were posted on a wall in numeric order. Participants then had an opportunity to place up to three green dot stickers on actions they thought were a high priority, and three red dots on stickers they would be comfortable leaving out of the plan (see photo below). Finally, participants shared their observations about the activity, and their rational for why they selected and prioritized certain actions, which included:

- There may be a disconnect between what we think will work and what will make a difference. Need to have information about what will be effective.
- Want to do all the actions. There will be political pushback, but it is past time to be taking action.
- There will need to be incentives for behavior change, but these actions are important.
- Liked actions related to bike and electric vehicle (EV) infrastructure – these also support safety, and that can be a disincentive to biking more
- Liked the “lights out” action – it’s something simple we can do. Also liked the no-vehicle area – again, it’s an action that could be taken without a lot of construction, relatively easily, and there are many examples other places.

- It's hard to pick a top 3, because they are all important.

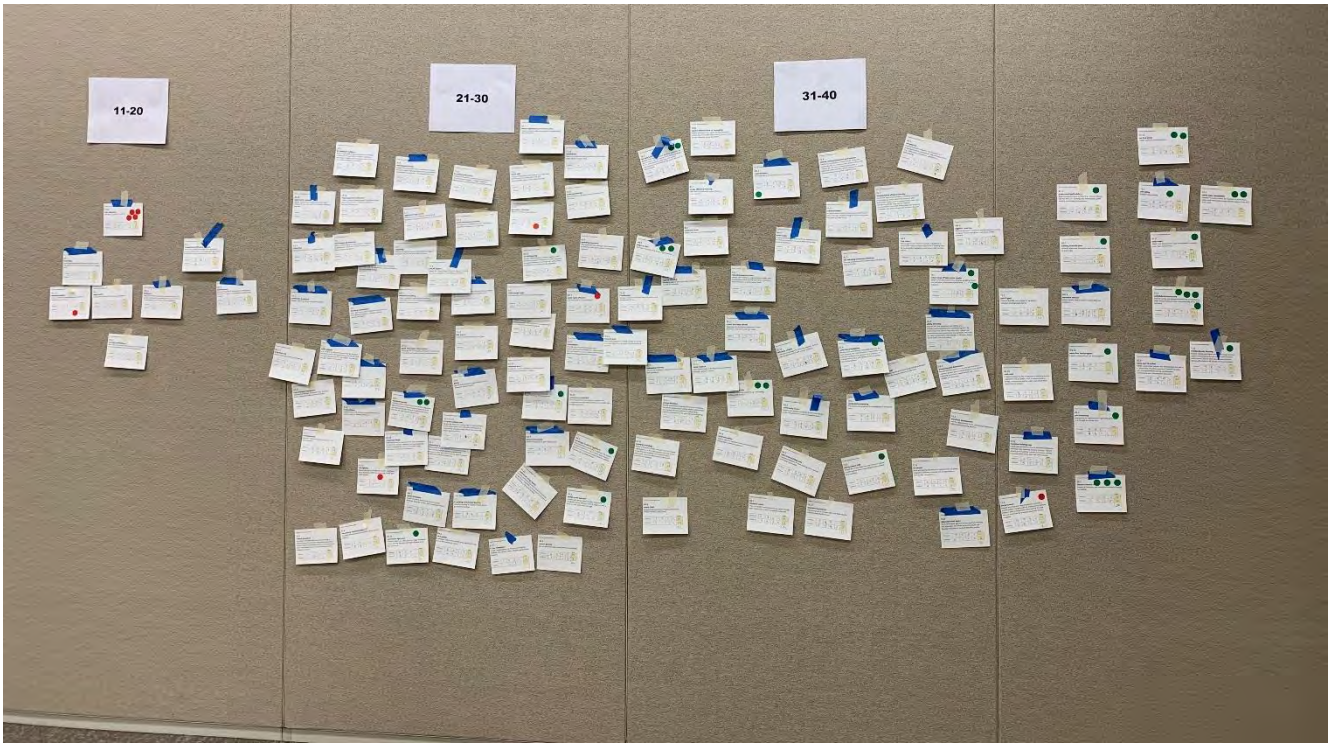

Figure 1. Image of Ranked Actions at Nov 18, 2019, Youth/Educator Focus Group Meeting hosted by Olympia School District.

- Likes actions that focused on incentives, and having EV charging stations at gas stations.
- Likes actions about bikes – it's nice to have areas where no cars are allowed
- Likes the action about developing rail options to Seattle, and incentivizing the switch to solar power.
- Liked the rail to Seattle action, as well as the actions related to no-idling and promoting roundabouts. Also actions that support bikes and EV.
- We need to do it all. Hope we can really go for it and show bold leadership, and education for the community to unleash innovations.
- Liked that youth, who are our future, are here and informing the process. We are listening to you, and hope you feel heard.
- Appreciated that education is very important, but education actions need to be more specific.
- Actions to address changes to passenger vehicles, which make up a large proportion of inventory, are important/difficult to change behavior.

December 2-4 – Sector Focus Groups Summary

Four meetings with the same general format were held for subject matter experts in the following categories: Buildings and Energy, Transportation and Land Use, Water and Solid Waste, Agriculture and Forests. Prior to these meetings, all actions had been given a rank for greenhouse gas reduction potential. Each group reviewed the actions relevant to their sector for the following:

1. Review the "Greenhouse Gas Reduction potential" ranks and rationale provided by the consulting team.

2. Rank each action on a scale of 1-5 for "Control" and "Speed of Deployment." A handout for the meeting specified how to apply this criteria.

Sector focus groups broke out into sub-groups of 4-7 attendees and were provided actions to review. Participants first individually reviewed and ranked 5-10 actions. After all particpants had finished individual work, groups reconvened to review individual grades and agree on group scores. After small groups reached a consensus on their assigned actions, small groups calculated the numerical scores of the actions they asessessed.

The Water, Agriculture, Forests, and Buildings and Energy groups completed this activity with enough time to then identify their individual preferences for actions – each participant had an opportunity to place up to three green dot stickers on actions they thought were a high priority, and three red dots on actions they would be comfortable leaving out of the plan.

Comments on the actions are recorded in the Communitywide Actions List, dated 12/10/2019 Other general comments noted from individual meetings, include:

Buildings & Energy

- Hard to determine GHG reduction without methodology for emmissions breakdown
- Zoning requirement for energy efficiency and RE upgrades in new buildings
- PSE investment in projects to meet SB(5293?) requirement
- Boulder, CO has an energy efficiency requirement that would be useful to review
- Concern that appliance requirements in new construction could limit multifamily housing development due to cost
- Concerns about IgCC measure relatability

Transportation & Land Use

- Many noted discrepencies with actions in strategy T1: Set land use policies that support efficient transportation networks, ie overlap, actions not properly defined.
- T1.1 Urban infill, T1.5 clustered development, T1.8 neighborhood centers, etc too similar, need to be combined or reconceptualized
- Concern about anti-idling focus, considered more productive and better application of resources to support electric vehicle conversion/ infrastructure

Water & Waste

- Definitions of control were hard to understand
- Actions not descriptive enough, more info on program and role desired
- Degrees of separation between control ranks hard to understand
  - W4.1, 4.2, 4.5
- Raised concern about "mechanism" for funding/ not funding an action
- Challenging to understand how a voluntary partner differs from an advocate in control ranking
- Concern over Low/ High emission sector methodology

Agriculture & Forests

- System already in place for collecting food waste Infrastructure
- Concern over Low/ High emission sector methodology

Sector Focus Group Participants

Youth & Educators – November 18, 2019

- Ella Jimenez, Tumwater High School student
- Alexis Nevy, Avanti High School student
- Kurt Cross, Olympia School District – Capital Planning
- Elyanna Calle, Timberline High School student
- Lacy Nadeau, Black Hills High School student
- Ruby Gruber, Olympia High School student
- Kaylee Shen, Olympia High School student
- Rebecca MH, Capital High School student
- Richard Coate, Tumwater High School
- Randy Weeks, Olympia High School
- Tom St Clair, educator
- Kristin Maring, educator
- Abby Ruskey, TCAT/YECO and Athena Group
- Susan McCleary, City of Olympia
- Susan Clark, City of Olympia
- Hilary Seidel, Olympia School District
- Tom Crawford, Thurston Climate Action Team (TCAT)
- Chris van Daalen, Northwest EcoBuilding Guild
- That Curtz, citizen/TCAT
- Allison Osterberg, TRPC
- Sara Porter, TRPC

Water & Waste – December 2, 2019

- Amanda Romero, Thurston County
- Gerald Tousley, Thurston County
- Frank Turner, citizen
- Joe Hiss, citizen
- Ron Jones, City of Olympia
- Helen Wheatley, citizen
- Wendy Steffensen, LOTT
- Gary Franks, City of Olympia
- Eric Christensen, City of Olympia
- Tom Crawford, TCAT
- Art Starry, Thurston County Environmental Health
- Les Tobias, TRPC
- Allison Osterberg, TRPC

Agriculture & Forests – December 2, 2019

- Frank Turner, citizen
- Marilyn Sitaker, The Evergreen State College
- Stephanie Bishop, Thurston Conservation District
- John Roush, City of Olympia
- Loretta Seppanen, CFLT
- Patrick Shults, WSU Extension
- Joe Hiss, citizen
- Jessica Brandt, City of Lacey
- Phyllis Farrell, TCAT
- Lisa Ceazan, citizen
- Les Tobias, TRPC
- Allison Osterberg, TRPC

Buildings & Energy – December 3, 2019

- Jonathan Kaplan, TCAT
- Kelsey Hulse, Puget Sound Energy
- Chris van Daalen, Northwest Ecobuilding Guild
- Owen Martin, The Artisans Group
- Mason Rolph, Olympia Community Solar
- Scott Morgan, The Evergreen State College
- Wayne Olsen, TCAT
- Tom Crawford, TCAT
- Eli Cole, City of Olympia
- Joel Baxter, WA legislature
- Larry Merrell, City of Olympia
- Leonard Bauer, City of Olympia
- Aaron Sauerhoff, Olympia Planning Commission
- Jon Bay, citizen
- Joe Hiss, citizen
- Allison Osterberg, TRPC
- Les Tobias, TRPC

Transportation & Land Use – December 4, 2019

- Karen Messmer, citizen
- David Ginther, City of Tumwater
- Jessica Gould, Intercity Transit
- Chris Hawkins, Thurston County
- Joe Hiss, citizen
- Gary Idleburg, WA Depart of Commerce
- Tom Crawford, TCAT
- Juan Valdez, citizen
- Michael Ambrogi, TRPC
- Allison Osterberg, TRPC
- Les Tobias, TRPC

Youth & Educator Priority Actions

January 28, 2020

The Thurston Climate Mitigation Plan will include a list of communitywide actions to reduce greenhouse gas emissions in order to meet the adopted emissions reduction target. The full list will be evaluated to identify the most promising actions by estimating how actions meet certain criteria that represent community values for the plan. On January 23, 2019, the Steering Committee for the Thurston Climate Mitigation Plan directed staff to include Youth Priorities in the formula for identifying top priority actions – in addition to other approved criteria. This memo outlines the top twenty priority actions [1]ranked by youth and educators.

	ACTION#	SHORT NAME	DESCRIPTION	YOUTH/EDUCATOR TOTAL SCORE	GREEN STICKER
1	B5.6	utility-scale renewables	Promote Thurston County as a location to build more utility-scale renewable energy projects such as solar and wind farms. Support locally owned/operated renewable energy companies.	40	2
2	B5.8	solar-ready	Amend local development code to require solar-ready construction.	39	1
3	T2.3	reduce idling	Work with the State and/or region to enacted legislation to minimize vehicle idling for GHG reductions, improved air quality and increased fuel efficiency. Coordinate with public agencies and private companies that transport people and materials to develop and enact internal policies that reduce idle time.	39	1
4	T5.1	walk/bike infrastructure	Coordinate cities of Thurston Counties Master Bicycle and Pedestrian plans into a large regional plan to expand walking and biking infrastructure, including separated and protected opportunities. Coordinate efforts to maximize funding mechanisms and opportunities.	39	4
5	T5.11	car-free zones	Reevaluate long term plans and update to prioritize pedestrians and people riding bikes. Set goals for mode shift and plans on how to achieve those goals like developing car-free corridors in commercial and mixed use areas to encourage mode shift.	39	2

[1] Top priority actions = actions with Total Scores > 36 or with two or more green dot stickers. This list represents approximately 17 percent of all actions ranked by the Youth/Educator Focus Group.

6	B4.4	green municipal buildings	Require that new local government facilities (e.g., the new Olympia City Hall and LOTT building) demonstrate green building technologies and practices.	38	1
7	T1.2	middle-density housing	Reevaluate and change zoning as needed to allow for a range of housing types to promote social economic integration of housing near the region's urban centers or moderate-density zones. Promote long-term equity and healthy communities by developing incentives such as density bonuses for development where a percentage of the units will be permanently affordable for household incomes that can no longer afford to live in these areas.	38	1
8	T6.1	Olympia-Seattle rail	Update plans to prioritize commuter rail connection between Olympia and Seattle. Work with State partners to develop a plan and find other partners that have similar vision to coordinate with.	38	3
9	W6.8	reusable takeout	Amend health code to allow reusable take out containers.	38	0
10	W4.10	waste less food program	Expand the TC Public Works "Waste Less Food" program.	38	1
11	G2.6	training diversification	Work with the Workforce Training and Education Coordinating Board (WTB) to ensure a wide variety of green jobs is part of the workforce training.	38	1
12	G2.7	jobs leadership	Provide technical assistance to local businesses to generate green jobs and practices.	38	1
13	G4.6	social cost of carbon	Develop and adopt policies that require the use of a "social cost of carbon measure" in zoning, development, construction, and transportation decisions.	38	0
14	G5.3	net-zero building code	Add as a high priority to municipality's legislative agenda - State Building Council and State Legislature to require net-zero energy use in all new buildings by the 2031 residential code cycle and amendments to State building code each 3-year cycle to meet that goal. Work with other cities to add this to the AWC priorities.	37	4
15	B5.3	municipal building solar	Install solar photovoltaics on all available and feasible municipal sites, including building rooftops, city hall, schools, police and fire stations, community centers, municipal water pump sites, and transit depots.	37	0
16	T5.6	park & pool	Require covered and safe bike storage at carpooling and pick up locations.	37	0

17	W6.6	supply chain	Provide free technical assistance to local businesses in reducing the carbon intensity of their supply chains.	37	0
18	W6.9	single-use ban	Ban single use plastics (e.g. straws, water bottles)	35	2
19	T5.4	school drop-off alternative modes	Maintain and expand a walking/biking incentive program with safety education for families.	34	2
20	G5.5	legislative agenda	Prioritize combating climate change in the municipality's legislative agenda each year. Instruct municipal lobbyist to track and report on climate bills, and to advocate for those bills that will help reduce local emissions.	28	2

Background

On November 18, 2019, the Olympia School District hosted a focus group for youth and educators to identify priority actions for the Thurston Climate Mitigation Plan. Prior to the meeting, a small group of student representatives reviewed the full action list, and selected a subset of 122 actions that they thought would be most relevant to youth and educators, that were stronger and more useful to discuss. The meeting participants then ranked each action for two criteria:

1. How effective do you think this action will be at reducing greenhouse gas emissions?
    - Scale of 1-5, where 1=not at all effective and 5=very effective
2. How effective do you think this action will be at providing other community benefits, other than greenhouse gas reductions? (Such as, benefits for the environment, social equity, economics, or adaptation)
    - Scale of 1-5, where 1=no co-benefits and 5=many co-benefits

Each action, and each criteria for each action, was ranked by four different people. The numeric ranks were totaled, and actions were posted on a wall in numeric order. Participants then had an opportunity to place up to three green dot stickers on actions they thought were a high priority, and three red dots on stickers they would be comfortable leaving out of the plan (see photo below). Finally, participants shared their observations about the activity, and their rational for why they selected and prioritized certain actions, which included:

- There may be a disconnect between what we think will work and what will make a difference. Need to have information about what will be effective.
- Want to do all the actions. There will be political pushback, but it is past time to be taking action.
- There will need to be incentives for behavior change, but these actions are important.
- Liked actions related to bike and electric vehicle (EV) infrastructure – these also support safety, and that can be a disincentive to biking more
- Liked the "lights out" action – it's something simple we can do. Also liked the no-vehicle area – again, it's an action that could be taken without a lot of construction, relatively easily, and there are many examples other places.

- It's hard to pick a top 3, because they are all important.

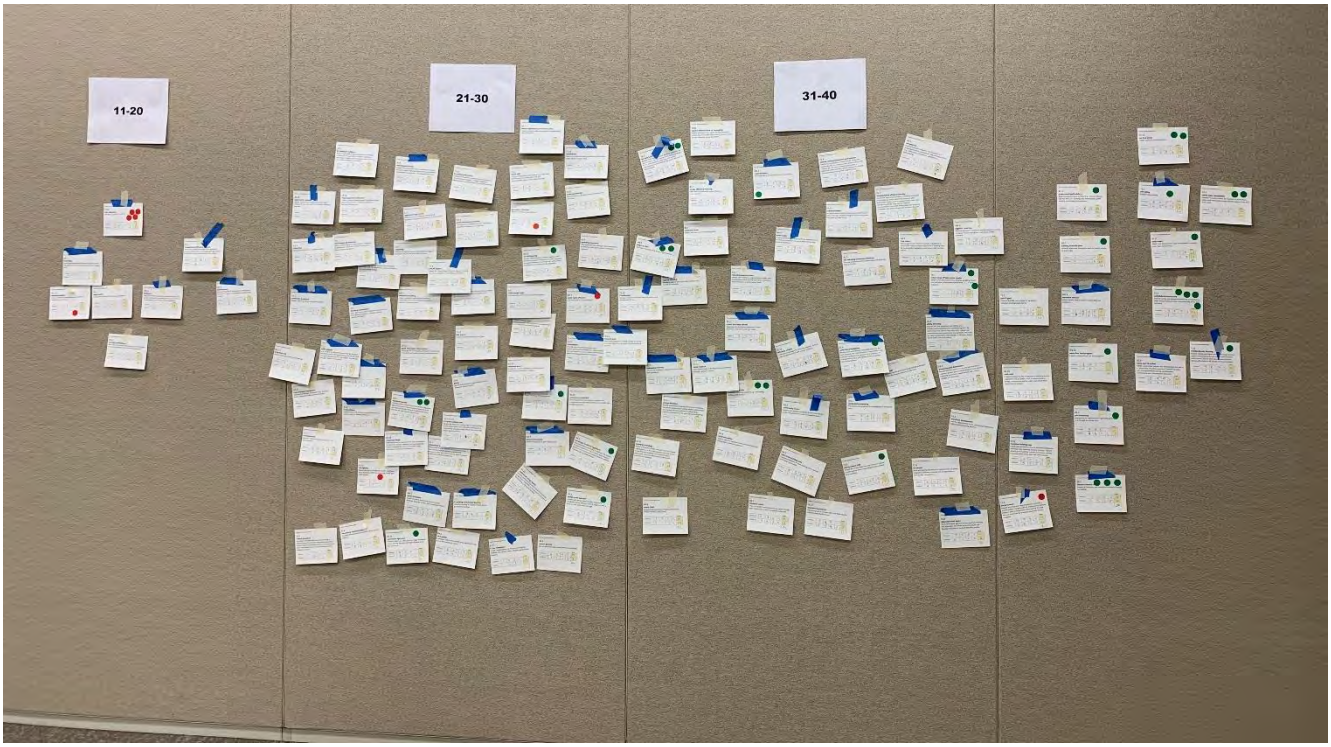

FIGURE 1. IMAGE OF RANKED ACTIONS AT NOV 18, 2019, YOUTH/EDUCATOR FOCUS GROUP MEETING HOSTED BY OLYMPIA SCHOOL DISTRICT.

- Likes actions that focused on incentives, and having EV charging stations at gas stations.
- Likes actions about bikes – it's nice to have areas where no cars are allowed
- Likes the action about developing rail options to Seattle, and incentivizing the switch to solar power.
- Liked the rail to Seattle action, as well as the actions related to no-idling and promoting roundabouts. Also actions that support bikes and EV.
- We need to do it all. Hope we can really go for it and show bold leadership, and education for the community to unleash innovations.
- Liked that youth, who are our future, are here and informing the process. We are listening to you, and hope you feel heard.
- Appreciated that education is very important, but education actions need to be more specific.
- Actions to address changes to passenger vehicles, which make up a large proportion of inventory, are important/difficult to change behavior.

Sector Focus Group Participants

Youth & Educators – November 18, 2019

- Ella Jimenez, Tumwater High School student
- Alexis Nevy, Avanti High School student
- Kurt Cross, Olympia School District – Capital Planning
- Elyanna Calle, Timberline High School student

- Lacy Nadeau, Black Hills High School student
- Ruby Gruber, Olympia High School student
- Kaylee Shen, Olympia High School student
- Rebecca MH, Capital High School student
- Richard Coate, Tumwater High School
- Randy Weeks, Olympia High School
- Tom St Clair, educator
- Kristin Maring, educator
- Abby Ruskey, TCAT/YECO and Athena Group
- Susan McCleary, City of Olympia
- Susan Clark, City of Olympia *(did not participate in action ranking)*
- Hilary Seidel, Olympia School District *(did not participate in action ranking)*
- Tom Crawford, Thurston Climate Action Team (TCAT) *(did not participate in action ranking)*
- Chris van Daalen, Northwest EcoBuilding Guild *(did not participate in action ranking)*
- That Curtz, citizen/TCAT *(did not participate in action ranking)*
- Allison Osterberg, TRPC *(did not participate in action ranking)*
- Sara Porter, TRPC *(did not participate in action ranking)*

Top 50 overall actions

Rank	Action ID	Short name	TPS
1	G5.5	legislative agenda	4.5
2	T1.2	middle-density housing	4.4
3	B1.6	rental housing EE baseline	4.3
4	B2.8	performance standard	4.3
5	T1.1	coordinated long term planning- future infill	4.3
6	T1.4	20-minute neighborhoods	4.3
7	G4.6	social cost of carbon	4.2
8	T3.11	EV education	4.2
9	T5.11	car-free zones	4.2
10	G5.2	solar-ready building code	4.1
11	T3.5	EV ready building code	4.1
12	T4.4	fareless system/youth ride free	4.1
13	B4.5	permitting incentives	4
14	T2.2	congestion mitigation	4
15	T3.2	free EV parking	4
16	T3.14	EV mass purchase discounts	3.95
17	T5.1	walk/bike infrastructure	3.9
18	T5.4	school drop-off alternative modes	3.9
19	T1.11	land use efficiency	3.9
20	T1.9	ADUs	3.9
21	T5.13	telecommuting infrastructure	3.85
22	B2.3	LED lighting	3.8
23	B3.4	exemplary buildings	3.8
24	B3.5	green building tracking	3.8
25	T2.17	teleworking/flex work	3.8
26	T3.10	convert to EV fleets	3.8
27	T4.10	rider education/benefits	3.8

Rank	Action ID	Short name	TPS
28	T4.3	rural transit	3.8
29	T5.2	barriers to transportation alternatives	3.8
30	B5.10	group purchasing	3.75
31	B4.4	green municipal buildings	3.7
32	B5.3	municipal building solar	3.7
33	T4.1	increase transit	3.7
34	B1.5	property tax credit	3.7
35	B4.11	grid-connected appliances	3.7
36	B4.7	land use incentives	3.7
37	B5.5	solSmart	3.7
38	T3.1	EV parking new construction	3.7
39	T3.7	EV integration	3.7
40	A5.1	reforestation & afforestation program	3.6
41	B2.10	energy project grants	3.6
42	B4.9	permit counter technical assistance	3.6
43	B5.8	solar-ready	3.6
44	G4.1	emissions inventory	3.6
45	T2.4	vehicle efficiency outreach	3.6
46	T4.15	promote transit benefits	3.6
47	B4.6	EE tax exemptions	3.55
48	B1.4	rental housing EE incentives	3.5
49	B2.6	cool roofs	3.5
50	B4.12	multifamily submetering	3.5
51	T1.3	Eco districts	3.5

Top actions by focus area (top 10 per focus area)

Rank	Focus Area	Action ID	Short name	TPS
1	A	A5.1	reforestation & afforestation program	3.6
2	A	A6.5	municipally-controlled canopy	3.4
3	A	A4.4	clearing limits	3.3
4	A	A4.6	code enforcement	3.2
5	A	A6.6	tree-aware zoning	3.2
6	A	A4.7	clustered development	3.1
7	A	A5.10	laminated timber	3.1
8	A	A3.5	institutional markets	3
9	A	A3.6	SNAP access	3
10	A	A3.7	hemp production	3
1	T	T1.2	middle-density housing	4.4
2	T	T1.1	coordinated long term planning-future infill	4.3
3	T	T1.4	20-minute neighborhoods	4.3
4	T	T3.11	EV education	4.2
5	T	T5.11	car-free zones	4.2
6	T	T3.5	EV ready building code	4.1
7	T	T4.4	fareless system/youth ride free	4.1
8	T	T2.2	congestion mitigation	4
9	T	T3.2	free EV parking	4
10	T	T3.14	EV mass purchase discounts	3.95
1	G	G5.5	legislative agenda	4.5
2	G	G4.6	social cost of carbon	4.2
3	G	G5.2	solar-ready building code	4.1
4	G	G4.1	emissions inventory	3.6
5	G	G4.2	performance measures	3.5

Rank	Focus Area	Action ID	Short name	TPS
6	G	G4.4	vulnerable populations	3.4
7	G	G1.7	social research (COMBINE WITH G1.2)	3.35
8	G	G2.5	cleantech park	3.35
9	G	G5.3	net-zero building code	3.2
10	G	G5.4	utility advocacy	3.1
1	W	W1.1	municipal energy efficiency	3.4
2	W	W2.10	water reuse	3.2
3	W	W2.4	permitting	3
4	W	W2.9	tiered rates	3
5	W	W2.12	high users	3
6	W	W2.16	metering	3
7	W	W2.2	water audits	3
8	W	W2.3	water conservation outreach	3
9	W	W2.5	rural conservation	3
10	W	W2.8	integrated incentives	3
1	B	B1.6	rental housing EE baseline	4.3
2	B	B2.8	performance standard	4.3
3	B	B4.5	permitting incentives	4
4	B	B2.3	LED lighting	3.8
5	B	B3.4	exemplary buildings	3.8
6	B	B3.5	green building tracking	3.8
7	B	B5.10	group purchasing	3.75
8	B	B4.4	green municipal buildings	3.7
9	B	B5.3	municipal building solar	3.7
10	B	B1.5	property tax credit	3.7

Top actions by strategy (top per strategy)

Strategy	w/ Rank	Action ID	Short name	TPS
A1	A11	A1.2	nutrient management	2.65
A2	A21	A2.1	regenerative agriculture	2.65
A3	A31	A3.5	institutional markets	3
A4	A41	A4.4	clearing limits	3.3
A5	A51	A5.1	reforestation & afforestation program	3.6
A6	A61	A6.5	municipally-controlled canopy	3.4
A7	A71	A7.1	marine vegetation	2.1
T1	T11	T1.2	middle-density housing	4.4
T2	T21	T2.2	congestion mitigation	4
T3	T31	T3.11	EV education	4.2
T4	T41	T4.4	fareless system/youth ride free	4.1
T5	T51	T5.11	car-free zones	4.2
T6	T61	T6.1	Olympia-Seattle rail	2.45
G1	G11	G1.7	social research (COMBINE WITH G1.2)	3.35
G2	G21	G2.5	cleantech park	3.35
G3	G31	G3.3	green energy bond	3.05
G4	G41	G4.6	social cost of carbon	4.2
G5	G51	G5.5	legislative agenda	4.5
W1	W11	W1.1	municipal energy efficiency	3.4
W2	W21	W2.10	water reuse	3.2
W3	W31	W3.1	nitrous oxide capture	2.6
W4	W41	W4.10	waste less food program	2.9
W5	W51	W5.4	FOG waste	2.6
W6	W61	W6.4	environmentally preferable purchasing policy	2.8
W7	W71	W7.1	waste route efficiency	1.6
B1	B11	B1.6	rental housing EE baseline	4.3
B2	B21	B2.8	performance standard	4.3
B3	B31	B3.4	exemplary buildings	3.8
B4	B41	B4.5	permitting incentives	4
B5	B51	B5.10	group purchasing	3.75
B6	B61	B6.2	electric appliances in new construction	3.5
B7	B71	B7.1	workforce development	3.35

Top Actions Across All Three Lists

Action ID	Short name	Action Description	# Lists	TOTAL PRIORITY SCORE
G5.5	legislative agenda	Prioritize combating climate change in the municipality's legislative agenda each year. Instruct municipal lobbyist to track and report on climate bills, and to advocate for those bills that will help reduce local emissions. Work with other cities to add this to the AWC priorities.	3	4.5
T1.2	middle-density housing	Reevaluate and change zoning as needed to allow for a range of housing types to promote social economic integration of housing near the region's urban centers or moderate-density zones. Promote long-term equity and healthy communities by developing incentives such as density bonuses for development where a percentage of the units will be permanently affordable for household incomes that can no longer afford to live in these areas.	3	4.4
B2.8	performance standard	Set energy efficiency performance standards for commercial buildings with gross floor areas smaller than 50,000 square feet.	3	4.3
B1.6	rental housing EE baseline	Pass an ordinance to require rental units to meet baseline levels of energy efficiency and make more stringent over time.	3	4.3
T3.11	EV education	Partner with environmental and other agencies to increase consumer awareness about EV options and incentives for use and purchase.	3	4.2
G4.6	social cost of carbon	Develop and adopt policies that require the use of a "social cost of carbon measure" in zoning, development, construction, and transportation decisions.	3	4.2
T5.11	car-free zones	Reevaluate long term plans and update to prioritize pedestrians and people riding bikes. Set goals for mode shift and plans on how to achieve those goals like developing car-free corridors in commercial and mixed use areas to encourage mode shift.	3	4.2
T4.4	fareless system/youth ride free	Develop a fareless system for public transit.	3	4.1
B4.5	permitting incentives	Offer streamlined permitting, lower fees, or other incentives for projects that meet green building certification standards.	3	4
T2.2	congestion mitigation	Develop congestion mitigation programs to increase transportation efficiency, reduce delay, and reduce emissions such as signalization coordination improvements along with application of speed harmonization techniques (ex. reevaluate speed limits, roundabouts vs signalized intersection, street connectivity). Added benefits are decrease idling time (pollution) and improve fuel efficiency (cost savings to driver).	3	4
B3.4	exemplary buildings	Create a Zero-Energy Building Challenge by partnering with public, private, non-profit and faith-based organizations. Facilitate rapid deployment and public awareness of high-profile demonstration buildings.	3	3.8
B5.10	group purchasing	Develop/support a city-sponsored group solar purchasing program.	3	3.75
A5.1	reforestation & afforestation program	Develop a coordinated reforestation/afforestation program. Begin by identifying priority areas where reforestation and afforestation may have carbon reduction benefits.	3	3.6

Action ID	Short name	Action Description	# Lists	TOTAL PRIORITY SCORE
T1.1	coordinated long term planning-future infill	Coordinate long-term plans with transit agencies to project where increased density would support more transit corridors. Then change zoning/density that would support new transit corridors and variety of household incomes. Promote long-term equity and healthy communities by developing incentives such as density bonuses for development where a percentage of the units will be permanently affordable for household incomes.	2	4.3
T1.4	20-minute neighborhoods	Increase the number of 20-minute neighborhoods (walkable environment, destinations that support a range of basic living needs and a residential density). Identify key infrastructure components needed to grow the number of 20-minute neighborhoods, then change zoning and codes if needed and coordinate with other jurisdictions to make public investments where necessary.	2	4.3
G5.2	solar-ready building code	Add as a high priority to municipality's legislative agenda - State-level amendments to State building code requiring solar-ready construction. Work with other cities to add this to the Association of Washington Cities (AWC) priorities.	2	4.1
T3.5	EV ready building code	Require all new residential construction be built EV ready. Create a simple and consistent residential charging station permitting process to reduce costs and time to development.	2	4.1
T3.2	free EV parking	Allow free parking for all electric vehicles at local government buildings and in city centers to encourage the adoption of all electric vehicles. Increase cost of parking for Non-EV vehicles.	2	4
T3.14	EV mass purchase discounts	Create a group purchase program for residents to get deep discounts on EVs, other fuel efficient and alternative fuel vehicles.	2	3.95
B2.3	LED lighting	Install LED lighting in public-sector buildings and infrastructure (e.g., street lights, traffic signals).	2	3.8
B3.5	green building tracking	Develop data methodology to monitor use and impacts of green building incentives, to inform future incentives and develop recommendations for policy or programs.	2	3.8
B4.4	green municipal buildings	Require that new local government facilities (e.g., the new Olympia City Hall and LOTT building) demonstrate green building technologies and practices.	2	3.7
B5.3	municipal building solar	Install solar photovoltaics on all available and feasible municipal sites, including building rooftops, city hall, schools, police and fire stations, community centers, municipal water pump sites, and transit depots.	2	3.7
B1.5	property tax credit	Create a property tax credit for property owners who participate in energy efficiency.	2	3.7
G4.1	emissions inventory	Prepare and publish an annual emissions inventory that tracks greenhouse gas emissions by jurisdiction and source category. Review and update emissions inventory methodology as necessary to address improvements to data or methodologies, improve consistency, incorporate changes to state or federal policies, or report on issues of local interest.	2	3.6
A6.5	municipally-controlled canopy	Maximize tree canopy on City-owned or City-controlled land.	2	3.4
W1.1	municipal energy efficiency	Conduct efficiency improvements to municipal water and sewage treatment systems. Prioritize components that consume the most energy and have high GHG emissions.	2	3.4

Action ID	Short name	Action Description	# Lists	TOTAL PRIORITY SCORE
G1.7	social research (COMBINE WITH G1.2)	Work with higher education institutions to research effective behavior change through marketing and educate. Use this information in developing campaigns to reduce high emissions GHGs.	2	3.35
G2.5	cleantech park	Develop a "cleantech" business park and provide incentives (tax, utility) for green business that co-locate.	2	3.35
A4.4	clearing limits	Add clearing limits (usually expressed as percentage) for large lot development in county and city zoning codes.	2	3.3
W2.10	water reuse	Develop a water reuse program for water conservation on site. Provide technical assistance and incentives, such as free rain barrels, to gather water and use on site (e.g., rain barrels for irrigation).	2	3.2
A3.5	institutional markets	Explore local policy and financial incentives to increase the percentage of regionally produced foods purchased by cafeterias in government and municipal institutions.	2	3
T5.1	walk/bike infrastructure	Coordinate cities of Thurston Counties Master Bicycle and Pedestrian plans into a large regional plan to expand walking and biking infrastructure, including separated and protected opportunities. Coordinate efforts to maximize funding mechanisms and opportunities.	1	3.9
T5.4	school drop-off alternative modes	Maintain and expand a walking/biking incentive program with safety education for families.	1	3.9
T1.11	land use efficiency	Set integrated goals to consider network efficiency in land use decisions, including how density in certain areas supports transit, increases efficiency of utility service, and other support facilities. Consider VMT in identifying locations for large employment facilities.	1	3.9
T1.9	ADUs	Amend development codes to allow for attached and detached ADU's in urban residential areas.	1	3.9
T5.13	telecommuting infrastructure	Develop grants and provide financial resources for installation of infrastructure necessary to support telecommuting.	1	3.85
T2.17	teleworking/flex work	Government agencies increase opportunities for employee teleworking options and staggering work days to reduce employees driving during peak traffic times.	1	3.8
T3.10	convert to EV fleets	Set policies and timetable for electrification of municipal and other governmental fleets. Require replacement of public fleets with cleaner, energy-efficient vehicles to reduce long term fuel costs, improve air quality and reduce greenhouse gas emissions.	1	3.8
T4.10	rider education/benefits	Maintain and expand a regional online page that lists all the mode shift education efforts and employer benefits opportunties (Thurston Here-To-There). Include a comments section for suggestions to further transit education and ridership.	1	3.8
T4.3	rural transit	Identify and implement first/last mile solutions for rural ridership (engage rural home owners associations for representation and feedback). Present this plan to TRPC with direction to explore pilot programs and secure funding sources.	1	3.8
T5.2	barriers to transportation alternatives	Develop a regional inventory to identify gaps in connectivity for safe cycling and walking. Then develop a strategy to prioritize projects and a plan for funding.	1	3.8
T4.1	increase transit	Increase local public transit routes/frequency with a focus on expanding transit service before and after traditional business hours and on weekends.	1	3.7
B4.11	grid-connected appliances	Require smart appliances in new construction, especially water heaters that control timing of demand.	1	3.7

Action ID	Short name	Action Description	# Lists	TOTAL PRIORITY SCORE
B4.7	land use incentives	Provide land use incentives (floor area ratio, density bonus, height bonus, parking reductions) for zero-net carbon buildings or other applications that dramatically increase energy efficiency.	1	3.7
B5.5	solSmart	Pursue SolSmart designations and adopt solar friendly practices.	1	3.7
T3.1	EV parking new construction	Require large commercial and residential buildings to dedicate a percentage of parking spots for electric vehicle charging.	1	3.7
T3.7	EV integration	Reevaluate regulations and make necessary changes to ensure charging stations are able to be permitted in locations where they are needed.	1	3.7
B2.10	energy project grants	Secure grant funding for high-profile, innovative energy efficiency and/or technology projects on commercial buildings in the county.	1	3.6
B4.9	permit counter technical assistance	Hire or contract with dedicated green building specialists to provide technical assistance through the permitting and development process.	1	3.6
T2.4	vehicle efficiency outreach	Develop educational campaigns about benefits (reduced GHG emission, increase fuel efficiency, safety) of properly inflated tires, including signage at gas stations and local businesses and partnering with schools.	1	3.6
T4.15	promote transit benefits	Work with employers and transit agencies to develop ways to incentivize employee ridership (ex. rebates for employees who give up use of employer parking facilities).	1	3.6
B5.8	solar-ready	Amend local development code to require solar-ready construction for all building types.	1	3.6
B4.6	EE tax exemptions	Create a local property tax reduction or credit for new buildings that meet an energy efficiency performance standard.	1	3.55
B1.4	rental housing EE incentives	Provide property tax breaks for landlords who install energy conservation measures in rental housing.	1	3.5
B2.6	cool roofs	Create an incentive program for the installation of reflective roofs on commercial buildings to reduce building energy consumption and the urban heat island effect.	1	3.5
B4.12	multifamily submetering	Require submetering for new multifamily buildings so residents can track energy use.	1	3.5
B6.2	electric appliances in new construction	Update municipal code to require electric appliances in new construction.	1	3.5
G4.2	performance measures	Develop community GHG reduction goals and performance measures. Regularly update and publicize for community to track their progress.	1	3.5
G4.4	vulnerable populations	Develop a data and monitoring mechanism that is specific to marginalized groups and their needs related to climate change and climate reality (e.g., access to transportation, access to A/C, proximity to cooling centers) and develop a plan to address these vulnerabilities with solutions that help reduce GHG emissions.	1	3.4
B7.1	workforce development	Create and support opportunities to link clean energy companies with vocational training facilities.	1	3.35
G5.3	net-zero building code	Add as a high priority to municipality's legislative agenda - State Building Council and State Legislature to require net-zero energy use in all new buildings by the 2031 residential code cycle and amendments to State building code each 3-year cycle to meet that goal. Work with other cities to add this to the AWC priorities.	1	3.2

Action ID	Short name	Action Description	# Lists	TOTAL PRIORITY SCORE
A4.6	code enforcement	Increase monitoring and enforcement of City and County zoning and other regulations that preserve sensitive areas.	1	3.2
A6.6	tree-aware zoning	Modify zoning setbacks and similar provisions designed to provide room for and encourage large trees.	1	3.2
G5.4	utility advocacy	Add as a high priority to municipality's legislative agenda - State and Utilities and Transportation Commission in implementing SB 5116, which requires a shift to clean electricity.	1	3.1
A4.7	clustered development	Incentivize cluster development, such as giving a 10-25% density bonus, to preserve more open space.	1	3.1
A5.10	laminated timber	Increase allowances for laminated timber in building code.	1	3.1
G3.3	green energy bond	Develop a green energy bond providing a monetary incentive to tackle prominent social issues such as climate change and a movement to renewable sources of energy. Start by researching the feasibility and impact.	1	3.05
W2.4	permitting	Review and update building code to ensure most efficient water practices and technologies are applied to new development.	1	3
W2.9	tiered rates	Study effectiveness and strategies for conservation with tiered rating structures for water and sewer, and if proven, apply new rate structures.	1	3
A3.6	SNAP access	Publicize federal nutrition incentive programs that aim to support small and mid-sized farms, such as SNAP, FMPP, LFPP, and FINI grant.	1	3
A3.7	hemp production	Develop an economic development plan for attracting industrial hemp production as a way to create local jobs and sequester carbon.	1	3
W2.12	high users	Identify greatest water users and provide targeted technical outreach and support to reduce water consumption.	1	3
W2.16	metering	Use metering to inform water consumers about their use compared to others on their utility bill. Provide technical assistance and education to higher users on ways to conserve water and improve household/business efficiencies.	1	3
W2.2	water audits	Conduct water audits of city and county facilities to determine prioritization of capital improvements.	1	3
W2.3	water conservation outreach	Expand water conservation outreach and incentive programs for residents and businesses through new funding sources (ex. grants) and partnerships.	1	3
W2.5	rural conservation	Provide technical assistance for rural "exempt" wells to conserve water.	1	3
W2.8	integrated incentives	Integrate City incentives for water and wastewater reductions with other aligned incentive programs (ex. PSE rebates for washing machines and dishwater energy savings) to encourage broader usage and conservation.	1	3
W4.10	waste less food program	Expand the TC Public Works "Waste Less Food" program.	1	2.9
W6.4	environmentally preferable purchasing policy	Local governments require departments, agencies, consultants and contractors to use recycled products whenever possible and not cost prohibitive.	1	2.8
A1.2	nutrient management	Provide education and incentives (e.g., grants, loans, technical assistance) reduce nitrous oxide emissions when managing fertilizer.	1	2.65
A2.1	regenerative agriculture	Expand regenerative agricultural practices (ex. low-till, no-till education programs) among farmers that aim for a "whole farm" approach. Provide education on how to increase organic matter content and water retention in soils within urban and agricultural settings.	1	2.65

Action ID	Short name	Action Description	# Lists	TOTAL PRIORITY SCORE
W3.1	nitrous oxide capture	Research and implement nitrous oxide mitigation strategies and strategies to avoid or reduce nitrous oxide emissions. Present findings and cost vs benefits analysis to policy makers to determine what changes should be made.	1	2.6
W5.4	FOG waste	Research feasibility of program to digest Food, Oils, and Grease (FOG) and/or commercial food waste at LOTT to recover energy and increase methane production and present to policy makers for consideration.	1	2.6
T6.1	Olympia-Seattle rail	Update plans to prioritize commuter rail connection between Olympia and Seattle. Work with State partners to develop a plan and find other partners that have similar vision to coordinate with.	1	2.45
A7.1	marine vegetation	Understand current efforts and develop a plan to enhance the protection of marine vegetation such as eelgrass to improve water quality, sequester, and improve fish habitat and survival.	1	2.1
W7.1	waste route efficiency	Partner with sanitation companies to evaluate the GHG reduction potential of utilizing one side for street pickup and present to policy makers for consideration.	1	1.6
T1.3	Eco districts	Identify potential Eco districts to advance innovative district-scale urban development, sustainability, and neighborhood equity. Then make necessary code/zoning changes to support their development and set ambitious performance outcomes to ensure their long-term success.	0	3.5
B3.1	energy education	Provide educational resources and technical assistance to industry professionals, building owners and managers on all aspects of energy efficient building design, retrofits, and operations for new and existing buildings.	0	3.5
B6.4	natural gas ban	Ban all new natural gas connections in new buildings.	0	3.5
T3.15	EV purchase incentives	Partner with car sale and lease dealerships to provide incentives for purchase of electric vehicles by Thurston County residents. Pilot with those neighborhoods, individuals with greatest VMT potential.	0	3.45
B1.8	landlord education	Educate landlords on options and benefits for improved energy efficiency.	0	3.4
B4.3	commercial EE recognition	Create program that recognizes energy efficiency leadership in new construction.	0	3.4
B3.2	efficiency rebate	Adopt "energy efficiency as a service" utility rebate model to direct energy savings to building owners who bear the costs of energy efficiency retrofits.	0	3.4
T2.3	reduce idling	Work with the State and/or region to enacted legislation to minimize vehicle idling for GHG reductions, improved air quality and increased fuel efficiency. Coordinate with public agencies and private companies that transport people and materials to develop and enact internal policies that reduce idle time.	0	3.35
T2.3	reduce idling	Work with the State and/or region to enacted legislation to minimize vehicle idling for GHG reductions, improved air quality and increased fuel efficiency. Coordinate with public agencies and private companies that transport people and materials to develop and enact internal policies that reduce idle time.	0	3.35
T4.8	alternative fuel buses	Transition area transit services to 100% renewable energy.	0	3.35
T5.7	urban bikeshare	Pilot and, if successful, implement a bike/scooter share program.	0	3.35

Action ID	Short name	Action Description	# Lists	TOTAL PRIORITY SCORE
B5.1	clean energy bonds/levy	Sell municipal bonds or create a local tax levy for local clean energy projects.	0	3.35
T3.3	solar parking lots	Work with utilities to develop installation of solar panels over surface parking spaces and structured parking garages to produce green energy for electric vehicles.	0	3.3
T5.12	bike/transit	Coordinate a meeting with bicycle advocacy groups and transit agencies to explore barriers (ex. limited bike storage on bus). Prioritize solutions and develop plan to reduce barriers.	0	3.3
B2.4	commercial lights-out	Introduce a "lights-out" policy that encourages businesses to turn off their signs and other lights at night when they are closed.	0	3.3
B4.2	building energy goals	Establish energy goals/benchmarks (e.g., LEED) for new commercial buildings.	0	3.3
B5.11	solar zoning	Review and amend zoning and development regulations where necessary to allow utility or community solar generation facilities less than 20 megawatts.	0	3.3
T2.15	TMAs	Mitigate traffic congestion and reduce GHGs by providing government grant dollars to Transportation Management Associations (TMAs) to provide membership-controlled transportation services in a range of areas including regional or city-wide service, along a specific corridor, or central business districts.	0	3.3
T3.12	gas station colocation	Require all new gas stations install EV stations and that current gas stations have low barriers (permitting, expense) to installing EV stations.	0	3.3
T5.3	biking to work	Require municipal and large employers to provide a shower and/or changing area for employees to facilitate biking to work, and secure/dry bike parking. Provide financial incentives for employer-sponsored bicycle programs.	0	3.3
B2.5	commercial utility outreach	Expand utility outreach to commercial power customers about the benefits of clean and efficient energy technologies and practices.	0	3.25
B5.7	electric infrastructure for renewables	Expand and retrofit the region's energy distribution, monitoring, and storage infrastructure to support more on-site renewable energy generation.	0	3.2
T2.7	carpooling	Work regionally to increase the HOV and HOT lanes available during peak times for car shares and carpools to reduce single occupancy trips.	0	3.2
B2.9	municipal building retrofits	Continue to identify and implement priority energy efficiency improvements in municipal buildings.	0	3.2
T1.12	corridor-centered development	Increase residential and mixed use development along designated transit corridors with monetary incentives such as tax incentives and improved fee structures. Determine impact fees and connection charges that, if reduced or waived, would generate denser development where transit and other services already exist.	0	3.15
T2.8	reduced parking requirements	Reduce the cost of development by reducing parking requirements for new residential and mixed use development along transit corridors and in urban centers. Could allow substitution of care share programs.	0	3.15
T1.6	climate-aware UGB	Amend county wide planning policies to require analysis of climate impacts, the costs to mitigate those impacts, and the costs to ensure efficient transit (e.g., public transit services) to inform future Urban Growth Area expansions and Annexations of current UGA. Then weigh those costs and impacts with opportunities and investment needed to accommodate people and business within annexed areas and approved UGAs.	0	3.1

Action ID	Short name	Action Description	# Lists	TOTAL PRIORITY SCORE
G5.6	Clean energy	Local government adopt and communicate policy statements and positions with the State Electeds that call for rapid conversion to clean energy in the power supply that serves Thurston County.	0	3.1
T4.13	park & ride	Work with transit providers to explore expansion of park & rides and park & pools.	0	3.1
T4.2	bus rapid transit	Expand rapid transit (ex. add transit only lanes in UGA or add express bus connections between South Sound cities), then develop funding mechanisms.	0	3.1
B7.3	climate impact fee	Evaluate and, if feasible, implement a regional climate impact fee on new development to fund regional climate mitigation projects and programs.	0	3.1
B1.3	residential energy retrofit program	Partner with energy audit providers and loan providers to establish and market residential energy efficiency and weatherization retrofit programs, with a focus on low-income residents, low-interest loans, and post audit follow-through.	0	3.05
B1.7	residential utility outreach	Expand utility outreach to residential electricity customers about the benefits of clean and efficient energy technologies/practices and available rebates and bill credits for efficient appliances and equipment. Focus on neighborhoods with older buildings and create group packages for efficiency upgrades, if possible.	0	3.05
B2.7	commercial utility rebates	Offer additional utility rebates or bill credits to encourage businesses to buy and install energy-efficient appliances and equipment.	0	3.05
T3.4	EV charging retrofit	Partner with business and utilities to develop incentives and streamlined process to install EV charging infrastructure at large government and commercial facilities with low public transit and high personal vehicle utilization to access (e.g., the Great Wolf Lodge, St. Martins Pavilion, IT transit stations, rural gov buildings/services).	0	3.05
T5.6	park & pool	Require covered and safe bike storage at carpooling and pick up locations.	0	3
T3.8	public building EV infrastructure	Require new public facilities (buildings, park-and-rides, trailheads) have EV infrastructure. Ensure that the infrastructure is adequate to meet the growing number of electric vehicles.	0	3
B5.9	on-bill financing	Provide additional utility incentives such as on-bill financing to support energy efficiency and renewable energy investments on buildings.	0	3
B6.5	natural gas fee	Create a utility fee for natural gas use.	0	3
A6.1	low-maintenance landscaping	Provide marketing and education campaign promoting the planting of low-maintenance landscaping to encourage more vegetation and tree canopy.	0	3
A6.2	street tree plan	Create a comprehensive street tree plan and/or planting guide that prioritizes goals for carbon sequestration, climate change resiliency, and other equitably distributed co-benefits. Plan should include minimum stocking standards for street trees.	0	3
B5.6	utility-scale renewables	Promote Thurston County as a location to build more utility-scale renewable energy projects such as solar and wind farms. Support locally owned/operated renewable energy companies.	0	2.95
B5.12	neighborhood grants	Fund the creation of low barrier grant opportunities for neighborhood clean energy and energy efficiency projects.	0	2.95
B5.4	net metering production incentive	Increase incentive ratio for connecting residential solar from 1:1 to 2:1.	0	2.95

Action ID	Short name	Action Description	# Lists	TOTAL PRIORITY SCORE
B4.14	state building code	Advocate for stricter energy efficiency requirements in state building code.	0	2.9
B6.7	utility advocacy	Add as a high priority to municipality's legislative agenda - State and Utilities and Transportation Commission in implementing SB 5116, which requires a shift to clean electricity.	0	2.9
B6.8	Clean energy	Local government adopt and communicate policy statements and positions with the State Electeds that call for rapid conversion to clean energy in the power supply that serves Thurston County.	0	2.9
G2.1	clean energy economy	Set policy that requires recruitment and retention practices for clean energy economy companies.	0	2.9
T4.14	transit & schools	Work with school and transit providers to understand if there is a likely partnership to coordinate routes with transit start and top times.	0	2.9
B1.2	residential energy audits	Develop and adopt policies that require residential properties to undertake an energy audit at the time of sale or during a substantial remodel. Work with financial institutions to develop mortgage products that incorporate audited energy efficiency recommendations.	0	2.9
B2.1	commercial energy benchmarking & disclosure	Require energy performance ratings for commercial structures be disclosed so that owners, tenants, and prospective buyers are informed before making purchasing or rental decisions.	0	2.9
B2.2	commercial energy audits	Develop and adopt policies that require commercial properties to undertake an energy audit at the time of sale or during a substantial remodel.	0	2.9
A4.3	tree codes	Review and revise local development regulations to require the carbon sequestration value of existing trees be considered in regulatory requirements like site plan review.	0	2.9
A6.9	Tree canopy ordinance	Develop a tree canopy ordinance that establishes a baseline for current urban canopy and sets goals for future canopy to increase cities' resilience. Combine direct cooling value (urban heat island mitigation) with carbon sequestration value when evaluating urban tree management.	0	2.9
T2.1	traffic analysis	Incorporate greenhouse gas emissions calculations into traffic impact analyses to identify land use proposals that have the potential to generate a substantial positive impact on the region.	0	2.9
G1.3	ClimeTime	Coordinate OSPI ClimeTime program with local government to bring youth into the feedback and planning process of developing climate mitigation programs and policy.	0	2.85
T2.16	Internal policy - decrease idle time	Coordinate with public agencies and private companies that transport people and materials to develop and enact internal policies that reduce idle time.	0	2.85
G4.3	other emission sources and sinks	Expand sources and sectors in future emissions inventories to inform future regulatory policy to reduce GHG emissions. Connected to actions T1.5 and W6.1, and sequestration actions.	0	2.85
W4.9	organics collection	Require food waste pickup at residential and commercial buildings to reduce landfill methane. Compliment with an ordinance that restricts compostables from going into the garbage and has a fining structure to enforce.	0	2.8
A6.7	adaptation	Educate City and County staff about low cost ways to adapt infrastructure to conform to the needs of growing trees, rather than removing the trees.	0	2.8

Action ID	Short name	Action Description	# Lists	TOTAL PRIORITY SCORE
G2.2	sustainable businesses	Develop a green guide for area businesses and build award programs to reward implementation.	0	2.8
W1.2	public water systems	Prioritize efficiency improvements to public water systems (Group A and Group B). Prioritize components that consume the most energy and have high GHG emissions.	0	2.8
W1.4	gravity sewer	Study the energy efficiency and cost impacts of gravity sewers versus STEP systems. As needed, introduce programs, regulations, and/or incentive programs.	0	2.8
W1.5	lifecycle costs	Assess the energy use or energy savings of wastewater-related projects, and other lifecycle costs. Make analysis available to decision-makers.	0	2.8
W2.13	combined sewer	Separate combined sewer and stormwater system. Start with feasibility study and follow through on findings.	0	2.8
W4.4	waste audits	Provide waste audits for business owners and education on practices that decrease waste (ex. compost, recycling, reuse).	0	2.8
T1.13	downtown development	Work with developers and investors to identify barriers to new investment and reinvestment projects of residential and commercial in urban centers. Then develop and implement policy changes and incentive programs in response.	0	2.75
G2.6	training diversification	Work with the Workforce Training and Education Coordinating Board (WTB) to ensure a wide variety of green jobs is part of the workforce training.	0	2.75
T2.9	congestion pricing	Explore congestion pricing between Thurston and Pierce counties along I-5 during peak hours to improve mobility by reducing traffic congestion, reduce greenhouse gas emissions, and create a more equitable transportation system. Target revenues to projects that enhance system efficiency.	0	2.75
A3.1	farmland preservation	Support farmland preservation through land use policies and financial incentives (e.g., conservation easements) to maintain production capacity and increase self-sufficiency.	0	2.75
B4.13	multifamily energy measures	Develop and advertise a business case financial model for multi-family developers to take energy efficiency and renewable energy measures.	0	2.7
B5.13	shore power	Develop shore power to improve air quality, reduce GHG emissions, improve local economy by serving the growing needs of local boat and ship customers.	0	2.7
W6.9	single-use ban	Ban single use plastics (e.g. straws, water bottles)	0	2.7
A5.11	carbon in the CAO	Authorize carbon as a justification for critical areas ordinance protection.	0	2.7
A6.8	landscape regulation	Modify landscape development code requirements to direct the use of landscaping appropriate to the site that provides shade in summer/ sun in winter.	0	2.7
B1.1	residential energy performance ratings	Require energy performance ratings and disclosures for homes at time of sale, lease, or rent so that owners, tenants, and prospective buyers are informed before making purchasing or rental decisions.	0	2.7
B4.1	green construction code	Adopt the International Green Construction Code (IgCC).	0	2.7
B5.2	feed-in tariffs	Offer feed-in tariffs to incentivize solar projects.	0	2.7
W6.6	supply chain	Provide free technical assistance to local businesses in reducing the carbon intensity of their supply chains.	0	2.7

Action ID	Short name	Action Description	# Lists	TOTAL PRIORITY SCORE
A4.5	stream buffers	Update permitting requirements to increase the required stream buffer size to increase carbon sequestration.	0	2.7
A6.4	tree protection	Revaluate municipal tree protection ordinances based on a review of national best practices.	0	2.7
B6.1	natural gas to electric appliances	Educate business owners and residents on the options for electric appliances and the benefit of pairing electrification with the installation of renewable energy.	0	2.65
T4.7	public transit ease	Create a partnership of transit providers and agree to a common goal of having an integrated navigation and payment system. Then work together to make an action plan.	0	2.65
A2.5	silvopasture	Develop education programs and incentives to encourage farmers to incorporate tree planting on farms (e.g., silvoculture, silvopasture, agroforestry, tree cropping).	0	2.65
G1.1	educational website	Develop user-friendly website and outreach materials to educate residents of the health and cost benefits of reducing GHG emissions in their lives and homes and resources on how to do it.	0	2.65
G1.9	staff training	Develop climate mitigation practices for government employees at work and require they be implemented. Set outcomes to measure effectiveness.	0	2.65
B7.2	public power	Transition to a publicly owned power utility district.	0	2.6
T1.15	land use emissions	Revaluate emissions tracking data for land use to ensure accuracy and tracking changes and to inform future regulatory policy in land use.	0	2.6
W2.11	watering schedule	Institute mandatory watering schedule that limits irrigation to certain days.	0	2.6
G5.1	UTC presence	Track, monitor and share information about Washington Utilities and Transportation Commission (UTC) meeting and actively recruit residents to give feedback and attend meetings to support bold GHG emission policy.	0	2.6
A5.7	legislative efforts	Lobby Washington State legislature in support of bills that positively affect carbon balance on state-managed lands.	0	2.6
G2.4	technical clearinghouse	Have TRPC or another entity function as a clearinghouse for government regulations roadblocks to clean technology development.	0	2.6
W2.1	municipal water ordinance	Develop a mandatory municipal water conservation ordinance.	0	2.6
W2.10b	reclaimed water	Expand the use of reclaimed water, especially where needed for irrigation.	0	2.6
W2.15	renter incentives	Develop and offer incentives for water conservation targeted to renters and multifamily residential units.	0	2.6
W2.6	agricultural water use	Evaluate agricultural water use and develop a program to buy back or reclaim excess capacity.	0	2.6
W2.7	low-water landscaping	Require water landscaping conservation practices for new development.	0	2.6
W4.7	deconstruction ordinance	Develop a building deconstruction ordinance, with requirements for deconstruction, reporting, inspections, and compliance tools.	0	2.6
T4.5	Sound Transit in Thurston County	Work with State Legislators and Governor's Office to identify opportunities and funding to expand Sound Transit to Thurston County.	0	2.55
A1.4	water use	Develop an incentive program (e.g., technical assistance) to improve the efficiency of agriculture irrigation systems. Identify grant funding.	0	2.55
A3.8	woody crops	Provide technical assistance to help residents, businesses, and the agricultural community grow woody perennial crops that help conserve water, store carbon, and provide other ecosystem services.	0	2.5

Action ID	Short name	Action Description	# Lists	TOTAL PRIORITY SCORE
W6.8	reusable takeout	Amend health code to allow reusable take out containers.	0	2.5
A1.6	feed additives	Provide education to promote methane-reducing livestock feed additives (ex. seaweed derivatives). Make cost effective by partnering with local vendors and consumers to develop a bulk purchase program.	0	2.45
A6.3	urban tree canopy incentive program	Develop partnership with organizations that offer financial incentives for expanding tree canopy in exchange for carbon credits purchased by businesses and other institutions.	0	2.45
T2.12	Eco driving education	Include awareness of fuel economy through driving techniques in curriculum for new drivers to reduce GHG emissions and develop long term habits.	0	2.45
W2.18	HOA watering outreach	Provide education and technical assistance to HOAs related to revising covenants that may be causing increase water consumption and/or prohibiting energy savings (ex. lawns must be irrigated and green, no water barrels).	0	2.4
W2.19	well conversion to public systems	Provide technical assistance to rural "exempt" well owners to convert to public water systems when service connections are available.	0	2.4
A3.3	processing and distribution hub	Develop a hub to process and distribute regionally-grown agricultural products to local markets (including restaurants, supermarkets, jails, schools, colleges, and hospitals).	0	2.4
W4.1	residential composting	Expand residential programs for composting and recycling food waste.	0	2.4
W6.1	consumption emissions education	Develop an education program about consumption-based emissions and simple ways to track and reduce consumption-based emissions for residents of Thurston County.	0	2.4
T6.2	Olympia ferry service	Provide ferry service between Olympia and Seattle. Work with State partners to develop a plan and work with other partners that have similar vision.	0	2.35
G2.7	jobs leadership	Provide technical assistance to local businesses to generate green jobs and practices.	0	2.35
A5.2	community forests	Expand extent of community forests that consider carbon sequestration in their management goals.	0	2.35
G3.1	tax benefits	Develop tax incentives for businesses that demonstrate GHG reductions in their production.	0	2.35
B3.3	PACE	Assess whether PACE is still desirable and, if so, how local and state policymakers could pursue a legislative solution or state constitutional amendment to develop a PACE program.	0	2.3
T1.14	development VMT caps	Require caps on VMT or vehicle trips for development on Olympia's Capitol Campus and other public development near clustered government offices.	0	2.3
T4.9	fed-compliant alternatives analysis	Work with the State partners and elected officials to understand future plans for mass transit. Secure funding in the State budget to conduct an alternatives analysis to determine what types of high capacity transit the region may be able to support in the future what funding mechanisms are available.	0	2.3
A1.1	manure management	Provide education and incentives (grants, loans, technical assistance) to support manure management that reduces methane and nitrous oxide emissions (ex. covered manure storage facilities, manure application practices).	0	2.25

Action ID	Short name	Action Description	# Lists	TOTAL PRIORITY SCORE
A1.3	waste-to-energy	Conduct a feasibility study on small-scale energy production (ex. capture and combustion of methane, anaerobic digestion, biofuel and biogas production), then identify partners, programs and incentives to develop across TC.	0	2.25
A2.4	soil carbon research	Fund/support regional soil carbon sequestration research to encourage adoption of region-specific conservation farming practices that store carbon.	0	2.25
A3.2	food system assessments	Encourage growth of local markets through market research and assessment of our ability to feed ourselves from regionally-produced foods.	0	2.25
A4.1	natural area preservation	Identify and establish a range of diverse, stable, long-term funding sources for the acquisition, restoration, and preservation of prime natural areas.	0	2.25
A4.2	working land preservation	Identify or develop local funding sources for agricultural and forestry conservation easements. This could include creating a system for bundling small monetary contributions to invest in collective conservation easement or land purchases.	0	2.25
A5.6	small forester education	Deploy an educational program for smaller foresters to increase understanding of carbon sequestration, emphasizing the better performance of mature rather than young trees.	0	2.25
B6.3	heat pumps	Investigate options and costs for using geothermal heat pumps for heating and cooling.	0	2.25
G1.2	consumption (COMBINE WITH G1.5)	Develop and run community based social marketing program to reduce consumption and inform consumers about options for reducing their carbon footprint.	0	2.25
A5.3	long-rotation timber	Mandate that timber companies lengthen the rotation of timber harvesting in Thurston County as part of their permits.	0	2.2
W2.17	gray water use	Require use of gray water in new residential and commercial buildings. Start with feasibility study and change building codes based on results.	0	2.2
W3.2	methane capture	Capture methane from wastewater operations and use to generate power to run systems. Begin by researching cost-effective methods and identifying funding sources to implement.	0	2.2
W3.3	hydrogen power	Investigate and determine if hydrogen power is a cost effective alternative energy source for operations, including technical vehicles, or for distribution and if so, identify funding source to implement.	0	2.2
W4.2	commercial composting	Expand commercial programs for composting food waste. Start by identifying funding and partners.	0	2.2
W4.5	gleaning	Expand gleaning programs and recovery and use of edible yet unwanted foods from restaurants, grocery stores, and schools.	0	2.2
W4.8	fruit teams	Partner with food banks and neighborhoods to harvest fruit from urban fruit trees.	0	2.2
W5.5	dry anaerobic digesters	Evaluate feasibility of a dry anaerobic digester with associated combined heat and power facility to process organics and agricultural waste locally. Present findings to appropriate policy makers for their consideration.	0	2.2
W6.7	water fill stations	Require all government-owned water fountains be replaced with water bottle filling stations at end of life and all new construction requires water bottle filling stations.	0	2.2
A7.2	blue carbon	Research actions to implement blue carbon programs in Thurston County aimed at sequestering carbon through the conservation and restoration of coastal and marine ecosystems.	0	2.1

Action ID	Short name	Action Description	# Lists	TOTAL PRIORITY SCORE
B6.6	demand pricing	Adjust fee scale to charge higher rates during high use times of day.	0	2.1
T1.10	Multifamily Tax Exemption (MFTE)	Expand Multifamily Tax Exemption Programs to increase residential development where services exist, and consider extending exemption timeframes.	0	2.1
G2.3	clean economy roundtables	Organize and facilitate roundtables with business leaders focused on clean economy strategies.	0	2.05
A5.5	species mix	As part of an educational/technical assistance program, promote species mixes for reforestation or aforestation that result in high-density carbon sequestration.	0	2
A5.8	slash-to-biochar	Seek grant funding to process slash to biochar and apply in forestry or agricultural settings.	0	2
A5.9	slash-to-fuel	Seek grant funding to explore the feasibility of utilizing slash as fuel in forestry equipment at scale commercially.	0	2
W4.11	regional recycling	Conduct an analysis of how a regional recycling facility could build local markets for recyclable materials. Develop a cost vs benefits analysis and present to policy makers.	0	2
W5.2	heat exchange	Research the feasibility of heat exchange potential of embedded energy in wastewater and/or reclaimed water and present to policy makers for consideration.	0	2
W5.3	kinetic energy	Research the feasibility of utilizing kinetic energy from transport of water and wastewater through piping networks and present to policy makers for consideration.	0	2
G1.4	Career Connects	Set a target to increase the percentage of green jobs in the Career Connects WA program each year.	0	1.95
A1.5	BMP audits	Develop and incorporate mandatory sustainability audits into conservation/farm plans. Develop program and identify funding reduce energy use and promote best management practices (BMPs).	0	1.95
A5.4	ecosystem services monetization	Expand market-based approaches for ecosystem services such as carbon credit trading.	0	1.9
B7.4	embodied carbon	Create incentives to increase the use of less carbon intensive building materials (mass timber, reduced concrete).	0	1.8
W6.2	meat reduction	Develop awards/recognition programs for restaurants that encourage plant-rich diet that reduce meat consumption.	0	1.8
W6.3	collaborative consumption	Develop a awards/recognition programs for “collaborative consumption” community projects like tool libraries and repair cafes, through mini-grant programs to encourage their use and new projects.	0	1.8
W6.5	product stewardship	Support state-level product stewardship legislation that requires producers to be involved in end-of- product-life management, either through product design changes (e.g. compostable snack bags), investing in take back programs , or placing a fee on the sale of products to support diversion.	0	1.8
G3.4	crowdsourcing	Develop and launch a crowdsourcing platform (like "The Gamechanger") that allows entrepreneurs to submit green proposals for policies and projects for local government and businesses and ideas to influence the future of energy and help to overcome a specific challenge.	0	1.7
G3.2	cost-sharing	Develop an Office of Green Building to work with the business sector to partner in sharing costs and expertise.	0	1.65
W1.3	rural wells	Provide a low interest loan program to encourage the use of efficient technology when permitting wells to serve new rural development.	0	1.6

Action ID	Short name	Action Description	# Lists	TOTAL PRIORITY SCORE
W5.1	waste-to-energy	Research the opportunities to generate additional energy from waste products (e.g., woody biomass and sewage) in Thurston County to reduce fossil fuel consumption and present to policy makers for consideration.	0	1.6
W7.2	waste service areas	Mandate that areas served redundantly by municipalities and private waste collection are eliminated, such as the Tumwater/Olympia border south of the high school, by trading service areas	0	1.4
A2.3	biochar	Thurston EDC, Port Authority and TCD partner to explore feasibility of biochar enterprise in Thurston County to promote amending soils with biochar.	0	1.4
W7.3	garbage fleet electrification	Electrify garbage truck fleet. Start by developing plan for municipal and private waste collectors that includes financing options.	0	1.2

Attachment H

All Ranked Actions

Overall Rank	#	Action short name	Action description	GHG reduction ranking (1=low, 5=high)	Control ranking (1=low, 5=high)	Speed of deployment ranking (1=low, 5=high)	Benefit ranking	Youth Boost?	TOTAL PRIORITY SCORE	Sticker	Sticker rationale
1	G5.5	legislative agenda	Prioritize combating climate change in the municipality's legislative agenda each year. Instruct municipal lobbyist to track and report on climate bills, and to advocate for those bills that will help reduce local emissions. Work with other cities to add this to the AWC priorities.	5	5	5	2	Y	4.5	1 green: JG	JG: Based on GHG reduction ranking of 5 and control of 5.
2	T1.2	middle-density housing	Reevaluate and change zoning as needed to allow for a range of housing types to promote social economic integration of housing near the region's urban centers or moderate-density zones. Promote long-term equity and healthy communities by developing incentives such as density bonuses for development where a percentage of the units will be permanently affordable for household incomes that can no longer afford to live in these areas.	4	5	3	5	Y	4.4	1 green: CH	CH: I'd combine this with 'urban infill' and '20-minute neighborhoods' strategies, as they are about creating more local districts where it's easy and incentives are aligned to develop or redevelop at a slightly higher density and with some mix of uses; we need to bring along land use and infrastructure to reduce demand for energy use and putting more destinations within easy, non-auto distance of where people live is a sure-fire way to do that.
3	B1.6	rental housing EE baseline	Pass an ordinance to require rental units to meet baseline levels of energy efficiency and make more stringent over time.	5	5	3	3		4.3		
4	B2.8	performance standard	Set energy efficiency performance standards for commercial buildings with gross floor areas smaller than 50,000 square feet.	5	5	3	3		4.3	1 red: ZK	ZK- This is completely impractical. We manage about 1,000,000 square feet of commercial space and if we had to bring every building up to some arbitrary standard, it would drive up rents and drive landlords out of the business. i just don't understand why it seems to be a challenge to understand that the more regulation we have, the higher costs will be.
5	T1.1	coordinated long term planning-future infill	Coordinate long-term plans with transit agencies to project where increased density would support more transit corridors. Then change zoning/density that would support new transit corridors and variety of household incomes. Promote long-term equity and healthy communities by developing incentives such as density bonuses for development where a percentage of the units will be permanently affordable for household incomes.	4	5	3	5		4.3		
6	T1.4	20-minute neighborhoods	Increase the number of 20-minute neighborhoods (walkable environment, destinations that support a range of basic living needs and a residential density). Identify key infrastructure components needed to grow the number of 20-minute neighborhoods, then change zoning and codes if needed and coordinate with other jurisdictions to make public investments where necessary.	4	5	3	5		4.3		
7	G4.6	social cost of carbon	Develop and adopt policies that require the use of a "social cost of carbon measure" in zoning, development, construction, and transportation decisions.	5	5	3	2	Y	4.2		
8	T3.11	EV education	Partner with environmental and other agencies to increase consumer awareness about EV options and incentives for use and purchase.	4	5	5	3		4.2		
9	T5.11	car-free zones	Reevaluate long term plans and update to prioritize pedestrians and people riding bikes. Set goals for mode shift and plans on how to achieve those goals like developing car-free corridors in commercial and mixed use areas to encourage mode shift.	4	5	3	4	Y	4.2	2 green: YOUTH	
10	G5.2	solar-ready building code	Add as a high priority to municipality's legislative agenda - State-level amendments to State building code requiring solar-ready construction. Work with other cities to add this to the Association of Washington Cities (AWC) priorities.	5	5	3	2		4.1	2 green: EC, MR	
11	T3.5	EV ready building code	Require all new residential construction be built EV ready. Create a simple and consistent residential charging station permitting process to reduce costs and time to development.	5	5	3	2		4.1		
12	T4.4	fareless system/youth ride free	Develop a fareless system for public transit.	5	3	5	3		4.1		

All Ranked Actions

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13	B4.5	permitting incentives	Offer streamlined permitting, lower fees, or other incentives for projects that meet green building certification standards.	4	5	5	2		4.0	4 green: ZK, KH, CVD, JDB	JDB- Same as above. Don't mandate increases in housing cost. Provide value to incentivize and make it easier for individuals to go green. ZK- Carrot vs. stick. incentivizing people to do something is more effective in building public trust and generating excitement than forcing them to. People are excited about getting solar panels because of a tax credit. most would be angry if it was required. ***
14	T2.2	congestion mitigation	Develop congestion mitigation programs to increase transportation efficiency, reduce delay, and reduce emissions such as signalization coordination improvements along with application of speed harmonization techniques (ex. reevaluate speed limits, roundabouts vs signalized intersection, street connectivity). Added benefits are decrease idling time (pollution) and improve fuel efficiency (cost savings to driver).	4	5	5	2		4.0		
15	T3.2	free EV parking	Allow free parking for all electric vehicles at local government buildings and in city centers to encourage the adoption of all electric vehicles. Increase cost of parking for Non-EV vehicles.	4	5	5	2		4.0		
16	T3.14	EV mass purchase discounts	Create a group purchase program for residents to get deep discounts on EVs, other fuel efficient and alternative fuel vehicles.	4	4	5	3		4.0		
17	T5.1	walk/bike infrastructure	Coordinate cities of Thurston Counties Master Bicycle and Pedestrian plans into a large regional plan to expand walking and biking infrastructure, including separated and protected opportunities. Coordinate efforts to maximize funding mechanisms and opportunities.	3	5	5	3	Y	3.9	5 green: CH, YOUTH (4)	CH: alongside electrification, we need to bring along land use and infrastructure to reduce demand for energy use; plus, on this one, lots of youth support!
18	T5.4	school drop-off alternative modes	Maintain and expand a walking/biking incentive program with safety education for families.	3	5	5	3	Y	3.9	2 green: YOUTH	
19	T1.11	land use efficiency	Set integrated goals to consider network efficiency in land use decisions, including how density in certain areas supports transit, increases efficiency of utility service, and other support facilities. Consider VMT in identifying locations for large employment facilities.	4	5	3	3		3.9		
20	T1.9	ADUs	Amend development codes to allow for attached and detached ADU's in urban residential areas.	4	5	3	3		3.9		
21	T5.13	telecommuting infrastructure	Develop grants and provide financial resources for installation of infrastructure necessary to support telecommuting.	4	5	4	2		3.9		
22	B2.3	LED lighting	Install LED lighting in public-sector buildings and infrastructure (e.g., street lights, traffic signals).	3	5	5	3		3.8	1 green: EC 1 red: YOUTH	EC- I'm actively working on several project in the City of Olympia Fire Departments to install LED lighting. After we invest and install the LED lighting it doesn't require training, awareness, or any license to continue to save energy. It's an ongoing savings we just need to continue to pursue changing everything to LED and that is low hanging fruit most of the time.
23	B3.4	exemplary buildings	Create a Zero-Energy Building Challenge by partnering with public, private, non-profit and faith-based organizations. Facilitate rapid deployment and public awareness of high-profile demonstration buildings.	3	5	5	3		3.8	1 green: CVD	
24	B3.5	green building tracking	Develop data methodology to monitor use and impacts of green building incentives, to inform future incentives and develop recommendations for policy or programs.	3	5	5	3		3.8	1 green: JDB	JDB- We should know if these incentives actually work, and better learn how to make them work, so we don't have to mandate increased cost for housing.
25	T2.17	teleworking/flex work	Government agencies increase opportunities for employee teleworking options and staggering work days to reduce employees driving during peak traffic times.	3	5	5	3		3.8		
26	T3.10	convert to EV fleets	Set policies and timetable for electrification of municipal and other governmental fleets. Require replacement of public fleets with cleaner, energy-efficient vehicles to reduce long term fuel costs, improve air quality and reduce greenhouse gas emissions.	3	5	5	3		3.8		

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27	T4.10	rider education/benefits	Maintain and expand a regional online page that lists all the mode shift education efforts and employer benefits opportunties (Thurston Here-To-There). Include a comments section for suggestions to further transit education and ridership.	3	5	5	3		3.8		
28	T4.3	rural transit	Identify and implement first/last mile solutions for rural ridership (engage rural home owners associations for representation and feedback). Present this plan to TRPC with direction to explore pilot programs and secure funding sources.	3	5	5	3		3.8		
29	T5.2	barriers to transportation alternatives	Develop a regional inventory to identify gaps in connectivity for safe cycling and walking. Then develop a strategy to prioritize projects and a plan for funding.	3	5	5	3		3.8		
30	B5.10	group purchasing	Develop/support a city-sponsored group solar purchasing program.	4	4	5	2		3.8		
31	B4.4	green municipal buildings	Require that new local government facilities (e.g., the new Olympia City Hall and LOTT building) demonstrate green building technologies and practices.	3	5	5	2	Y	3.7	1 green: YOUTH	
32	B5.3	municipal building solar	Install solar photovoltaics on all available and feasible municipal sites, including building rooftops, city hall, schools, police and fire stations, community centers, municipal water pump sites, and transit depots.	3	5	5	2	Y	3.7		
33	T4.1	increase transit	Increase local public transit routes/frequency with a focus on expanding transit service before and after traditional business hours and on weekends.	4	3	5	3		3.7		
34	B1.5	property tax credit	Create a property tax credit for property owners who participate in energy efficiency.	4	5	3	2		3.7	1 green: LB	LB- This is the same rationale as B1.4 but for all property owners rather than just rentals.
35	B4.11	grid-connected appliances	Require smart appliances in new construction, especially water heaters that control timing of demand.	4	5	3	2		3.7		
36	B4.7	land use incentives	Provide land use incentives (floor area ratio, density bonus, height bonus, parking reductions) for zero-net carbon buildings or other applications that dramatically increase energy efficiency.	4	5	3	2		3.7	4 green: LM, LB, AS, JDB	LB- Certain land use incentives could be offered that would provide savings to a development, which would then be invested in measures to increase energy efficiency. The specific incentives offered should only be those that also directly provide GHG emission reductions. For example, reduced parking requirements would likely decrease automobile use while at the same time providing cost savings that would be invested in energy efficiency in a building. *** JDB- Increase housing capacity without increasing housing costs and cost of developers building more units to meet demand. *** LM- Impact of land use items are a give and take, parking reduction or floor area ratio may not create such a large hit to the structure but require a value engineering approach to the purposed project. “Less is more concept”. ***
37	B5.5	solSmart	Pursue SolSmart designations and adopt solar friendly practices.	4	5	3	2		3.7	2 green: MR, OM	MR- Solsmart is not a single action, it is a US Department of Energy program tailored to create a healthy policy environment for the solar industry. Pursuit of SolSmart designations could result in improvements in planning, zoning, community outreach, and utility relations. This suite of actions could cumulatively make a huge difference. ***
38	T3.1	EV parking new construction	Require large commercial and residential buildings to dedicate a percentage of parking spots for electric vehicle charging.	4	5	3	2		3.7		
39	T3.7	EV integration	Reevaluate regulations and make necessary changes to ensure charging stations are able to be permitted in locations where they are needed.	4	5	3	2		3.7		
40	A5.1	reforestation & afforestation program	Develop a coordinated reforestation/afforestation program. Begin by identifying priority areas where reforestation and afforestation may have carbon reduction benefits.	3	5	5	2		3.6		

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41	B2.10	energy project grants	Secure grant funding for high-profile, innovative energy efficiency and/or technology projects on commercial buildings in the county.	3	5	5	2		3.6	2 green: MR, YOUTH	MR- Upfront costs are one of the largest barriers to renewable energy and energy efficiency projects. I encourage the removal of commercial building restrictions so that residential and industrial buildings qualify.
42	B4.9	permit counter technical assistance	Hire or contract with dedicated green building specialists to provide technical assistance through the permitting and development process.	3	5	5	2		3.6	2 green: SM, KH 1 red: LB	LB- Green building expertise would be most effective much earlier than the permitting and development process. Building developers are typically developing their financing packages and preliminary design work well in advance of submitting for a permit. It is during those phases that green building technical assistance should be offered. Perhaps it could be offered through a partnership with the local chapter of American Institute of Architects, or with Olympia Master Builders? *** SM-Most people have an end goal – house, barn, ADU, commercial building – then look for the least expensive path to get there and/or follow the well-worn paths that are obvious. If we want people to seriously consider and pursue other options then we need guides. ***
43	B5.8	solar-ready	Amend local development code to require solar-ready construction for all building types.	3	5	3	3	Y	3.6	4 green: LM, EC, MR, YOUTH	EC- If we have homes that are solar ready meaning some of the cost of infrastructure is included in new construction, we would be more likely to turn the curve. This would be a slight increase in construction but, a huge benefit in the long term. *** LM- Solar ready requirement is a much less burden (labor and funds) to comply with while under or during construction verses after the building is completed. ***
44	G4.1	emissions inventory	Prepare and publish an annual emissions inventory that tracks greenhouse gas emissions by jurisdiction and source category. Review and update emissions inventory methodology as necessary to address improvements to data or methodologies, improve consistency, incorporate changes to state or federal policies, or report on issues of local interest.	3	5	5	2		3.6		
45	T2.4	vehicle efficiency outreach	Develop educational campaigns about benefits (reduced GHG emission, increase fuel efficiency, safety) of properly inflated tires, including signage at gas stations and local businesses and partnering with schools.	3	5	5	2		3.6		
46	T4.15	promote transit benefits	Work with employers and transit agencies to develop ways to incentivize employee ridership (ex. rebates for employees who give up use of employer parking facilities).	3	5	5	2		3.6		
47	B4.6	EE tax exemptions	Create a local property tax reduction or credit for new buildings that meet an energy efficiency performance standard.	4	5	2	2		3.6	**1 green: KH**	
48	B1.4	rental housing EE incentives	Provide property tax breaks for landlords who install energy conservation measures in rental housing.	3	5	3	3		3.5	2 green: CVD, LB	LB- One of the largest opportunities for improvement in reducing energy use is in existing housing, and particularly multi-family housing. This would be a strong incentive for multi-family property owners to invest in upgrades that conserve energy. Because it's for rental housing, it would also help address housing affordability issues for those with low incomes as it would reduce energy bills for tenants. ***
49	B2.6	cool roofs	Create an incentive program for the installation of reflective roofs on commercial buildings to reduce building energy consumption and the urban heat island effect.	3	5	3	3		3.5		

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50	B4.12	multifamily submetering	Require submetering for new multifamily buildings so residents can track energy use.	3	5	3	3		3.5		
51	T1.3	Eco districts	Identify potential Eco districts to advance innovative district-scale urban development, sustainability, and neighborhood equity. Then make necessary code/zoning changes to support their development and set ambitious performance outcomes to ensure their long-term success.	3	5	3	3		3.5		
52	B3.1	energy education	Provide educational resources and technical assistance to industry professionals, building owners and managers on all aspects of energy efficient building design, retrofits, and operations for new and existing buildings.	4	3	5	2		3.5	1 green: ZK	ZK- This is low cost and treats the public as though they are intelligent enough to make a good decision. I don't believe we should be forcing people to make decisions they don't want to or simply cannot afford to make. Additionally, when education is done effectively, adoption follows. I prefer the carrot over the stick.
53	B6.2	electric appliances in new construction	Update municipal code to require electric appliances in new construction.	4	5	3	1		3.5	1 green: LM	LM- Electrical is typically more efficient than but gas should not be eliminated. Gas has high efficiency when paired well to systems that utilized both energy sources.
54	B6.4	natural gas ban	Ban all new natural gas connections in new buildings.	4	5	3	1		3.5	4 red: AS, JM, EC, ZK, JDB, LM, KH	JDB- Cleaner fossil fuel, abundant. Adds cost to housing on Thurston County residents and won't improve global climate problem in measurable way. *** EC- B6.4: I'm not ready to stand behind banning natural gas yet. This resource is widely used, and I'd need more evidence to pros and cons to this proposed changed to understand the benefit in this drastic proposal. *** ZK- Maybe the worst idea of them all. Natural gas is less costly to use in many cases than electricity. again, i believe the public is smart enough to make good decisions and that it's not right to force something on them that they don't want. choice and competition keep costs lower. We keep talking about an affordable housing crisis and yet most of these contemplated regulations will make housing more expensive. so, we might put a tiny dent in the global climate problem at the extent of exacerbating the most pressing problem in our community, affordable housing. Should we tackle efficiency? absolutely. but there housing affordability is at least as important and you can't do both at the same time, at least not this way. *** LM- New buildings may need to have the gas utility for back up measures should the power go down. Full dependence of electrical systems limits the user. *** SM- Short-sighted, particularly for large buildings. Most of the Puget Sound region heats
55	G4.2	performance measures	Develop community GHG reduction goals and performance measures. Regularly update and publicize for community to track their progress.	4	5	3	1		3.5		
56	T3.15	EV purchase incentives	Partner with car sale and lease dealerships to provide incentives for purchase of electric vehicles by Thurston County residents. Pilot with those neighborhoods, individuals with greatest VMT potential.	4	2	5	3		3.5		

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57	B1.8	landlord education	Educate landlords on options and benefits for improved energy efficiency.	3	5	5	1		3.4	1 green: EC	EC- I'm a firm believer that many landlords want to save money on energy and or lower our carbon footprint. I've found from my experience being an EL01 licensed electrician and working as the Facility Supervisor many times it's awareness and education. I think this is key and could really make a difference on our long-term energy goals promoting a clear ROI or purpose to improved energy efficiency.
58	B4.3	commercial EE recognition	Create program that recognizes energy efficiency leadership in new construction.	3	5	5	1		3.4	1 red: MR	MR- Recognition and greenwashing is not likely to get us anywhere closer to our goal. See: Thurston Green Business designations. Consider energy efficiency building code improvements or funding for local EE projects.
59	A6.5	municipally-controlled canopy	Maximize tree canopy on City-owned or City-controlled land.	2	5	5	3		3.4	1 green: JR	JR- Easy to implement, Inexpensive (don't need to purchase any additional land). Property and the authority to plant trees on it is under the direct control (and future protection) of the City/County. Creates tangible activity that citizens and volunteers can directly participate in. Numerous co-benefits.One of the few sequestration opportunities.
60	B3.2	efficiency rebate	Adopt "energy efficiency as a service" utility rebate model to direct energy savings to building owners who bear the costs of energy efficiency retrofits.	5	2	2	3		3.4		
61	G4.4	vulnerable populations	Develop a data and monitoring mechanism that is specific to marginalized groups and their needs related to climate change and climate reality (e.g., access to transportation, access to A/C, proximity to cooling centers) and develop a plan to address these vulnerabilities with solutions that help reduce GHG emissions.	2	5	5	3	Y	3.4	1 green: YOUTH	
62	W1.1	municipal energy efficiency	Conduct efficiency improvements to municipal water and sewage treatment systems. Prioritize components that consume the most energy and have high GHG emissions.	2	5	5	3		3.4		
63	B5.1	clean energy bonds/levy	Sell municipal bonds or create a local tax levy for local clean energy projects.	4	5	2	1		3.4		
64	B7.1	workforce development	Create and support opportunities to link clean energy companies with vocational training facilities.	3	4	5	2		3.4	1 green: ZK	
65	G1.7	social research (COMBINE WITH G1.2)	Work with higher education institutions to research effective behavior change through marketing and educate. Use this information in developing campaigns to reduce high emissions GHGs.	3	4	5	2		3.4		
66	G2.5	cleantech park	Develop a "cleantech" business park and provide incentives (tax, utility) for green business that co-locate.	3	5	2	3		3.4		
67	T2.3	reduce idling	Work with the State and/or region to enacted legislation to minimize vehicle idling for GHG reductions, improved air quality and increased fuel efficiency. Coordinate with public agencies and private companies that transport people and materials to develop and enact internal policies that reduce idle time.	4	2	5	2	Y	3.4		
68	T4.8	alternative fuel buses	Transition area transit services to 100% renewable energy.	4	3	4	2		3.4		
69	T5.7	urban bikeshare	Pilot and, if successful, implement a bike/scooter share program.	3	4	5	2		3.4		
70	A4.4	clearing limits	Add clearing limits (usually expressed as percentage) for large lot development in county and city zoning codes.	3	5	3	2		3.3	1 green: PS	PS- Conversion is probably the greatest threat to forests and climate change mitigation in the long-term, as it results in a loss of carbon sequestration capability while also producing emissions. Urban expansion puts significant pressure on small forest landowners and industry to sell valuable land. Reducing the ability to clear forests would directly address this issue.

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71	B2.4	commercial lights-out	Introduce a "lights-out" policy that encourages businesses to turn off their signs and other lights at night when they are closed.	3	5	3	2		3.3	1 red: YOUTH 4 red: CVD, SM, LM, LB	LB- While this appears to be voluntary, it is unlikely to be very successful as most lights left on in businesses are for security reasons. Businesses are not likely leaving lights on that do not serve a purpose already, as that is a cost to them. Additionally, business lighting frankly provides additional street lighting – without it, cities may face demands for additional street lighting to offset the loss of light for pedestrian and vehicle safety on streets. *** LM- Grab for “lights-out” regarding “other lights” goes too deep. If “other lights” means exterior building, security, parking, walking paths etc? The concept is idealistic but security of and around structures and emergency response/access would have to be compromised. With that said, illuminated “signage” could be turned off while businesses are closed. *** SM- Night lights are on for security as much as for business visibility. This policy needs to seriously address that concern, it’s currently too broad and too narrow-minded, focused only on energy. I think there are more productive approaches. ***
72	B4.2	building energy goals	Establish energy goals/benchmarks (e.g., LEED) for new commercial buildings.	3	5	3	2		3.3		
73	B5.11	solar zoning	Review and amend zoning and development regulations where necessary to allow utility or community solar generation facilities less than 20 megawatts.	3	5	3	2		3.3		
74	T2.15	TMAs	Mitigate traffic congestion and reduce GHGs by providing government grant dollars to Transportation Management Associations (TMAs) to provide membership-controlled transportation services in a range of areas including regional or city-wide service, along a specific corridor, or central business districts.	3	5	3	2		3.3		
75	T3.12	gas station colocation	Require all new gas stations install EV stations and that current gas stations have low barriers (permitting, expense) to installing EV stations.	3	5	3	2		3.3	1 red: CH	CH: just think this is an outmoded way of thinking… everywhere with electricity is potentially a fill-up and gas stations are not where EV owners want to hang-out while charging; would be more in favor of capping quantity of gas stations!
76	T3.3	solar parking lots	Work with utilities to develop installation of solar panels over surface parking spaces and structured parking garages to produce green energy for electric vehicles.	3	3	5	3		3.3		
77	T5.12	bike/transit	Coordinate a meeting with bicycle advocacy groups and transit agencies to explore barriers (ex. limited bike storage on bus). Prioritize solutions and develop plan to reduce barriers.	3	3	5	3		3.3		
78	T5.3	biking to work	Require municipal and large employers to provide a shower and/or changing area for employees to facilitate biking to work, and secure/dry bike parking. Provide financial incentives for employer-sponsored bicycle programs.	3	5	3	2		3.3	1 red: YOUTH	
79	B2.5	commercial utility outreach	Expand utility outreach to commercial power customers about the benefits of clean and efficient energy technologies and practices.	4	2	5	2		3.3		
80	B5.7	electric infrastructure for renewables	Expand and retrofit the region's energy distribution, monitoring, and storage infrastructure to support more on-site renewable energy generation.	4	1	5	3		3.2		
81	T2.7	carpooling	Work regionally to increase the HOV and HOT lanes available during peak times for car shares and carpools to reduce single occupancy trips.	4	1	5	3		3.2	1 green: JG	JG: This benefits SOV’s but more importantly incentivizes transit trips.
82	W2.10	water reuse	Develop a water reuse program for water conservation on site. Provide technical assistance and incentives, such as free rain barrels, to gather water and use on site (e.g., rain barrels for irrigation).	2	5	4	3		3.2	1 green: TC	

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83	A4.6	code enforcement	Increase monitoring and enforcement of City and County zoning and other regulations that preserve sensitive areas.	2	5	5	2		3.2	1 green: BG; 1 red: PS	PS- As someone who works regularly with small forest landowners and, to a lesser extent, industrial timber growers, I have seen very little evidence to believe there is significant code violation occurring to make increasing monitoring efforts a worthy investment. It may be successful in preventing some violations but I think there are better ways to allocate resources. ***
84	A6.6	tree-aware zoning	Modify zoning setbacks and similar provisions designed to provide room for and encourage large trees.	2	5	5	2		3.2		
85	B2.9	municipal building retrofits	Continue to identify and implement priority energy efficiency improvements in municipal buildings.	2	5	5	2		3.2	1 red: MR	MR- I understand that the Cities (or at least Olympia) have made large strides in this area. The focus could shift to non-municipal buildings. Non-consequential.
86	G5.3	net-zero building code	Add as a high priority to municipality's legislative agenda - State Building Council and State Legislature to require net-zero energy use in all new buildings by the 2031 residential code cycle and amendments to State building code each 3-year cycle to meet that goal. Work with other cities to add this to the AWC priorities.	5	1	3	2	Y	3.2	2 green: YOUTH	
87	T1.12	corridor-centered development	Increase residential and mixed use development along designated transit corridors with monetary incentives such as tax incentives and improved fee structures. Determine impact fees and connection charges that, if reduced or waived, would generate denser development where transit and other services already exist.	3	2	3	5		3.2		
88	T2.8	reduced parking requirements	Reduce the cost of development by reducing parking requirements for new residential and mixed use development along transit corridors and in urban centers. Could allow substitution of care share programs.	4	2	3	3		3.2		
89	T1.6	climate-aware UGB	Amend county wide planning policies to require analysis of climate impacts, the costs to mitigate those impacts, and the costs to ensure efficient transit (e.g., public transit services) to inform future Urban Growth Area expansions and Annexations of current UGA. Then weigh those costs and impacts with opportunities and investment needed to accommodate people and business within annexed areas and approved UGAs.	3	5	3	1		3.1		
90	A4.7	clustered development	Incentivize cluster development, such as giving a 10-25% density bonus, to preserve more open space.	2	5	3	3		3.1		
91	A5.10	laminated timber	Increase allowances for laminated timber in building code.	2	5	3	3		3.1		
92	B7.3	climate impact fee	Evaluate and, if feasible, implement a regional climate impact fee on new development to fund regional climate mitigation projects and programs.	4	4	2	1		3.1	2 green: OM, LR 5 red: LM, JDB, CVD, KH, SM	JDB- Illegal?, Affordable Housing Crisis, Older houses are more harmful to environment than newer more efficient housing, Adds cost to housing on Thurston County residents and won't improve global climate problem in measurable way. *** LM- Cost to develop and build has already hit the building community enough without adding new fees and cost to comply with regulation. The cost ends up getting past down to the consumer and outcry for affordable housing and building goes without saying. *** SM- Impact fees should pay for the additional use/expansion of existing public services – roads, emergency response, schools, police. I don't agree that taking money from new development to renovate old development is a reasonable or even ethical use of an impact fee. Push them to build Net Zero or to Passive House standards. Put their money where they can see some value for it. ***

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93	G5.4	utility advocacy	Add as a high priority to municipality's legislative agenda - State and Utilities and Transportation Commission in implementing SB 5116, which requires a shift to clean electricity.	5	1	3	2		3.1		
94	G5.6	Clean energy	Local government adopt and communicate policy statements and positions with the State Electeds that call for rapid conversion to clean energy in the power supply that serves Thurston County.	5	1	3	2		3.1	1 green: CH	CH: I think this has been a known important underpinning and multiplier to all the efforts listed about electrification in buildings and transportation energy use… it's an early and often, continuous advocacy need
95	T4.13	park & ride	Work with transit providers to explore expansion of park & rides and park & pools.	3	3	5	2		3.1		
96	T4.2	bus rapid transit	Expand rapid transit (ex. add transit only lanes in UGA or add express bus connections between South Sound cities), then develop funding mechanisms.	3	3	5	2		3.1		
97	B1.3	residential energy retrofit program	Partner with energy audit providers and loan providers to establish and market residential energy efficiency and weatherization retrofit programs, with a focus on low-income residents, low-interest loans, and post audit follow-through.	3	2	5	3		3.1	1 green: YOUTH	
98	B1.7	residential utility outreach	Expand utility outreach to residential electricity customers about the benefits of clean and efficient energy technologies/practices and available rebates and bill credits for efficient appliances and equipment. Focus on neighborhoods with older buildings and create group packages for efficiency upgrades, if possible.	3	2	5	3		3.1		
99	B2.7	commercial utility rebates	Offer additional utility rebates or bill credits to encourage businesses to buy and install energy-efficient appliances and equipment.	3	2	5	3		3.1		This should receive a very low equity rank
100	T2.3	transportation efficiency service	Create and fund a transportation efficiency service for local residents that gives an assessment of a households current transportation costs, shows cost saving potential by using cleaner forms of transportation, connection with vendors and financing as needed, and follows to see if changes were adopted by household.	3	4	3	2		3.1		
101	T3.4	EV charging retrofit	Partner with business and utilities to develop incentives and streamlined process to install EV charging infrastructure at large government and commercial facilities with low public transit and high personal vehicle utilization to access (e.g., the Great Wolf Lodge, St. Martins Pavilion, IT transit stations, rural gov buildings/services).	3	2	5	3		3.1		
102	G3.3	green energy bond	Develop a green energy bond providing a monetary incentive to tackle prominent social issues such as climate change and a movement to renewable sources of energy. Start by researching the feasibility and impact.	2	5	4	2		3.1		
103	T3.8	public building EV infrastructure	Require new public facilities (buildings, park-and-rides, trailheads) have EV infrastructure. Ensure that the infrastructure is adequate to meet the growing number of electric vehicles.	3	3	3	3		3.0		
104	T5.6	park & pool	Require covered and safe bike storage at carpooling and pick up locations.	3	3	5	1	Y	3.0		
105	W2.4	permitting	Review and update building code to ensure most efficient water practices and technologies are applied to new development.	2	5	3	3		3.0		
106	W2.9	tiered rates	Study effectiveness and strategies for conservation with tiered rating structures for water and sewer, and if proven, apply new rate structures.	2	5	3	3		3.0	1 green: AS	
107	A3.5	institutional markets	Explore local policy and financial incentives to increase the percentage of regionally produced foods purchased by cafeterias in government and municipal institutions.	1	5	5	3		3.0		
108	A3.6	SNAP access	Publicize federal nutrition incentive programs that aim to support small and mid-sized farms, such as SNAP, FMPP, LFPP, and FINI grant.	1	5	5	3		3.0		
109	A3.7	hemp production	Develop an economic development plan for attracting industrial hemp production as a way to create local jobs and sequester carbon.	1	5	5	3		3.0	1 red: MS	
110	A6.1	low-maintenance landscaping	Provide marketing and education campaign promoting the planting of low-maintenance landscaping to encourage more vegetation and tree canopy.	1	5	5	3		3.0		
111	A6.2	street tree plan	Create a comprehensive street tree plan and/or planting guide that prioritizes goals for carbon sequestration, climate change resiliency, and other equitably distributed co-benefits. Plan should include minimum stocking standards for street trees.	1	5	5	3		3.0		
112	B5.9	on-bill financing	Provide additional utility incentives such as on-bill financing to support energy efficiency and renewable energy investments on buildings.	4	1	5	2		3.0	1 green: YOUTH	
113	B6.5	natural gas fee	Create a utility fee for natural gas use.	4	3	3	1		3.0		
114	W2.12	high users	Identify greatest water users and provide targeted technical outreach and support to reduce water consumption.	1	5	5	3		3.0		
115	W2.16	metering	Use metering to inform water consumers about their use compared to others on their utility bill. Provide technical assistance and education to higher users on ways to conserve water and improve household/business efficiencies.	1	5	5	3		3.0		

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116	W2.2	water audits	Conduct water audits of city and county facilities to determine prioritization of capital improvements.	1	5	5	3		3.0	5 green: JMH, AS, WS, TC, (JD)	WS- There may be some low hanging fruit in cities and counties to explore. For example, not all cities have retrofitted their toilets to water- conserving models. ***
117	W2.3	water conservation outreach	Expand water conservation outreach and incentive programs for residents and businesses through new funding sources (ex. grants) and partnerships.	1	5	5	3		3.0		
118	W2.5	rural conservation	Provide technical assistance for rural "exempt" wells to conserve water.	1	5	5	3		3.0	1 red: AS	
119	W2.8	integrated incentives	Integrate City incentives for water and wastewater reductions with other aligned incentive programs (ex. PSE rebates for washing machines and dishwater energy savings) to encourage broader usage and conservation.	1	5	5	3		3.0	1 green: TC	
120	B5.12	neighborhood grants	Fund the creation of low barrier grant opportunities for neighborhood clean energy and energy efficiency projects.	3	5	2	1		3.0		
121	B5.6	utility-scale renewables	Promote Thurston County as a location to build more utility-scale renewable energy projects such as solar and wind farms. Support locally owned/operated renewable energy companies.	3	2	5	2	Y	3.0	2 green: YOUTH	
122	B5.4	net metering production incentive	Increase incentive ratio for connecting residential solar from 1:1 to 2:1.	4	2	3	2		3.0		
123	B4.14	state building code	Advocate for stricter energy efficiency requirements in state building code.	5	1	3	1		2.9	2 green: YOUTH 1 red: CH	CH: just seems like we're already wringing as much efficiency as possible out of the building code – very good as it is so gains would be quite marginal?
124	B6.7	utility advocacy	Add as a high priority to municipality's legislative agenda - State and Utilities and Transportation Commission in implementing SB 5116, which requires a shift to clean electricity.	5	1	3	1		2.9		
125	B6.8	Clean energy	Local government adopt and communicate policy statements and positions with the State Electeds that call for rapid conversion to clean energy in the power supply that serves Thurston County.	5	1	3	1		2.9	2 green: CH, LR	CH: I think this has been a known important underpinning and multiplier to all the efforts listed about electrification in buildings and transportation energy use… it's an early and often, continuous advocacy need
126	G2.1	clean energy economy	Set policy that requires recruitment and retention practices for clean energy economy companies.	3	3	5	1		2.9		
127	T4.14	transit & schools	Work with school and transit providers to understand if there is a likely partnership to coordinate routes with transit start and top times.	3	3	5	1		2.9		
128	A4.3	tree codes	Review and revise local development regulations to require the carbon sequestration value of existing trees be considered in regulatory requirements like site plan review.	2	5	3	2		2.9	1 green: BG	
129	A6.9	Tree canopy ordinance	Develop a tree canopy ordinance that establishes a baseline for current urban canopy and sets goals for future canopy to increase cities' resilience. Combine direct cooling value (urban heat island mitigation) with carbon sequestration value when evaluating urban tree management.	2	5	3	2		2.9		
130	B1.2	residential energy audits	Develop and adopt policies that require residential properties to undertake an energy audit at the time of sale or during a substantial remodel. Work with financial institutions to develop mortgage products that incorporate audited energy efficiency recommendations.	4	1	3	3		2.9	1 red: ZK	ZK- As someone who's company manages almost 2,000 residential units and is involved in selling lots of units, I can tell you that this is just another way to increase cost and make housing less affordable. people already struggle to finance a home and adding a requirement for energy upgrades/audits/etc. will just make housing less attainable and affordable for even more people.
131	B2.1	commercial energy benchmarking & disclosure	Require energy performance ratings for commercial structures be disclosed so that owners, tenants, and prospective buyers are informed before making purchasing or rental decisions.	4	1	3	3		2.9		
132	B2.2	commercial energy audits	Develop and adopt policies that require commercial properties to undertake an energy audit at the time of sale or during a substantial remodel.	4	1	3	3		2.9		
133	T2.1	traffic analysis	Incorporate greenhouse gas emissions calculations into traffic impact analyses to identify land use proposals that have the potential to generate a substantial positive impact on the region.	2	5	3	2		2.9		
134	W4.10	waste less food program	Expand the TC Public Works "Waste Less Food" program.	1	5	5	2	Y	2.9	1 red: LR	

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135	G1.3	ClimeTime	Coordinate OSPI ClimeTime program with local government to bring youth into the feedback and planning process of developing climate mitigation programs and policy.	3	2	5	2		2.9		
136	G4.3	other emission sources and sinks	Expand sources and sectors in future emissions inventories to inform future regulatory policy to reduce GHG emissions. Connected to actions T1.5 and W6.1, and sequestration actions.	2	5	4	1		2.9		
137	T2.16	Internal policy - decrease idle time	Coordinate with public agencies and private companies that transport people and materials to develop and enact internal policies that reduce idle time.	3	2	5	2		2.9		
138	W4.9	organics collection	Require food waste pickup at residential and commercial buildings to reduce landfill methane. Compliment with an ordinance that restricts compostables from going into the garbage and has a fining structure to enforce.	2	5	3	2		2.8		
139	W6.4	environmentally preferable purchasing policy	Local governments require departments, agencies, consultants and contractors to use recycled products whenever possible and not cost prohibitive.	2	5	3	2		2.8		
140	A6.7	adaptation	Educate City and County staff about low cost ways to adapt infrastructure to conform to the needs of growing trees, rather than removing the trees.	1	5	5	2		2.8		
141	G2.2	sustainable businesses	Develop a green guide for area businesses and build award programs to reward implementation.	1	5	5	2		2.8	1 red: LR	
142	W1.2	public water systems	Prioritize efficiency improvements to public water systems (Group A and Group B). Prioritize components that consume the most energy and have high GHG emissions.	1	5	5	2		2.8		
143	W1.4	gravity sewer	Study the energy efficiency and cost impacts of gravity sewers versus STEP systems. As needed, introduce programs, regulations, and/or incentive programs.	1	5	5	2		2.8	1 green: ETC	
144	W1.5	lifecycle costs	Assess the energy use or energy savings of wastewater-related projects, and other lifecycle costs. Make analysis available to decision-makers.	1	5	5	2		2.8	1 green: JMH	
145	W2.13	combined sewer	Separate combined sewer and stormwater system. Start with feasibility study and follow through on findings.	1	5	5	2		2.8	5 red: JMH, TC, AS, WS, PF	WS- Separation of the storm system has been looked at a number of times and found to not be feasible. These studies can be made available
146	W4.4	waste audits	Provide waste audits for business owners and education on practices that decrease waste (ex. compost, recycling, reuse).	1	5	5	2		2.8		
147	T1.13	downtown development	Work with developers and investors to identify barriers to new investment and reinvestment projects of residential and commercial in urban centers. Then develop and implement policy changes and incentive programs in response.	3	2	3	3		2.8		
148	G2.6	training diversification	Work with the Workforce Training and Education Coordinating Board (WTB) to ensure a wide variety of green jobs is part of the workforce training.	2	2	5	3	Y	2.8	1 green: YOUTH	
149	T2.9	congestion pricing	Explore congestion pricing between Thurston and Pierce counties along I-5 during peak hours to improve mobility by reducing traffic congestion, reduce greenhouse gas emissions, and create a more equitable transportation system. Target revenues to projects that enhance system efficiency.	4	1	2	3		2.8		Equity concern
150	A3.1	farmland preservation	Support farmland preservation through land use policies and financial incentives (e.g., conservation easements) to maintain production capacity and increase self-sufficiency.	2	5	2	2		2.8	2 green: LS, SB	LS- Keeping land in active farms means less impermeable surfaces than housing, thus more soil to store carbon. ***
151	A5.11	carbon in the CAO	Authorize carbon as a justification for critical areas ordinance protection.	2	5	3	1		2.7		
152	A6.8	landscape regulation	Modify landscape development code requirements to direct the use of landscaping appropriate to the site that provides shade in summer/ sun in winter.	2	5	3	1		2.7		
153	B4.13	multifamily energy measures	Develop and advertise a business case financial model for multi-family developers to take energy efficiency and renewable energy measures.	3	2	4	2		2.7		
154	B5.13	shore power	Develop shore power to improve air quality, reduce GHG emissions, improve local economy by serving the growing needs of local boat and ship customers.	3	2	4	2		2.7		
155	W6.9	single-use ban	Ban single use plastics (e.g. straws, water bottles)	2	3	3	3	Y	2.7	2 green: YOUTH	

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156	A4.5	stream buffers	Update permitting requirements to increase the required stream buffer size to increase carbon sequestration.	1	5	3	3		2.7	1 red: PS	PS- Washington Forest Practice Rules (as well as Thurston County codes) are among the strictest in the nation and do a sufficient job of protecting streams and fish habitat. Mandated buffers have disproportionate negative effects on small forest landowners, who lose access to valuable timber in the restricted harvest. The financial burden caused by this impact often makes them more likely to sell their forest for development purposes, which ultimately means less forestland (and less carbon sequestered). Furthermore, restricting harvest does not necessarily mean more carbon will be sequestered in the long-term. Wood products act as a carbon sink and, over a long enough period, net primary productivity (related to net carbon sequestered) in forests declines.
157	A6.4	tree protection	Revaluate municipal tree protection ordinances based on a review of national best practices.	1	5	3	3		2.7		
158	B1.1	residential energy performance ratings	Require energy performance ratings and disclosures for homes at time of sale, lease, or rent so that owners, tenants, and prospective buyers are informed before making purchasing or rental decisions.	4	1	3	2		2.7		
159	B4.1	green construction code	Adopt the International Green Construction Code (IgCC).	4	1	3	2		2.7	1 red: CVD	
160	B5.2	feed-in tariffs	Offer feed-in tariffs to incentivize solar projects.	4	1	3	2		2.7		
161	W6.6	supply chain	Provide free technical assistance to local businesses in reducing the carbon intensity of their supply chains.	1	5	4	2	Y	2.7		
162	B6.1	natural gas to electric appliances	Educate business owners and residents on the options for electric appliances and the benefit of pairing electrification with the installation of renewable energy.	3	2	5	1		2.7	1 green: YOUTH	
163	T4.7	public transit ease	Create a partnership of transit providers and agree to a common goal of having an integrated navigation and payment system. Then work together to make an action plan.	3	2	5	1		2.7		
164	A1.2	nutrient management	Provide education and incentives (e.g., grants, loans, technical assistance) reduce nitrous oxide emissions when managing fertilizer.	2	2	5	3		2.7	3 green: PF, SB, TC	
165	A2.1	regenerative agriculture	Expand regenerative agricultural practices (ex. low-till, no-till education programs) among farmers that aim for a "whole farm" approach. Provide education on how to increase organic matter content and water retention in soils within urban and agricultural settings.	2	2	5	3		2.7	4 green: LS, TC, PF, MS	LS- This is a focus on soil health. The more life in the soil, the more carbon is stored. Reg Ag is a term for approaches that make more life in the soil. ***
166	A2.5	silvopasture	Develop education programs and incentives to encourage farmers to incorporate tree planting on farms (e.g., silvoculture, silvopasture, agroforestry, tree cropping).	2	2	5	3		2.7		
167	G1.1	educational website	Develop user-friendly website and outreach materials to educate residents of the health and cost benefits of reducing GHG emissions in their lives and homes and resources on how to do it.	2	2	5	3		2.7		
168	G1.9	staff training	Develop climate mitigation practices for government employees at work and require they be implemented. Set outcomes to measure effectiveness.	2	2	5	3		2.7		
169	B7.2	public power	Transition to a publicly owned power utility district.	3	3	3	1		2.6	1 red: KH	
170	T1.15	land use emissions	Revaluate emissions tracking data for land use to ensure accuracy and tracking changes and to inform future regulatory policy in land use.	3	3	3	1		2.6		
171	W2.11	watering schedule	Institute mandatory watering schedule that limits irrigation to certain days.	2	5	3	1		2.6	3 red: ETC, JMH, AS	
172	W3.1	nitrous oxide capture	Research and implement nitrous oxide mitigation strategies and strategies to avoid or reduce nitrous oxide emissions. Present findings and cost vs benefits analysis to policy makers to determine what changes should be made.	2	3	5	1		2.6	2 Green: ETC, WS	
173	A5.7	legislative efforts	Lobby Washington State legislature in support of bills that positively affect carbon balance on state-managed lands.	1	5	5	1		2.6		
174	G2.4	technical clearinghouse	Have TRPC or another entity function as a clearinghouse for government regulations roadblocks to clean technology development.	1	5	5	1		2.6		

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175	G5.1	UTC presence	Track, monitor and share information about Washington Utilities and Transportation Commission (UTC) meeting and actively recruit residents to give feedback and attend meetings to support bold GHG emission policy.	3	1	5	2		2.6		
176	W2.1	municipal water ordinance	Develop a mandatory municipal water conservation ordinance.	1	5	3	3		2.6	2 red: WS, JG	WS- The cities are already working together with LOTT on a water conservation plan. It seems like this might be redundant (although maybe it gets at the same thing as W2.2?)*** Check sticker - no longer on card? Did it fall off? JG: Already done.
177	W2.10b	reclaimed water	Expand the use of reclaimed water, especially where needed for irrigation.	1	3	5	3		2.6	1 green: AS	
178	W2.15	renter incentives	Develop and offer incentives for water conservation targeted to renters and multifamily residential units.	1	5	3	3		2.6		
179	W2.6	agricultural water use	Evaluate agricultural water use and develop a program to buy back or reclaim excess capacity.	1	5	3	3		2.6		
180	W2.7	low-water landscaping	Require water landscaping conservation practices for new development.	1	5	3	3		2.6	1 red: TC	
181	W4.7	deconstruction ordinance	Develop a building deconstruction ordinance, with requirements for deconstruction, reporting, inspections, and compliance tools.	2	5	2	2		2.6	1 red: AR	AR- My understanding of building deconstruction is that it is a slow and costly process; furthermore, it is difficult to find markets for salvaged construction materials.
182	W5.4	FOG waste	Research feasibility of program to digest Food, Oils, and Grease (FOG) and/or commercial food waste at LOTT to recover energy and increase methane production and present to policy makers for consideration.	1	3	5	3		2.6		
183	T4.5	Sound Transit in Thurston County	Work with State Legislators and Governor's Office to identify opportunities and funding to expand Sound Transit to Thurston County.	3	2	3	2		2.6	1 red: CH	CH: this is way too long term to be very helpful in meeting targets as it seems like we're more than 30 years out to when we would see any service to TC
184	A1.4	water use	Develop an incentive program (e.g., technical assistance) to improve the efficiency of agriculture irrigation systems. Identify grant funding.	1	5	2	3		2.6	4 red: MS, SB, LS, TC	LS- In our area inefficient irrigation is a couple months out of the year issue on only some farms as many farms have no water rights and can't irrigate. ***
185	A3.8	woody crops	Provide technical assistance to help residents, businesses, and the agricultural community grow woody perennial crops that help conserve water, store carbon, and provide other ecosystem services.	2	2	4	3		2.5		
186	W6.8	reusable takeout	Amend health code to allow reusable take out containers.	2	3	3	2	Y	2.5		
187	T6.1	Olympia-Seattle rail	Update plans to prioritize commuter rail connection between Olympia and Seattle. Work with State partners to develop a plan and find other partners that have similar vision to coordinate with.	3	1	2	3	Y	2.5	4 green: LR, YOUTH (3)	
188	A1.6	feed additives	Provide education to promote methane-reducing livestock feed additives (ex. seaweed derivatives). Make cost effective by partnering with local vendors and consumers to develop a bulk purchase program.	2	2	5	2		2.5		
189	A6.3	urban tree canopy incentive program	Develop partnership with organizations that offer financial incentives for expanding tree canopy in exchange for carbon credits purchased by businesses and other institutions.	2	2	5	2		2.5		
190	T2.12	Eco driving education	Include awareness of fuel economy through driving techniques in curriculum for new drivers to reduce GHG emissions and develop long term habits.	2	2	5	2		2.5		
191	W2.18	HOA watering outreach	Provide education and technical assistance to HOAs related to revising covenants that may be causing increase water consumption and/or prohibiting energy savings (ex. lawns must be irrigated and green, no water barrels).	1	2	5	3		2.4		
192	W2.19	well conversion to public systems	Provide technical assistance to rural "exempt" well owners to convert to public water systems when service connections are available.	1	2	5	3		2.4	3 red: ETC, AS, TC	
193	A3.3	processing and distribution hub	Develop a hub to process and distribute regionally-grown agricultural products to local markets (including restaurants, supermarkets, jails, schools, colleges, and hospitals).	1	4	4	2		2.4	1 green: MS	
194	W4.1	residential composting	Expand residential programs for composting and recycling food waste.	1	3	5	2		2.4	1 red: LR	
195	W6.1	consumption emissions education	Develop an education program about consumption-based emissions and simple ways to track and reduce consumption-based emissions for residents of Thurston County.	1	3	5	2		2.4		

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196	T6.2	Olympia ferry service	Provide ferry service between Olympia and Seattle. Work with State partners to develop a plan and work with other partners that have similar vision.	3	1	2	3		2.4		
197	A5.2	community forests	Expand extent of community forests that consider carbon sequestration in their management goals.	1	3	4	3		2.4		
198	G2.7	jobs leadership	Provide technical assistance to local businesses to generate green jobs and practices.	1	2	5	3	Y	2.4		
199	G3.1	tax benefits	Develop tax incentives for businesses that demonstrate GHG reductions in their production.	1	5	2	2		2.4		
200	B3.3	PACE	Assess whether PACE is still desirable and, if so, how local and state policymakers could pursue a legislative solution or state constitutional amendment to develop a PACE program.	3	1	3	2		2.3	1 green: SM	SM- Given a few assumptions, which I believe are safe – that the financed systems stay on the property – PACE provides a means for property owners to set up long-term financing for desirable energy projects, and the liability remains attached to the project. That reduces the need for a higher sales cost (and subsequent risks) to recoup the owner's liabilities if the property changes hands in the near future.
201	T1.14	development VMT caps	Require caps on VMT or vehicle trips for development on Olympia's Capitol Campus and other public development near clustered government offices.	3	1	3	2		2.3	1 green: JG	JG: I've seen the effectiveness of this on increasing walking/ biking in my own area and it actually helps people get used to the idea of walking and biking places instead of driving. This is based on a positive outcome instead of a sanction and I just had to include it.
202	T4.9	fed-compliant alternatives analysis	Work with the State partners and elected officials to understand future plans for mass transit. Secure funding in the State budget to conduct an alternatives analysis to determine what types of high capacity transit the region may be able to support in the future what funding mechanisms are available.	3	1	3	2		2.3		
203	A1.1	manure management	Provide education and incentives (grants, loans, technical assistance) to support manure management that reduces methane and nitrous oxide emissions (ex. covered manure storage facilities, manure application practices).	1	2	5	3		2.3		
204	A1.3	waste-to-energy	Conduct a feasibility study on small-scale energy production (ex. capture and combustion of methane, anaerobic digestion, biofuel and biogas production), then identify partners, programs and incentives to develop across TC.	2	2	5	1		2.3	1 green: TC	
205	A2.4	soil carbon research	Fund/support regional soil carbon sequestration research to encourage adoption of region-specific conservation farming practices that store carbon.	2	2	5	1		2.3	1 red: SB	
206	A3.2	food system assessments	Encourage growth of local markets through market research and assessment of our ability to feed ourselves from regionally-produced foods.	1	2	5	3		2.3	3 red: SB, TC, LS	LS- Food System AssessmI am inclined to more on the ground approaches than studies ***
207	A4.1	natural area preservation	Identify and establish a range of diverse, stable, long--term funding sources for the acquisition, restoration, and preservation of prime natural areas.	1	2	5	3		2.3		
208	A4.2	working land preservation	Identify or develop local funding sources for agricultural and forestry conservation easements. This could include creating a system for bundling small monetary contributions to invest in collective conservation easement or land purchases.	1	2	5	3		2.3		
209	A5.6	small forester education	Deploy an educational program for smaller foresters to increase understanding of carbon sequestration, emphasizing the better performance of mature rather than young trees.	1	2	5	3		2.3		
210	B6.3	heat pumps	Investigate options and costs for using geothermal heat pumps for heating and cooling.	2	2	5	1		2.3		
211	G1.2	consumption (COMBINE WITH G1.5)	Develop and run community based social marketing program to reduce consumption and inform consumers about options for reducing their carbon footprint.	2	2	5	1		2.3		

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212	A5.3	long-rotation timber	Mandate that timber companies lengthen the rotation of timber harvesting in Thurston County as part of their permits.	2	1	5	2		2.2	3 red: BG, PS, LFH	LFH- The biggest trees hold the most carbon. This would encourage cutting down larger trees *** LS- This would place an even more extreme financial burden on small forest landowners than increased stream buffers. While many smaller forest landowners would not have a problem with longer rotations because they don't intend to harvest, larger landowners who depend on harvest revenue would be seriously affected. I also believe this would impact forest industry in Thurston County. Both of which would be more likely to sell land in the county in order to remain financially viable. The only way this impact could be alleviated is with a generous carbon payment program, which would be difficult to implement. Instead, using carbon payments as an incentive for longer rotations would reduce negative impacts. ***
213	W2.17	gray water use	Require use of gray water in new residential and commercial buildings. Start with feasibility study and change building codes based on results.	2	1	3	3		2.2		
214	W3.2	methane capture	Capture methane from wastewater operations and use to generate power to run systems. Begin by researching cost-effective methods and identifying funding sources to implement.	1	3	5	1		2.2	1 red: WS	
215	W3.3	hydrogen power	Investigate and determine if hydrogen power is a cost effective alternative energy source for operations, including technical vehicles, or for distribution and if so, identify funding source to implement.	1	3	5	1		2.2		
216	W4.2	commercial composting	Expand commercial programs for composting food waste. Start by identifying funding and partners.	1	2	5	2		2.2	1 green: AR	
217	W4.5	gleaning	Expand gleaning programs and recovery and use of edible yet unwanted foods from restaurants, grocery stores, and schools.	1	2	5	2		2.2		
218	W4.8	fruit teams	Partner with food banks and neighborhoods to harvest fruit from urban fruit trees.	1	2	5	2		2.2		
219	W5.5	dry anaerobic digesters	Evaluate feasibility of a dry anaerobic digester with associated combined heat and power facility to process organics and agricultural waste locally. Present findings to appropriate policy makers for their consideration.	1	2	4	3		2.2		
220	W6.7	water fill stations	Require all government-owned water fountains be replaced with water bottle filling stations at end of life and all new construction requires water bottle filling stations.	1	5	2	2		2.2		
221	A7.1	marine vegetation	Understand current efforts and develop a plan to enhance the protection of marine vegetation such as eelgrass to improve water quality, sequester, and improve fish habitat and survival.	1	2	4	3		2.1		
222	A7.2	blue carbon	Research actions to implement blue carbon programs in Thurston County aimed at sequestering carbon through the conservation and restoration of coastal and marine ecosystems.	1	2	4	3		2.1		
223	B6.6	demand pricing	Adjust fee scale to charge higher rates during high use times of day.	3	1	3	1		2.1	2 red: JDB, AS	JDB- Increasing cost on heat when people need it most. Adds cost to housing on Thurston County residents and won't improve global climate problem in measurable way. ***
224	T1.10	Multifamily Tax Exemption (MFTE)	Expand Multifamily Tax Exemption Programs to increase residential development where services exist, and consider extending exemption timeframes.	2	1	3	3		2.1		
225	G2.3	clean economy roundtables	Organize and facilitate roundtables with business leaders focused on clean economy strategies.	1	2	5	2		2.1		
226	A5.5	species mix	As part of an educational/technical assistance program, promote species mixes for reforestation or aforestation that result in high-density carbon sequestration.	1	1	5	3		2.0	2 red: PF, BG	

All Ranked Actions

Overall Rank	#	Action short name	Action description	GHG reduction ranking (1=low, 5=high)	Control ranking (1=low, 5=high)	Speed of deployment ranking (1=low, 5=high)	Benefit ranking	Youth Boost?	TOTAL PRIORITY SCORE	Sticker	Sticker rationale
227	A5.8	slash-to-biochar	Seek grant funding to process slash to biochar and apply in forestry or agricultural settings.	1	1	5	3		2.0	1 red: JR	JR- There was discussion among several of the other forestry experts early in this process, that mentioned conflicting research about the actual GHG reductions that could be realized with either of these proposals. In fact some of them even indicated there were potentially increases in the GHG emissions that would or could be realized from these activities. These are also activities that are very much removed from the day to day operations of local government and /or beyond the influence of local government.
228	A5.9	slash-to-fuel	Seek grant funding to explore the feasibility of utilizing slash as fuel in forestry equipment at scale commercially.	1	1	5	3		2.0	2 red: JR, JR	JR- Not sure I remember correctly but I believe it might have been Dylan Fischer that mentioned the conflicting research on these issues. Given his background as a forest climate scientist, I suggest asking him this question.
229	W4.11	regional recycling	Conduct an analysis of how a regional recycling facility could build local markets for recyclable materials. Develop a cost vs benefits analysis and present to policy makers.	1	1	4	3		2.0		
230	W5.2	heat exchange	Research the feasibility of heat exchange potential of embedded energy in wastewater and/or reclaimed water and present to policy makers for consideration.	1	1	4	3		2.0		
231	W5.3	kinetic energy	Research the feasibility of utilizing kinetic energy from transport of water and wastewater through piping networks and present to policy makers for consideration.	1	1	4	3		2.0		
232	G1.4	Career Connects	Set a target to increase the percentage of green jobs in the Career Connects WA program each year.	1	2	3	3		2.0		
233	A1.5	BMP audits	Develop and incorporate mandatory sustainability audits into conservation/farm plans. Develop program and identify funding reduce energy use and promote best management practices (BMPs).	2	2	3	1		2.0		
234	A5.4	ecosystem services monetization	Expand market-based approaches for ecosystem services such as carbon credit trading.	1	2	4	2		1.9		
235	B7.4	embodied carbon	Create incentives to increase the use of less carbon intensive building materials (mass timber, reduced concrete).	2	2	2	1		1.8	1 green: AS	
236	W6.2	meat reduction	Develop awards/recognition programs for restaurants that encourage plant-rich diet that reduce meat consumption.	1	2	4	1		1.8	1 green: YOUTH 1 red: AR	
237	W6.3	collaborative consumption	Develop a awards/recognition programs for “collaborative consumption” community projects like tool libraries and repair cafes, through mini-grant programs to encourage their use and new projects.	1	2	4	1		1.8	1 green: AR	
238	W6.5	product stewardship	Support state-level product stewardship legislation that requires producers to be involved in end-of- product-life management, either through product design changes (e.g. compostable snack bags), investing in take back programs , or placing a fee on the sale of products to support diversion.	2	1	2	2		1.8	1 green: AR	
239	G3.4	crowdsourcing	Develop and launch a crowdsourcing platform (like "The Gamechanger") that allows entrepreneurs to submit green proposals for policies and projects for local government and businesses and ideas to influence the future of energy and help to overcome a specific challenge.	1	2	4	1		1.7	1 red: JG	JG: Too vague and could produce zero results.
240	G3.2	cost-sharing	Develop an Office of Green Building to work with the business sector to partner in sharing costs and expertise.	1	3	2	1		1.7	1 red: JG	JG: Too vague and could produce zero results.
241	W1.3	rural wells	Provide a low interest loan program to encourage the use of efficient technology when permitting wells to serve new rural development.	1	2	2	2		1.6		
242	W5.1	waste-to-energy	Research the opportunities to generate additional energy from waste products (e.g., woody biomass and sewage) in Thurston County to reduce fossil fuel consumption and present to policy makers for consideration.	1	1	2	3		1.6		
243	W7.1	waste route efficiency	Partner with sanitation companies to evaluate the GHG reduction potential of utilizing one side for street pickup and present to policy makers for consideration.	1	2	3	1		1.6	1 red: YOUTH	

All Ranked Actions

Overall Rank	#	Action short name	Action description	GHG reduction ranking (1=low, 5=high)	Control ranking (1=low, 5=high)	Speed of deployment ranking (1=low, 5=high)	Benefit ranking	Youth Boost?	TOTAL PRIORITY SCORE	Sticker	Sticker rationale
244	W7.2	waste service areas	Mandate that areas served redundantly by municipalities and private waste collection are eliminated, such as the Tumwater/Olympia border south of the high school, by trading service areas	1	1	3	1		1.4		
245	A2.3	biochar	Thurston EDC, Port Authority and TCD partner to explore feasibility of biochar enterprise in Thurston County to promote amending soils with biochar.	1	2	2	1		1.4	3 red: MS, TC, JH	
246	W7.3	garbage fleet electrification	Electrify garbage truck fleet. Start by developing plan for municipal and private waste collectors that includes financing options.	1	1	1	2		1.2	1 red: AR	

Appendix 10.5 - Scenarios Analysis Report

Hammerschlag LLC

MEMO

Subject: **Scenario Analysis Tool User's Guide**

From: Roel Hammerschlag

To: Allison Osterberg, Thurston Regional Planning Council

Date: July 6, 2020

Doc. no.: TH-015(d)

Introduction

The Scenario Analysis Tool permits the Thurston Regional Planning Council (TRPC) and other Thurston Climate Mitigation Plan (TCMP) partners to test impacts of hypothetical climate policies on the future. A user of the Scenario Analysis Tool can posit future reductions in twenty-five strategy metrics related to the Thurston County economy, and receive instant visual feedback regarding the associated greenhouse gas (GHG) reductions. (Figure 1)

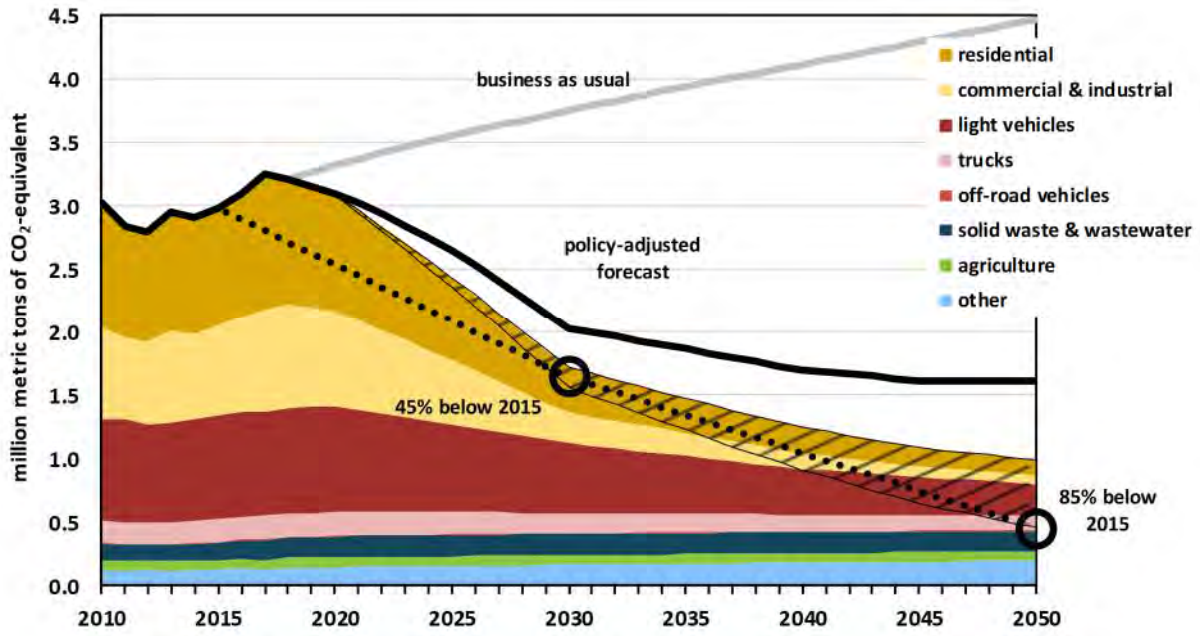

Figure 1 – Sample output of the Scenario Analysis Tool. Data from 2010-2018 are actuals as reported in the Thurston County GHG inventory; data from 2019-2050 are forecast. The crosshatched area indicates potential reductions associated with user input values for carbon sequestration projects or GHG offsets.

This memo is divided into three sections:

User Guide **p. 2**

Methodology **p. 5**

Case Study **p. 11**

The *User Guide* provides "get started" level, practical guidance for appropriate and easy use of the tool. *Methodology* describes in detail how the user's activity level inputs are translated into GHG emissions outputs. Many readers may want to skip this section, and instead utilize the case study as further guidance toward successful use. *Case Study* applies the tool to proposed TCMP Assessed Actions generated by a collaboration between TRPC, the Climate Advisory Workgroup and the consultant, as of May 15, 2020.

User Guide

Spreadsheet Structure and User Dashboard

The Scenario Analysis Tool is coded in Microsoft Excel 2019, and includes nine tabs 'cover', 'dashboard', 'engine', 'ref', 'preprocessing', 'definitions', 'units', 'change log' and 'cites'. All substantive computations occur on the tab 'engine', but the user can effectively use the tool working entirely with the user dashboard on tab 'dashboard'. The dashboard places the primary inputs and outputs in a single visual field. (Figure 2)

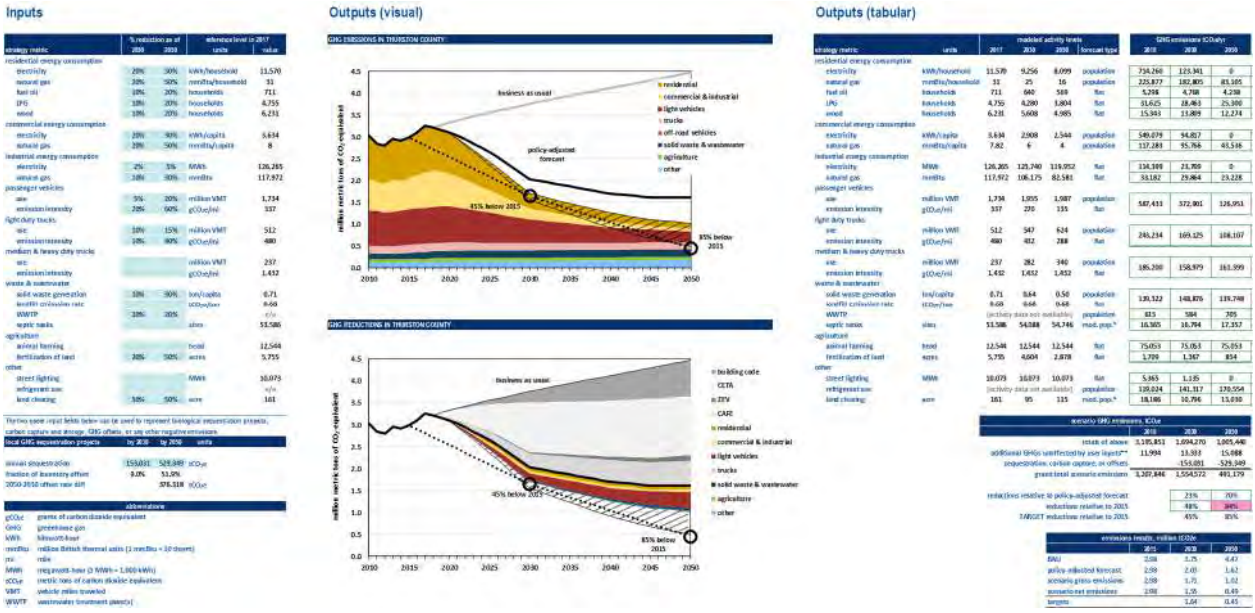

Figure 2 – Major features of the Scenario Analysis Tool's user dashboard. The tabular area on the left edge provides fields for user input (light blue shaded cells) and a key to abbreviations used in the calculator. The center area includes visual output detailing a forecast of the Thurston County GHG inventory in the upper graphic, and anticipated GHG reductions due to state and federal policies (grey) and TCMP strategies (colors) in the lower graphic. The tabular area on the right forecasts changes to activity metrics and GHG emissions

Graphical Output

The primary feature of the dashboard is the output graphic. The graphic includes the following five components:

- **Business-as-usual (BAU)**: The upward-sloping, grey line; this is the first of two reference scenarios. This represents the emissions we would expect if energy and climate policies remain fixed as they were during the 2010-2018 timeframe, and population grows following current, state forecasts.
- **Policy-adjusted forecast**: The thick, black line; this is the second of two reference scenarios. The policy-adjusted forecast adjusts BAU downward according to the impacts of future energy code components of state building code, the Clean Energy Transition Act (CETA), and anticipated increases to vehicle fuel economies. The vast majority of difference between BAU and the policy-adjusted forecast is due to CETA.
- **Targets pathway**: The downward-sloping, dotted black line. The two open circles represent the two GHG reduction targets: 45% below 2015 by 2030, and 85% below 2015 by 2050, following the interlocal agreement for a regional climate mitigation plan.[1] The dotted black line is a piecewise-linear pathway from actual emissions in 2015 to 2030 target emissions; and to 2050 target emissions. The linear pathway is for visual reference; the interlocal agreement only specifies the two targets, not the pathway.
- **Scenario emissions**: The solid colored areas. Each area represents the emissions from a different sector of the economy. From top to bottom these sectors are: residential buildings (dark yellow), commercial & industrial buildings (light yellow), transportation (red), solid waste & wastewater (blue); agriculture (green); and miscellaneous (grey). The top of the stack of shaded areas represents total emissions. Emissions from 2010 to 2018 are actuals, emissions from 2019 to 2050 are projections.
- **Sequestration**: The crosshatched area along the top of the scenario emissions stack. These represent the user's input of biological sequestration projects, carbon capture and storage, GHG offsets or other negative emissions. If negative emissions are allowed toward target achievement, then the net outcome of the user's inputs should be read as the pathway of the underside of the sequestration wedge.

It can be a point of confusion that the targets pathway references calendar year 2015, but that the transition from actual data to projections is between calendar years 2018 and 2019. The emissions targets were legally specified relative to a baseline emissions year, 2015, to make them definitive. In contrast, the projected emissions are computed by whatever method is most accurate, maximizing the use of historical actuals. Since actuals were available through calendar year 2018, we began the estimates as of 2019 to maximize precision of the tool. This does not affect the computed emission targets in any way.

[1] Thurston County et al., "Interlocal Agreement between Thurston County, The City of Lacey, the City of Olympia, the City of Tumwater, and the Thurston Regional Planning Council for a Regional Climate Mitigation Plan," 2018.

Tabular Output

Tabular outputs are available on the right-hand side of the dashboard, labeled "OUTPUT: GHG emissions by strategy metric" in Figure 2. Each cell in this region of the dashboard reports absolute emissions in the last measured year 2018, as well as in the two target years 2030 and 2050. Even though the user inputs a fractional *reduction*, the tool outputs absolute *emissions*. As the user's input reductions increase, the output emissions decrease.

The emissions reported for each strategy metric are non-overlapping, and add to create the same total as the top of the scenario emissions stack in the graphic. The three such totals for 2018, 2030 and 2050 can be found below the strategy metric-specific outputs in cells 'dashboard'!X42:Z42.

Below the total GHG outputs, the percentage reductions achieved in 2030 and 2050 appear in pink cells 'dashboard'!Y45:Z45, which can be compared to their respective numeric targets in cells 'dashboard'!Y46:Z46.

Input

Reductions to Strategy Metrics

The user can alter scenario emissions by adjusting the twenty-five pairs of 2030 and 2050 strategy metric reductions. In Figure 2, these are the light blue-shaded cells indicated with "INPUT: reductions to strategy metrics". If you leave any of these cells blank, then the tool assumes the emissions are equal to those under the policy-adjusted forecast. In most cases where you input a value for 2030, the policy prescription will imply an equal or more aggressive reduction be input for 2050. The only exception would be for cases where you expect a policy to sunset, followed by a rollback of consumer behavior or infrastructure.

Think of each strategy metric either as an average activity level or as a total activity level. Average activity level if the units listed for the strategy metric are a ratio, total activity level if the units are not a ratio. The first and third strategy metrics offer examples of the two cases.

The first strategy metric is residential electricity consumption, measured in units *kWh/household*. Since these units are a ratio, the metric assesses the degree to which your proposed bundle of policies can reduce the average electricity per household. For example, if your policy bundle reduces electricity consumption by 20% in 10% of all homes, then the average reduction per household is 10% × 20% = 2%.

The third strategy metric, residential fuel oil consumption, is measured in units *households*. Since these units are not a ratio, they assess the degree to which your policy can reduce the total number of households that are using fuel oil.

Other Inputs

Below the graphical output, there are two additional input fields for negative GHG emissions achieved in 2030 and 2050, respectively. For each of the two years, input the negative emissions expected *in that year*, in metric tons of CO_2-equivalent. Unlike the strategy metrics, where the Scenario Analysis Tool automatically computes GHG emissions from your percentage reductions, in the case of the two negative emissions fields you must compute the GHG emissions exogenous to the calculator.

Two 'engine' tab of the tool offers two additional inputs for advanced control of the calculator's behavior. First, at cell 'engine'!G68 you can control the slope of the BAU reference scenario (and hence all the other time series outputs) by choosing an alternate population forecast. This is not recommended, since the central population forecast is TRPC's only formally adopted forecast.

Second, the "exclude heavy-duty trucks" checkbox at cell 'engine'!E83 allows the user to remove heavy-duty truck emissions from the analysis. Most heavy-duty truck emissions in Thurston County are due to Interstate 5 through-traffic, which is out of the partner jurisdictions' control.

Methodology

Step 1: Generate a BAU forecast

For each inventory category, the Scenario Analysis Tool creates a Business As Usual (BAU) forecast of GHG emissions from 2019 through 2050. The BAU forecast represents the anticipated growth of GHG emissions in each inventory category, under the assumption that policies remain identical to those nominally in place during the 2010-2018 period covered by the existing time series of Thurston County GHG inventories.

Each inventory category forecast is based on the calendar year 2018 emissions level. Most inventory categories are assumed to increase proportionally to county population, such that emissions in a future year are equal to the emissions in 2018 multiplied by the ratio of population in the future year and population in 2018. The remaining inventory categories are assumed to remain fixed at the 2018 level. (Table 1)

population-based forecast	flat forecast
residential electricity	industrial electricity
commercial electricity	outdoor lighting
residential fossil gas	industrial fossil gas
commercial fossil gas	off-road vehicles
passenger vehicles	septic systems
light duty trucks	enteric fermentation
medium & heavy duty trucks	manure management
motorcycles	agricultural soil management
solid waste methane	
solid waste process	
solid waste transportation	
composting	
Budd inlet WWTP	
other WWTP	
ODS substitutes	
residential land conversion	

Table 1 – Thurston County greenhouse gas inventory categories grouped by their forecasting treatment in the Scenario Analysis Tool.

Future populations are drawn from TRPC's adopted forecast,[2] which is computed through forecast year 2040. Population projections from 2041 through 2050 are linear interpolations based on the forecast years 2031 through 2040.

Step 2: Apply future policy impacts

Next, inventory categories affected by anticipated changes to Washington State Building Energy Code,[3] the Clean Energy Transformation Act,[4] or average vehicle fuel economy are adjusted downward according to the corresponding legal requirements. (Table 2)

affected by building code	affected by CETA	affected by vehicle fuel economy
residential electricity	residential electricity	passenger vehicles
commercial electricity	commercial electricity	light duty trucks
residential fossil gas	industrial electricity	medium & heavy duty trucks
commercial fossil gas	outdoor lighting	

Table 2 – Thurston County greenhouse gas inventory categories affected by policy adjustments in the Scenario Analysis Tool.

Impact of Washington State Building Energy Code is described with a linearized policy model. The GHG emission rate from new buildings follow a linear pathway from their rate in 2018, to zero as of 2031 per the prescription in state law. From 2031 through 2050, the GHG emission

[2] https://www.trpc.org/236/Population-Employment-Forecasting

[3] RCW 19.27A.020(2)(a)

[4] 2019 SB 5116

rate from new buildings remains zero. We assume average building life to be 40 years, so that each year 1/40 of the forecast building stock is modeled to be replaced by new stock. The new stock then emits GHGs at whichever rate is ascribed by the linearized policy model at the time of its construction, for the duration of its 40-year life.

The Clean Energy Transformation Act impacts electricity emission factors, which have an instantaneous impact on the emissions forecast, unlike the Building Energy Code. CETA requires elimination of coal-fired electricity before January 1, 2026; limits emitting resources to 20% or less of generation as of January 1, 2030; and requires complete decarbonization as of January 1, 2045. The scenario analysis tool represents these policy requirements with three linear ramps. The first, 2018-2026 ramp begins with Puget Sound Energy's (PSE's) actual mix of coal and gas as of 2018,[5] and ends with the coal fraction entirely replaced with gas as 2026. The second, 2026-2030 ramp ends with gas making up exactly 20% of PSE's mix as of 2030. The third, 2030-2045 ramp ends with zero fossil fuel emissions as of 2045. After 2045, PSE emissions stay fixed at zero. This approach is based on the conservative assumption that the "alternative compliance options" required by CETA during 2030-2044 do not offset the remaining fossil fuel emissions.

The impacts of vehicle fuel economy changes are applied according to forecasts developed by TRPC[6] (Table 3).

	2015	2017	2030	2040	2050
cars (gCO_2e/mi)	443	425	309	246	235
cars (deflator)		1.000	.727	.579	.553
trucks (gCO_2e/mi)	596	570	403	351	339
trucks (deflator)		1.000	.707	.616	.594

Table 3 – Actual (2015) and forecast (2030, 2040 and 2050) vehicle emission intensities provided by TRPC, and emissions deflators computed for the Scenario Analysis Tool. The emission intensities in 2017 were computed by linear interpolation between the TRPC-provided values for 2015 and 2030.

TRPC forecasts of vehicle emission intensity were developed from an amalgam of primary sources. For each vehicle category, the Scenario Analysis Tool computes the emission intensity as of 2017 by linear interpolation between TRPC-provided categories, and assigns an emissions deflator value of 1.0 to this 2018 reference intensity. (2018 is the last year of historical

[5] Department of Commerce, "Washington State Electric Utility Fuel Mix Disclosure Reports for Calendar Year 2018" (Washington State, November 7, 2019), https://www.commerce.wa.gov/growing-the-economy/energy/fuel-mix-disclosure/.

[6] TRPC 2013 Household Travel Survey (miles driven by vehicle model year and fuel type); Puget Sound Regional Planning Council Lifetime mileage-weighted average CO2 equivalent emissions factors for model years 1990-2020, by vehicle type, https://www.trpc.org/317/Household-Travel-Survey.

emissions data in the tool.) The calculator then assigns deflator values for each vehicle category proportional to TRPC's projected emissions intensity pathway, from 2019 through 2050.

Expert input from Climate Advisory Workgroup members indicated that Washington's Zero Emissions Vehicle requirement would result in 7% of vehicle sales being EVs by 2025. The model assumes a linear ramp in sales share to 7% by 2025, and then a fixed sales share of 7% thereafter. The statewide, light vehicle fleet gradually accumulates EVs throughout the model timespan. Based on an assumed, average vehicle life of ten years, the light vehicle fleet is approximately 17% EVs by the model horizon of 2050.

Step 3: Compute deflator curves

In the dashboard, the user inputs fractional reductions in each strategy metric anticipated as of 2030 and 2050. For each strategy metric the Scenario Analysis Tool builds a deflator curve consisting of two linear ramps, the first from 2020 to 2030, and the second from 2030 to 2050. The value of each deflator curve begins at 1 in 2020, decreases to 1 minus the user's input 2030 reduction in 2030, and then decreases to 1 minus the user's input 2050 reduction in 2050.

It is in this step that the crosswalk between strategy metrics and inventory categories is executed. (Table 4)

strategy metric	inventory category(ies)
residential electricity	residential electricity
residential fossil gas	residential fossil gas
residential fuel oil	residential fuel oil
residential LPG	residential LPG
residential wood	residential wood
commercial electricity	commercial electricity
commercial fossil gas	commercial fossil gas
industrial electricity	industrial electricity
industrial fossil gas	industrial fossil gas
passenger vehicle use	passenger vehicles
passenger vehicle EF	
light duty truck use	light duty trucks
light duty truck EF	
heavy duty truck use	medium & heavy duty trucks
heavy duty truck EF	
solid waste generation	methane emissions, solid waste process, solid waste transportation
landfill emission rate	methane emissions
wastewater treatment plants	Budd Inlet WWTP, other WWTP
septic tanks	septic systems
animal farming	enteric fermentation, manure management
fertilization of land	agricultural soil management
street lighting	outdoor lighting
refrigerant use	ozone depleting substitutes
land clearing	residential land conversion

Table 4 – Inventory categories, by which strategy metrics impact them. The strategy metrics appear in the same order in which they appear on the Scenario Analysis Tool dashboard.

There are three inventory categories that are unaffected by dashboard inputs, and for which no deflator curves are computed. These three inventory categories are: *motorcycles*, *off-road vehicles*, and *composting*.

Step 4: Apply deflator curves to the policy-adjusted forecast

The policy-adjusted forecast for each inventory category created in Step 2, is multiplied by its respective deflator curve computed in Step 3. Inventory categories having no deflator curve are left unchanged.

Step 5: Compute GHG offset forecast

The dashboard inputs for GHG offsets are converted to a 2020-2050 time series, beginning at zero in 2020, with a linear increase to the user's input value for 2030, followed by a linear increase to the user's input value for 2050.

Step 6: Roll up inventory categories into sectors

Finally, the 27 inventory categories are rolled up into six sectors: residential buildings, commercial & industrial buildings, transportation, solid waste & wastewater, agriculture, and other in preparation for graphing and tabular output on the dashboard. (Table 5)

sector	contains inventory categories
residential	residential electricity residential fossil gas residential fuel oil residential LPG residential wood
commercial & industrial	commercial electricity commercial fossil gas industrial electricity industrial fossil gas
transportation	passenger vehicles light duty trucks medium & heavy duty trucks motorcycles off-road vehicles
solid waste & wastewater	methane emissions process emissions solid waste transport composting Budd Inlet WWTP other WWTP septic systems
agriculture	enteric fermentation manure management agricultural soil management
other	streetlighting ODS substitutes residential land conversion

Table 5 – Assignment of inventory categories to sectors (for graphical output in the Scenario Analysis Tool dashboard).

Case Study

The delivered version TH-010(q) of the Scenario Analysis Tool contains Cascadia Consulting Group / Hammerschlag LLC estimates for reductions in fourteen of the strategy metrics, in cells 'dashboard'!P5:Q36. These are our estimates of strategy metric reductions associated with aggressive deployment of all 71 TCMP Assessed Actions as documented in file <TCMP_draft priority climate actions_20200515.pdf>.[7]

We (Cascadia Consulting Group / Hammerschlag LLC) estimated the strategy metric reductions by collecting, for each strategy metric, the subset of TCMP Assessed Actions that would impact the strategy metric, and estimating based on professional experience the expected reduction under the condition that all actions in the subset are deployed. In each instance we considered the potential assuming full support of relevant municipal, county and state governments. In the case of voluntary measures we assumed widespread consumer or customer interest, but limited by normal economic circumstances. We took into account interactions among each subgroup of actions so that their effect was considered in concert, not simply a sum of the effects if each one were deployed singly.

Residential Sector

strategy metric	contributing actions	reductions 2030	reductions 2050
residential electricity	B1.1 residential energy performance ratings B1.2 residential energy audits B1.4 rental housing EE incentives B1.5 property tax credit B1.6 rental housing EE baseline B3.5 green building tracking B4.5 permitting incentives B4.6 EE tax exemptions B4.7 land use incentives B4.9 permit counter technical assistance B4.11 grid-connected appliances B4.12 multifamily submetering B5.5 solSmart B5.8 solar-ready B5.10 group purchasing G1.7 social research T1.2 middle-density housing T1.3 Eco districts	20%	30%
residential fossil gas	B1.1 residential energy performance ratings B1.2 residential energy audits B1.4 rental housing EE incentives B1.5 property tax credit B1.6 rental housing EE baseline B3.5 green building tracking B4.5 permitting incentives B4.6 EE tax exemptions	20%	50%

[7] Received from Allison Osterberg via email, 2020-05-15.

strategy metric	contributing actions	reductions 2030	2050
	B4.7 land use incentives B4.9 permit counter technical assistance B4.12 multifamily submetering B6.1 natural gas to electric conversions B6.2 electric appliances in new construction B6.4 natural gas ban G1.7 social research T1.2 middle-density housing T1.3 Eco districts		
residential fuel oil	B1.1 residential energy performance ratings B1.2 residential energy audits B1.4 rental housing EE incentives B1.5 property tax credit B1.6 rental housing EE baseline B4.5 permitting incentives G1.7 social research	10%	20%
residential LPG	B1.1 residential energy performance ratings B1.2 residential energy audits B1.4 rental housing EE incentives B1.5 property tax credit B1.6 rental housing EE baseline B4.5 permitting incentives B6.2 electric appliances in new construction G1.7 social research	10%	20%
residential wood	B1.1 residential energy performance ratings B1.2 residential energy audits B1.4 rental housing EE incentives B4.5 permitting incentives G1.7 social research	10%	20%

The *residential electricity* and *residential fossil gas* strategy metrics share the majority of their contributing actions, specifically:

B1.1 residential energy performance ratings	B4.6 EE tax exemptions
B1.2 residential energy audits	B4.7 land use incentives
B1.4 rental housing EE incentives	B4.9 permit counter technical assistance
B1.5 property tax credit	B4.12 multifamily submetering
B1.6 rental housing EE baseline	G1.7 social research
B3.5 green building tracking	T1.2 middle-density housing
B4.5 permitting incentives	T1.3 Eco districts

All of these actions either provide an opportunity to act on both electric and fossil gas energy simultaneously or independently, or they affect the building shell in which case both types of energy consumption are likely to be reduced. Our higher estimate of reduction in 2050 for *residential fossil gas*, reflects the likely substitution of heat pumps for fossil gas furnaces in response to (a) the various efficiency incentives included for both strategy metrics and (b) contributing action B6.1 *fossil gas to electric conversions*.

Residential fuel oil, *residential LPG* and *residential wood* achieve lower reductions, because utilities have far less ability to bring incentive programs for these three fuels to homes.

Comparing Policies for New Buildings vs. Existing Buildings

The Scenario Analysis Tool estimates stock of new buildings vs. existing buildings by assuming a 40-year average building lifetime. So for a policy affecting new buildings, even if it goes into force immediately in 2020, then as of 2030 75% of buildings will be those that existed today, and even by the model horizon of 2050, 25% of buildings will be those that existed today, and therefore unaffected by the new buildings policy. Of course, the longer that implementation of a buildings policy is delayed, the higher these fractions of extant buildings will be in 2050 and especially 2030.

Among the residential buildings actions, those targeted specifically at new buildings are:

B4.5 permitting incentives
B4.6 EE tax exemptions
B4.7 land use incentives
B4.9 permit counter technical assistance
B4.12 multifamily submetering

In our 2030 estimates, these five incentives make no substantive contributions to the 20% reductions estimated for 2030 in residential electricity and residential fossil gas, due to the dominance of existing building stock expected (especially after considering some lag between Thurston Climate Mitigation Plan release and eventual deployment of the policies). By 2050 however, these policies are making substantial contributions to our estimates of the policy bundle impacts to residential electricity (30% reduction total) and residential fossil gas (50% reduction total).

Contribution of Local Renewable Energy Production

Local renewable energy production is supported by the actions:

B5.5 solSmart
B5.8 solar-ready
B5.10 group purchasing

Local renewable energy production is input into the Scenario Analysis Tool as a reduction in demand for grid electricity. Hence these actions are included in the policy bundles that affect strategy metrics *residential electricity* and *commercial electricity* (and, in the case of B5.8 solar-ready, *industrial electricity*).

All three actions provide infrastructure support, but with neither a portfolio standard nor financial incentives. Furthermore, *B5.8 solar-ready* impacts new buildings only (see discussion above). So, the local renewable production actions' contributions to our reduction estimates are small. Strategy metrics *residential electricity* and *commercial electricity* are ratio metrics, so the impact of each action needs to consider penetration into the market as well as the impact at each household. For example, if each household in a *B5.10 group purchasing* collective purchases sufficient panels to displace 30% of its electricity consumption, and as of 2030 5% of all households join collectives, then the reduction to utility electric demand will be $5\% \times 30\% = 1.5\%$.

Commercial and Industrial Sectors

strategy metric	contributing actions	reductions 2030	reductions 2050
commercial electricity	B2.1 commercial energy benchmarking & disclosure B2.3 LED lighting B2.6 cool roofs B2.8 performance standard B3.1 energy education B3.4 exemplary buildings B3.5 green building tracking B4.4 green public buildings B4.5 permitting incentives B4.6 EE tax exemptions B4.7 land use incentives B4.9 permit counter technical assistance B5.3 public building solar B5.5 solSmart B5.8 solar-ready B5.10 group purchasing T1.3 Eco districts	20%	30%
commercial fossil gas	B2.1 commercial energy benchmarking & disclosure B2.8 performance standard B3.1 energy education B3.4 exemplary buildings B3.5 green building tracking B4.4 green public buildings B4.5 permitting incentives B4.6 EE tax exemptions B4.7 land use incentives B4.9 permit counter technical assistance B4.11 grid-connected appliances B6.1 natural gas to electric conversions B6.4 natural gas ban T1.3 Eco districts	20%	50%
industrial electricity	B3.1 energy education B4.11 grid-connected appliances B5.8 solar-ready	2%	5%
industrial fossil gas	B3.1 energy education B6.4 natural gas ban	10%	30%

As in the residential sector, electricity and fossil gas are equally susceptible to many of the proposed actions. The commercial sector has historically responded with less elasticity to energy efficiency incentives than the residential sector, which is the primary reason for our somewhat lower estimates here.

Industrial sector emissions are a combination of typical, building HVAC and lighting energy similar to the predominant drivers in commercial sector emissions, but then combined with industrial process loads such as fans, motors, and process heat. In Thurston County industrial

sector emissions are relatively small; for example its natural gas combustion emissions, at 7,800 tCO_2e in 2017, are less than 0.3% of the county's 3 million tCO_2e inventory.

Transportation Sector

strategy metric	contributing actions	reductions 2030	reductions 2050
passenger vehicle use	G1.7 social research T1.1 coordinated long term planning- future infill T1.2 middle-density housing T1.3 Eco districts T1.4 20-minute neighborhoods T1.9 ADUs T1.11 land use efficiency T2.2 congestion mitigation T2.17 teleworking/flex work T4.1 increase transit T4.3 rural transit T4.4 fareless system/youth ride free T4.10 rider education/benefits T4.15 promote transit benefits T5.1 walk/bike infrastructure T5.2 barriers to transportation alternatives T5.4 school drop-off alternative modes T5.11 car-free zones T5.13 telecommuting infrastructure	5%	20%
passenger vehicle EF	G1.7 social research T2.4 vehicle efficiency outreach T3.1 EV parking new construction T3.2 free EV parking T3.5 EV ready building code T3.7 EV integration T3.10 convert to EV fleets T3.11 EV education T3.14 EV mass purchase discounts T3.15 EV purchase incentives	20%	60%
light duty truck use	T1.3 Eco districts T1.11 land use efficiency T2.2 congestion mitigation	5%	10%
light duty truck EF	T3.10 convert to EV fleets	5%	20%
medium & heavy truck use	*consultant's reduction target*		20%
medium & heavy truck EF	*consultant's reduction target*		10%

TCMP Assessed Actions approaches to transportation are generally aggressive, and especially take into account the importance of urban form. Vehicle use is famously inelastic, so our 2050 estimate of a 20% reduction in VMT per capita reflects very aggressive policymaking in this arena, matching the contributing actions.

Even though the EV policies proposed to affect the strategy metric *passenger vehicle EF* are perhaps not as comprehensive, they still result in relatively large reduction estimates because they are strongly enabled by the increasing availability and dropping prices of electric vehicles on the national and international market.

In the interests of increasing the potential to meet the particularly challenging 2050 TCMP target, we are also offering two *consultant's reduction targets* for medium and heavy trucks in 2050. Use and emission factor associated with medium and heavy trucks are not targeted by any of the TCMP proposed strategies but, especially in the long term, they can be modestly affected by municipal policy. Use can decrease as a consequence of dense urban design: attention to commercial product delivery within urban planning measures like T1.3 *Eco districts* or T1.11 *land use efficiency* would be effective levers for impacting truck use. Emission factor can also be impacted, by creating regulatory requirements for the types of vehicles permitted to service selected areas or eco districts.

New Emissions from EVs

Adoption of EVs plays substantially into our reduction estimates for strategy metric *passenger vehicle EF*. Though EVs do genuinely displace tailpipe emissions from gasoline and diesel fuel, that displacement is mitigated by new, stack emissions from the power plants that supply the additional electricity demand.

The Scenario Analysis Tool uses simple calculator-style methodologies that do not lend themselves to introduction of a new energy resource (electricity) into a specific sector (transportation) through replacement. This means that scenarios that feature large penetration of EVs into the vehicle market may underestimate the gross emissions inventory. We find this bias to be acceptably limited in scope, because CETA is driving electric emissions factor to zero on a timeline at least as fast as most imaginable forecasts for substantial displacement of conventional vehicles by EVs. Indeed, new emissions from EVs can only impact 2030 target achievement since the 2050 target comes after CETA's 2045 deadline for complete decarbonization.

Mode Shift vs Urban Planning

"Mode shift" is the professional term of art for getting people out of their cars. Alternatives to cars include buses, trains, bicycles, walking and telecommuting. Mode shift also includes shifting people from driving alone to carpooling. When viewed in isolation, mode shift as a GHG reduction policy is a method for minimizing the emission factors associated with fixed needs for travel.

Urban planning, on the other hand, can reduce the needs or distances for travel to begin with. Besides simply cutting GHGs due to shorter trip lengths, urban planning induces additional mode shifts by more thoroughly mixing use (placing residences closer to workplaces and

shopping districts); increasing density; favoring walking & biking ("complete streets"); clustering development around transit trunk lines such as train tracks; and other methods.

It is our professional experience that isolated mode shift programs often require significant costs or subsidies to encourage participation. Urban planning, on the other hand, seems to induce more significant change with little direct financial cost to the responsible government (though there may be indirect costs). Hence, we weight the reductions achievable with the TCMP Assessed Actions package strongly toward 2050 versus 2030, to reflect the slower penetration but higher effectiveness of the urban planning policies included.

Solid Waste & Wastewater Sector

strategy metric	contributing actions	reductions 2030	reductions 2050
solid waste generation	G1.7 social research W4.4 waste audits W4.10 waste less food program	10%	30%
landfill emission rate	***aggressive landfill gas recovery & destruction***	50%	50%
wastewater treatment plants	W1.1 municipal energy efficiency W3.1 nitrous oxide capture	20%	20%

Solid waste (landfilled waste) generation has been strongly targeted by municipal policy for decades. The TCMP Assessed Actions in this sector are relatively indirect and do not have a lot of power to reach beyond the substantial voluntary participation in recycling and composting already occurring. This limits our estimates for impacts in this strategy metric. That said, the bulk of methane generation from typical, municipal solid waste arises from food waste, which is already a primary target of municipal waste diversion programs. We estimate that roughly one-third of the methane commitment associated with Thurston County solid waste still comes from food. Successful, complete diversion of this stream to composting could reduce solid waste emissions at least 30%.

Wastewater treatment plants are receiving substantial design & improvements attention in Thurston County, so we model ambitious reductions in their associated emissions deployed in the near future, but no additional plant improvements after 2030.

Agriculture Sector

strategy metric	contributing actions	reductions 2030	reductions 2050
fertilization of land	A1.2 nutrient management A2.1 regenerative agriculture	20%	50%

Thurston County includes both successful examples of and strong advocacy for progressive farming techniques that can reduce GHG emissions associated with chemical fertilizers. The two proposed actions relating to fertilization of land are likely to be embraced strongly, and will have a receptive audience. Hence we assigned relatively ambitious reductions to this strategy metric.

Land Use and Sequestration

strategy metric	contributing actions	reductions or tCO_2e seq. 2030	2050
sequestration	A5.1 reforestation & afforestation program A6.5 municipally-controlled canopy A6.9 tree canopy preservation G4.3 other emission sources and sinks	153,000 tCO_2e	529,000 tCO_2e

Sequestration is not technically a strategy metric in the Scenario Analysis Tool, but the user dashboard allows input of net sequestration estimates for 2030 and 2050, respectively. We are offering values of 153,000 tCO_2e and 529,000 tCO_2e for the two years, based on afforestation of 8% of Thurston County's land area (about 37,000 acres) and conversion of about 30% of Thurston County's agricultural land from conventional to regenerative agriculture. Regenerative agriculture enhances soil health by increasing soil organic carbon levels while ensuring appropriate carbon to nitrogen ratios, and increases carbon sequestration by maximizing plant productivity. The 8% afforestation goal stretches the limit of what is available, but once again we are trying to push boundaries for the sake of achieving the TCMP partners' targets.

Result

Implementing all estimated strategy metric reductions described above produces final Scenario Analysis Tool output as shown in Figure 3.

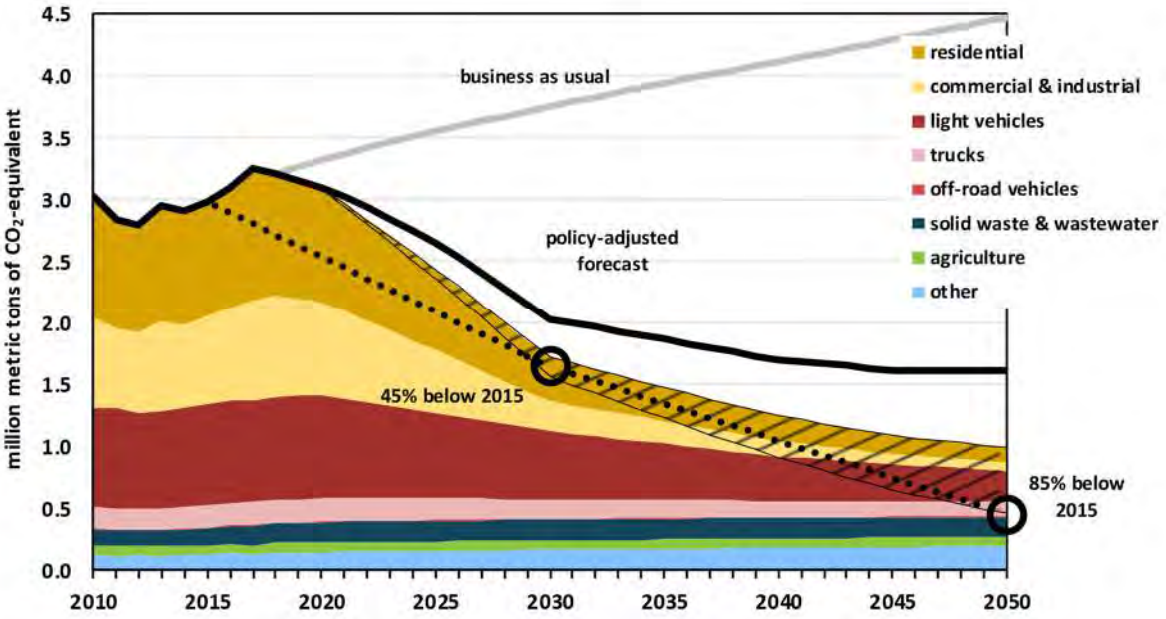

Figure 3 – Scenario Analysis Tool output under the Case Study assumptions and reduction estimates.

The impacts of state, federal and TCMP policies can also be visualized as reductions (rather than the resulting, absolute emissions), per Figure 4.

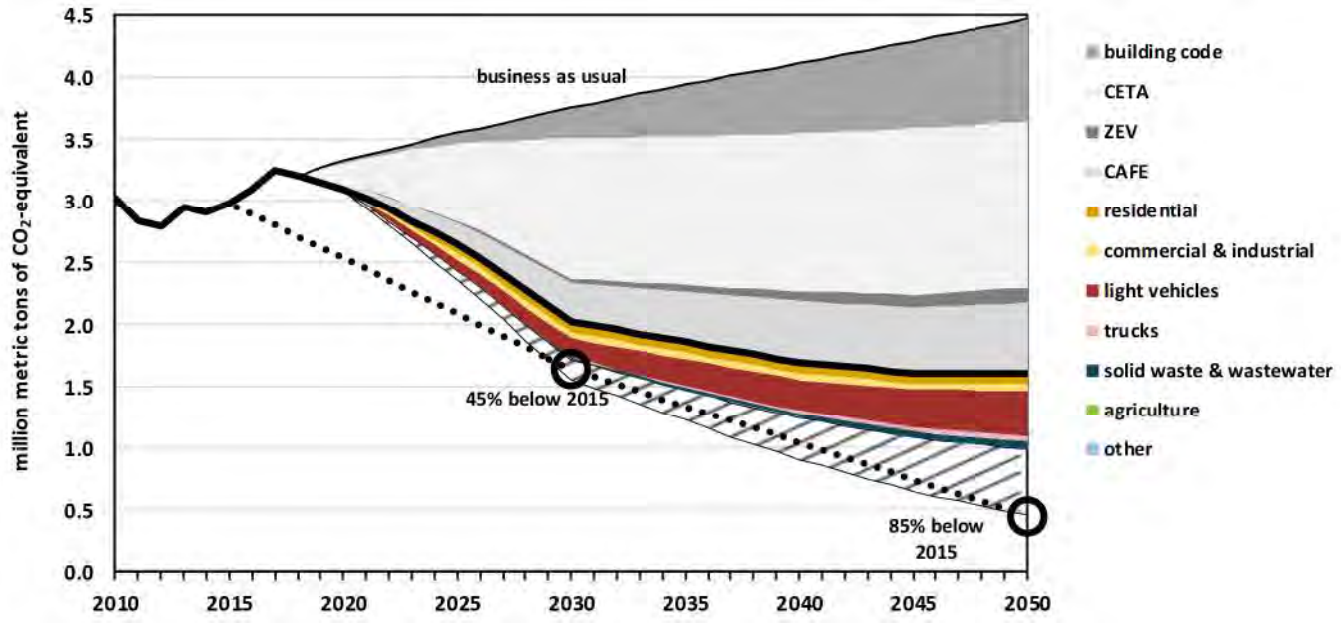

Figure 4 – GHG reductions caused by federal and state (grey-shaded) and TCMP (colors) policies. The cross-hatched area is additional reduction associated with sequestration in forest and soils.

It is clear from Figure 4 that that CETA plays a critical role in achieving the 2030 target, by bringing the policy-adjusted forecast strongly downward. For both target years, state (building code, CETA and ZEV) and federal (CAFE) policies play a significant role in suppressing emissions far enough that the TCMP strategies can bridge the difference to the TCMP targets.

Target achievement requires not just aggressive GHG reduction, but also aggressive sequestration. The gross emissions (the top of the stack of solid-colored areas) exceeds the targets; sequestration is represented by the cross-hatched overlay, and the net emissions appear as the lower edge of the cross-hatched overlay. This lower edge passes through or below the centers of the target circles, as desired. The results are presented numerically in Figure 5.

emissions results, million tCO2e			
	2015	2030	2050
BAU	2.98	3.75	4.47
policy-adjusted forecast	2.98	2.03	1.62
scenario gross emissions	2.98	1.72	0.99
scenario net emissions	2.98	1.57	0.46
targets		1.64	0.45

Figure 5 – Scenario Analysis Tool output under the Case Study assumptions and reduction estimates.

These results represent only one scenario for achieving the targets. The Scenario Analysis Tool is designed to be transparent and accessible, so that TCMP partners can model alternative scenarios that may be more achievable in the political, economic and physical contexts of

Thurston County and its communities. We encourage the project partners to experiment with the tool and find the best path forward to achieving their GHG reduction goals.

Respectfully submitted,

Roel Hammerschlag, Principal
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Appendix 10.6 - Communitywide Implementation Strategy

Appendix 10.6

Implementation Strategy

Overview

The Thurston Climate Mitigation Plan includes a communitywide implementation strategy for each of the four partner jurisdictions (Thurston County, Lacey, Olympia, and Tumwater) that identifies actions and next steps needed to achieve the 2030 and 2050 greenhouse gas emission reduction targets. This implementation strategy draws from the list of communitywide actions assessed as part of the scenario analysis completed in May 2020.

Implementation Approaches

Staff from the four partner jurisdictions grouped actions into four general approaches:

Approach Options

- **Legislative agenda:** actions that would require action by the state legislature to create additional authority or make other changes to state law before action can occur at the local level, and actions that are best addressed at a state level, rather than local.
- **Regional coordination:** actions that build on existing regional programs or would benefit from taking a shared approach.
- **Individual jurisdictions:** actions that can be addressed by individual jurisdictions, through various work programs and departments.
- **Supporting partner:** actions best led by a different entity in the community, rather than a local government

Tasks

The strategy identifies overarching tasks tied to each approach.

Associated Actions

The strategy identifies actions assessed and prioritized as part of the multicriteria analysis that should be considered during implementation of the task.

Timeframe

The timeframe identifies the estimated span of time it will take for the action to be completed or substantially underway. It may also identify sequential actions that can't be started until other foundational work is complete.

Timeframe Options

- Ongoing
- Short term: 0-5 years
- Mid-term: 5-10 years
- Long term: 10+ years

Primary Mechanism

Primary mechanism identifies the type of activity needed to implement the action.

Primary Mechanism Options

- Existing program
- New program
- Regulatory/code change
- Capital improvement
- Support of a third-party partner

Partners

The strategy identifies other potential partners or stakeholders who should be included in implementation of the action.

Potential Funding Source

The strategy identifies potential funding sources.

Funding Source Options

- Federal
- State
- Local
- Existing funds
- Grant
- Other

Cost Estimates

The consultant team developed rough estimates of potential direct costs to the four partner jurisdictions to complete an action or get it substantially underway (ex. staff or other resources). These cost estimates are offered to show scale and relative magnitude of the costs involved with different actions, and are not exact. The estimates do not include broader costs to other potential partners.

Cost Estimate Options

- Low (L): $0-$100,000
- Medium (M): $100,000-$1,000,000
- High (H): $1,000,000+

Attachments:

- Communitywide implementation strategy

Tasks	Associated Actions			Implementation Details					
Approach	Action #	Action Short Name	Action Description	Primary Mechanism	Partners	Timeframe	Potential Funding Source	Total Cost Estimate	Total Cost Rationale
Legislative Agenda: Work together to advocate for changes to state law that advance climate mitigation priorities									
	G5.5	legislative agenda	Prioritize combating climate change in the municipality's legislative agenda each year. Instruct municipal lobbyist to track and report on climate bills, and to advocate for those bills that will help reduce local emissions. Work with other cities to add this to the AWC priorities.	Existing program	State, Thurston County, Lacey, Olympia, Tumwater	Short term (0-5 years)	Local	L	Can leverage ongoing partnerships.
A	Establish additional financial incentives for property owners to invest in energy efficiency upgrades, such as authority to provide local tax credits or exemptions.								
	B1.4	rental housing EE incentives	Provide property tax breaks for landlords who install energy conservation measures in rental housing.	New program	landlords, property managers, renters	Short term (0-5 years)	Local	L	Initial cost is low, but may result in less local tax revenue in the long-term.
	B1.5	property tax credit	Create a property tax credit for property owners who participate in energy efficiency.	New program	homeowner associations, property managers, landlords, renters, property owners	Short term (0-5 years)	Local	L	Cost is low, but may result in less local tax revenue in the long-term.
	B4.6	EE tax exemptions	Create a local property tax reduction or credit for new buildings that meet an energy efficiency performance standard.	Regulatory/code change	Development Community	Short term (0-5 years)	Local	M	Will take resources to determine standard and how to measure/enforce. May result in less local tax revenue in the long-term.
B	Establish additional authority to ensure standard building energy efficiency information is provided to prospective tenants and consumers during real estate transactions, at times of sale, lease, or rent.								
	B1.1	residential energy performance ratings	Require energy performance ratings and disclosures for homes at time of sale, lease, or rent so that owners, tenants, and prospective buyers are informed before making purchasing or rental decisions.	Regulatory/code change	home inspectors, realtors, lending institutions, building code council, state legislators, landlords	Short term (0-5 years)	State, Existing funds	M	Policy will be low-cost, but developing programs and structures and conducting ongoing monitoring and evaluation will add costs.
	B1.2	residential energy audits	Develop and adopt policies that require residential properties to undertake an energy audit at the time of sale or during a substantial remodel. Work with financial institutions to develop mortgage products that incorporate audited energy efficiency recommendations.	Regulatory/code change	remodeling professionals, PSE, energy auditors, real estate professionals	Short term (0-5 years)	State, Local	M	Policy will be low-cost, but developing programs and structures and conducting ongoing monitoring and evaluation will add costs.

	B1.6	rental housing EE baseline	Pass an ordinance to require rental units to meet baseline levels of energy efficiency and make more stringent over time.	Regulatory/code change	landlords, property managers, renters, ESCos	Mid term (5-10 years)	State, Local	M	Policy will be low-cost, but developing programs and structures and conducting ongoing monitoring and evaluation will add costs.
	B2.1	commercial energy benchmarking & disclosure	Require energy performance ratings for commercial structures be disclosed so that owners, tenants, and prospective buyers are informed before making purchasing or rental decisions.	Regulatory/code change	Property Owners and Managers, real estate professionals, landlords, renters	Mid term (5-10 years)	State, Local	M	Policy will be low-cost, but developing programs and structures and conducting ongoing monitoring and evaluation will add costs.
C	Build on changes in the state building and energy code to support an even faster shift toward greater efficiency and electric appliances in new construction.								
	B2.8	performance standard	Set energy efficiency performance standards for commercial buildings with gross floor areas smaller than 50,000 square feet.	Regulatory/code change	Property Owners and Managers, ESCos	Mid term (5-10 years)	State, Local	M	Policy will be low-cost, but developing programs and structures and conducting ongoing monitoring and evaluation will add costs.
	B4.11	grid-connected appliances	Require smart appliances in new construction, especially water heaters that control timing of demand.	Regulatory/code change	Development Community, WABO	Short term (0-5 years)	Local	L	Upfront costs for policy development. Ongoing costs for monitoring, enforcement, and support. Cost of appliances would fall on property owner.
	B4.12	multifamily submetering	Require submetering for new multifamily buildings so residents can track energy use.	Regulatory/code change	Property Owners and Managers	Short term (0-5 years)	Local	L	Upfront costs for policy development. Ongoing costs for monitoring, enforcement, and support. Cost of submetering would fall on property owner.
	B6.2	electric appliances in new construction	Update municipal code to require electric appliances in new construction.	Regulatory/code change	Development Community	Mid term (5-10 years)	Local	L	Straightforward policy adjustment.
	B6.4	natural gas ban	Ban all new natural gas connections in new buildings.	Regulatory/code change	Development Community/WABO	Mid term (5-10 years)	Local	M	Will take time to do stakeholder outreach (contraversial issue) and develop policy that everyone can agree on (e.g., identifying exemptions).

		G5.2	solar-ready building code	Add as a high priority to municipality's legislative agenda - State-level amendments to State building code requiring solar-ready construction. Work with other cities to add this to the Association of Washington Cities (AWC) priorities.	Existing program	State, Thurston County, Lacey, Olympia, Tumwater, TCAT	Short term (0-5 years)	Local	L	Build on B5.8
Regionally Coordinated: Work together to develop regional approaches to climate mitigation activities.										
	A	Buildings & permitting: Develop standard approaches to incentivize and track green building practices across the region.								
		B3.5	green building tracking	Develop data methodology to monitor use and impacts of green building incentives, to inform future incentives and develop recommendations for policy or programs.	New program	public and private organizations	Mid term (5-10 years)	State, Local, Grants	L	Could scale depending on how in depth the assessment would be. Assume this would start rudimentary.
		B4.5	permitting incentives	Offer streamlined permitting, lower fees, or other incentives for projects that meet green building certification standards.	Existing program	development community, OMB, builders	Short term (0-5 years)	Existing Funds	L	Will need resources to develop the program structure, but certification standards are already in existence so that should lower program development costs.
		B4.7	land use incentives	Provide land use incentives (floor area ratio, density bonus, height bonus, parking reductions) for zero-net carbon buildings or other applications that dramatically increase energy efficiency.	Regulatory/code change	Development Community	Short term (0-5 years)	Local, Existing funds	L	Program development will require initial costs. Ongoing costs should be incorporated into standard permitting/review processes. Likely low participation in the short-term due to stringent criteria.
	B	Buildings & permitting: Develop standard approaches to consider climate impacts in permitting decisions.								
		T1.11	land use efficiency	Set integrated goals to consider network efficiency in land use decisions, including how density in certain areas supports transit, increases efficiency of utility service, and other support facilities. Consider VMT in identifying locations for large employment facilities.	New program	Development Community, EDC, Large employers	Short term (0-5 years)	Local, State, Existing funds	M	Will require some time for research and cordination with large employers.
		G4.6	social cost of carbon	Develop and adopt policies that require the use of a "social cost of carbon measure" in zoning, development, construction, and transportation decisions.	New program	State, Thurston County, Thurston County Health, Lacey, Olympia, Tumwater, TCAT	Mid term (5-10 years)	Local, Grant	L	City of Seattle has a model for this to build from.
	C	Buildings & permitting: Develop model regional standards or codes for priority climate actions								

	B4.4	green municipal buildings	Require that new local government facilities (e.g., the new Olympia City Hall and LOTT building) demonstrate green building technologies and practices.	Capital improvement	State, development community, St. Martins Engineering Students	Short term (0-5 years)	Other, Grant	M	Requirement will be low cost, but implementing improvements will cost more.
	T3.1	EV parking new construction	Require large commercial and residential buildings to dedicate a percentage of parking spots for electric vehicle charging.	Regulatory/code change	Development Community, PSE	Short term (0-5 years)	Local	L	Straightforward policy adjustment. May require some time to determine appropriate percentage.
	T3.5	EV ready building code	Require all new residential construction be built EV ready. Create a simple and consistent residential charging station permitting process to reduce costs and time to development.	Regulatory/code change	Development Community	Short term (0-5 years)	Local	L	Straightforward - have other jurisdiction templates available for this.
D	Transportation planning: Support, and in some cases expand, existing programs, and consider and address climate mitigation goals, targets, and actions in regional transportation projects.								
	T4.10	rider education/benefits	Maintain and expand a regional online page that lists all the mode shift education efforts and employer benefits opportunties (Thurston Here-To-There). Include a comments section for suggestions to further transit education and ridership.	Existing program	Employers	Ongoing	Grant, Existing funds	L	
	T4.15	promote transit benefits	Work with employers and transit agencies to develop ways to incentivize employee ridership (e.g., rebates for employees who give up use of employer parking facilities).	Existing program	State agencies, Large employers, Development Community, TRPC, Intercity Transit	Ongoing	State	L	Assume incentive funding covered by employer, state, etc.
	T5.1	walk/bike infrastructure barriers to transportation alternatives	Coordinate cities of Thurston Counties Master Bicycle and Pedestrian plans into a large regional plan to expand walking and biking infrastructure, including separated and protected opportunities. Coordinate efforts to maximize funding mechanisms and opportunities.	Existing program	TRPC, WSDOT	Short term (0-5 years)	Local, Federal	M	Broader planning effort would require extensive public/stakeholder engagement and coordination.
	T5.2		Develop a regional inventory to identify gaps in connectivity for safe cycling and walking. Then develop a strategy to prioritize projects and a plan for funding.	Existing program	TRPC	Ongoing	Local	M	
E	Transportation planning: Prioritize funding for transportation projects that advance climate mitigation priorities								

	T2.2	congestion mitigation	Develop congestion mitigation programs to increase transportation efficiency, reduce delay, and reduce emissions such as signalization coordination improvements along with application of speed harmonization techniques (ex. reevaluate speed limits, roundabouts vs signalized intersection, street connectivity). Added benefits are decrease idling time (pollution) and improve fuel efficiency (cost savings to driver).	Existing program	Development Community, Employers, WDOT	Ongoing	Local, Federal	M	Large-scale study covering large land areas. Assume includes implementation of recommended congestion mitigation program.
	T4.3	rural transit	Identify and implement first/last mile solutions for rural ridership (engage rural home owners associations for representation and feedback). Present this plan to TRPC with direction to explore pilot programs and secure funding sources.	New program	TRPC, intercity Transit	Long term (10+ years)	Other	L	Cost will depend on identified solution.
	T5.13	telecommuting infrastructure	Develop grants and provide financial resources for installation of infrastructure necessary to support telecommuting.	New program	Telecommunications	Long term (10+ years)	State, Grant	M	Depends on extent of financial resources and abiltiy to identify other funders.
F	Food waste: Support and expand Thurston County's waste less food program								
	W4.10	waste less food program	Expand Thurston County's "Waste Less Food" program.	Existing program	Waste services, Thurston County Food Bank, Public Works Waste ReSources	Short term (0-5 years)	Other	L	Depends on extent of expansion.
G	Carbon sequestration: Develop a regional program to track and certify carbon sequestration, including through afforestation and regenerative agriculture.								
	A5.1	reforestation & afforestation program	Develop a coordinated reforestation/afforestation program. Begin by identifying priority areas where reforestation and afforestation may have carbon reduction benefits.	New program	WDNR, WDFW,TCD (Forest RCPP), Land Trusts, Conservation organizations	Mid term (5-10 years)	Other, Local	H	Not many other local government models to build from here - will likely take time to develop program and conduct study.
H	Monitoring and assessment: Monitor and regularly report on the region's progress on climate action.								
	G4.1	emissions inventory	Prepare and publish an annual emissions inventory that tracks greenhouse gas emissions by jurisdiction and source category. Review and update emissions inventory methodology as necessary to address improvements to data or methodologies, improve consistency, incorporate changes to state or federal policies, or report on issues of local interest.	Existing program	Thurston County, Lacey, Olympia, Tumwater, TCAT	Ongoing	Local	M	While individual inventories are less expensive ($20-$50k), conducting them annually will add up over time.
	G4.2	performance measures	Develop community GHG reduction goals and performance measures. Regularly update and publicize for community to track their progress.	Existing program	Thurston County, Lacey, Olympia, Tumwater, TCAT	Ongoing	Local	L	Can build on G4.2.

	G4.3	other emission sources and sinks	Expand sources and sectors in future emissions inventories to inform future regulatory policy to reduce GHG emissions. Connected to actions T1.5 and W6.1, and sequestration actions.	New program	Thurston County, Lacey, Olympia, Tumwater, TCAT	Short term (0-5 years)	Local	L	Can build on G4.2.
	G4.4	vulnerable populations	Develop a data and monitoring mechanism that is specific to marginalized groups and their needs related to climate change and climate reality (e.g., access to transportation, access to A/C, proximity to cooling centers) and develop a plan to address these vulnerabilities with solutions that help reduce GHG emissions.	New program	State, Thurston County, Thurston County Health, Lacey, Olympia, Tumwater, TCAT	Mid term (5-10 years)	Local, Grant	M	Study + plan - done well will also require stakeholder/public engagement with hard-to-reach communities.
I	Coordination: Support ongoing regional coordination of climate action, through the continuation of the current steering committee or other governance body								
J	Coordination: Keep the community informed about and engaged in climate mitigation activities								
	G1.7	social research and behavior change campaigns	Work with higher education institutions to research effective behavior change through marketing and educate. Use this information in developing campaigns to reduce high emissions GHGs.	Support of third party partner	State	Short term (0-5 years)	Other, Grant	L	
K	Coordination: Seek and support funding for climate mitigation priorities.								
Individual Jurisdictions: Address climate mitigation priorities through departments and work programs of individual jurisdictions									
A	Municipal operations: Reduce emissions from government operations								
	B2.3	LED lighting	Install LED lighting in public-sector buildings and infrastructure (e.g., street lights, traffic signals).	Existing program	PSE, state offices, school districts, LOTT, County, Port	Ongoing	Existing Funds, Other	L	LEDs are increasingly inexpensive. Limited to only public sector buildings.
	B5.3	municipal building solar	Install solar photovoltaics on all available and feasible municipal sites, including building rooftops, city hall, schools, police and fire stations, community centers, municipal water pump sites, and transit depots.	Capital improvement		Mid term (5-10 years)	Local, Grant	M	PVs are increasingly inexpensive, but the cost would fall entirely on the jurisdictions.
	T2.17	teleworking/flex work	Increase opportunities for employee teleworking options and staggering work days to reduce employees driving during peak traffic times.	Existing program	State, School Districts, Port	Ongoing	Local, Grant	L	Time for working with large employers, partnering with co-working companies, etc.
	T3.2	free EV parking	Allow free parking for all electric vehicles at local government buildings and in city centers to encourage the adoption of all electric vehicles. Increase cost of parking for Non-EV vehicles.	Existing program	State	Mid term (5-10 years)	Local	L	Straightforward action - Jurisdictions have direct control.
	T3.10	convert to EV fleets	Set policies and timetable for electrification of municipal and other governmental fleets. Require replacement of public fleets with cleaner, energy-efficient vehicles to reduce long term fuel costs, improve air quality and reduce greenhouse gas emissions.	Existing program	Internal Fleet Users	Ongoing	Other	M	Marginal cost of electric alternatives could require additional resources in the near-term as technologies develop.

	W1.1	municipal energy efficiency	Conduct efficiency improvements to municipal water and sewage treatment systems. Prioritize components that consume the most energy and have high GHG emissions.	Existing program	Third Party Consultant	Short term (0-5 years)	Local	M	Depends on what upgrades are needed.
	W2.2	water audits	Conduct water audits of city and county facilities to determine prioritization of capital improvements.	Existing program	Third Party Consultant	Short term (0-5 years)	Local	L	Audits are straightforward. Does not include costs of implementing audit recommendations.
B	Code and regulatory changes.								
	B2.6	cool roofs	Create an incentive program for the installation of reflective roofs on commercial buildings to reduce building energy consumption and the urban heat island effect.	New program	landlords, property managers, renters	Short term (0-5 years)	State, Grants	M	Policy will be low-cost, but developing programs and structures and conducting ongoing monitoring and evaluation will add costs.
	B5.5	solSmart	Pursue SolSmart designations and adopt solar friendly practices.	Regulatory/code change	Olympia Community Solar	Short term (0-5 years)	Local	M	Depending on where jurisdictions are starting, could require introduction of new policies and programs.
	B5.8	solar-ready	Amend local development code to require solar-ready construction for all building types.	Regulatory/code change	Development Community/WABO	Mid term (5-10 years)	Local	L	Straightforward policy adjustment.
	B5.10	group purchasing	Develop/support a city-sponsored group solar purchasing program.	New program	SPARK NW, Olympia Community Solar	Long term (10+ years)	Local	L	Already being developed and implemented by PSE (e.g., Green Direct) - could work with them to expand.
	T1.1	coordinated long term planning- future infill	Coordinate long-term plans with transit agencies to project where increased density would support more transit corridors. Then change zoning/density that would support new transit corridors and variety of household incomes. Promote long-term equity and healthy communities by developing incentives such as density bonuses for development where a percentage of the units will be permanently affordable for household incomes.	Regulatory/code change	TRPC, Intercity Transit, Development Community	Short term (0-5 years)	Local	M	Partnerships with transit agencies would require staff time. Incentive development and implementation will also require initial and ongoing resources.
	T1.2	middle-density housing	Reevaluate and change zoning as needed to allow for a range of housing types to promote social economic integration of housing near the region's urban centers or moderate-density zones.	Regulatory/code change	Development Community, development community, housing stakeholders, Homeowner associations (CCRs)	Short term (0-5 years)	Local, Grant	M	Evaluation will take time and zoning adjustments will likely require some level of public and stakeholder engagement.

T1.3	Eco districts	Identify potential Eco districts to advance innovative district-scale urban development, sustainability, and neighborhood equity. Then make necessary code/zoning changes to support their development and set ambitious performance outcomes to ensure their long-term success.	Regulatory/code change	Development Community	Mid term (5-10 years)	Local	M	
T1.4	20-minute neighborhoods	Increase the number of 20-minute neighborhoods (walkable environment, destinations that support a range of basic living needs and a residential density). Identify key infrastructure components needed to grow the number of 20-minute neighborhoods, then change zoning and codes if needed and coordinate with other jurisdictions to make public investments where necessary.	Regulatory/code change	Development Community, Homeowner associations (CCRs)	Mid term (5-10 years)	Local, Federal	H	This is a large-scale action that requires both zoning/code adjustments and infrastructure investments.
T1.9	ADUs	Amend development codes to allow for attached and detached ADU's in urban residential areas.	Regulatory/code change	Development Community, Homeowner associations (CCRs)	Short term (0-5 years)	Local	L	Straightforward policy adjustment, but will require some level of public engagement.
T3.7	EV integration	Reevaluate regulations and make necessary changes to ensure charging stations are able to be permitted in locations where they are needed.	Regulatory/code change	State	Short term (0-5 years)	Local	L	May take some time for a study on this, but otherwise straightforward. May cost more if extensive public engagement is needed.
T5.11	car-free zones	Reevaluate long term plans and update to prioritize pedestrians and people riding bikes. Set goals for mode shift and plans on how to achieve those goals like developing car-free corridors in commercial and mixed use areas to encourage mode shift.	New program	Development Community, local businesses	Mid term (5-10 years)	Local, Existing funds, Grant	M	Broader planning effort would require extensive public/stakeholder engagement and coordination.
A6.5	municipal canopy	Maximize tree canopy on City-owned or City-controlled land, where appropriate in balance with other City goals.	Existing program	Citizen groups	Mid term (5-10 years)	Local	L	Straightforward - cost will depend on extent of existing tree canopy.
A6.9	tree canopy preservation	Develop a tree canopy ordinance that establishes a baseline for current urban canopy and sets goals for future canopy to increase cities' resilience. Combine direct cooling value (urban heat island mitigation) with carbon sequestration value when evaluating urban tree management.	Regulatory/code change	Citizen groups/Development Community	Short term (0-5 years)	Local	L	Can build on A5.1.
C	Staff development							
B4.9	permit counter technical assistance	Hire or contract with dedicated green building specialists to provide technical assistance through the permitting and development process.	New program	Development Community	Mid term (5-10 years)	Local	L	Cost will depend on whether jurisdiction subsidizes cost of technical assistance. Assume jursdiction serves as lisiason but not funder.
Supporting Partner: Support climate mitigation actions led by other organizations.								
A	Intercity Transit							

	T4.1	increase transit	Increase local public transit routes/frequency with a focus on expanding transit service before and after traditional business hours and on weekends.	Support of third party partner	TRPC, Development Community, Intercity Transit	Mid term (5-10 years)	Other	H	This is a large-scale action that can scale up depending on needs. Unclear to what extent transit agencies vs. jurisdictions would assume cost.
	T4.4	fareless system/youth ride free	Maintain a fareless system for public transit.	Support of third party partner	None	Short term (0-5 years)	Other	H	Will result in reduced transit revenues. Will require substantial subsidies. Unclear to what extent jursidiction vs. transit agency would incur cost.
	T5.4	school drop-off alternative modes	Maintain and expand a walking/biking incentive program with safety education for families.	Support of third party partner	Intercity Transit, School Districts	Ongoing	Local	L	Likely able to build on existing programs.
B	Thurston Conservation District								
	A1.2	nutrient management	Provide education and incentives (e.g., grants, loans, technical assistance) reduce nitrous oxide emissions when managing fertilizer.	Existing program	Farm bureau, Conservation District	Ongoing	Other	L	Could partner with extension offices for this.
	A2.1	regenerative agriculture	Expand regenerative agricultural practices (ex. low-till, no-till education programs) among farmers that aim for a "whole farm" approach. Provide education on how to increase organic matter content and water retention in soils within urban and agricultural settings.	Existing program	TESC POP program, St Martins University, Thurston Conservation District	Mid term (5-10 years)	Other	L	Could partner with extension offices for this.
C	LOTT Clean Water Alliance								
	W3.1	nitrous oxide capture	Research and implement nitrous oxide mitigation strategies and strategies to avoid or reduce nitrous oxide emissions. Present findings and cost vs benefits analysis to policy makers to determine what changes should be made.	New program	0	Short term (0-5 years)	Other	L	
D	Thurston Economic Development Council								
	B6.1	natural gas to electric conversions	Educate business owners and residents on the options for electric appliances and the benefit of pairing electrification with the installation of renewable energy. Create incentives to support fuel switching.	New program	Property Owners and Managers	Mid term (5-10 years)	Grant	L	Depends on extent of education - low cost would include development of initial informational materials and collateral for events, City websites, etc.
	W4.4	waste audits	Provide waste audits for business owners and education on practices that decreate waste (e.g., compost, recycling, reuse).	Existing program	Thurston County, Lacey, Olympia, Tumwater, LeMay	Short term (0-5 years)	Local, Grants	M	Cost will depend on scale of participation.
	W6.6	supply chain	Provide free technical assistance to local businesses in reducing the carbon intensity of their supply chains.	Support of third party partner	Ecology TREE program, Chamber of Commerce, EDC	Mid term (5-10 years)	Other	M	Will likely required contractors for expertise. Cost will depend on extent of participation.
E	Puget Sound Energy								

	B3.1	energy education	Provide educational resources and technical assistance to industry professionals, building owners and managers on all aspects of energy efficient building design, retrofits, and operations for new and existing buildings.	Support of third party partner	WABO and building organizations	Mid term (5-10 years)	State	M	Development of educational materials will be upfront costs. Technical assistance will be ongoing and will require staff/consultant time.
	B6.1	natural gas to electric conversions	Educate business owners and residents on the options for electric appliances and the benefit of pairing electrification with the installation of renewable energy. Create incentives to support fuel switching.	New program	Property Owners and Managers	Mid term (5-10 years)	Grant	L	Depends on extent of education - low cost would include development of initial informational materials and collateral for events, City websites, etc.
F	Other								
	B3.4	exemplary buildings	Create a Zero-Energy Building Challenge by partnering with public, private, non-profit and faith-based organizations. Facilitate rapid deployment and public awareness of high-profile demonstration buildings that use innovative energy efficiency and/or technology.	Support of third party partner	public and private organizations	Mid term (5-10 years)	State	L	Parntering with organizations should help lower jurisdiction costs. One-time cost for the challenge.
	T3.11	EV education	Partner with environmental and other agencies to increase consumer awareness about EV options and incentives for use and purchase.	Support of third party partner	State	Short term (0-5 years)	Grant	L	Partnership presents opportunity for cost sharing. Straightforward awareness building program.
	T3.14	EV mass purchase discounts	Create a group purchase program for residents to get deep discounts on EVs, other fuel efficient and alternative fuel vehicles.	New program	State	Mid term (5-10 years)	Grant	L	May take time and resources to identify partners and develop program. Once established, cost will be minimal to maintain.
	T3.15	EV purchase discounts	Partner with car sale and lease dealerships to provide incentives for purchase of electric vehicles by Thurston County residents. Pilot with those neighborhoods, individuals with greatest VMT potential.	New program	State	Mid term (5-10 years)	State	L	May take time and resources to identify partners and develop program. Once established, cost will be minimal to maintain.

Appendix 10.7 - Monitoring Protocol

Monitoring Framework

Appendix 10.7

Overview

The Thurston Climate Mitigation Plan includes a monitoring framework to gauge accountability and track progress toward achieving the adopted greenhouse gas emission targets.

Methodology

The monitoring framework includes three components:

- A Greenhouse Gas Emissions Inventory – The emissions inventory uses local data to estimate the relative contribution of emissions from different sectors, including energy in buildings, transportation, agriculture, and solid waste. Since 2010, the Thurston Climate Action Team (TCAT) has estimated annual community-wide greenhouse gas emissions within Thurston County using a nationally recognized protocol developed by the International Council of Local Environmental Initiatives (ICLEI). TCAT's 2018 Inventory was used as the information foundation for the scenario analysis.

- Key Performance Indicators – quantitative metrics that indicate progress towards the goals and strategies of the plan. The key performance indicators include inputs to the Greenhouse Gas Emissions Inventory (ex., kilowatt hours of residential energy consumption), outputs from the Greenhouse Gas Emissions Inventory (ex., tons of greenhouse gas emissions from residential energy use), and supplemental indicators that address factors outside the emissions inventory (ex., number of public electric vehicle charging stations). Each indicator has a baseline value for the year 2010, and will have target values for 2030 and 2050 that can be used to track progress.

- Action Progress – qualitative updates on the status of individual actions included in the plan.

Reporting

One of the guiding principles identified at the start of the planning process was:

> ***Adaptive.*** *Consider both the short- and long-term impacts of climate change, regularly report on progress, and review and revise targets and approaches as needed to address emerging information about the timing and severity of climate impacts or the effectiveness of policies;*

As part of the Implementation of the Thurston Climate Mitigation Plan, reporting and revisions are recommended on the following schedule:

Annually

- Greenhouse Gas Emissions Inventory
- Key Performance Indicators – note: some indicators may be updated less frequently depending on data availability, aiming for every 3-5 years at a minimum.
- Priority Actions

Every 2 Years

- Minor updates to actions; set priority actions for next two-year cycle

Every 4-5 Years

- Substantial updates to strategies and actions

Every 8-10 Years

- Full review and update of the Thurston Climate Mitigation Plan

The Monitoring Program is anticipated to be managed by Thurston Regional Planning Council, or other entity identified in a Phase 3 Interlocal Agreement, with support from participating jurisdictions. Monitoring progress reports are anticipated to be presented to a future iteration of the Steering Committee, or other entity identified in a Phase 3 Interlocal Agreement, and communicated through an online dashboard viewable to the public.

Attachment:

- Key Performance Indicators

Reporting Year (enter the current year):	2020

Focus Area	Strategies	KPI ID	KPI	Category
Agriculture & Forests	Manage forests to sequester carbon.	AF1	Annual tree sequestration (MTCO2e)	Supplemental
Agriculture & Forests	Reduce emissions from agricultural practices.	AF2	Land fertilization (acres)	GHG Inventory Input
Agriculture & Forests	Reduce emissions from agricultural practices.	AF3	Animal farming (# of heads)	GHG Inventory Input
Agriculture & Forests	Reduce emissions from agricultural practices.	AF4	Agriculture GHG emissions (MTCO2e)	GHG Inventory Output
Agriculture & Forests	Reduce emissions from the urban landscape.	AF5	Percent tree canopy cover	Supplemental
Buildings & Energy	Convert to cleaner fuel sources.	BE1	Total residential natural gas consumption (MMBtu)	GHG Inventory Input
Buildings & Energy	Convert to cleaner fuel sources.	BE2	Per-household residential natural gas consumption (MMBtu/household)	GHG Inventory Input
Buildings & Energy	Convert to cleaner fuel sources.	BE2	Residential fuel oil consumption (households)	GHG Inventory Input
Buildings & Energy	Convert to cleaner fuel sources.	BE4	Residential LPG consumption (households)	GHG Inventory Input
Buildings & Energy	Convert to cleaner fuel sources.	BE5	Residential wood consumption (households)	GHG Inventory Input
Buildings & Energy	Convert to cleaner fuel sources.	BE6	Industrial natural gas consumption (MMBtu)	GHG Inventory Input
Buildings & Energy	Convert to cleaner fuel sources.	BE7	Commercial natural gas consumption (MMBtu)	GHG Inventory Input
Buildings & Energy	Convert to cleaner fuel sources.	BE8	Commercial natural gas GHG emissions (MTCO2e)	GHG Inventory Output
Buildings & Energy	Convert to cleaner fuel sources.	BE9	Industrial natural gas GHG emissions (MTCO2e)	GHG Inventory Output
Buildings & Energy	Convert to cleaner fuel sources.	BE10	Residential electricity GHG emissions (MTCO2e)	GHG Inventory Output
Buildings & Energy	Convert to cleaner fuel sources.	BE11	Residential natural gas GHG emissions	GHG Inventory Output
Buildings & Energy	Convert to cleaner fuel sources.	BE12	Residential fuel oil GHG emissions (MTCO2e)	GHG Inventory Output
Buildings & Energy	Convert to cleaner fuel sources.	BE13	Residential LPG GHG emissions (MTCO2e)	GHG Inventory Output
Buildings & Energy	Convert to cleaner fuel sources.	BE14	Residential wood GHG emissions (MTCO2e)	GHG Inventory Output
Buildings & Energy	Convert to cleaner fuel sources.	BE15	Total natural gas consumption (MMBtu)	GHG Inventory Input
Buildings & Energy	Convert to cleaner fuel sources.	BE16	Proportion of housing units with electric heating (%)	Supplemental
Buildings & Energy	Convert to cleaner fuel sources.	BE17	Total building energy GHG emissions (MTCO2e)	GHG Inventory Output
Buildings & Energy	Convert to cleaner fuel sources.	BE18	Electricity emissions factor (MTCO2e/MWh)	GHG Inventory Input
Buildings & Energy	Convert to cleaner fuel sources.	BE19	Local green power purchases (kWh)	Supplemental
Buildings & Energy	Increase the production of local renewable energy.	BE20	Renewable electricity (% of total)	Supplemental
Buildings & Energy	Increase the production of local renewable energy.	BE21	Grid-supplied renewable electricity (MWh)	Supplemental
Buildings & Energy	Increase the production of local renewable energy.	BE22	Estimated local solar installations (#)	Supplemental
Buildings & Energy	Reduce energy use across building types.	BE23	Commercial electricity consumption (kWh)	GHG Inventory Input
Buildings & Energy	Reduce energy use across building types.	BE24	Per-sf commercial electricity consumption (kWh/sf)	GHG Inventory Input
Buildings & Energy	Reduce energy use across building types.	BE25	Commercial electricity GHG emissions (MTCO2e)	GHG Inventory Output
Buildings & Energy	Reduce energy use across building types.	BE26	Industrial electricity consumption (MWh)	GHG Inventory Input
Buildings & Energy	Reduce energy use across building types.	BE27	Industrial electricity GHG emissions (MTCO2e)	GHG Inventory Output
Buildings & Energy	Reduce energy use across building types.	BE28	Total energy consumption (MMBtu)	GHG Inventory Input
Buildings & Energy	Reduce energy use across building types.	BE29	Per-sf commercial energy use (MMBtu/sf)	GHG Inventory Input
Buildings & Energy	Reduce energy use across building types.	BE30	Energy-efficient buildings (# LEED certified)	Supplemental
Buildings & Energy	Reduce energy use across building types.	BE31	Percent of population with disproportionate energy/housing costs as a percentage of household income	
Buildings & Energy	Reduce energy use in residential buildings.	BE32	Residential electricity consumption (KWh/household)	GHG Inventory Input
Buildings & Energy	Reduce energy use in residential buildings.	BE33	Residential energy use per capita (MMBtu/household)	GHG Inventory Input
Cross-Cutting	Conduct education and outreach across climate mitigation areas.	CC1	Community participation in TCMP events (# attendees)	Supplemental
Cross-Cutting	Enhance monitoring and evaluation of climate mitigation measures and outcomes.	CC2	Percent of actions that are completed or underway	Supplemental

Cross-Cutting	Enhance monitoring and evaluation of climate mitigation measures and outcomes.	CC3	New, local green jobs created, by demographic group (% or # , by demographic)	
Transportation & Land Use	Increase adoption of electric vehicles.	TL1	Proportion of passenger vehicles that are electric (%)	GHG Inventory Input
Transportation & Land Use	Increase adoption of electric vehicles.	TL2	Electric vehicles (# registered)	GHG Inventory Input
Transportation & Land Use	Increase adoption of electric vehicles.	TL3	Number of public EV charging spots (#)	Supplemental
Transportation & Land Use	Increase efficiency of the transportation system.	TL4	Passenger/light duty vehicle carbon intensity (gCO_2e/mi)	GHG Inventory Input
Transportation & Land Use	Increase efficiency of the transportation system.	TL5	Passenger/light duty vehicle GHG emissions ($MTCO_2e$)	GHG Inventory Output
Transportation & Land Use	Increase efficiency of the transportation system.	TL6	Medium- & heavy-duty truck emission intensity (gCO_2e/mi)	GHG Inventory Input
Transportation & Land Use	Increase efficiency of the transportation system.	TL7	Medium- & heavy-duty truck GHG emissions ($MTCO_2e$)	GHG Inventory Output
Transportation & Land Use	Increase efficiency of the transportation system.	TL8	Transportation GHG emissions ($MTCO_2e$)	GHG Inventory Output
Transportation & Land Use	Increase the use of public transit.	TL9	Percent of population within 1/2 mile of transit	
Transportation & Land Use	Increase the use of public transit.	TL10	Public transit ridership (passenger boardings)	Supplemental
Transportation & Land Use	Increase the use of public transit.	TL11	AllTransit Performance Score	Supplemental
Transportation & Land Use	Increase the use of public transit.	TL12	Percent of residents who live within 1/2 mile of public transit	Supplemental
Transportation & Land Use	Increase use of active forms of travel and more efficient commute modes.	TL13	Median household transportation costs as a percentage of median household income	Supplemental
Transportation & Land Use	Increase use of active forms of travel and more efficient commute modes.	TL14	Bike lanes (miles)	Supplemental
Transportation & Land Use	Increase use of active forms of travel and more efficient commute modes.	TL15	Sidewalks (miles)	Supplemental
Transportation & Land Use	Increase use of active forms of travel and more efficient commute modes.	TL16	Number of personal vehicles per capita	Supplemental
Transportation & Land Use	Increase use of active forms of travel and more efficient commute modes.	TL17	Percent of residents who commute to work by bike	Supplemental
Transportation & Land Use	Increase use of active forms of travel and more efficient commute modes.	TL18	Average Walk Score in Thurston County (out of 100)	Supplemental
Transportation & Land Use	Increase use of active forms of travel and more efficient commute modes.	TL19	Average Bike Score in Thurston County (out of 100)	Supplemental
Transportation & Land Use	Set land use policies that support increased density and efficient transportation networks.	TL20	Passenger/light-duty vehicle use (VMT)	GHG Inventory Input
Transportation & Land Use	Set land use policies that support increased density and efficient transportation networks.	TL21	Medium- & heavy-duty truck use (VMT)	GHG Inventory Input
Transportation & Land Use	Set land use policies that support increased density and efficient transportation networks.	TL22	Total vehicle miles traveled (VMT) in Thurston	GHG Inventory Input
Water & Waste	Divert more solid waste from landfills.	WW1	Per-capita solid waste generation (wet tons/capita)	Supplemental
Water & Waste	Divert more solid waste from landfills.	WW2	Solid waste GHG emissions ($MTCO_2e$)	GHG Inventory Output
Water & Waste	Divert more solid waste from landfills.	WW3	Total tons of waste disposed to landfill (wet tons)	GHG Inventory Input
Water & Waste	Divert more solid waste from landfills.	WW4	Organic waste disposed to landfill (wet tons)	GHG Inventory Input
Water & Waste	Divert more solid waste from landfills.	WW5	Waste diversion rate (weight of recycled and composted waste/total weight of waste	Supplemental
Water & Waste	Divert more solid waste from landfills.	WW6	Proportion of disposed waste that is compostable (%, by weight)	GHG Inventory Input
Water & Waste	Reduce emissions from wastewater treatment operations.	WW7	Wastewater GHG emissions ($MTCO_2e$)	GHG Inventory Output
Water & Waste	Reduce emissions from wastewater treatment operations.	WW8	Septic tank GHG emissions ($MTCO_2e$)	GHG Inventory Output

Appendix 10.8 - Community Engagement Summary

Appendix 10.8

Community Engagement Summary

Overview

Perspectives from a wide range of people throughout the community helped shape the Thurston Climate Mitigation Plan's development. Many of the communitywide actions identified to reduce greenhouse gas emissions will need extensive long-term commitment from across the region. Involving residents and members of the public in the development and decision-making process can help increase buy-in and participation and ensures that communitywide actions are as effective as possible.

Cascadia Consulting Group developed a Public Engagement Strategy that guided community outreach throughout the planning process (see Attachment A).

Public Engagement Methods

- ### Climate Advisory Workgroup
  This committee included public- and private-sector members of the community with subject matter expertise in one of five sectors: Buildings and Energy, Transportation and Land Use, Water and Waste Management, Agriculture and Forestry, and Cross-cutting. The Climate Advisory Workgroup was tasked with identifying, evaluating, and recommending a list of impactful actions to achieve the emissions reduction goal. Workgroup members also reviewed and provided input on project goals and guiding principles, public engagement strategy, scenario results, and implementation strategies. The Workgroup met six times between June 2019 and July 2020.
- ### Community Survey
  In 2019, an online community questionnaire gathered a baseline understanding of the community's priorities, perspectives, and concerns. The survey was shared through the TRPC website, social media, e-newsletters, listservs, and partner networks. The survey was open from August 12 to September 30, 2019 and received 1,397 responses. Results from the survey are summarized in Attachment B.
- ### Pop-Up Events
  The project team engaged with the community at local events, including Tenino Oregon Trail Days; Thurston County Fair; the Yelm, Olympia, and Tumwater Farmers Markets; and the Olympia Fall Arts Walk, among others. These pop-up events provided an opportunity for visitors to learn more about the project, ask questions to project staff, and provide input through interactive activities. Summer 2019 outreach is summarized in Attachment B.
- ### Community Briefings
  The project team gave presentations to a number of committees and organizations. These presentations typically included an overview of the project and an opportunity to provide high-level recommendations for the plan's development. A list of Community Briefings held between August 2019 and August 2020 is included in Attachment C.
- ### Interviews
  To better understand the impacts of the strategies and actions being considered, the consultant team conducted interviews with representatives from key sectors and organizations. Interview subjects included

representatives from the Thurston County Food Bank, Confederated Tribes of the Chehalis Reservation, Olympia Master Builders, Hispanic Roundtable, and Homes First. Interviewees provided feedback on their organization's climate impact mitigation work; climate impacts to the communities in which they work; as well as concerns, challenges, and potential barriers to implementation of the actions. Interviews are summarized in Attachment D.

- Public Comments
  Time for public comments was set aside at all Steering Committee and Climate Advisory Workgroup meetings. Public comments also were received through direct email and voicemail messages to TRPC staff. Between February 2019 and August 2020, TRPC staff tracked 104 comments from 39 separate individuals. Of these, 53 comments were provided at 11 sperate Steering Committee meetings, 16 were provided at four sperate Climate Advisory Workgroup meetings, 34 were provided by email, and one was provided by voicemail. Public comments received through August 19, 2020 are detailed in Attachment E – major comment themes are described below.
- Website, Contact List, Social and Traditional Media
  Throughout the project, TRPC maintained a dedicated website which was frequently updated with meeting materials and other relevant project information. Visitors to the website had the option to sign up to receive project updates via email, a list of 687 interested parties as of July 2020. TRPC promoted opportunities for public input at key decision points through social media posts and press releases.

There will be additional opportunities for community engagement during the review of the draft plan, and as individual jurisdictions work to implement actions in the years to come.

Additional information will be added to this section based on feedback gathered during the public review period.

Public Comment Themes

Public comment themes varied according to the process timeline for plan development. Early comments focused on increased involvement from affected emissions sectors and impacted communities. Later comments focused on decision-making processes related to action selection and metrics for measuring their impact. Below is a list of common themes from the public commenting process. A comprehensive list of public comments is included in Attachment E.

Community Involvement

Comments regarding community involvement included requests to extend participation in the planning process to various organizations and communities in the region that commenters felt were absent or underrepresented. These included organizations such as the Sierra Club, Audubon Society, Olympia Community Solar, and labor unions. Commenters also mentioned increase involvement from industries such as nuclear energy, local builders, and other private sector businesses. There were also requests for more demographic diversity including youth and tribal members with a broader request for an increased focus on social equity and justice.

Criteria

Comments relating to criteria included recommendations or requested changes to measurements used to select priority actions from the comprehensive list developed by the project team. Many comments focused on making energy as clean and efficient as possible. These included comments for improved efficiency in single-family homes and multifamily structures. Other areas of interest were carbon sequestration and agricultural activities. Many

commenters also asked for clarity and increased emphasis on equity and coordination with government efforts beyond the regional level.

Methods

Comments relating to methods focus on the types of actions being considered and the appropriate way to qualify and quantify their impacts. These included questions about the quantitative analysis used to rank actions based on identified criteria. A major focus was how actions would be weighed for high-impact sectors such as buildings & energy and transportation and how those applied measures would affect the composition and sector-focus of a final priority action list. Other comments emphasized the need for mitigation actions to be balanced with sequestration actions.

Targets/Goals

Comments regarding targets and goals tended to recommend favoring specific approaches that were believed to deliver the best results for reducing emissions. Since the TCMP takes a broad and regional approach to climate change mitigation, various sectors and contributions for/to GHG emissions are addressed in this plan. Some comments focused on reducing reliance and use of potent GHG sources such as natural gas in order to meet future emission targets. The largest block of comments was directed at the two options for priority action identification (option A and B) and whether emission reduction or parity across sectors was more likely to deliver plan goals.

General

Many general comments were also provided to the Steering Committee and Advisory Workgroup members, as well as to TRPC staff. These included general comments about the importance of maintaining the natural environment and recommendations for additional consideration. In many cases commenters suggested specific resources and new developments occurring within effected communities. Others provided thoughts on feasibility and the level of commitment required for effective implementation.

Attachments:

- Attachment A: Public Engagement Strategy
- Attachment B: Early Outreach Report
- Attachment C: List of Community Briefings
- Attachment D: Priority Audiences, Interview Summary
- Attachment E: Public Comment Matrix

FINAL

Public Engagement Strategy

Thurston Climate Mitigation Plan

TASK 2.2 DELIVERABLE: FINAL| July 17, 2019

THURSTON REGIONAL PLANNING COUNCIL

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Public Engagement Strategy

The benefits and costs of climate mitigation will affect everyone in Thurston County. A holistic, equitable, and thorough approach to public engagement will be used to solicit public input on potential mitigation actions and best align actions with community priorities.

The Thurston Climate Mitigation Plan (TCMP) is a continuation of the efforts of the Thurston Regional Planning Council (TRPC), Thurston County, and the cities of Lacey, Olympia, and Tumwater to prepare for and reduce the impacts of climate change on residents, businesses, government operations, and the region's lands and waters. The TCMP is intended to include actions at multiple levels—from actions that individual citizens can take to actions that all member jurisdictions undertake—that will help solidify the climate partnership, consider social justice and equity, and make measurable progress towards the TCMP's goals.

The Public Engagement Strategy provides a framework for engaging communities across Thurston County and the cities of Lacey, Olympia, and Tumwater in support of TCMP development and implementation. It includes the following elements, detailed in the sections that follow:

- Public engagement goals.
- Priority audiences to engage.
- Methods to engage key audiences.
- A schedule and process for engagement, review of findings, and coordination.
- The responsibilities of the consultant team, TRPC staff, Steering Committee, and Climate Advisory Workgroup during engagement.

Engagement Goals and Objectives

Consistent with the overall TCMP goals, the Public Engagement Strategy is designed to solicit input on potential mitigation actions and best align those actions with community priorities. Our engagement efforts have three high-level goals and supporting objectives, listed in the table below. Together, these goals and objectives lay the groundwork for ongoing engagement during TCMP implementation.

Goal A	**Lay the groundwork for continued community engagement** on climate action. Objective: Deliver honest and consistent messaging to the public. Objective: Build relationships with trusted community liaisons to help engage hard-to-reach populations such as communities of color, low-income, rural, youth, and elderly communities, and military families. Objective: Provide a range of engagement options to suit different lifestyles, availability, and ways of processing information.
Goal B	**Promote alignment between community and government climate priorities,** while recognizing the separate roles, responsibilities, and interests of individuals and organizations. Objective: Solicit meaningful input from a diverse and representative set of partners and stakeholders. Objective: Capture areas of convergence and divergence regarding climate action priorities throughout Thurston County, including gaps and unmet needs, where applicable.
Goal C	**Build public support for climate action** across Thurston County. Objective: Develop broad awareness of anticipated climate impacts throughout Thurston County and the cities of Lacey, Olympia, and Tumwater and efforts to address them, including the co-benefits of action and the costs of inaction. Objective: Meet participants where they are, with respect for their involvement in climate change action and their different needs, wants, and priorities regarding climate mitigation. Objective: Clearly describe the focus and boundaries of the TCMP, how the TCMP is to be used, and the role that public input and informed decision making will play in TCMP implementation.

Priority Audiences

To ensure the TCMP captures the perspectives of those likely to be most affected by climate change and TCMP implementation, we will engage a diversity of individuals and organizations across the County.[1] We have categorized the priority audiences into three groups, listed here and described in more detail below:

- Organizations directly affected by implementation of TCMP actions
- Communities most vulnerable to climate impacts
- Other hard-to-reach populations

Individuals and organizations within these groups will vary in their understanding of climate change and climate impacts, and their level of support for climate action. Our approach is designed to fairly and fully engage the public across these spectra. Please see Appendix B for a summary of priority audiences and engagement methods for each.

Note: Engagement with tribal government and staff is not included here, as tribes are not considered stakeholders because they are sovereign nations and co-managers of natural resources with Washington state. Tribal staff are engaged through the Climate Advisory Workgroup and through existing relationships with community groups and governments involved in this project. Both the Nisqually Indian Tribe and Confederated Tribes of the Chehalis Reservation are members of the Thurston Regional Planning Council.

Organizations directly affected by implementation of TCMP actions

This group of stakeholders includes organizations that may be affected by TCMP implementation (i.e., may experience new benefits or costs), with a focus on non-governmental entities that may be asked to implement or support implementation of TCMP actions.[2] There is some overlap with the Climate Advisory Workgroup membership:

- Construction companies or contractors who build new or retrofit existing buildings and homes may be required or encouraged to implement TCMP actions.
- Farmers and ranchers may implement actions that store more carbon on the landscape. They may also be among the first who need to adapt to climate impacts.
- Renewable energy companies and those who support them to install and maintain renewable energy may be required or encouraged to implement certain TCMP actions.
- Property owners and managers who may be asked to install retrofits or implement other carbon reduction measures.
- Utilities such as LOTT Clean Water Alliance and Puget Sound Energy whose business operations are affected by climate impacts and mitigation actions.

[1] In this Public Engagement Strategy, "we" refers firstly to the TRPC project team and consultant team leading public engagement. It also includes the TRPC Steering Committee as the decision maker in this process.
[2] Since this strategy is focused on public engagement, it does not include methods to engage government entities beyond the Steering Committee engagement described herein. The Steering Committee acts separately and is the primary method to engage government entities in the TCMP process.

- **NGOs with land management responsibilities** such as Capitol Land Trust, Nisqually Land Trust, South of the Sound Community Farmland Trust, and Center for Natural Lands Management may implement actions that improve land carbon storage or management of fertilizers, manure, etc.

Communities most vulnerable to climate impacts

Communities most vulnerable to climate impacts include those who face disproportionate health, economic, social, and cultural impacts from climate change. This priority audience also includes the organizations that serve these communities.

- **Low-income communities** and **communities of color** are disproportionately likely to 1) live in higher-pollution areas, 2) live in homes without adequate cooling or public transportation access, 3) be susceptible to environmentally-related health conditions such as asthma, 4) and face systemic barriers to engaging in public processes and receiving public services. Additional environmental stressors like climate change exacerbate these conditions.
- **Rural communities** tend to receive fewer public services than their urban counterparts and have less access to support such as cooling centers. They also face time and distance barriers to attend public events, and digital barriers to engagement such as slow or no internet.
- **Those who live and work outside** such as people experiencing homelessness, construction workers, landscapers, farmers, and ranchers. Relevant organizations for reaching this group include the Food Bank, Farmers Markets, farming cooperatives, and unions.
- **Youth** today will be the first generation across the four jurisdictions to live in a widely climate-altered future. The actions taken today will determine their risk and vulnerability as adults.

Other hard-to-reach populations

Other hard-to-reach populations includes military families and middle-income families (especially those with children). These communities tend to engage less due to factors like time constraints and a lack of familiarity with the community.

- **Military families** may struggle to feel a part of a new community, even if they are expected to stay for several years, and therefore engage less in planning efforts like these.
- **Middle-income families, especially those with children,** often lack the time to engage in planning efforts like these.

TCMP Committees

TCMP executive decision-making happens in the **Steering Committee**, made of representatives of five organizations directly affected by TCMP actions: Thurston County; the cities of Olympia, Lacey and Tumwater; and TRPC.

TCMP analysis and recommendations are guided by the larger **Climate Advisory Workgroup**, which includes representatives from as many of the priority audiences as possible. These two governing bodies provide a secondary interface to the priority audiences, that works in parallel to the approaches described in this Public Engagement Strategy.

Engagement Approaches

To ensure a robust engagement process that is tailored to diverse needs and interests across Thurston County and the cities of Lacey, Olympia, and Tumwater, our approach includes both **broad-brush** and **targeted engagement**. This approach strategically engages priority audiences around areas of interest, potential impact, geography, and key project milestones to meaningfully inform the selection of mitigation actions in the TCMP.

Since Phase 1 of this process (target setting) included relatively little engagement and engagement around the adaptation plan was completed about two years ago, this design **focuses first on building awareness/interest in the process and identifying the priorities/ concerns of priority audiences.** Our approach for this first focus is attendance at **summer fairs/festivals and targeted engagement** in coordination with community liaisons. An **engagement toolkit** that includes a brief digital questionnaire on climate mitigation concerns and priorities will be available to support targeted engagement and throughout the process. **Email communications**, a **webpage,** and **traditional and social media** engagement will also support ongoing communications and will be managed by TRPC staff.

Once awareness and interest are built, the broader public is more likely to engage and broader engagement methods such as a **widely distributed survey and open houses** will be used. This engagement approach also positions priority audiences to meaningfully engage in determining and prioritizing the list of actions, which increases the likelihood they will participate in the later stages of the process. Our approach only asks for broader input when a solid, prioritized list of draft actions—in the form of the draft TCMP—are ready for review. This approach recognizes that open houses are most effective (i.e., highest attendance, most representative of population) when engagement and interest are already in place.

Descriptions of these approaches are provided below. **Appendix B. Summary of Public Engagement Strategy** links these approaches with priority audiences. **Table 1. Potential engagement metrics** offers potential measures to track engagement performance. **Table 2. Distribution of engagement budget across approaches** describes how the public engagement budget will be spent, the number of engagement events, and key assumptions about roles and responsibilities of TRPC staff, the Steering Committee, Climate Advisory Workgroup, and the engagement/consultant team. The **Public Engagement Timeline** provides details on the timing of engagement, and the **Thurston Climate Mitigation Plan Development** describes how engagement results will be used to develop the TCMP.

Ongoing, existing engagement approaches

- **Steering Committee** provided input on public engagement goals, objectives, and priority audiences that was used to prepare this Public Engagement Strategy. They will also review and approve the Public Engagement Strategy; provide guidance to identify key community liaisons, summer fairs/festivals to attend, and good locations for open houses; and, connect the consultant team to community liaisons, as appropriate. As stated in the scope of work for the overall planning effort, jurisdiction staff may assist with engagement by staffing fair/festival booths and open houses, and using the engagement toolkit at public events they are already attending for work.
- **Climate Advisory Workgroup** will review and provide input on the Public Engagement Strategy. They will also provide guidance to identify key community liaisons, summer fairs/festivals to attend, and good locations for open houses, as well as connect the consultant team to

community liaisons as appropriate. Climate Advisory Workgroup members may also use the engagement toolkit to gather input at events they are already attending for work or in their role as a Climate Advisory Workgroup member. CAW members will also participate as subject matter experts and help lead discussions in breakout focus groups, as described below.

Ongoing, new engagement approaches

- **Engagement toolkit** with a factsheet on the planning process and ways to engage, talking points for those using the toolkit, easy-to-use methods to gather input (e.g., digital questionnaire), and instructions about what to do with the input gathered. Member jurisdiction staff, Climate Advisory Workgroup members, the to-be-identified community liaisons, and community volunteers (as appropriate) could use this toolkit to leverage already-planned public events or engagement, effectively broadening the scope of outreach to include events people are attending for related reasons. This toolkit could be especially effective at reaching rural communities and low- and middle-income families who are unlikely to come to an in-person open house or take a survey, but have common community gathering spaces they frequent (e.g., community center). It could make use of materials that would also be used at fairs/festivals, be prepared early in the process for immediate use, and be used throughout the process.
- **Climate change webpage** to provide up-to-date information on the TCMP status and development, including upcoming engagement opportunities and documents available for review and comment.
- **Email communications**, managed by TRPC staff and member jurisdictions, to manage and coordinate response to project-related inquiries, distribute and manage invitations to events, draft and send listservs, coordinate review of project materials, etc.
- **Traditional and social media** engagement, managed by TRPC staff and member jurisdictions, to generate media interest and expand the audience aware of engagement opportunities related to the TCMP. Newspapers, community TV, online outlets, and social media are included. Media engagement will be targeted to public engagement and TCMP milestones such as the fairs/festivals and digital questionnaire in summer 2019 and the release of the draft TCMP for public review and input in early 2020.

Initial engagement approaches

- **Fairs and festivals** will take place primarily in summer and fall of 2019 and will be used to raise awareness about the planning effort and ways to engage going forward. See Appendix A for a list of fairs and festivals TRPC and jurisdiction staff and the consultant team will work together to support; the consultant team may attend 1-2 fairs/festivals if time and budget allow.
- **Coordination with community liaisons** who can provide recommendations on how best to engage the most impacted populations and hard-to-reach populations. Much of this liaising would occur early in the process (summer-fall 2019), so these priority audiences are able to shape the list of actions prior to multi-criteria analysis and action prioritization. We would ask community liaisons to return to communities with updates on how their information was used, share the opportunity to comment on the draft TCMP, and encourage involvement in TCMP implementation. We have reserved some of this engagement for later in the process for this reason. We would rely on the Steering Committee and Climate Advisory Workgroup to identify and connect the engagement team with community liaisons.

- Ad-hoc interviews and briefings to gather input from experts, community liaisons, and other practitioners and to vet or review components of the planning process and TCMP development. These methods can also be used to engage key individuals or organizations who could not otherwise participate in the process. If appropriate, a digital questionnaire with 3-5 questions could be used to gather responses on climate action priorities, areas of greatest concern, and areas of greatest opportunity. This would provide a mechanism for comparing across priority audiences while also gathering information unique to particular audiences. If used, this questionnaire should take no more than 5-7 minutes to complete to allow most of the time to be spent in conversation. We assume that most interviews would be phone calls and the consultant team does not attend most briefings. Instead, community liaisons would report back and could use the engagement toolkit if desired. As with the community liaison approach above, we would provide updates to interviewees and those who were briefed about how their information was used, the opportunity to comment on the draft TCMP, and ways to stay engaged through TCMP implementation.
- Climate Advisory Focus Group meetings will convene members of the CAW and other subject matter experts around the major emissions sources identified for Thurston County, including buildings & energy, transportation & land use, water & waste, and agriculture & forests. The groups will also include community members with experience, such as education, that cuts across multiple segments and categories. This engagement is being led through a process separate from the Public Engagement Strategy.

Subsequent, broader engagement approaches

- Online survey to solicit input on draft actions, following completion of the multi-criteria analysis. This could be timed to inform the open house content and/or to provide a digital engagement opportunity for those who cannot attend the open houses in person. If the latter, we encourage the online survey to include as much of the open house content as possible, to bring greater parity to the in-person and digital engagement methods. We also encourage translation into Spanish, Vietnamese, and Korean as the most commonly spoken languages in addition to English.
- Open houses toward the end of the process, to gather input on the draft TCMP. Two open houses are recommended within a 2-3 week window. These should take place in two locations that together will reach the broadest sub-set of Thurston County residents. If possible, at least one should be held partly during normal business hours so that those who work evenings can attend. We recommend materials or portions of materials be translated into Spanish, Vietnamese, and Korean.

Table 1. Potential engagement metrics.

**Overall metrics can be tracked for most methods, added up periodically to adapt engagement tactics, and added up at the end of the process to provide a big picture of engagement performance.*

Engagement Approach	Potential metrics
Overall metrics*	• Geographic parity – were the four jurisdictions equitably reached? • Population parity – do those reached reflect the demographics of Thurston County and the cities of Lacey, Olympia, and Tumwater? • # comments on draft TCMP • Type and diversity of comments on draft TCMP – this can provide a sense of which perspectives have been engaged.
Fairs/festivals	• # interactions at booth • # fairs/festivals attended
Coordination with community liaisons	• Do liaisons collectively reach priority audiences? • Rate of scheduling interviews, briefings, or other engagement with priority audiences (e.g., # scheduled compared to # attempted) • Level of specificity of input gathered
Ad-hoc interviews and briefings	• # attended • Specific groups reached and how they compare to priority audiences • Level of specificity of input gathered • Level of follow-on engagement from attendees (would need to set up tracking for this)
Online survey	• Inclusiveness and broadness of advertising to request input • # respondents • # sign-ups to list serv from survey page (if this is set up and can be tracked) • Demographic representativeness
Open houses	• # attendees • # interactions (i.e., # people commenting on materials and # substantive conversations with attendees had by event staff) • Inclusiveness and broadness of advertising for events • Level of specificity of input gathered
Engagement toolkit	• Rate of use at events they're taken to • Cost of preparation vs. rate of use at events they're taken to • # flyers taken • # list serv sign-ups from toolkit (if this is set up and can be tracked) • Level of specificity of input gathered • Level of follow-on engagement from attendees (would need to set up tracking for this)
Webpage	• # visitors (new and repeat) • Time spent on page • # click-throughs on materials • # list serv sign-ups (if this is set up and can be tracked)

Engagement Approach	Potential metrics
	• # emails sent from page (if this is set up and can be tracked)
Email communications	• # emails • # new and repeat emailers • Responsiveness to email (e.g., response within 72 hours) • Level of follow-on engagement (e.g., do they take survey, or attend briefing or open house?)

Table 2. Distribution of engagement budget across approaches.

Engagement Approach	Frequency	Budget
Steering Committee & Climate Advisory Workgroup	*Covered under separate task.*	*N/A*
Fairs/festivals	Up to 12. *Assumes consultant team provides training for staff to do the outreach. May attend 1-2 if time/budget allows.*	$2,000
Coordination with community liaisons	Weekly to bi-weekly in early stages, then tapering off.	$5,000
Ad-hoc interviews and briefings	Up to 20. *Assumes most interviews are over the phone and consultant team does not attend most briefings. Most occur early in process, but some are reserved for input on draft TCMP.*	$3,000
Online survey	1	$2,000
Open houses	2	$17,500
Engagement toolkit	1 *Assumes fair/festival materials can be used and/or slightly modified for toolkit.*	$1,500
Webpage	*Managed by TRPC. Consultant may provide occasional language.*	*Negligible*
Email communications	*Managed by TRPC. Consultant may provide occasional input on responses.*	*Negligible*
	Total	$31,000

Key Questions and Messages for Priority Audiences

Priority audiences will be asked a common set of questions and hear some common key messages about the TCMP. There are also a few, distinct questions for individual priority audiences. These are described in more detail below.

Questions and key talking points for all priority audiences

Where appropriate, key messages to respond to questions are included below with the question they address.

Which climate impacts do you think will affect you (or are affecting you) most?

- For example, residents and organizations we speak with may list extreme heat and wildfire.

Thurston County and the cities of Lacey, Olympia, and Tumwater are identifying how they will work together to reduce the county's carbon footprint. They are considering actions to encourage such as making public transit more widespread and affordable, lower-carbon building materials for new construction, and energy-saving rebates and incentives for homeowners and renters. Which of these would be most helpful for limiting the impacts you expect? Why?

- For example, residents and organizations may request energy-saving rebates and incentives, air conditioning, or more money for local services like fire departments.

Why should I participate in the Thurston Climate Mitigation Plan development process?

- This is your opportunity to tell us your priorities and concerns when it comes to practices and policies related to climate change that will reduce the climate footprint of Thurston County and the cities of Lacey, Olympia, and Tumwater.
- It is an opportunity to highlight and compile actions and progress that you, your City, your County, and your community are making related to climate mitigation.
- The County and the cities of Olympia, Lacey, and Tumwater have limited resources and many competing demands. In guiding future funding priorities, we want to be as responsive as possible to individual and community shared priorities and needs.
- This TCMP will lead directly to projects and money spent on the ground. It is not just a guidance document; by participating, you have an influence on public spending and project implementation.
- The TCMP helps build a more resilient region for our residents, businesses, and visitors. Many of the actions being considered have benefits beyond climate mitigation. For example, providing faster and more reliable public transit can make getting around easier and more enjoyable; rebates and incentives to reduce your household's energy consumption reduce energy bills as well as greenhouse gas emissions.

Why is the TCMP being developed now?

- Greenhouse gas emissions from transportation, energy use, land use change, and other sources are changing our climate in ways that will put the community at risk. Unless we take action, projected changes in temperature, snowpack, severe storms, sea level rise, and wildfire risk will threaten County and City infrastructure, natural resources, and public health. By taking action to reduce emissions and store more carbon, the County and cities will help protect the health and well-being of their residents and economies.
- The County and the cities of Olympia, Lacey, and Tumwater, and the community have taken action to be more sustainable for many years, including setting greenhouse gas emissions reductions targets and a

climate adaptation plan. To optimize the use of resources and funds moving forward, we need a companion effort to reduce emissions and store carbon. The longer we wait to take action to meet these targets, the harder it will be to do.

- The TCMP will build on several recently completed comprehensive greenhouse gas inventories of community operations. These inventories provide a clear baseline for identifying priorities and tracking progress toward reducing emissions.
- The TCMP will build on past efforts to establish a clear road map of priority actions and projects to be completed in the short- and long-term, and will help direct on-the-ground project implementation funding.

How will my input be used?

- Community input will be considered, along with input from the TRPC Steering Committee and Climate Advisory Workgroup and careful evaluation of potential actions against agreed-upon metrics such as cost, effectiveness, and feasibility, to help identify recommendations for priority actions. Specifically, your input will be analyzed and considered in devising the TCMP priorities and list of prioritized actions.
- In our engagement process, we are prioritizing organizations likely to be affected by implementation of TCMP actions, those who are most vulnerable to climate impacts, and other hard-to-reach populations who typically do not engage in planning processes. This approach prioritizes those most directly affected by climate change to ensure their priorities, concerns, and needs are addressed in the Thurston Climate Mitigation Plan as well as those who face the greatest barriers to engagement to try to achieve representative engagement across the County. This approach also includes broad engagement methods that will reach those already engaged in climate efforts or government planning processes more generally, recognizing that those who commonly or easily engage will engage in this process if they wish.
- The TCMP marks the beginning of an ongoing, iterative process that will evolve and grow over time. Actions or issues that cannot be addressed through this TCMP will be listed as suggested actions suitable or complementary to other projects, programs or services as deemed appropriate.
- Actions and ideas identified in the TCMP will inform and may be incorporated into future community plans, such as comprehensive plans and utility management plans.

What is climate mitigation?

- Climate mitigation refers to actions that take heat-trapping greenhouse gases like carbon dioxide out of the atmosphere and/or prevent greenhouse gases from entering the atmosphere in the first place. Examples of climate mitigation include transitioning away from fossil fuels and toward renewable energy sources, retrofitting buildings to use less energy and lose less energy from normal operations, driving less and investing in a fuel-efficient vehicle, eating less meat, buying local products that have not been transported long distances, preserving mature trees that hold more carbon, and managing soil and land for carbon storage. Actions such as these not only remove carbon from the air, they improve local air quality, public health, energy efficiency, and the economy.
- The amount of greenhouse gases we emit is directly related to how warm the planet will get. The more we greenhouse gases we produce through our activities, the warmer our planet will get. Therefore, reducing, or mitigating, our emissions will help to limit the amount of warming we will experience globally, and will mean fewer negative impacts on our community and region.
- Even with sharp reductions in greenhouse gas emissions and sharp increases in carbon storage, we will still experience the impacts of climate change. It takes time for the global climate to adjust and until it does, climate adaptation will be used to prepare for and bounce back from these unavoidable climate change impacts.
- Together, climate mitigation and climate adaptation help reduce our climate risks now and in the future.

Why does the TCMP focus only on mitigation?

- Carbon reduction targets and an adaptation plan have already been prepared and approved for implementation by Thurston County and the cities of Lacey, Olympia, and Tumwater.
- The carbon reduction target is 45% below 2015 levels by 2030 and 85% below 2015 levels by 2050. With these targets already prepared and approved, we now need to determine how we will reach these targets through mitigation actions. This is the goal of the TCMP.
- The Thurston Climate Adaptation Plan covers 91 adaptation actions, including 25 priority actions, to prepare for drought, water quality issues, flood, erosion, wildfire, and extreme heat, to sustain healthy plants and animals, and to support a resilient, lower-carbon transportation and energy infrastructure.
- You can learn more at www.trpc.org/climate.

Why is money being spent on climate change when we have so many other pressing issues to address?

- Climate change exacerbates challenges we already face like affordable housing, adequate access to quality public health, and increasing traffic and commute times.
- Environmental issues are health issues. Pollution from greenhouse gasses leads to unhealthy communities, intensifies climate change, and threatens water and food supply. We need clean air, clean water, and thriving nature for good health. Efforts to stop climate-related pollution help everyone live healthier lives.
- Some people in our County and cities are more vulnerable to the impacts of climate change, including children, the elderly and sick, those experiencing low-income, communities of color, rural communities, and those who live and work outside. In some cases, they are already feeling the effects of hotter summers and rising energy costs. Therefore, we need to act now to reduce these vulnerabilities.
- By considering climate change as we work to solve these other problems, we are more efficient with our limited resources. For example, investing in environmentally conscious building materials and energy-saving retrofits not only keeps greenhouse gases out of the air but reduces energy bills. Ensuring common community gathering spaces have air conditioning means our emergency rooms will face fewer cases of heat-related illness and injury. In addition, taking actions that help our public transit system be more affordable and reliable will reduce the number of cars on the road along with the emissions from gasoline and diesel.
- Since climate change is a relatively new challenge, we need to make sure we are properly preparing for the risks it brings. We took a similar approach when we developed a Flood Hazard Mitigation Plan for Thurston County and by proactively addressing issues that cause flooding we have reduced the risk and damages to Thurston County residents and business, as well as lowered insurance rates compared to other areas of the state and country.

Climate change is a large, global problem. The scale of the issue means my individual actions don't even matter, right?

- Lasting and dramatic change comes from countless little shifts throughout society. Mitigating climate change comes from anybody, including you!

  - If you are looking for **easy changes in everyday shopping or travel habits**, you can eat less meat, avoid excess plastic during take-out, support local farmers, carpool to work, and/or shop in the bulk section of your local grocery store.
  - Whether you **own or rent a home**, you can use energy-saving light bulbs, compost, wash in cold water, line dry clothes, turn the water off while washing hands or brushing teeth, and/or borrow tools for repairs instead of buying new.
  - If you live in a **rural area**, you can reduce the number of single trips you take, carpool, and/or plant native trees.
  - Not only can you change daily habits but talking to your friends and family and participating in this planning process can make a difference.
- Your personal actions plus your input on the TCMP can help protect us against climate change, strengthen our communities, bring good jobs, and help ensure the health and wellbeing of our children and future generations.

Questions and key messages for organizations affected by implementation of TCMP actions

In addition to the questions and key messages for all audiences, the following questions pertain specifically to this priority audience:

- What are you already doing that supports climate mitigation?

Questions and key messages for communities most vulnerable to climate impacts

In addition to the questions and key messages for all audiences, the following questions pertain specifically to this priority audience:

- Some common effects of climate change that are already being felt are needing more air conditioning due to hotter summers, more frequent flooding, and more smoke from wildfires. Are you experiencing any of these already?
- What actions are you taking to respond?
- How would you ideally respond and what is preventing you from doing that?

Questions and key messages for other hard-to-reach populations

In addition to the questions and key messages for all audiences, the following questions pertain specifically to this priority audience:

- Some common strategies to help reduce greenhouse gas emissions are to drive less (especially driving alone) and combine trips, eat less meat and dairy, waste less food, buy second-hand, and use energy- and water-saving appliances, light bulbs, etc. Are you already using any of these? Would you like to, and why?
- What would make it easier to be more sustainable in your day-to-day life, besides more time?
- Is there anything you wish the County or City did with regard to sustainability, energy efficiency, or reducing greenhouse gas emissions?

Public Engagement Timeline Overview

Key engagement milestones include:

- **Summer/fall 2019:** Fairs/festivals, interviews, and briefings to gather input on TCMP priorities, list of actions, and criteria for action selection.
- **Fall/winter 2019-2020:** Incorporate first round of public input into action development, multi-criteria analysis, and draft Plan document.
- **Late March/early April 2020:** Online survey and open houses to gather input on draft TCMP. Potentially, a few interviews or briefings.
- **April/May 2020:** Incorporate second round of public input to revise draft TCMP.

Engagement Input or Decision	Committee or Workgroup Timing
• Approve Public Engagement Strategy • Confirm future Public Engagement Strategy approval points and role of Workgroup (i.e., can they be responsible for guidance on details of Public Engagement Strategy implementation?). • Provide community liaison connections and fair/festival recommendations. • Confirm who is interested in having and using an engagement toolkit.	• Steering Committee Meeting #5 (June 26)
• Red flags and input on the Public Engagement Strategy. • Provide community liaison connections and fair/festival recommendations. • Confirm who is interested in having and using an engagement toolkit.	• Email to Climate Advisory Workgroup (first two bullets; input needed by early July in order to be prepared for fairs/festivals) • Climate Advisory Workgroup #2 (third bullet)
• Hear about priorities emerging from fairs/festivals, interviews, and briefings to date. • Hear about types of actions emerging from interviews and briefings to date. • Input on proposed changes to engagement tactics. Approval of significant changes (Steering Committee only).	• Steering Committee Meeting #6 (August 19 or 26) • Climate Advisory Workgroup focus groups, if appropriate (Aug/Sept)
• Hear about results of initial engagement in summer, including how engagement informed list of actions and selection of action evaluation criteria. • Provide input on possible survey topics and open house locations.	• Steering Committee Meeting #7 (October) • Climate Advisory Workgroup #3 (October)
• Provide input on open house plan and any open house planning questions that have come up.	• Climate Advisory Workgroup #4 (November)

Engagement Input or Decision	Committee or Workgroup Timing
• Review and approve open house plan, draft survey questions, and survey distribution plan (approval from Steering Committee only).	• Steering Committee Meeting #8 (January) • Climate Advisory Workgroup #5 (January)
• Review and approve key open house materials (approval from Steering Committee only). • Confirm who will staff open houses. • Provide input on any changes to survey or open house timeline and details.	• Steering Committee Meeting #9 (February) • Climate Advisory Workgroup #6 (February)
• Hear update on open house planning and survey.	• Steering Committee Meeting #10 (March) • Climate Advisory Workgroup #7 (March)
• Staff open houses	• Some members of Steering Committee and Climate Advisory Workgroup (late March/early April)

Thurston Climate Mitigation Plan Development

Input from the public engagement process will be used to develop and refine the TCMP using the following steps:

1. **Develop list of actions and criteria for action evaluation with input from priority audiences:** Results from briefings and interviews with priority audiences will be provided to the technical team for use in developing a list of actions that reflects the priorities, needs, and concerns of priority audiences and aligns with overall TCMP objectives. To the extent possible, input will be organized to make it seamless and easy to integrate in developing the list of actions and selecting criteria for the multi-criteria analysis. Input will also be provided in a timely manner, so it can meaningfully inform the list of actions and criteria selection. Specifically, the engagement team will use consistently formatted report-out documents and potentially, a digital questionnaire that organizes input by climate impacts of greatest concern, topic areas (buildings, energy, transportation, land use, agriculture, etc.), priorities for action, criteria by which to evaluate actions, and key considerations.
2. **Identify TCMP priorities:** Using the same process described above, results from briefings and interviews with priority audiences will be provided to the technical team to help identify and inform selection of TCMP priorities. Similarly, results from the fairs/festivals booths on where people would like support with climate action will be provided as input on TCMP priorities. This input will be organized as much as possible into TCMP priorities emerging from other engagement methods, including Steering Committee and Climate Advisory Workgroup engagement.
3. **Incorporate comments, feedback, and recommendations on draft TCMP to produce the final TCMP:** Two methods will provide most of the input on the draft TCMP: the online survey and the open houses. Survey results will be provided in report form, with summary tables, to the technical team to

aid the revision of actions and other TCMP components. Open house results will be digitized and organized by the part of the TCMP they inform to make integrating them more efficient. If time and budget allow, a brief open house summary articulating key themes and implications for TCMP revision may be prepared. If additional interviews or briefings are held at this stage, input will be organized by the part of the TCMP they inform to the extent possible and provided to the technical team for incorporation. The engagement team will review the draft final TCMP before final distribution to check for consistency with public input and provide any suggested revisions. The draft final TCMP for member jurisdiction approval will be posted on the TRPC webpage and broadly circulated by TRPC via email, social media, and other means identified.

Appropriate records of individual events such as briefing and interview notes, workshop summaries, and survey reports will be prepared and provided to TRPC via the shared folder and as appropriate, via email. All print materials such as comment cards, flip chart notes, and worksheets will be digitized (e.g., take photos, scanned) and made available to TRPC and the consultant team. Any video and voice recordings will be retained in a shared online location and provided to TRPC as requested, and posted on the project webpage as appropriate.

The engagement team will be responsible for making engagement recommendations and advising on how to meaningfully reflect public input in the TCMP. However, the final decision about public engagement questions rests with the Steering Committee, with the guidance and input of the Climate Advisory Workgroup.

Appendix A: Summer Fairs and Festivals Schedule

Fairs and festivals were arranged into two tiers based on criteria such as likelihood of engaging priority audiences, representative coverage of the county, and whether booths from government entities are commonplace.

Tier 1. Priority fairs/festivals to attend

- Lacey Fireworks Spectacular: July 3
- Tenino Oregon Trail Days: July 26-28
- Thurston County Fair: July 31-August 4
- Tumwater Brewfest: August 17
- Olympia Harbor Days: August 30-September 1
- Olympia Fall Arts Walk: October 4-5
- Tumwater Farmers Market: Wednesdays, 10 AM to 2 PM

Tier 2. Fairs/festivals to attend if possible

- Lacey South Sound BBQ Festival: July 13
- Olympia Brewfest: August 3
- Lacey Summer Concerts in the Park: August 10
- Rainier Roundup Days: August 24
- Thurston County Emergency Preparedness Expo: September #
- Nisqually Watershed Festival: September 28
- Olympia Farmers Market
- Yelm Farmers Market: Saturdays, 10 AM-3 PM
- Tenino Farmers Market: Saturdays
- Tumwater Screen on the Green
- Tumwater Community Recycling Event
- Tumwater University
- Police Citizens Academy
- Fire Academy

Proposed materials

- Quick carbon footprint activity that shows their household's emissions and asks them where they would like to focus reductions and/or where they are able to focus reductions in the short-term.
- Display board on Thurston County emissions, how far adaptation will get us, and what the TCMP hopes to achieve with mitigation.
- Flyer/factsheet to take home with information on the process, upcoming events, and ways to engage. Include social media handles and tags as appropriate.
- Postcard
- Short digital questionnaire

Appendix B. Summary of Public Engagement Strategy

Strategies for engagement differ depending on the organization or entity being engaged. Some are *informed* about key steps and decisions, others are *consulted* to obtain feedback on analysis, issues, and decisions, some are *involved* to ensure their concerns and aspirations are directly reflected in the decisions made, some *collaborate* to provide advice and guidance on each aspect of decision-making, and finally, some may be *empowered* if final decision-making is in the hands of a particular organization or entity.

Within the Priority Audiences identified, the engagement strategy and methods are tailored to the interests, expertise, and level of responsibility of the various organizations and entities engaged in this process.

Stakeholder	Role/Reason	Engagement	Methods[3]	Frequency 1=least; 3=most
Advisory or decision making role in process and TCMP development				
Steering Committee	• Final decision maker (Elected officials) • Advisory role	Empower	• Committee meetings • Early reviewer	3
Climate Advisory Workgroup	• Advisory role	Collaborate	• Workgroup meetings • Early reviewer • Others TBD	3
Organizations directly affected by implementation of TCMP actions				
Construction companies or contractors • Olympia Master Builders • Habitat for Humanity • Small Planet Supply • Center for Sustainable Infrastructure, Zero Net Carbon Building Alliance, Passive House NW, ShiftZero, American Institute of Architects, Eco Build Guild, Unions	• May have to follow new policies or regulations • May incur benefits/costs from chosen actions • Provide guidance on feasibility of actions	Involve (priorities) Consult (draft TCMP)	• Climate Advisory Workgroup • Interviews • Briefings	2

[3] All methods are available to all stakeholders. The most applicable methods are listed here. The engagement toolkit is designed for use with fairs/festivals, community liaisons, and briefings.

Stakeholder	Role/Reason	Engagement	Methods[3]	Frequency 1=least; 3=most
• Thurston County Chamber, Tumwater Area Chamber of Commerce, Lacey South Sound Chamber				
Farmers and ranchers • Our Common Home Farms • Faith Harvest Helpers	• May have to follow new policies or regulations • May incur benefits/costs from chosen actions • Provide guidance on feasibility of actions • Directly affected by climate impacts like drought and flood	Involve (priorities) Consult (draft TCMP)	• Climate Advisory Workgroup • Community liaison • Interviews	2
Renewable energy companies • Thurston Economic Development Council • Thurston Thrives • Thurston Energy • Thurston County Chamber, Tumwater Area Chamber of Commerce, Lacey South Sound Chamber	• May have to follow new policies or regulations • May incur benefits/costs from chosen actions • Provide guidance on feasibility of actions	Involve (priorities) Consult (draft TCMP)	• Climate Advisory Workgroup • Interviews • Briefings	2
Property owners and managers • Thurston County Realtors Association • Thurston Economic Development Council • HOA's, Realtors • Building Industry Association of Washington • Thurston Thrives	• May have to follow new policies or regulations • May incur benefits/costs from chosen actions • Provide guidance on feasibility of actions	Involve (priorities) Consult (draft TCMP)	• Climate Advisory Workgroup • Interviews • Briefings	2

Stakeholder	Role/Reason	Engagement	Methods[3]	Frequency 1=least; 3=most
• Association of Washington Business, Washington Center for Women in Business, Better Business Bureau serving the Northwest • Thurston County Chamber, Tumwater Area Chamber of Commerce, Lacey South Sound Chamber				
Utilities • Puget Sound Energy, LOTT Clean Water Alliance, Washington State Department of Enterprise Services Energy Group, Thurston Thrives	• Provide guidance on feasibility of actions • May be asked to cooperate with new policies or regulations • May incur benefits/costs from chosen actions	Involve (priorities) Consult (draft TCMP)	• Climate Advisory Workgroup • Briefings	2
NGOs with land management responsibilities • Capitol Land Trust • Nisqually Land Trust • South of the Sound Community Farmland Trust • Center for Natural Lands Management • Olympia Coalition for Ecosystem Preservation • Thurston Conservation District • Olympia Ecosystem Preservation Land • Olympic Region Clean Air Agency • Veterans Ecological Trades Collective	• Provide guidance on likely impact and feasibility of actions • May have novel ideas to increase carbon storage • May have to follow new policies or regulations • May incur benefits/costs from chosen actions	Involve (priorities) Consult (draft TCMP)	• Climate Advisory Workgroup • Interviews • Briefings	2
Communities most vulnerable to climate impacts				

Stakeholder	Role/Reason	Engagement	Methods[3]	Frequency 1=least; 3=most
Low-income communities • Thurston County Board of Health • Churches, Salvation Army • PTAs • POWER • SideWalk Homeless Services • Thurston Thrives • YMCA, Boys/Girls Club, Big Brothers/Big Sisters of SW WA,	• Affected by climate change and likely to be among those hit "first and worst" by impacts • Provide input on feasibility of actions	Involve (priorities) Consult (draft TCMP)	• Community liaisons • Fairs/festivals • Survey • Open houses	2
Communities of color • Thurston County Board of Health • Churches • PTAs, Capital Region ESD 113 • Thurston Thrives • YMCA, Boys/Girls Club, Big Brothers/Big Sisters of SW WA	• Affected by climate change and likely to be among those hit "first and worst" by impact • Provide input on feasibility of actions	Involve (priorities) Consult (draft TCMP)	• Community liaisons • Fairs/festivals • Survey • Open houses	2
Rural communities • Thurston County Board of Health • Rotary, Kiwanis, Churches, PTA • Thurston Thrives • YMCA, Boys/Girls Club, Big Brothers/Big Sisters of SW WA	• Affected by climate change and likely to be among those hit "first and worst" by impacts • Provide input on feasibility of actions	Involve (priorities) Consult (draft TCMP)	• Community liaisons • Fairs/festivals • Survey • Open houses	2
Those who live and work outside • Thurston County Board of Health • Labor Ready • Thurston County Food Bank • Weyerhauser	• Affected by climate change and likely to be among those hit "first and worst" by impacts • Provide input on feasibility of actions	Involve (priorities) Consult (draft TCMP)	• Community liaisons • Fairs/festivals • Survey • Open houses	2
Youth	• First generation to live in climate-altered future as adults	Involve (priorities)	• Climate Advisory Workgroup	2

Stakeholder	Role/Reason	Engagement	Methods[3]	Frequency 1=least; 3=most
• High schools, St. Martin's University, Evergreen State College, Capital Region ESD 113, Olympia School District, North Thurston Public Schools, South Puget Sound Community College • YMCA, Boys/Girls Club, Big Brothers/Big Sisters of SW WA	• Provide input on feasibility and impact of actions	Consult (draft TCMP)	• Community liaisons • Fairs/festivals • Survey • Open houses	
Other hard-to-reach populations				
Military families • South Sound Military and Communities Partnership • North Thurston Public School Military Liaison	• Affected by climate change • Make significant investment when moving, which is an opportunity for carbon reduction via purchases • May have ideas for actions from other places they have lived • Provide input on feasibility of actions	Involve (priorities) Consult (draft TCMP)	• Community liaisons • Fairs/festivals • Survey • Open houses	2
Middle-income families (esp. with children) • Rotary, Kiwanis, Churches, PTA, ESD 113 • YMCA, Boys/Girls Club	• Affected by climate change • Provide input on feasibility of actions	Involve (priorities) Consult (draft TCMP)	• Community liaisons • Fairs/festivals • Survey • Open houses	2
General public and media				
General public • Thurston County Chamber, Tumwater Area Chamber of Commerce, Lacey South Sound Chamber	• Provide information to interested persons	Inform	• Webpage • Survey • Fairs/festivals • Open houses	1
Media • Newspapers (The Olympian, Nisqually Valley News, Centralia Chronicle)	• Build awareness and interest in participation, especially for summer	Inform	• Webpage • TRPC, County, and City social media	1

Stakeholder	Role/Reason	Engagement	Methods[3]	Frequency 1=least; 3=most
• Online outlets (ThurstonTalk, Olympia Standard Podcast) • Community TV – TCTV • Local newsletters, social media	fairs/festivals and commenting on draft TCMP • Expand reach of engagement		• TCTV spot during draft TCMP comment period	

Thurston Climate Mitigation Plan

Summer/Fall 2019 Public Input Summary

November 1, 2019

Introduction

This document summarizes public input gathered during summer and fall 2019 to inform the priorities and actions of the Thurston Climate Mitigation Plan. Public outreach was designed around the following engagement goals:

- Lay the groundwork for continued community engagement on climate action.
- Promote alignment between community and government climate priorities, while recognizing the separate roles, responsibilities, and interests of individuals and organizations.
- Build public support for climate action across Thurston County.

Approximately 2,000 people participated in this public outreach phase at a summer/fall event or through an online survey. At least 5,500 people viewed the traditional and social media posts used to increase awareness and engagement in the planning process; the "We're Listening" Facebook video accounts for most of this reach, with 4,684 reached, 59 reactions or comments on the content, and 25 shares.[1]

This document begins with an overarching summary of all input, followed by separate breakdowns of key outcomes from the summer/fall events and survey. For additional details, see the following attached appendices:

- Appendix A: Outreach Log
- Appendix B: Event Materials
- Appendix C: Demographic Comparison
- Appendix D: Survey Responses

Response Overview

Events	Survey
▪ **15 events** between July 27 and October 5 ▪ **605** interactions with the public ▪ **461 postcards** distributed ▪ **168 factsheets** distributed ▪ **208 Action Ideas** submitted	▪ **1,397 responses** between August 12 and September 30 ▪ **15** distribution channels used ▪ **71% completion rate** ▪ **8 minutes** typically spent

Participation in the events, online survey, and media posts was voluntary and self-selecting. Therefore, this summary may most represent the perspectives of those with strong views on the topic; those with the time and ability to engage in the process; and those with the most access to the venues used for engagement.

[1] Note: The circulation for The Olympia, Thurston Talk, and other traditional media, as well as website traffic for the planning process, are not included in this estimate. Therefore, the reach could be significantly higher.

The survey was the most comprehensive and widely distributed form of engagement. The high response rate lends greater confidence to the trends and themes included in this summary. However, most respondents identified as white and female, between the ages of 40 and 59, and reported a higher income (see Demographics). Survey trends and themes are therefore most reflective of these demographics and may be missing trends and themes reflective of other demographics in the Thurston region. Compared to Thurston County's overall population, respondents were generally older and identified more often as white, with a similar income distribution to survey respondents (see Appendix C).

Key Themes & Suggested Actions

- **Across outreach methods, participants showed the broadest support for Buildings & Energy sector actions.** Whether prioritizing focus areas, investing fictitious money, or choosing the personal actions they would like to take, survey respondents showed the broadest support for actions to shift to more renewable and clean energy sources, and to make buildings more energy-efficient and carbon-smart. This includes exploring incentives, subsidies, and mandates to encourage renewable energy; investing in renewable energy; and improving building energy-efficiency.
- **Transportation & Land Use actions were a focus at public events and of actions people would like to take.** Across the six public events, actions to support transportation & land use were the overwhelming choice. Ideas included investing in bicycle and pedestrian facilities, electric vehicles, and public transit, and encouraging high-density areas that improve resource sustainability and efficiency. Similarly, two of the four most popular actions survey respondents said they would like to take are purchasing or driving an all-electric vehicle (48%) and driving a vehicle that gets more than 30 MPG in the city (25%).
- **The individual actions of greatest interest to survey respondents are those the Thurston County Mitigation Plan could support:** These include investing in solar panels for home or business (57%), purchasing or driving an all-electric vehicle (48%), participating in a renewable energy program through local utility (30%), and driving a vehicle that gets more than 30 MPG in the city (25%).
- **All four drivers of action were at least moderately important to survey respondents.** Impact (how much carbon pollution will be reduced) was the most important driver of action. Of the 185 responses recommending a new driver of action, time/urgency was the most commonly suggested (15%) followed by accountability (8%). Approximately one-third of suggestions were proxies for impact, cost, feasibility, and equity.
- **Priority focus areas and the most important drivers of action varied by factors like age, where survey respondents lived, and their income.** Some of these differences were statistically significant and are detailed in their respective sections.

Summer/Fall Events

At events, the public could provide input on the following question by placing sticky notes on a large poster:

- What actions or ideas should be included in the Climate Action Plan?

The public provided **208 actions or ideas across six events,** with 74% of ideas shared at the Thurston County Fair. Across all events, **ideas for transportation & land use were most common;** more than half of ideas in rural Tenino and Yelm were in this sector. It is important to note that extrapolation of trends from all events except the Thurston County Fair is less reliable due to the low number of responses.

Event	# Ideas	Agriculture & Forests	Buildings & Energy	Transportation & Land Use	Water & Waste	Cross-Cutting
Emergency Preparedness Expo	11	36%	27%	27%	9%	0%
Tenino Oregon Trail Days	10	0%	20%	60%	10%	10%
Thurston County Fair	154	14%	18%	28%	15%	25%
Olympia Arts Walk	13	8%	31%	38%	0%	23%
Tumwater Brewfest	10	0%	20%	20%	10%	50%
Yelm Farmers Market	10	10%	10%	50%	20%	10%
Total	208	13%	19%	31%	9%	19%

Actions and ideas to include in the Plan

Key themes from the post-its the public submitted are summarized below:

Theme	Sector(s)	Description
Agricultural Practices	☒ Agriculture & Forests ☐ Buildings & Energy ☐ Transportation & Land Use ☐ Waste & Water ☐ Cross-cutting	▪ Address environmental sustainability of agricultural practices. ▪ Some of these options include: o Carbon farming o Pesticide reduction in farm applications o Growing hemp industrially o Reduction in cattle production/farming
Tree Canopy & Forest Health	☒ Agriculture & Forests ☐ Buildings & Energy ☐ Transportation & Land Use ☐ Waste & Water ☐ Cross-cutting	▪ Improve tree canopy and forest health, preserving trees and lands, and reforestation efforts (or stopping deforestation). ▪ Ideas include: o Plant more trees o Forest preservation, particularly old growth forests o Incentivize maintaining trees and natural vegetation on properties o Preserve green spaces o Prohibit development of farmland

Theme	Sector(s)	Description
Energy Efficiency	☐ Agriculture & Forests ☒ Buildings & Energy ☐ Transportation & Land Use ☐ Waste & Water ☐ Cross-cutting	▪ Create a framework to improve energy efficiency, particularly in buildings. ▪ Ideas include: o Use LEED building standards o Home temperature regulation o Energy conservation best practices o Retrofit older homes/buildings, particularly public buildings like schools
Renewable Energy	☐ Agriculture & Forests ☒ Buildings & Energy ☐ Transportation & Land Use ☐ Waste & Water ☐ Cross-cutting	▪ Develop programs and goals to move toward renewable energy. ▪ Ideas include: o Incentives/subsidies for solar energy (homeowners and developers) o Mandates for solar energy (for new buildings) o Invest in alternative and renewable energy sources (including partnerships with PSE) o Invest in wind-powered infrastructure o Require public buildings to have renewable energy components
Alternative Modes & Infrastructure	☐ Agriculture & Forests ☐ Buildings & Energy ☒ Transportation & Land Use ☐ Waste & Water ☐ Cross-cutting	▪ Invest in three primary areas to improve sustainable transportation: bicycle and pedestrian facilities, electric vehicles, and public transit. ▪ Ideas include: o More bike lanes and incentives for bicyclists o Shared use paths (bike, walk, and roll like roller blading or skate boarding) o Electric fleets for busses (Intercity Transit and Public School District) o Expand public transit to more rural areas o Improve public transit reliability and connectivity o Incentivize taking transit
Population Density	☐ Agriculture & Forests ☐ Buildings & Energy ☒ Transportation & Land Use ☐ Waste & Water ☐ Cross-cutting	▪ Encourage high-density areas that improve resource sustainability and efficiency. ▪ Ideas include: o Make downtown more walkable and accessible o Rezone to allow higher density in cities o Incentivize higher density development (multi-use, multi-family buildings)
Solid Waste Management	☐ Agriculture & Forests ☐ Buildings & Energy ☐ Transportation & Land Use ☒ Waste & Water ☐ Cross-cutting	▪ Reduce waste through targeted action such as ordinances/mandates, incentive programs, and outreach/education. ▪ Ideas include: o Redistribute unused food to community, such as Tacoma's Food is Free program

Theme	Sector(s)	Description
		○ Reduce use of disposable/single-use plastics, including for restaurants ○ Mandatory recycling/compost programs (particularly in multi-family buildings)
Water Management	☐ Agriculture & Forests ☐ Buildings & Energy ☐ Transportation & Land Use ☒ Waste & Water ☐ Cross-cutting	▪ Improve water infrastructure and treatment to enhance reliability and reuse. ▪ Ideas include: ○ Reclaimed water program ○ Water retention landscapes ○ Costs to large businesses for water use (example: Walmart should pay a tiered rate for water)
Education	☐ Agriculture & Forests ☐ Buildings & Energy ☐ Transportation & Land Use ☐ Waste & Water ☒ Cross-cutting	▪ Implement educational programs that create climate change awareness and buy-in, as well as programs that train people for green jobs. ▪ Ideas include: ○ K-12 climate change curriculum ○ Vocational education to install renewable energy, particularly solar panels
Pollution	☐ Agriculture & Forests ☐ Buildings & Energy ☐ Transportation & Land Use ☐ Waste & Water ☒ Cross-cutting	▪ Reduce both air pollution and other types of pollution. ▪ Ideas include: ○ Restrictions on toxic weed killers or pesticides in city limits ○ Reduced ocean dumping
National or international policy	☐ Agriculture & Forests ☐ Buildings & Energy ☐ Transportation & Land Use ☐ Waste & Water ☒ Cross-cutting	▪ Look to changes in national and international policy to address climate change. ▪ Ideas include: ○ Support for international emissions reductions policies ○ Focus on large emissions sources such as reducing fossil fuel extraction or reducing emissions from other high-emitting countries

Survey Summary

The online survey asked for input on the following topics:

- Which **focus areas** to prioritize in the Thurston Climate Mitigation Plan
- How to **invest in focus areas**
- Other **ideas** the Plan should focus on
- The most important **drivers of action** to consider in the Plan
- **Individual climate mitigation actions** people take and would like to take

Focus areas to prioritize

Survey respondents were asked to share their top two focus areas to prioritize in the Thurston Climate Mitigation Plan. After responding, respondents were told the top two contributors to carbon pollution in Thurston County are energy use in residential and commercial buildings, and transportation. They were then asked again for the top two focus areas to prioritize.

Key findings from these two questions include:

FOCUS AREAS

- Shift from fossil fuel-powered to more renewable and clean electricity sources
- Increase the use of alternative forms of transportation
- Store more carbon in trees, plants, and soil
- Increase urban density
- Reduce consumption and waste
- Make our homes, businesses, and buildings more energy-efficient and carbon-smart

- Without knowing the top two contributors in Thurston County, survey respondents selected shifting to **more renewable and clean electricity sources** (49%) and **storing more carbon** in trees, plants, and soil (40%) as the top two areas the Thurston County Mitigation Plan should focus on.
- After reading building energy use and transportation were the top two contributors to Thurston County's greenhouse gas emissions, respectively, **31% of survey respondents changed the top two areas they recommend the Thurston Climate Mitigation Plan focus on:**
    - **70%** of respondents selected **making homes and buildings more energy-efficient and carbon-smart** as the top focus area for the Thurston Climate Mitigation Plan.
    - **47%** of respondents selected **increasing the use of alternative forms of transportation,** making it the second-highest sector selected.
    - The focus on storing more carbon in trees, plants, and soil fell sharply, to 15%, while the focus on shifting to more renewable and clean energy sources fell slightly, to 42%.
- Some of the focus areas survey respondents prioritized varied by income or where they lived:
    - **68% of those with an income between $15,000-$24,999 prioritized the shift from fossil fuel to renewable and clean energy sources,** significantly higher than those with an income between $75,000-99,999 (45%) or $100,000+ (48%).
    - **72% of those with incomes higher than $75,000 prioritized more energy-efficient and carbon-smart homes, businesses, and other buildings,** significantly higher than those with an income of $25,000-$34,999 (11.4%), $35,000-$49,999 (20%), and $50,000-$74,999 (24%).
    - **33% of those living in Olympia prioritized the use of alternative forms of transportation** (riding the bus, walking, carpool/vanpool, and biking, as well as more fuel-efficient vehicles) compared to those from Lacey (24%), Tumwater (20%), or unincorporated Thurston County (18%).

- 24% of those living in unincorporated Thurston County and 33% of those living in Tenino prioritized "Store more carbon in trees, plants, and soil" after being provided the top two contributors to carbon pollution (building energy use and transportation).

How to invest in focus areas

Survey respondents invested $1,000 fictional dollars across the six focus areas. Key findings include:

- Both overall and on average, survey respondents **invested the most in more energy-efficient and carbon-smart buildings**, and shifting to **more renewable and clean electricity:**
  - More energy-efficient and carbon-smart buildings: $284,748 invested overall, with an average investment of $338.
  - More renewable and clean electricity sources: $263,079 invested overall, with an average investment of $341.
- Both overall and on average, survey respondents **invested the least in reducing consumption and waste,** and **increasing urban density:**
  - Reducing consumption and waste: $117,706 invested overall, with an average investment of $191.
  - Increasing urban density: $121,173 invested overall, with an average investment of $215.
- **Survey respondents tended to spread out their investment between 3-4 focus areas.** The most common focus areas survey respondents selected were:
  - More energy-efficient and carbon-smart buildings
  - Shifting to more renewable and clean electricity sources
  - Storing more carbon in trees, plants, and soil
  - Increasing the use of alternative forms of transportation

Ideas to focus on

Survey respondents were provided an opportunity to identify any key actions or ideas they felt should be included in the plan. Many of the 612 responses to this open-ended question fall into the focus areas previously identified. Additional key themes from these responses are summarized below, by sector.

Agriculture & Forests

Theme	Description
Tree and land preservation	▪ Preserve existing trees, forest lands, and open space, and restore degraded areas
Local food network	▪ Support markets for locally grown food to reduce carbon emissions from transportation
Blue carbon	▪ Explore options to sequester carbon in marine environments

Buildings & Energy

Theme	Description
Alternative energy sources	▪ Include actions that support the region's transition to a variety of renewable and alternative energy sources beyond solar and wind, including nuclear, geothermal, and hydrogen
Public power	▪ Create a locally managed public utility district to supply power

Transportation & Land Use

Theme	Description
Transportation system efficiency	▪ Increase the efficiency of the existing transportation system by improving traffic flow, coordinating signals, and reducing idling
Rural connections	▪ Consider low-carbon transportation options for residents connecting between rural areas and urban centers
Development	▪ Concern about impact of commercial development in Lacey and proposal for industrial development in South Thurston County
Regional connections	▪ Support mass transit connections to other regions, such as rail options to Seattle

Waste & Water

Theme	Description
Plastic waste	▪ Reduce consumption of single-use plastics
Low meat diet	▪ Include actions to educate about the emissions reduction benefits of a low meat diet
Water use	▪ Reduce water consumption

Cross-Cutting

Theme	Description
Education	▪ Invest in actions that educate the public about climate impacts and available solutions, and support widespread adoption of climate-friendly behavior
Financial tools	▪ Develop means to finance climate actions and/or equitably distribute the costs of shifting to a low carbon society, such as a carbon tax
Data and monitoring	▪ Conduct additional analysis to calculate footprint from other sectors not included in the current inventory, such as consumption of materials created outside Thurston County, or CFCs

Other

Theme	Description
No action needed	▪ Climate change is not an issue, or should not be a local priority
Equity	▪ Build in equity to actions and prioritize actions that support equity
Adaptation	▪ Include actions to support climate adaptation, such as addressing sea-level rise-related flooding in Downtown Olympia
Pollution/General environment	▪ Concerns about air, water, or other pollution and environmental issues, not related to climate change mitigation
Population	▪ Concerns about population growth

Drivers of action

Survey respondents rated the importance of four factors for determining which actions to include in the Plan: impact, cost, feasibility, and equity. They could also suggest a new factor. Key findings include:

- Survey respondents indicated **all four drivers of action were at least moderately important:**

    - Impact (how much carbon pollution will be reduced) was the most important driver of action. 61% of respondents rated it most important, and 93% of respondents rated it at least moderately important.
    - Equity, feasibility, and cost were all rated moderately important drivers of action. Of these, equity was rated most important overall, followed by feasibility and cost.
        - Impact: 93% of respondents rated at least moderately important
        - Equity: 85% of respondents rated at least moderately important
        - Feasibility: 81% of respondents rated at least moderately important
        - Cost: 74% of respondents rated at least moderately important
- 185 survey respondents suggested one or more **new drivers of action.**
    - **Approximately one-third** of the suggested drivers were **proxies for impact, cost, feasibility, and equity.**
    - **Time/urgency** was the most commonly suggested new driver (15% of suggestions), followed by **accountability** (8% of suggestions).
    - Most comments about time/urgency emphasized how long it would take to realize the benefits of action or the need to act urgently; a few comments questioned the necessity to act at all or the level of priority compared to other societal needs.
    - Comments about accountability included being able to verify the need for action or the quantitative impact of results, basing action on sound science or likely impact instead of other factors like political will or popularity, and wise use of public resources.
- The level of importance of some drivers varied by household income, where the respondent lived, or age:
    - **Cost:** 77% of respondents with a household income greater than $35,000 said cost is the most important to consider in choosing actions to reduce carbon pollution. This is significantly higher than the 2% of those with a household income of $25,000-34,999.
    - **Equity:** 15% of respondents who work in Thurston County (but live outside the county) and 9% of respondents who live in Lacey ranked equity as the least important. This is significantly higher than the 4% of respondents who live in Olympia who ranked equity as the least important.
    - **Impact:** 78% of respondents in the 15-24 age group ranked "Impact: how much carbon pollution will be reduced" as most important, significantly higher than the 61% and 56% of those aged 40-54 and 55-69, respectively.

Individual actions

These survey questions provided respondents an opportunity to share the types of mitigation actions they already take in their daily lives and which actions they would be interested in taking. Key findings include:

- The **top actions** people are **taking** include both services that government provides and everyday habits most anyone can build:
  - Regularly recycle and/or compost (94%)
  - Save energy at home and work by turning off lights and water, using energy-saving light bulbs, etc. (92%)
  - Use reusable or compostable containers and beverage bottles or bring their own (79%)
- The **top actions** people would **like** to take could generally be incentivized or otherwise supported through government action and/or public-private partnerships:
  - Invest in solar panels for home or business (57%)
  - Purchase or drive an all-electric vehicle (48%)
  - Participate in a renewable energy program through local utility (30%)
  - Drive a vehicle that gets more than 30 MPG in the city (25%)
- The two actions people would most like to do are the two actions the fewest number of people are already doing: investing in solar panels and investing in an all-electric vehicle.

DRIVERS

- **Impact:** how much carbon pollution will be reduced
- **Cost:** how much money it will cost
- **Feasibility:** how easy it will be to implement
- **Equity:** whether costs and benefits of action will be distributed fairly across communities or whether actions will avoid disproportionately affecting the most vulnerable in our communities

Demographics

Note that about 1,000 of 1,397 responded to the demographic questions. Appendix C compares survey respondent demographics to the overall population of Thurston County. [2] *Key findings include:*

- **Residence:** Majority (40%) live in Olympia or Thurston County (unincorporated) (20.5%).
- **Sex:** Majority (60%) of respondents identify as female.
- **Age:** Largest group of respondents is 55-69 years old (30%), then 40-54 (25%) and 25-39 (19%). Compared to Thurston County's overall population, survey respondents are generally older.
- **Race/Ethnicity:** Majority of respondents (91%) identify as white, compared to 82% of Thurston County's overall population. Additionally, about three times as many survey respondents identified as American Indian & Alaska Native compared to Thurston County's overall population.
- **Income:** Largest group of respondents have a household income of $100,000 or more (33%), followed by $50,000-$74,999 (19%). The results are similar for Thurston County overall, with 28% reporting an income over $100,000 and 21% reporting an income of $50,000-$74,999.

[2] An analysis of statistical significance for the comparison of survey respondent demographics and the overall population of Thurston County was not performed.

Next steps

The initial phase of public outreach has been focused on identifying community priorities for climate action, gathering potential actions and ideas to include in the plan, and better understanding the actions individuals are taking and would like to take around climate change. As the planning process moves from the identification of strategies and actions to the evaluation and selection of specific strategies and actions to include in the Thurston Climate Mitigation Plan, public outreach will shift to gather more specific input on draft strategies and actions, and continue to focus on reaching diverse and hard-to-reach audiences.

The following next steps for outreach are anticipated:

- Increased focus on engaging community liaisons: Successfully engaging with community liaisons—trusted representatives or advocates of communities—is the primary approach being used to reach communities who are typically harder to reach in the Thurston region. This method supports all three engagement goals. In many cases, relationships with community liaisons are just being formed between the team leading this planning process and the liaisons. Accordingly, significant resources are being devoted to build these relationships. Concerted attention will be needed in the next phase of outreach, not only to build relationships but to identify the appropriate approach for engagement with each liaison. Examples of options to work together included distributing information about the Plan, collecting input on the Plan, participating in an interview, and participating in a briefing.
- Interviews and briefings with experts, community liaisons, and other practitioners: In fall/winter 2019-2020, interviews and briefings will be used to gather detailed input on the strategies and actions, including their evaluation, and to reach key individuals or organizations who would otherwise be unable to participate in the process. This approach primarily supports the second engagement goal, to promote alignment between community and government priorities.
- Public open houses and survey to gather feedback on the full draft Thurston Climate Mitigation Plan: In 2020 once a complete draft of the mitigation plan is complete, open houses will be held in locations and at times designed to reach the broadest sub-set of Thurston County residents. These in-person events will be paired with a widely distributed survey. Both methods will seek input on the draft vision, goals, strategies, and actions in the Thurston Climate Mitigation Plan. Participation in an open house or detailed survey is typically greater and more representative of the public when levels of awareness and engagement in the planning process are higher, because these events represent a significant time investment for most community members. Therefore, the open houses and detailed survey are planned toward the end of the planning process to take advantage of the awareness and engagement built by earlier outreach. This method supports all three engagement goals.
- Ongoing traditional and social media to maintain interest in the planning process: Email communications, webpage updates, Facebook and Twitter posts, and outreach to traditional and social media partners will all continue to maintain interest and engagement in the planning process. These methods directly support the first and third engagement goals.

Appendix A. Outreach Log

A detailed log of all outreach completed in summer and fall 2019 is below.

Public presentations

- 8/13/2019 – Presentation to the Thurston County Board of Health
- 8/16/2019 – Presentation to South Thurston Economic Development Initiative (STEDI)
- 9/9/2019 - Tumwater Tree Board meeting
- 9/10/2019 - Tumwater Planning Commission meeting
- 9/11/2019 – Deschutes Estuary Restoration Team (DERT) "Looking Locally at Climate Impacts" Community Forum
- 10/1/2019 – Lacey Planning Commission meeting

Public events

- 7/3/2019 - Lacey Fireworks Spectacular
- 7/13/2019 - Lacey South Sound BBQ Festival
- 7/27/2019 – Tenino Oregon Trail Days
- 7/31-8/4/2019 – Thurston County Fair
- 8/10/2019 – Lacey Summer Concerts in the Park
- 8/17/2019 - Tumwater Brewfest
- 8/24/2019 – Rainier Round Up Days
- 8/24/2019 – Yelm Farmers Market
- 8/30-9/1/2019 – Harbor Days
- 9/4/2019 – Tumwater Farmers Market
- 9/11/2019 - Tumwater Farmers Market
- 9/20/2019 – Climate Strike
- 9/27/2019 – Olympia Farmers Market
- 9/28/2019 – Emergency Preparedness Expo
- 10/4-10/5/2019 – Olympia Fall Arts Walk

Media

- 9/15/2019 – Dr Rachel Wood Health Matters column in The Olympian: https://www.theolympian.com/living/health-fitness/article235101832.html
- 9/19/2019 - Press Release – 9/19
- 9/20/2019 - Reprint of press release in Thurston Talk
- 9/20/2019 – Olympian Article on Climate Strike included link to survey

Online Survey Advertising

- 8/12/2019 – Posted on TRPC's website
- 8/13/2019 – Facebook Post
  - Video url: https://www.facebook.com/trpc.org/videos/431863840748620/
- 8/13/2019 – Twitter Post
  - Link: https://twitter.com/TRPCorg/status/1161303311594610688
- 8/16/2019 – Email newsletter and weblink from City of Olympia, Public Works, 382 distribution
- 8/19/2019 – Posted on Thurston County home page

- 8/19/2019 - Posted on City of Tumwater Climate Change, Greenhouse Gas Emissions, and Energy Conservation webpage
- 8/19/2019 – Emailed to ECO Network
- September 2019 – Published in Lacey Utility insert "Lacey Life" – 25,500 distribution
- 8/20/2019 – Emailed to Nisqually River Council
- 8/20/2019 – City of Tumwater email newsletter
- Thurston County Community Planning email newsletter
- 9/11/ 2019 – Posted on TESC MES Blog
- 9/18/ 2019 – Emailed to Thurston Thrives contact list
- Emailed to WRIA 13 watershed Group
- 9/16/2019 – Promoted through South Thurston Economic Development Initiative (STEDI) (August and Sept meetings)
- September 2019 – Postcards sent out through Timberland Library network

Organizations Contacted to Identify Community Liaisons

Community liaisons—trusted representatives or advocates of communities—have been identified as a key resource to reach communities who are typically harder to reach in the Thurston region. During summer and fall, initial contact was made to the organizations below to provide information about the planning process and explore if and how to work together to gather input to shape the Thurston Climate Mitigation Plan. Options to work together included distributing information about the Plan, collecting input on the Plan, participating in an interview, and participating in a briefing.

- Asset Building Coalition
- Black Alliance of Thurston County
- Boys and Girls Club of Thurston County
- Community Action Council
- Family Support Center
- Hispanic Roundtable
- Intercity Transit Walk 'N Roll Program
- Interfaith Works
- Joint Base Lewis McChord, External Communications
- Korean Women's Association (Lacey Community Office)
- Lacey Veterans Service Hub
- Olympia Kiwanis Club
- Olympia Master Builders
- Rochester Organization of Families (ROOF)
- Rotary Gateway
- South Thurston Economic Development Initiative (STEDI)
- Thurston Thrives
- YWCA

Appendix B. Event Materials

Factsheet

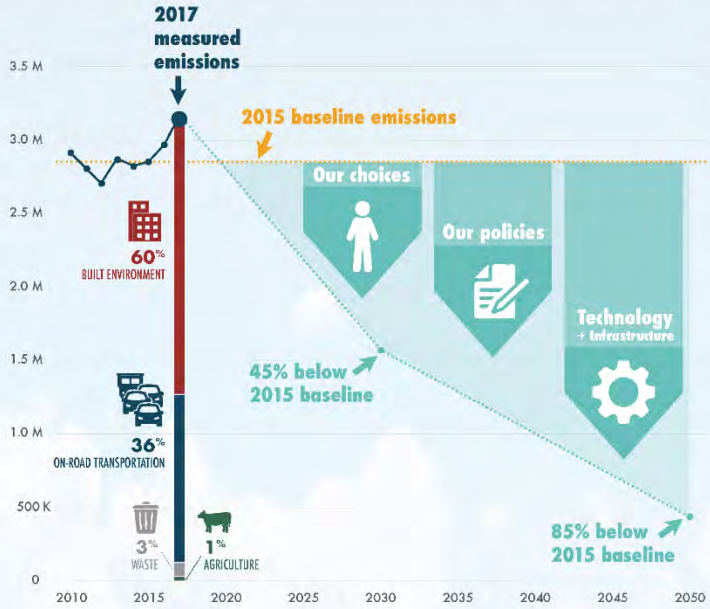
Figure 1. First page of project factsheet with overviews of reasons to take action, the planning process, and ways to get involved.

Thurston Climate Mitigation Plan

FACTSHEET | SUMMER 2019

WHERE DO WE NEED TO GO?

In 2018, Thurston County and the cities of Lacey, Olympia, and Tumwater set targets to reduce carbon pollution emissions **45% below our 2015 baseline by 2030** and **85% below the 2015 baseline by 2050.** These targets are in line with those set by other countries and communities around the world to minimize global temperatures.



HOW WILL WE GET THERE?

To meet these shared targets, all communities will need to take action across a variety of sectors—especially from buildings and transportation, which make up the bulk of emissions.

We will explore actions that support:

- **Choices** that reduce or prevent greenhouse gas emissions.
- **Policies and legislation** that promote climate goals.
- **Investment in technologies and infrastructure** that advance a low-carbon future.

Meeting these targets will not be easy—we will all need to play our part. The region's growing population will make reaching the goal even more challenging. The average **person in Thurston County will need to reduce their carbon footprint by 90% by 2050 to meet our target.**

YOU CAN HELP US GET THERE!

Make your voice heard! In 2019, visit us at a fair or festival booth, take a short survey on community climate priorities, or attend a community briefing. In 2020, provide input on the draft Thurston Climate Mitigation Plan through a survey or open house.

SIGN UP for updates via www.trpc.org/climate.

Figure 2. Second page of project factsheet with desired goals and the types of actions that could be used to achieve them.

Postcard

Figure 3. Small "postcard" with project information and ways to get involved.

Poster

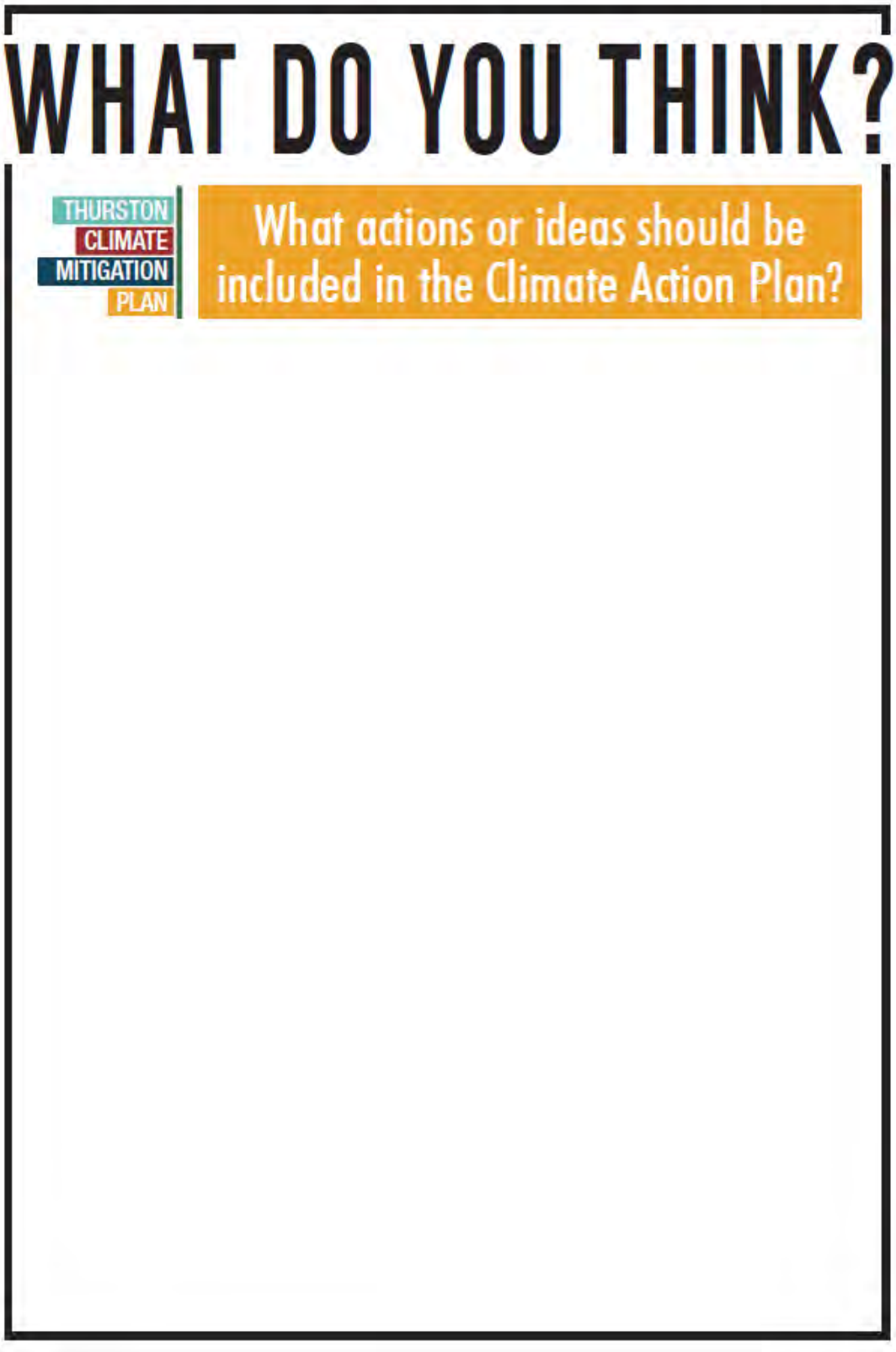
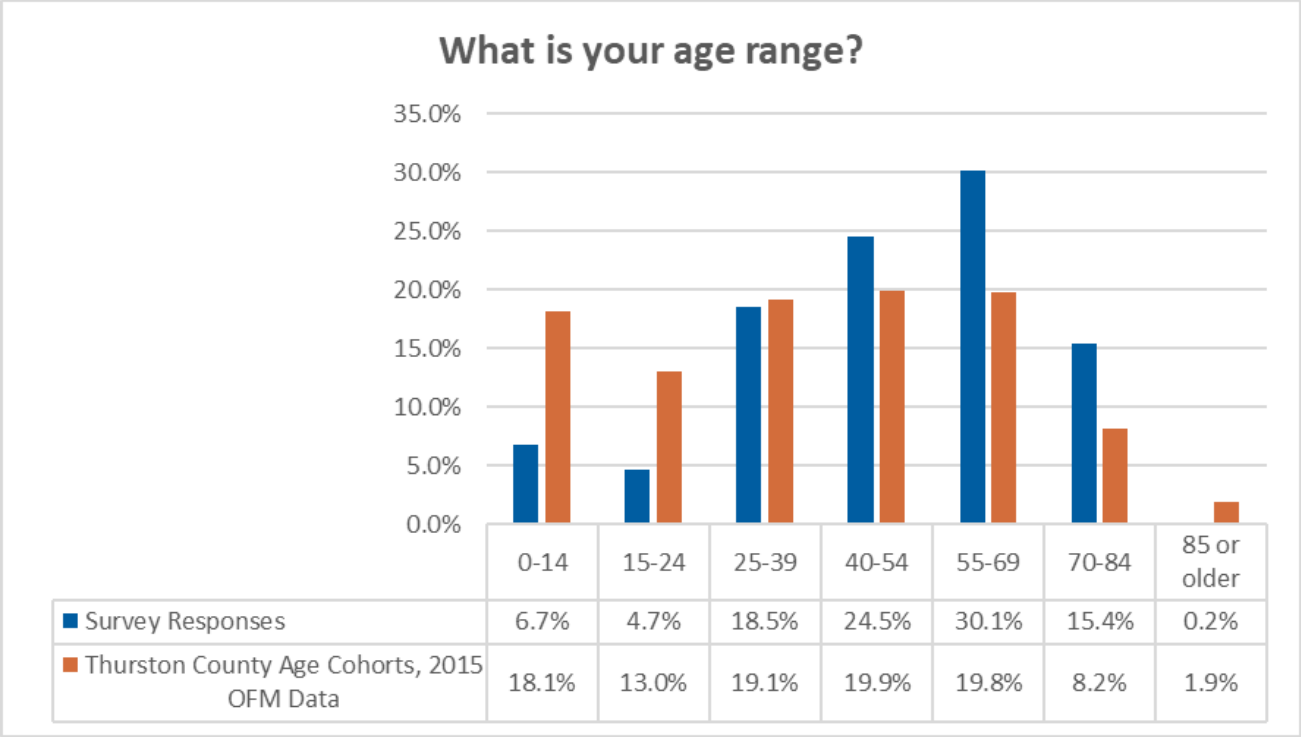


Figure 4. Interactive display board to gather input on which actions or ideas should be included in the Climate Action Plan.

Appendix C. Demographic Comparison



	0-14	15-24	25-39	40-54	55-69	70-84	85 or older
Survey Responses	6.7%	4.7%	18.5%	24.5%	30.1%	15.4%	0.2%
Thurston County Age Cohorts, 2015 OFM Data	18.1%	13.0%	19.1%	19.9%	19.8%	8.2%	1.9%

Figure 5. Survey respondents were generally older than the overall population of Thurston County. However, an analysis for statistical significance of this trend was not performed.

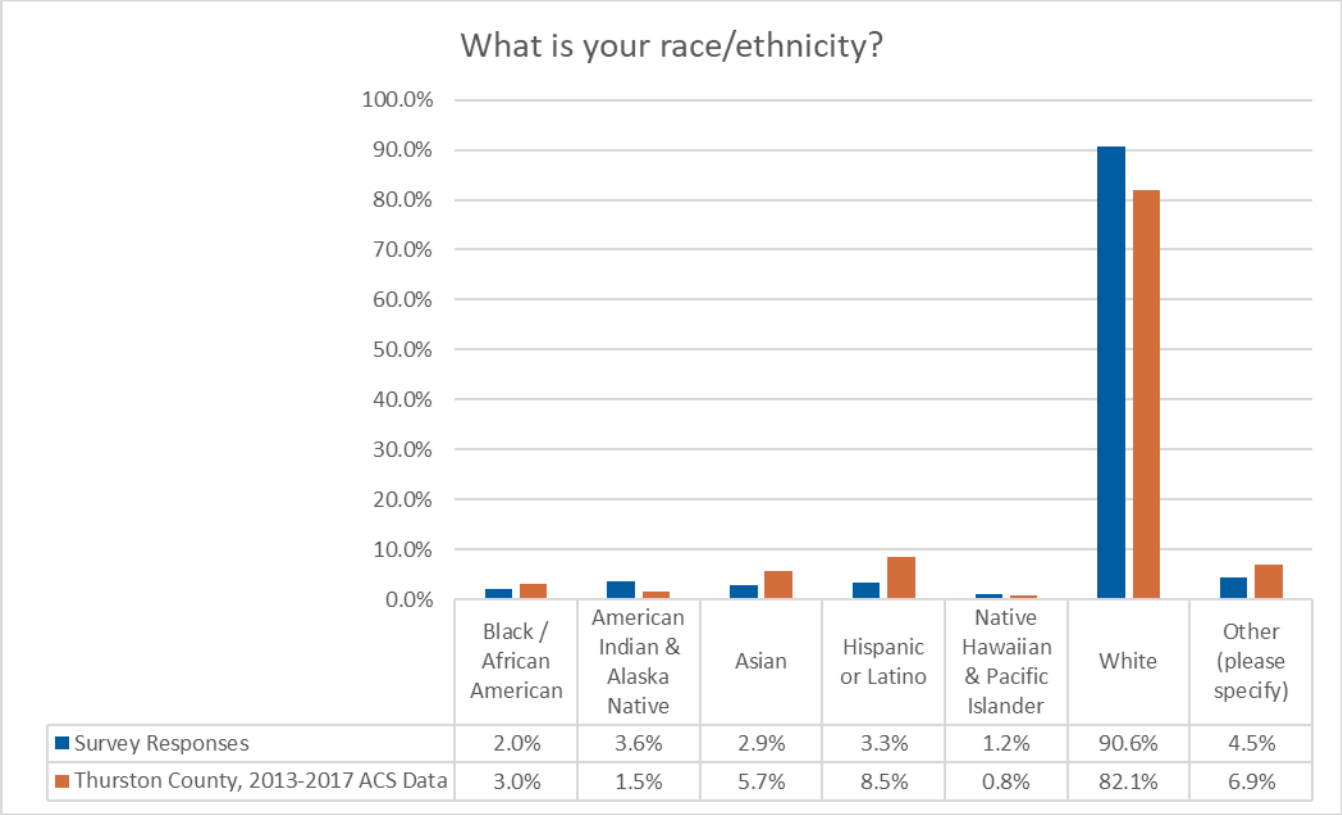
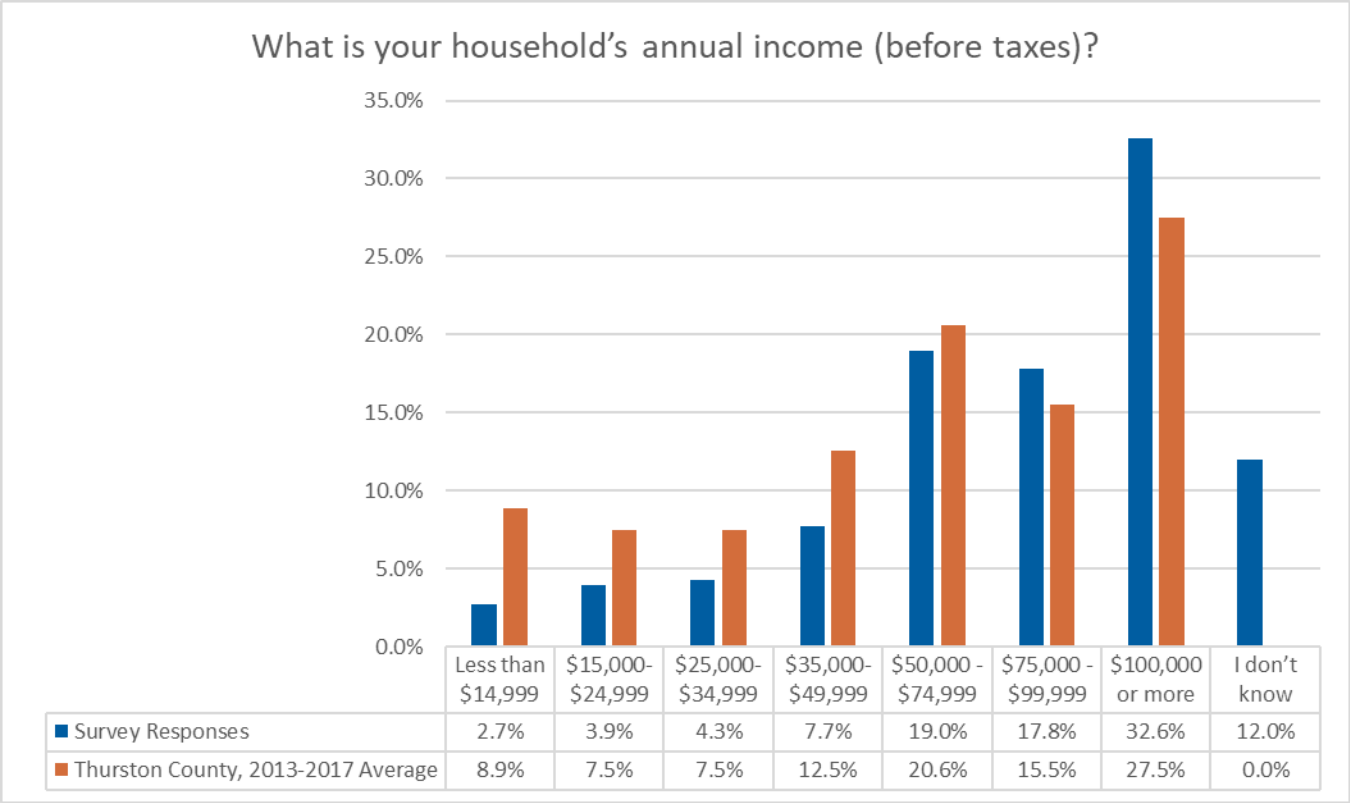


Figure 6. A greater proportion of survey respondents identified as White, American Indian & Alaska Native, and Native Hawaiian & Pacific Islander than the overall population of Thurston County. Fewer survey respondents identified as Black/African American, Asian, Hispanic or Latino, and/or another race/ethnicity compared to the overall population of Thurston County. However, an analysis for statistical significance of these trends was not performed.



	Less than $14,999	$15,000-$24,999	$25,000-$34,999	$35,000-$49,999	$50,000 - $74,999	$75,000 - $99,999	$100,000 or more	I don't know
Survey Responses	2.7%	3.9%	4.3%	7.7%	19.0%	17.8%	32.6%	12.0%
Thurston County, 2013-2017 Average	8.9%	7.5%	7.5%	12.5%	20.6%	15.5%	27.5%	0.0%

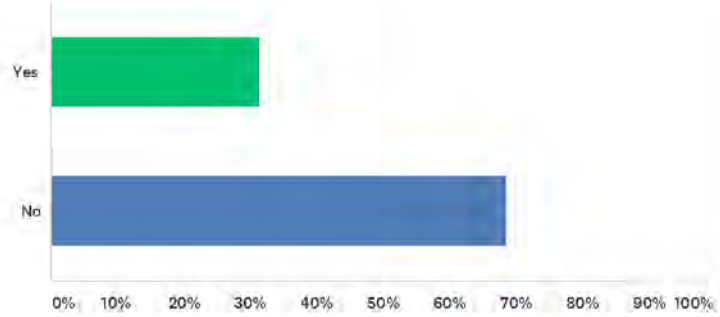
Figure 7. Compared to the overall population of Thurston County, a greater proportion of survey respondents reported a household income of more than $75,000. Conversely, a lower proportion of survey respondents reported an income of less than $74,999 compared to the overall population of Thurston County. However, an analysis for statistical significance of these trends was not performed.

Appendix D. Survey Responses

Thurston Climate Mitigation Plan: Community Questionnaire

Q1 Did you know that in 2018, Thurston County, and the cities of Lacey, Olympia, and Tumwater, committed to reducing greenhouse gas emissions (i.e., carbon pollution) 45% below 2015 levels by 2030 and 85% below 2015 levels by 2050?

Answered: 1,373 Skipped: 24

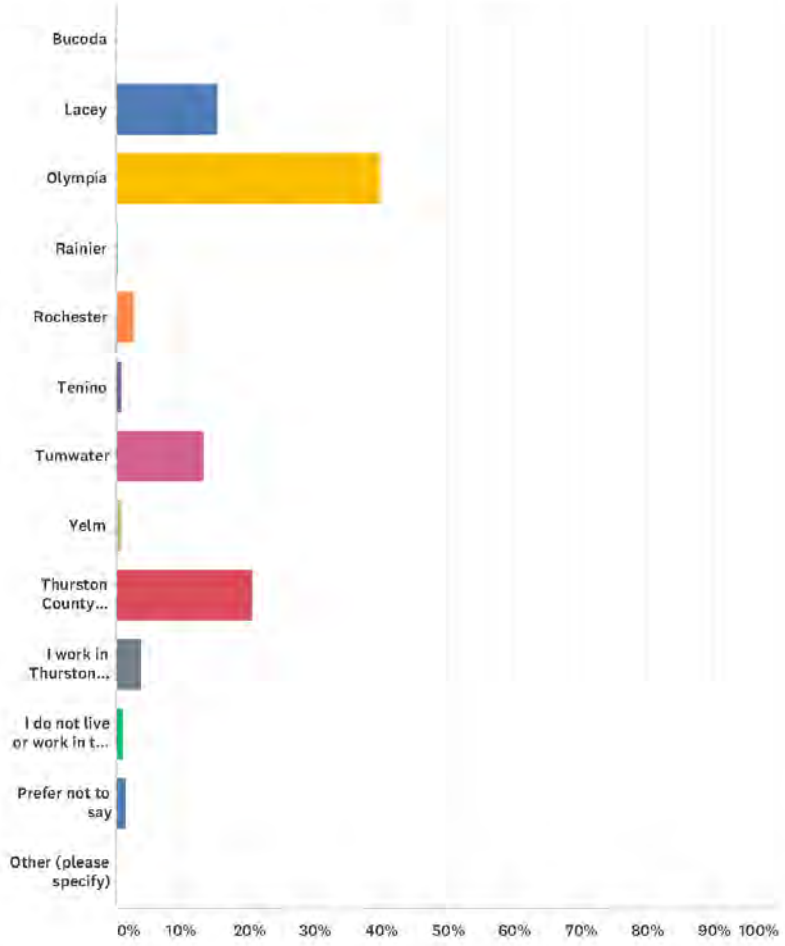


ANSWER CHOICES	RESPONSES	
Yes	31.32%	430
No	68.68%	943
TOTAL		1,373

1 / 19

Q2 Where do you live? We'll use this information to better understand how communities throughout Thurston County would like to act on climate change and what they are already doing. Please select one.

Answered: 1,389 Skipped: 8

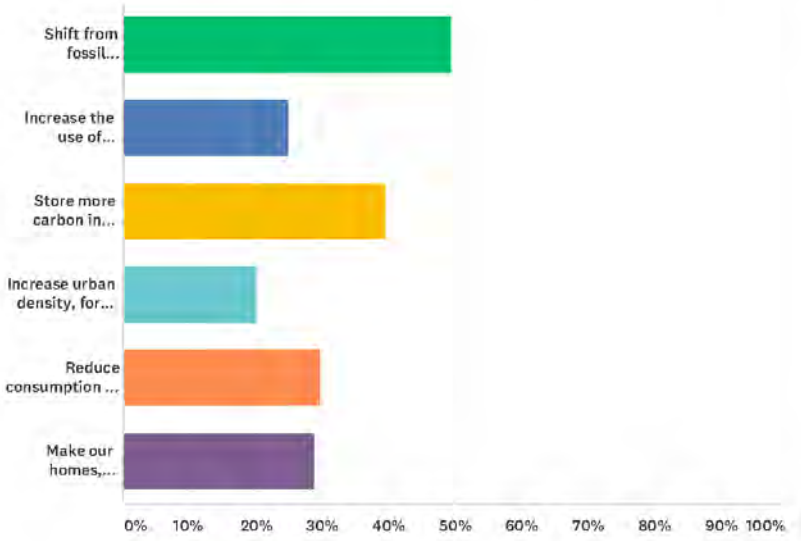


ANSWER CHOICES	RESPONSES	
Bucoda	0.00%	0
Lacey	15.33%	213
Olympia	39.67%	551
Rainier	0.50%	7

Rochester	2.66%	37
Tenino	0.94%	13
Tumwater	13.25%	184
Yelm	0.94%	13
Thurston County (unincorporated)	20.45%	284
I work in Thurston County, but live outside the county	3.74%	52
I do not live or work in the Thurston County region	1.01%	14
Prefer not to say	1.51%	21
Other (please specify)	0.00%	0
TOTAL		1,389

Q3 Climate mitigation is about putting less carbon pollution into the air. Ways to reduce carbon pollution include driving less; using more fuel-efficient vehicles and appliances; using cleaner, renewable energy sources; and storing more carbon in trees, plants, and soil. From the list below, what top two areas do you think the Thurston Climate Mitigation Plan should focus on? Please choose up to two areas.

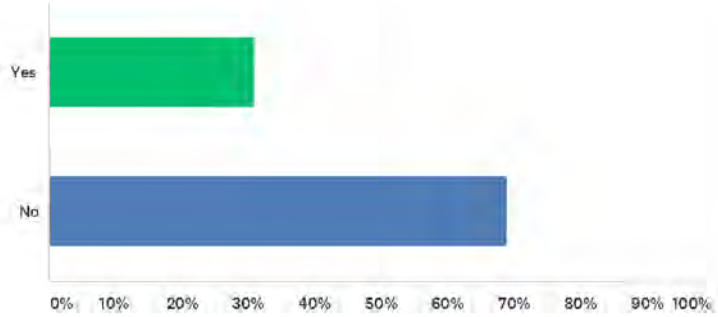
Answered: 1,300 Skipped: 97



ANSWER CHOICES	RESPONSES	
Shift from fossil fuel-powered to more renewable and clean electricity sources (e.g., from coal to wind/hydro/solar energy).	49.46%	643
Increase the use of alternative forms of transportation, such as riding the bus, walking, carpool, vanpool and biking, as well as more fuel-efficient vehicles.	25.00%	325
Store more carbon in trees, plants, and soil, for example by preserving large trees, increasing tree canopy, and managing soil for carbon storage in addition to other benefits.	39.62%	515
Increase urban density, for example with accessible public transportation, mixed use buildings (e.g., retail on the bottom floor and residences above), and affordable housing.	20.15%	262
Reduce consumption and waste by recycling and composting more, avoiding single-use items, and repairing or retrofitting instead of buying new.	29.69%	386
Make our homes, businesses, and other buildings more energy-efficient and carbon-smart, for example through energy retrofits, energy-saving appliances, and sustainable building materials.	28.92%	376
Total Respondents: 1,300		

Q4 Energy use in residential and commercial buildings is the #1 contributor to carbon pollution in Thurston County. Transportation is #2. Does this change the top two areas you think the Thurston Climate Mitigation Plan should focus on?

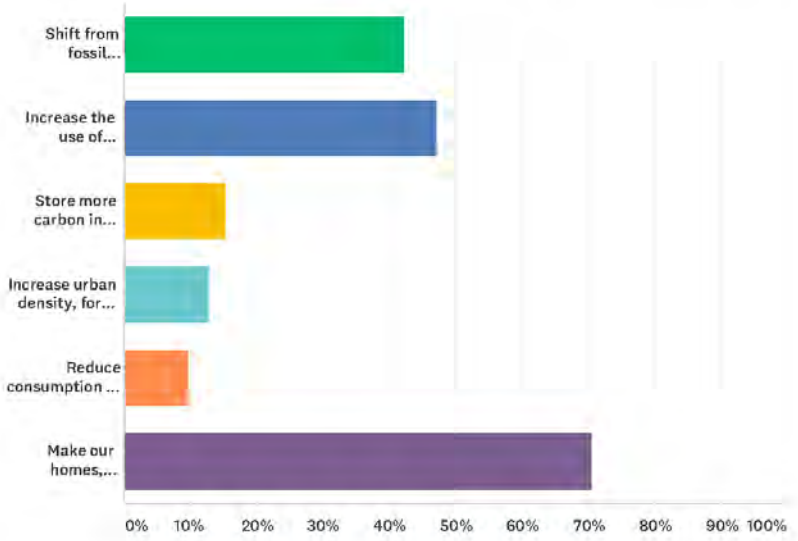
Answered: 1,273 Skipped: 124



ANSWER CHOICES	RESPONSES	
Yes	30.87%	393
No	69.13%	880
TOTAL		1,273

Q5 From the list below, what top two areas do you now think the Thurston Climate Mitigation Plan should focus on? Please choose up to two areas.

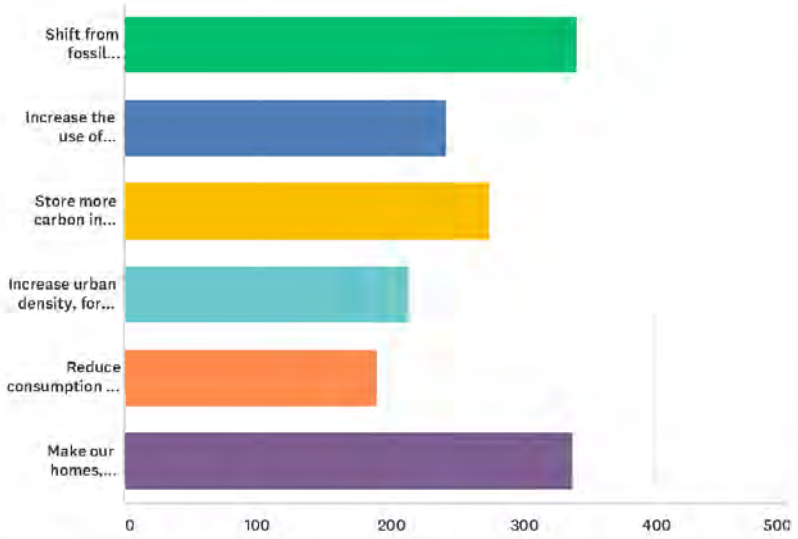
Answered: 399 Skipped: 998



ANSWER CHOICES	RESPONSES	
Shift from fossil fuel-powered to more renewable and clean electricity sources (e.g., from coal to wind/hydro/solar energy).	42.36%	169
Increase the use of alternative forms of transportation, such as riding the bus, walking, carpool, vanpool and biking, as well as more fuel-efficient vehicles.	47.12%	188
Store more carbon in trees, plants, and soil, for example by preserving large trees, increasing tree canopy, and managing soil for carbon storage in addition to other benefits.	15.29%	61
Increase urban density, for example with accessible public transportation, mixed use buildings (e.g., retail on the bottom floor and residences above), and affordable housing.	12.78%	51
Reduce consumption and waste by recycling and composting more, avoiding single-use items, and repairing or retrofitting instead of buying new.	9.52%	38
Make our homes, businesses, and other buildings more energy-efficient and carbon-smart, for example through energy retrofits, energy-saving appliances, and sustainable building materials.	70.43%	281
Total Respondents: 399		

Q6 Using the same list as the previous question, if you had $1,000 dollars to invest to reduce carbon pollution, how would you spend it? You can put the imaginary money toward one, some, or all of the options. Answers must add up to 1000. Use whole numbers only. Do not include commas.

Answered: 1,154 Skipped: 243



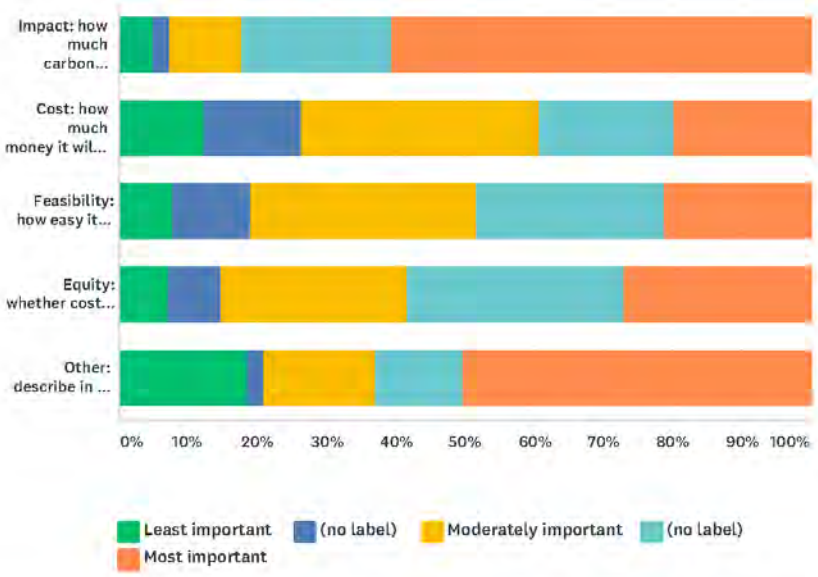
ANSWER CHOICES	AVERAGE NUMBER	TOTAL NUMBER	RESPONSES
Shift from fossil fuel-powered to more renewable and clean electricity sources (e.g., from coal to wind/hydro/solar energy).	341	263,079	772
Increase the use of alternative forms of transportation, such as riding the bus, walking, carpool, vanpool, and biking, as well as more fuel-efficient vehicles.	243	164,694	678
Store more carbon in trees, plants, and soil, for example by preserving large trees, increasing tree canopy, and managing soil for carbon storage in addition to other benefits.	275	202,600	736
Increase urban density, for example with accessible public transportation, mixed use buildings (e.g., retail on the bottom floor and residences above), and affordable housing.	215	121,173	564
Reduce consumption and waste by recycling and composting more, avoiding single-use items, and repairing or retrofitting instead of buying new.	190	117,706	618
Make our homes, businesses, and other buildings more energy-efficient and carbon-smart, for example through energy retrofits, energy-saving appliances, and sustainable building materials.	338	284,748	843
Total Respondents: 1,154			

Q7 Have we missed any key areas the Thurston Climate Mitigation Plan should focus on? This can also include actions you think are important to include in the plan.

Answered: 612 Skipped: 785

Q8 What do you think is most important to consider in choosing actions to reduce carbon pollution?

Answered: 1,163 Skipped: 234



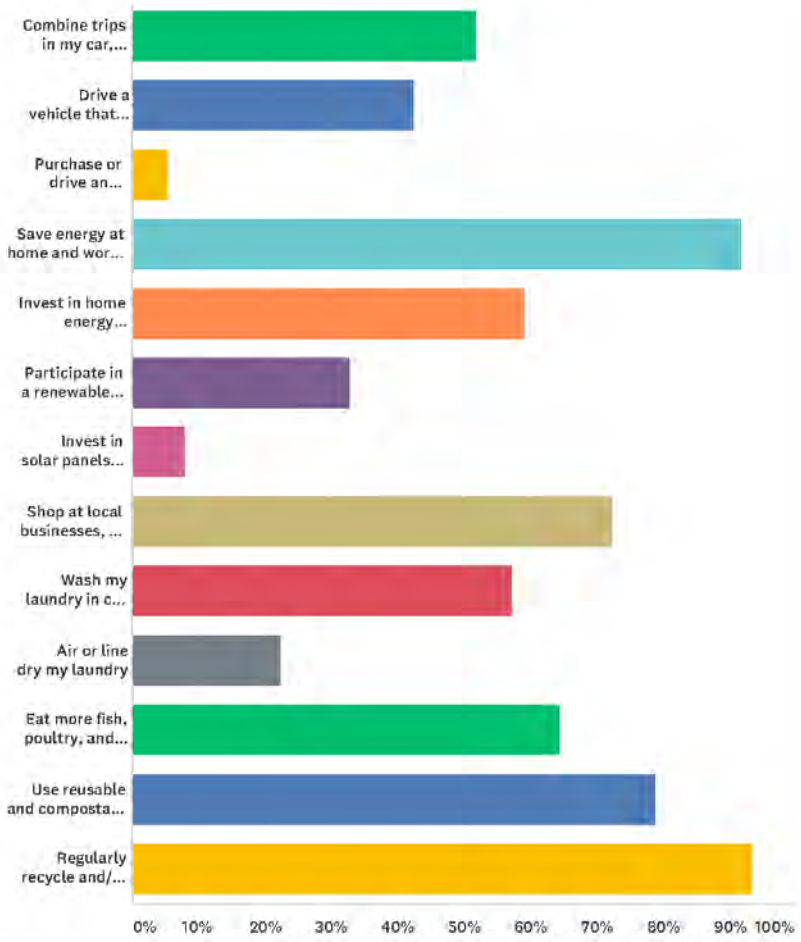
	LEAST IMPORTANT	(NO LABEL)	MODERATELY IMPORTANT	(NO LABEL)	MOST IMPORTANT	TOTAL	WEIGHTED AVERAGE
Impact: how much carbon pollution will be reduced	4.73% 53	2.50% 28	10.45% 117	21.61% 242	60.71% 680	1,120	4.31
Cost: how much money it will cost	12.18% 137	14.13% 159	34.40% 387	19.38% 218	19.91% 224	1,125	3.21
Feasibility: how easy it will be to implement	7.63% 85	11.31% 126	32.68% 364	27.11% 302	21.27% 237	1,114	3.43
Equity: whether costs and benefits of action will be distributed fairly across communities or whether actions will avoid disproportionately affecting the most vulnerable in our communities	7.02% 79	7.55% 85	27.00% 304	31.35% 353	27.09% 305	1,126	3.64
Other: describe in the text box below	18.52% 40	2.31% 5	16.20% 35	12.50% 27	50.46% 109	216	3.74

Q9 If you selected "other" above, please briefly describe the driver here.

Answered: 186 Skipped: 1,212

Q10 Two ways to take action on climate change are for communities to act and for governments to act through processes like the Thurston Climate Mitigation Plan. Individual action can also make a difference. Here are some common climate mitigation actions individuals take. What do you already do? Select all that apply.

Answered: 1,151 Skipped: 246

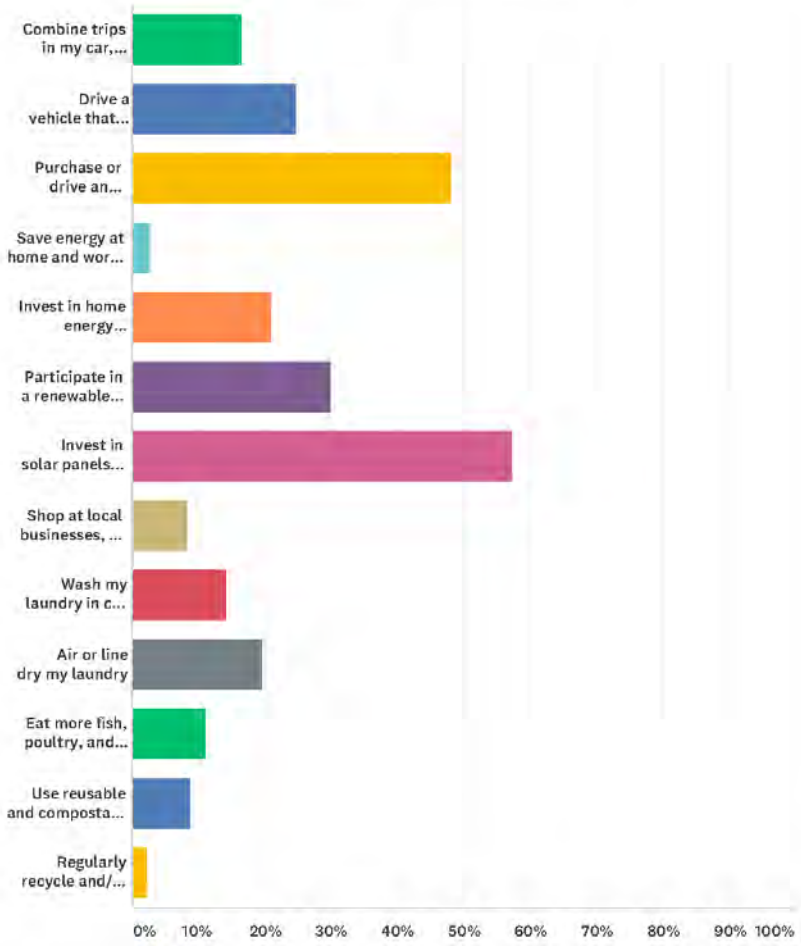


ANSWER CHOICES	RESPONSES	
Combine trips in my car, carpool, take public transit, walk, or ride a bike to a destination at least once a week	51.95%	598
Drive a vehicle that gets more than 30 MPG in the city	42.57%	490
Purchase or drive an all-electric vehicle	5.47%	63

Save energy at home and work by turning off lights and water, using energy-saving light bulbs, etc.	91.75%	1,056
Invest in home energy improvements, such as installing insulation, efficient windows, heating and/or appliances	59.17%	681
Participate in a renewable energy program through my local utility	32.84%	378
Invest in solar panels for my home or business	7.91%	91
Shop at local businesses, in bulk, and/or at re-use or thrift stores	72.46%	834
Wash my laundry in cold water	57.25%	659
Air or line dry my laundry	22.42%	258
Eat more fish, poultry, and vegetable protein	64.47%	742
Use reusable and compostable containers and beverage bottles, or bring my own	78.97%	909
Regularly recycle and/or compost	93.57%	1,077
Total Respondents: 1,151		

Q11 What would you be interested in doing that you are not currently doing? Select all that apply.

Answered: 1,023 Skipped: 374



ANSWER CHOICES	RESPONSES	
Combine trips in my car, carpool, take public transit, walk, or ride a bike to a destination at least once a week	16.62%	170
Drive a vehicle that gets more than 30 MPG in the city	24.73%	253
Purchase or drive an all-electric vehicle	48.09%	492
Save energy at home and work by turning off lights and water, using energy-saving light bulbs, etc.	2.74%	28
Invest in home energy improvements, such as installing insulation, efficient windows, heating and/or appliances	21.02%	215

Participate in a renewable energy program through my local utility	30.01%	307
Invest in solar panels for my home or business	57.38%	587
Shop at local businesses, in bulk, and/or at re-use or thrift stores	8.31%	85
Wash my laundry in cold water	14.27%	146
Air or line dry my laundry	19.65%	201
Eat more fish, poultry, and vegetable protein	11.05%	113
Use reusable and compostable containers and beverage bottles, or bring my own	8.80%	90
Regularly recycle and/or compost	2.25%	23
Total Respondents: 1,023		

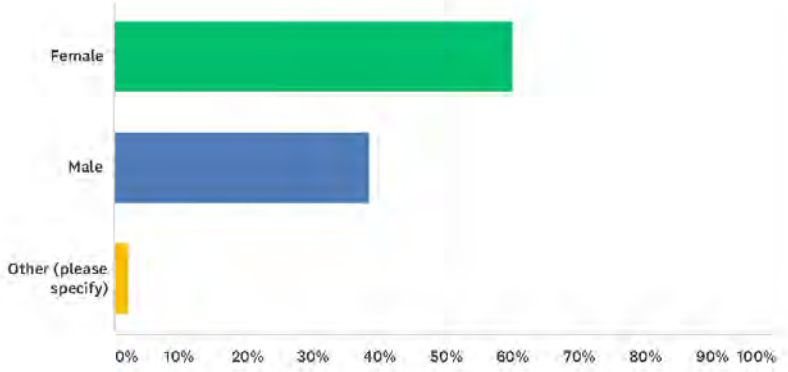
Q12 Please provide your email address if you would like to hear about updates and future opportunities to provide input on the Thurston Climate Mitigation Plan. We will send about 2-3 emails per month.

Answered: 543 Skipped: 854

ANSWER CHOICES	RESPONSES	
Email address	100.00%	543

Q13 What is your gender?

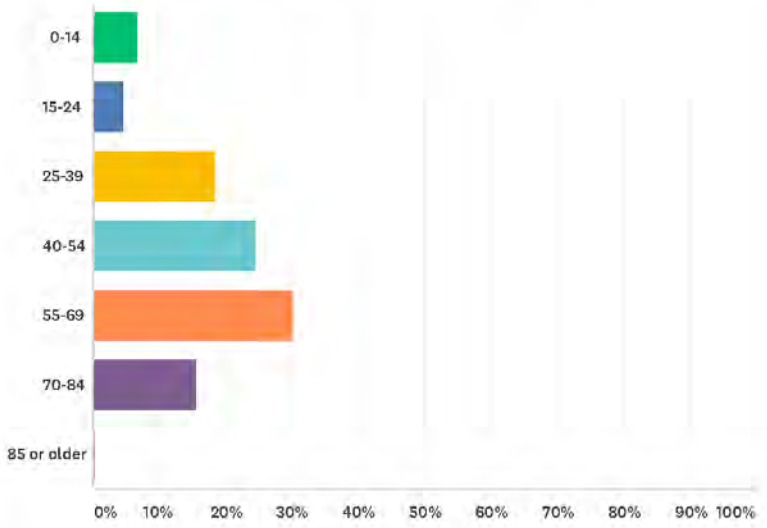
Answered: 1,063 Skipped: 334



ANSWER CHOICES	RESPONSES	
Female	60.02%	638
Male	38.48%	409
Other (please specify)	2.07%	22
Total Respondents: 1,063		

Q14 What is your age range?

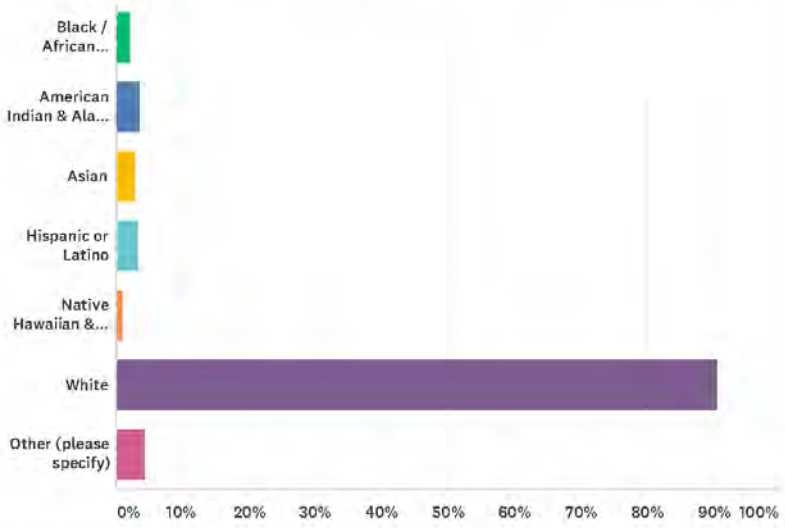
Answered: 1,073 Skipped: 324



ANSWER CHOICES	RESPONSES	
0-14	6.71%	72
15-24	4.66%	50
25-39	18.45%	198
40-54	24.51%	263
55-69	30.10%	323
70-84	15.38%	165
85 or older	0.19%	2
TOTAL		1,073

Q15 What is your race/ethnicity (check as many as apply)?

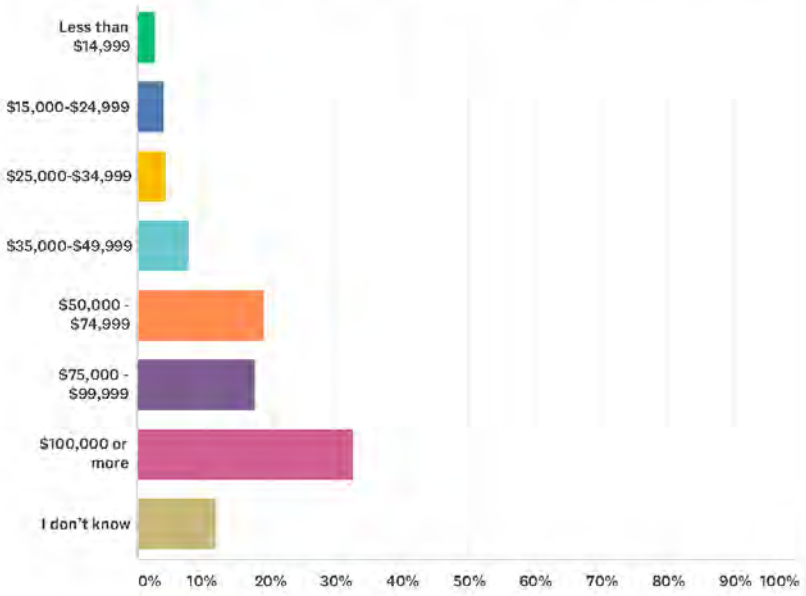
Answered: 1,046 Skipped: 351



ANSWER CHOICES	RESPONSES	
Black / African American	2.01%	21
American Indian & Alaska Native	3.63%	38
Asian	2.87%	30
Hispanic or Latino	3.25%	34
Native Hawaiian & Pacific Islander	1.15%	12
White	90.63%	948
Other (please specify)	4.49%	47
Total Respondents: 1,046		

Q16 What is your household's annual income (before taxes)?

Answered: 1,023 Skipped: 374



ANSWER CHOICES	RESPONSES	
Less than $14,999	2.74%	28
$15,000-$24,999	3.91%	40
$25,000-$34,999	4.30%	44
$35,000-$49,999	7.72%	79
$50,000 - $74,999	18.96%	194
$75,000 - $99,999	17.79%	182
$100,000 or more	32.55%	333
I don't know	12.02%	123
TOTAL		1,023

Thurston Climate Mitigation Plan
List of Community Briefings, through August 2020

Public Presentations

- 8/13/2019 –Thurston County Board of Health
- 8/16/2019 –South Thurston Economic Development Initiative (STEDI)
- 9/9/2019 – Tumwater Tree Board
- 9/10/2019 – Tumwater Planning Commission
- 9/11/2019 – Deschutes Estuary Restoration Team (DERT) "Looking Locally at Climate Impacts" Community Forum
- 10/1/2019 – Lacey Planning Commission
- 11/12/2019 – Tumwater Planning Commission
- 12/10/2019 – Olympia City Council study session
- 12/12/2019 – Lacey City Council Work session
- 12/13/2019 – Lincoln Elementary, presentation to 4th/5th Grade class
- 1/14/2020 – Tumwater City Council
- 1/29/2020 – Lacey Youth Council
- 2/7/2020 – Thurston Regional Planning Council
- 2/27/2020 – Olympia Master Builders, Government Affairs Committee
- *NOTE: several planned events were canceled in March and April 2020 in response to COVID-19 restrictions on public gatherings.*
- 5/21/2020 – Olympia City Council – Land Use Committee
- 6/23/2020 – Lacey General Government Committee
- 7/14/2020 – Tumwater City Council Work Session
- 8/5/2020 – Intercity Transit Authority
- 8/11/2020 – Tumwater City Council Work Session

Additional Organizations Contacted to Identify Community Liaisons or Offer Briefings

- Rochester Organization of Families (ROOF)
- Hispanic Roundtable
- South Thurston Economic Development Initiative (STEDI)
- Joint Base Lewis McChord, External Communications
- Boys and Girls Club of Thurston County
- Rotary Gateway
- Olympia Kiwanis Club
- Black Alliance of Thurston County
- YWCA
- Lacey Veterans Service Hub
- Korean Women's Association (Lacey Community Office)
- Interfaith Works
- Asset Building Coalition
- Community Action Council
- Family Support Center
- Intercity Transit Walk 'N Roll Program
- Thurston Thrives
- Thurston County Solid Waste Advisory Committee
- Thurston County Realtor's Association

Interview Summary

As part of the outreach conducted to inform the Thurston Climate Mitigation Plan, we conducted five interviews with community organizations and representatives. These 30-minute phone interviews provided an opportunity to understand how local organizations and communities perceive the impact of climate change in their community and any steps they're taking to mitigate climate change impacts. These interviews also provided an opportunity for interviewees to provide feedback on the potential strategies and actions of the Plan. Outcomes from the interviews are summarized in the table below, and the full interview notes can be found here.

Interview Participants

- Construction Companies/Contractors
  - Trudy Soucoup, Homes First – January 24, 2020
  - Erin Hall, Olympia Master Builders – February 7, 2020
- Communities of Color
  - Lola Flores, Hispanic Roundtable – January 27, 2020
  - Amy Loudermilk, Confederated Tribes of the Chehalis – January 29, 2020
- Food Bank
  - Robert Coit, Thurston County Food Bank – February 6, 2020

Stakeholder Group	Current/Planned Activities	Needs/Requests	Areas of Support	Areas of Concern	Other Input/Comments
Construction Companies/ Contractors	• Homes First is refurbishing old buildings to turn them into affordable, low-impact multi-family development. • Have been working with Olympia to get infill housing ordinances in place.	• Financial incentives/resources. • Keep policy changes (e.g., building codes) consistent among jurisdictions. • Ensure there is input received for how policy will impact builders/construction industry and account for impacts before implementation. • Mixed models of financial incentives/fees.	• Creating more sustainable, low impact development. • Solar and EV-ready building code. • Incentive programs. • Increased density.	• Affordability. Making sure decisions don't increase costs in a way that impacts housing affordability (both to consumer and builders). • Impact fees. • Local code changes coming before expected state code changes. (Avoid redundancies where possible.)	• Interested in continuing to be a part of the process—especially during implementation.
Communities of Color/ Tribes	• Vulnerability Impacts Assessment • Limited outreach/education	• Outreach & education • Materials with tips/information, in-language materials. • Create opportunities for relationship-building and engagement with diverse communities. • Government-to-government outreach and interaction.	• Education and outreach efforts. • Behavior-modifying changes; opportunities for people to understand how their choices make a difference. • Expanding transportation to rural communities.	• Consistency among counties/governments. • Impacts to rural/low-income communities and underrepresented communities. (Particularly financial impacts.) • Scalability and ease of implementation.	• Interested in supporting outreach efforts and disseminating materials about the Plan.

Foodbank	• Addresses food waste and food deserts.	• Informational materials.	• Improving food waste recovery systems; expanding partnerships. • Expanded incentives for people/organizations to participate	• Cost to food bank. • Potential participating organizations may have a sense of perceived liability for food they donate and be less likely to participate.	• Interested in sharing information about the Plan with networks. • Interested in providing feedback on community behalf.

Attachment E

Public Comment Matrix

ID	Date	Name	Source	Topic	Sub-Topic	Weighting - Topic	Weighting - SubTopic	Type of Comment	Summary
100	6-Feb-19	Lynn Fitz-Hugh	Oral - Steering Committee	Goals	Community Involvement	1	1	Change Requested	Young people like high-schoolers need to be involved in the process.
101	6-Feb-19	Tom Crawford	Oral - Steering Committee	Early Actions	methods	1	1	Support	There have been other recommendations and studies for action ideas. We should look at those rather than starting from scratch.
102	6-Feb-19	Abby Ruskey	Oral - Steering Committee	Early Actions	Methods	1	1	Support	The Thurston County Climate Action Convention in April will focus on solutions and we can look to them for local solutions.
103	6-Feb-19	Barb	Oral - Steering Committee	General Support	Community Involvement	1	1	Support	Action groups should be included and more people from environmental groups such as Audubon, and Sierra Club.
104	6-Feb-19	Tom Crawford	Oral - Steering Committee	General Support	Community Involvement	1	1	Support	Should get a person from the Climate Activist group, or the coordinating council from the Climate Action Team.
105	6-Feb-19	Mason Rolph	Oral - Steering Committee	Community Involvement	General Support	1	1	Support	The stakeholder group is missing someone from renewable energy.
106	6-Feb-19	Helen Wheatly	Oral - Steering Committee	Early Actions	Community Involvement	1	1	Change Requested	There should be someone from social justice in the stakeholder group, maybe the labor union as well.
107	8-Mar-19	Tom Crawford	Oral - Steering Committee	General Support	Community Involvement	0	0	Support	Thurston Climate Action Team is willing to work with the project team and help provide information.
108	8-Mar-19	Chris van Daalen	Oral - Steering Committee	Goals	Targets	1	1	Support	Zero energy buildings.
109	8-Mar-19	Tony Wilson	Oral - Steering Committee	Early Actions	Accountability	1	1	Support	Oil pipelines and energy is being wasted. What don't we realize could be changed today.
110	8-Mar-19	Mason Rolph	Oral - Steering Committee	Community Involvement	General Support	0	0	Support	All port owned properties are being looked at for solar. Community Solar would like to participate in the Advisory Workgroup.
111	8-Mar-19	Carole Richmond	Oral - Steering Committee	Early Actions	Methods	1	1	Support	There are unaccounted emissions we could be harnessing for energy, like flare offs from refineries.
112	8-Mar-19	William Golding	Oral - Steering Committee	General Climate	General Climate	1	1	Support	There are many opportunities to learn from what has already been done.
113	24-Apr-19	Tom Crawford	Oral - Steering Committee	Community Involvement	Tribal Participation	1	1	Policy Question	Tribal participation status and if there is a way to speed up that process.
114	24-Apr-19	Phyllis Farrell	Oral - Steering Committee	General Support	General Support	1	1	Support	Keep up the good work.
115	22-May-19	Emma Seng	Oral - Steering Committee	Advisory workgroup (CAW)	General Climate	1	1	Support	Summary of Olympia High Schoolers resolutions for Olympia. The high schollers would like to help with the plan.
116	22-May-19	Tom Crawford	Oral - Steering Committee	Early Actions	Goals	1	1	Support	TCAT's campaign for carbon free Thurston. Make sure climate actions are effective and lead to real change.
117	22-May-19	Mason Rolph	Oral - Steering Committee	Targets	Tribal Participation	1	1	Policy Question	On what schedule should emissions goals be revisited? Readjust for new science. What is the status of tribal participation?
118	22-May-19	Ryan Campbell	Oral - Steering Committee	General Support	Community Involvement	1	1	Support	Engaging the community through stakeholders is a great idea.
119	22-May-19	Chris Van Daalen	Oral - Steering Committee	Community Involvement	Goals	1	0	Change Requested	Building community is a hard to reach group. Suggests doing some financial analysis in the plan for zero carbon buildings.
120	22-May-19	Graham Sackrison	Oral - Steering Committee	Community Involvement	General Climate	1	1	Change Requested	Having breakout meetings of CAW to bring in more specialists to get more detailed information.
121	22-May-19	William Golding	Oral - Steering Committee	Community Involvement	Tribal Participation	1	1	Policy Question	Where is tribal coordination?
123	11-Jun-19	Ari Simmons	Oral - Advisory Workgroup	Targets	Timeline	1	1	Support	Wants to ensure a streamlined process for clean energy. What's happening now is not enough and we need to continue and work faster, build bridges.
124	11-Jun-19	Jasmine MacLean	Oral - Advisory Workgroup	Targets	Timeline	1	1	Change Requested	We need a more realistic timeline on the meeting agenda, since we ran out of time.

Public Comment Matrix

125	11-Jun-19	Janine Lindsey	Oral - Advisory Workgroup	General Climate	Goals	0	0	Change Requested	There are major developments and small developments taking away trees, and there are opportunities now to mitigate for that.
126	11-Jun-19	Jeff Miller	Oral - Advisory Workgroup	Targets	Goals	1	1	Support	Work on the scale first. Using other jurisdictions plan for efficiency so it doesn't take so long to get those numbers set.
127	11-Jun-19	Ryan Campbell	Oral - Advisory Workgroup	Advisory workgroup (CAW)	Community Involvement	1	1	Change Requested	Industry and manufactures should be on the group and the advisory community.
128	26-Jun-19	Thad Curtz	Oral - Steering Committee	Targets	Goals	1	1	Policy Question	Speaking about similarities with other cities that have done similar planning. Only so much a jursidiction can do.
129	26-Jun-19	Jeff Miller	Oral - Steering Committee	Targets	Goals	1	1	Support	Suggestion for transportation actions and measurements.
130	26-Jun-19	Lynn Fitz-Hugh	Oral - Steering Committee	Targets	Goals	1	1	Support	Thankful for expanded measurement structure.
131	29-Jun-19	Thad Curtz	Email	General Support	Methods	1	1	Support	I worked to summarize ideas for reducing local emissions for transportation and building energy in 4 cities' completed climate action plans. I'd appreciate your sending this note and the attachments on to the members of the steering committee and to the members of the working group.
132	1-Jul-19	Thad Curtz	Email	General Support	Methods	0	0	Support	I took a look at the 2016 update to the TCAT inventory today and discovered that they made various changes in how they did the estimates. I'd appreciate it if you'd send this note on to the people who got the original version of the tables.
133	4-Jul-19	Janine Lindsey	Email	General Climate	Goals	1	1	Change Requested	Stop removing the valuable trees we do have, to build single-family housing development. Need to regard trees as powerful partners in our climate crisis.
134	18-Jul-19	Paul Pickett	Oral - Advisory Workgroup	Timeline	Goals	1	1	Support	We need to be innovative and urgent. New funding, new science, don't presume. There are a lot of large flat roofs, count all the flat spaces and see on GIS. We could get a lot of energy from them.
135	18-Jul-19	Thad Curtz	Oral - Advisory Workgroup	Targets	Goals	1	1	Policy Question	We should ask ourselves why things haven't been progressing from sustainable thurston, or such little has been done with sustainable thurston.
136	18-Jul-19	Jeff Miller	Oral - Advisory Workgroup	Goals	Community Involvement	1	1	Support	Private sector outreach, finding businesses the individual providers. Tracking existing policies and investment, long term education and trades professions.
137	18-Jul-19	Ari Simmons	Oral - Advisory Workgroup	Community Involvement	General Support	1	1	Support	Community solar can host some additional talking spaces to talk about meeting stuff.
138	17-Aug-19	Kozmo Bates	Email	Criteria	Equity	1	1	Policy Question	Equity in the action prioritization doesn't make sense to me. As I read it, it assumes that "fair" means an action will affect all economic groups equally. To me, fair would mean it would affect polluters and groups with more resources greater than those with less.
139	20-Aug-19	Jim Lazar	Email	Targets	Goals	1	1	Policy Question	I offset my carbon footprint by purchasing CCAs, which are the gold standard in mitigation. The PSE Green Power program is TERRIBLE. Less than half of the money actually goes to buy green power. Much of it is consumed in PSE advertising and overhead.

Public Comment Matrix

140	21-Aug-19	Howard Glastetter	Email	Targets	Goals	1	1	Policy Question	FERC has no rules as to how high the reservoir should be. TP often runs the reservoir levels at 2 to 4 feet from capacity in the winter in order to run all dam generators at full capacity. This high level sets things up for serious flooding in Thurston County's Nisqually Valley. I believe this is also an ecological concern that Thurston County needs to address.
141	22-Aug-19	Mike Ardington	Email	Criteria	Goals	1	1	Policy Question	We should focus first on efforts to make our buildings and homes more energy efficient. Never in my life have I seen so much bad and biased science taking place, with the predictive models, based on proxy data and biased algorithms, I urge the County to approach this cautiously and with an eye toward both fiscal responsibility and rational thinking.
142	29-Aug-19	Tom Crawford	Oral - Steering Committee	Targets	Revenue Streams	1	1	Policy Question	What combinations of actions get us to where we need to go. Developed new revenue sources and conversations around the plan. It may not be too early to look toward early revenue streams.
143	1-Sep-19	Leslie mcClure	Email	Targets	Goals	1	1	Policy Question	I just finished your Lacey, WA climate survey and what struck me the most is the city's abdication of responsibility! We are way, way, way past the ability of the consumer to stop climate change, although every little bit helps.
144	11-Sep-19	Nadine Chiechi	Email	Targets	Goals	1	1	Support	In Ireland with a pop less than 5mil virtually everyone drives a manuel, diesel fueled, subcompact car. Hotels requested you reuse towels and air dry them. In the Netherlands I was surprised to see their city buses were solar powered and had panels all down the roof!
145	26-Sep-19	Matt Longenbaugh	Email	General Support	Community Involvement	1	1	Support	Put my name on email list for updates. Kudos for reaching out to interested folks here in the county.
146	24-Oct-19	Chuck Murray	Oral - Steering Committee	Targets	Goals	1	1	Support	I recommend build up your building departments- make them a great tool for achieving your goals. There will be an infrastructure that develops around this, builders and architects will know how to use it and apply it.
147	16-Oct-19	Thad Curtz	Email	General Support	Methods	0	0	Support	I've been building a website to share materials about actually implementing the various ideas that have been proposed for reducing emissions. It's at www.climatetoolbox.info. If you have suggestions about corrections, about possible additions, or about other ways I might try to make this more useful over time, I hope you'll send them to me.
148	23-Oct-19	Barak Gale	Email	Community Involvement	General Support	1	1	Support	Here is a link to the approximate 600 cards that were signed (same as number printed), most with comments, by people at the September 20 Climate Strike at the Capitol. Please share with other members of the Steering Committee.
149	24-Oct-19	Barak Gale	Oral - Steering Committee	General Support	Criteria	1	1	Support	I apricate the conversation that we will have to get just about all these things done to see the results we want. I appreciate the comment that tracking should not veto promising technologies.
150	24-Oct-19	Thad Curtz	Oral - Steering Committee	Targets	Goals	1	1	Policy Question	The clean energy act is going to have significant impacts on the all the other changes are going to look like. It will be much more realistic and probably even make you feel a little bit better if were starting from that basis rather than a business as usual stance.

Public Comment Matrix

151	24-Oct-19	Mark Walker	Oral - Steering Committee	Criteria	Accountability	1	1	Support	I'm also here to advocate for an outside monitoring group. If you don't audit the legislation you got in place, people will lose interest, faith and backing. Being accountable and publicly transparent where this current and future legislation is working.
152	27-Nov-19	Thad Curtz	Email	General Support	Goals	0	1	Support	I'd like to pass my thoughts about a couple of issues involved in prioritizing actions for the climate plan on to you. During the next phase of this process, I hope you'll have an opportunity to sort out their implications for our planning in collaboration with the consultants.
153	2-Jan-20	Leslea Steffel-Dennis	Email	Targets/ Criteria	Goals	1	1	Change Requested	I am extremely distressed by the removal of acres of forest, to strip and build monstrous warehouses. No evidence of solar or permeable driveways. Increases in truck traffic stuggle with roundabouts in area and pollute. Questions about the permitting process for these developments.
154	16-Jan-20	Wayne Olsen	Oral - Advisory Workgroup	Criteria	Goals	1	1	Change Requested	I have questions about how we will quantify outcomes down the road at the city level and individual level to see what impact were having. Most of you are aware that our goal posts are moving in terms of what the scientists have found, we are going to need to redouble our efforts and be aggressive to reach our reduction goals.
155	16-Jan-20	Lynn Fitz-Hugh	Oral - Advisory Workgroup	Criteria	Methods	1	1	Change Requested	Things that score high on sequestration value do not tend to have high emissions. And so, by their nature sequestration actions may not rate very high for prioritization based on these criteria. We talked about having a sidebar in the plan, so actions that did not make it into the final plan were still represented. I just want to make sure that does not fall off as we move forward with drafting the plan.
156	16-Jan-20	Frank Turner	Oral - Advisory Workgroup	Timeline	Community Involvement	1	1	Change Requested	When we reach our goals in 2050, it will be the youth who are sitting in this room. They are going to be the ones doing this work, so they need to be involved. Nuclear power as an option is being discussed around the country; it would be wise for this group to have an explicit position on nuclear power.
157	17-Jan-20	Pat Rasmussen	Email	Criteria	Methods	1	1	Change Requested	What method are you using to rank Regenerative Agriculture in the TRPC planning process? Shouldn't you be harmonizing what you do with State priorities?
158	21-Jan-20	Pat Rasmussen	Other	Criteria	Methods	0	0	Change Requested	Regenerative Agriculture ranks low in your process which is in conflict with what is being called for and being done at the State level.
159	23-Jan-20	Wayne Olsen	Oral - Steering Committee	Timeline	Goals	1	1	Support	I Applaud the efforts of the Committee. The cost of inaction is mounting. I urge the Committee to keep more actions and to be aggressive – to choose actions which will result in the most GHG reductions before it's too late.
160	23-Jan-20	Lynn Fitz-Hugh	Oral - Steering Committee	Criteria	Methods	0	0	Change Requested	There is a large footprint of emissions outside of Thurston County that isn't being accounted for in the plan. Because of how the scoring is being done, any action with sequestration is scoring low since it isn't an emitter. I would like to see a sidebar accompanying the plan addressing carbon sequestration actions.

Public Comment Matrix

161	23-Jan-20	Thad Curtz	Oral - Steering Committee	Targets	Methods	1	1	Change Requested	Current ratings have been skewed because they include actions that significantly reduce GHG emissions, but completely depend on state action. Any kind of tax benefit or write-off won't be authorized unless passed by the state, and those actions should be lumped into their own lobbying category. Carbon sequestration will not help solve our problems.
162	23-Jan-20	Tom Crawford	Oral - Steering Committee	Criteria	Targets	1	1	Change Requested	Not enough knowledge to provide accurate scoring. Government actions and mandates are necessary to face head on, but we shouldn't depend on statewide actions. The consultant's quantitative analysis should look at combinations of actions and interactions that would have the most impact.
163	23-Jan-20	Lisa Ceazan	Oral - Steering Committee	General Climate	Targets	1	1	Change Requested	I brought a comment from Lisa Rasmussen who couldn't attend the meeting. Lisa requests that regenerative agriculture be included in the mitigation plan as a sidebar, due to its ability to reduce current GHG emissions from conventional agricultural practices and to draw down carbon emissions by sequestering it in the soil and plants.
164	23-Jan-20	Jeff Miller	Oral - Steering Committee	Targets	Community Involvement	0	0	Support	Support electrified mobility and the renewable energy to support it. There are opportunities for investments, private investments, and investments zones within Thurston County. Everyone is going to need to participate and invest in some way for the change.
165	4-Mar-20	Joel Carlson	Email	Targets	Goals	1	1	Change Requested	Requiring all construction to be electric only with heat pumps would save a huge amount of carbon pollution from gas, oil and other fossil fuels. We must also fast track microgrids for energy resilience.
166	12-Mar-20	Mason Rolph	Oral - Advisory Workgroup	General Support	Community Involvement	1	1	Support	The State of Washington created a new solar energy incentive program for low-income customers. If the cities are looking for money for their programs, they may be able to get some there.
167	12-Mar-20	Jeff Miller	Oral - Advisory Workgroup	General Climate	General Support	1	1	Support	There are now electric charging stations at the waterfront, down by the farmers market.
168	12-Mar-20	Lynn Fitz-Hugh	Oral - Advisory Workgroup	Criteria	Methods	0	0	Change Requested	Wanted to thank Allison for taking TCAT's recommendation and considering sequestration in the chart. Lynn asked for a count to see how people were feeling about Option A and B.
169	12-Mar-20	Thad Curtz	Oral - Advisory Workgroup	Targets	Methods	0	0	Change Requested	Concerned about the gap in the inventory. We shouldn't be considering sequestration and other factors that weren't included in the original 2015 baseline. He is in favor of keeping Option A and the actions that will have greater reductions in greenhouse gases.
170	12-Mar-20	Thad Curtz	Email	General Support	Targets	0	1	Support	Requesting input and advice about estimates for potential reductions and implimentation. Provided inital estimates for reducitons in agricultural sequestration, county trees, and residential dinsity. Concerned that the relationship between canopy coverage, forested lands and development are tangled. Provided links to estimates.

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171	18-Mar-20	Thad Curtz	Email	Targets/ Criteria	Goals	0	0	Change Requested	I urge you to focus on Option A. Since the point of the plan is to reduce emissions, I think we should concentrate on actions that will help reduce emissions the most. I also want to urge you to make some changes in the current Option A list - Item B6.2 below seems especially important to me. See email for all recommended changes.
172	18-Mar-20	Thad Curtz	Email	Targets/ Criteria	Goals	0	0	Policy Question	I think reformulation of actions T2.8 car shares and T2.13 Carshare infrastructure narrows the ideas significantly.
173	19-Mar-20	Karen Messmer	Email	Targets	Goals	1	1	Change Requested	Prohibition of natural gas service for new homes has disappeared from the plans. I saw something about 'fuel switching not allowed' but this would not be fuel switching since new homes would be all electric and not have gas service. I think the law being referred to is about electric utilities not about cities. It is premature to remove this action from consideration.
174	21-Apr-20	Joel Carlson	Email	Targets	Goals	0	1	Change Requested	We must build more multi-story condominiums because they are more energy efficient, allow for great walk-able urban villages and help our growth management goals. Building codes must mandate electric only construction. We must switch to sustainable farming that stores carbon in the soil.
175	21-Apr-20	Tom Crawford	Email	General Support	Targets	0	0	Change Requested	Both lists contain items that are not useful and some important actions have fallen off the lists due to scoring. We recommend Cascadia Consulting use comments received, their experience with other climate action plans, and their best judgment to select the actions for quantitative analysis. We would like greater transparency in this process. It would help to have more documents posted to the project web pages in ways that are easier to find and follow.
176	21-Apr-20	Thad Curtz	Email	Targets/ Criteria	Goals	0	0	Support	I want to urge you to focus on Option A. Since the the plan is supposed to be reducing emissions, I think we should be concentrating on actions that will help reduce emissions the most.
177	23-Apr-20	Tom Crawford	Oral - Steering Committee	General Support	Accountability	0	1	Change Requested	There are parallels between COVID 19 and the crisis of climate change. Similar becuase they will have continued impact to the economy. Prevention is best. Encouraged by taking a proactive approach.
178	23-Apr-20	Lynn Fitz-Hugh	Oral - Steering Committee	General Climate	Methods	1	1	Support	TCAT spent a lot of time going over Options A and B, and they came to a similar conclusion as the Committee. Allow the consultant to cull the list in order to meet goal targets. Climate change will not end and there is no going back.
179	23-Apr-20	Chris Van Daalen	Oral - Steering Committee	Targets	Methods	1	0	Change Requested	The plan needs to go further and be able to evolve and innovate as new technology comes out. The final plan needs big ideas. Shouldn't put as much weight into CETA reductions. Building efficiency actions have other co-benefits.
180	23-Apr-20	Thad Curtz	Oral - Steering Committee	General Support	Targets	0	0	Support	I sent in comments before the meeting about what should be added to and taken away from Options A and B. Latest TCAT Inventory shows increased emissions.

Public Comment Matrix

181	23-Apr-20	Kelsey Hulse	Oral - Steering Committee	methods	General Climate	1	1	Change Requested	There has been a great deal of work ranking the actions, and Option A best reflects that process. Not considering all that work when an Option B is now being considered. Ending with a plan that is digestible to the public, helpful, and useful.
182	23-Apr-20	Ryan Campbell	Oral - Steering Committee	General Climate	Methods	1	1	Change Requested	Option A is most effective for the biggest problems – buildings & energy and transportation. Solar self-generation apparatus at residential units. We need to look at carbon sequestration since we already have a lot of trees being more cost-effective. There are also unique energy solutions, like hydro-pump storage.
183	23-Apr-20	Karen Messmer	Oral - Steering Committee	Targets	Goals	1	1	Change Requested	Climate action needs to be a way we do business, not a special program. We can do many actions that don't cost a lot of money. There are ways jurisdictions can pressure building regulations, and CETA. Finding the critical actions and the list that will get us to the target goals.
184	22-May-20	Jeffrey Miller	Email	General Climate	General Support	1	1	Support	Wastewater treatment plant upgrade in Tenino, value for the County perspective to count emissions reduction (methane) air and water protection? Regional plan for electrification of transportation?
185	27-May-20	Thad Curtz	Email	Scenarios	Goals	1	1	Change Requested	There are a couple of things in the updated overview of the scenario tool in the packet for the meeting that I hope you'll discuss further and clarify when you get together this Thursday.
186	28-May-20	Chris Van Daalen	Oral - Steering Committee	Goals	Methods	0	1	Support	A large percentage of our future greenhouse gas emissions will be come from our existing buildings, specifically around natural gas. Providing incentives to retrofit existing buildings is big deal. We should advocate for COVID economic recovery funds to support shovel-ready initiatives that would be tied to implementing actions in the plan.
187	28-May-20	Tom Crawford	Oral - Steering Committee	Scenarios	Methods	1	1	Change Requested	Assessing cost at a high level and then getting into more detail will be very important. I suggest supplementing that with a list of benefits that can be expected and will accrue as a result of implementing these actions.
188	28-May-20	Karen Messmer	Oral - Steering Committee	Goals	Methods	0	1	Support	Policy and code actions taken by jurisdictions are not going to have substantial costs but save for consumers. A house that didn't have to run gas connections could have lower costs and cheaper to operate. Retrofits are much more expensive than doing it right the first time.
189	28-May-20	Thad Curtz	Oral - Steering Committee	Methods	Criteria	0	1	Recommendation	Many items on the list can have a significant impact our emissions, need to lobby in a coordinated way at next legislative session. Regulation doesn't cost anything except political capital, so you may as well get started now. Stimulus should be distributed to shovel-ready projects through grants. Spend money on actions instead of planning.
190	28-May-20	Chris Hawkins	Email	Community Involvement	Goals	1	1	Support	The Thurston Thrives Climate & Clean Energy Action Team recommends continuation of joint steering committee or coalition. Dedicate resources and staffing for action implimentation and aligning plan with regional strategies. Encourage partners to do the same.

Public Comment Matrix

191	9-Jun-20	Karen Messmer	Email	Goals	Methods	1	1	Policy Question	I question how rural transit is can reduce net emissions. Electrification of rural life-line transportation could reduce emissions, also ride share or van pool.
192	25-Jun-20	Joel Carlson	Email	Goals	Methods	0	0	Support	Banning gas in new construction could really make a difference. Not easy to pass, we'll need help.
193	26-Jun-20	Joel Carlson	Email	Methods	Criteria	0	1	Support	PG&E in California has moved to ban gas in California.
194	12-Jul-20	Lynn Fitz-Hugh	Email	Methods	Methods	0	1	Policy Question	Wondering if we could have paranthesis for sequestration that says: silvapasturing, cover cropping, crop rotation, managed grazing, etc.
195	17-Jul-20	Tom Crawford	Email	Goals	Methods	0	0	Policy Question	Questions about Scenario Analysis, Implementation Strategy and Implementation Matrix.
196	20-Jul-20	Thad Curtz	Email	Goals	Methods	1	0	Policy Question	I thought we had somewhat more ability to act on some of these items without further state authority than the current language in this section suggests. If that's right, maybe more final versions could be modified to make the possible maneuvering room we do have explicit…
197	23-Jul-20	Chris Van Daalen	Oral - Steering Committee	Targets	Methods	0	0	Support	Pretty big assumption that policy adjusted wedge for buildings & energy sector can be achieved. Without local action addressing building energy efficiency unlikely big impacts will happen. Need to build a green economy with COVID recovery. Disappointed to wait until November before jurisdictions can adopt the plan.
198	23-Jul-20	Lynn Fitz-Hugh	Oral - Steering Committee	Methods	Criteria	0	0	Support	Gratified that sequestration is addressed in plan. Concerns about waiting to adopt the plan until November. I urge you to move as rapidly as possible. Possible for builders to leave trees, it's just not convenient, tree codes will need review.
199	23-Jul-20	Thad Curtz	Oral - Steering Committee	Goals	Targets	0	1	Support	Lots of annual variation in emissions, some actions will show effects very gradually. Monitoring framework allows for fewer updates. I've analyzed current grid emissions for costs and benefits for different vehicles in Thurston County for steering committee review.
200	23-Jul-20	Karen Messmer	Oral - Steering Committee	Goals	Timeline	1	0	Support	Don't need technical experts in each jurisdiction, lots of resources and experts in community. Start big actions with incremental impacts now. Transportation and walkability are very important.
201	23-Jul-20	Tom Crawford	Oral - Steering Committee	Early Actions	Timeline	0	0	Support	I encourage you to review actions for legislative effort , see what actions can begin now. TCAT stands ready to support this effort.
202	23-Jul-20	Wayne Olsen	Oral - Steering Committee	Scenarios	Timeline	1	1	Policy Question	I am representing the Panorama Green team. Members will wait to see the draft plan before making recommendations to city councils, concern for delayed release of draft.
203	13-Aug-20	Joel Carlson	Email	Scenarios	Goals	1	0	Support	Concern results from Climate Mitigation study imply no significant actions will be approved. Natural gas ban will make climate mitigation efforts worthwhile, need to reverse fossil fuel reliance before it is too late.
204	17-Aug-20	Pat Rasmussen	Email	Methods	Criteria	0	1	Support	Everyone loves planting trees and caring for them, nut trees and fruit trees it will also help local food security and reduce transportation.