



RESOLUTION NO. 40878

1 A RESOLUTION adopting the 2030 Climate Action Plan (“Plan”) and Climate
2 Adaptation Strategy (“Strategy”) which outlines a pathway to reach the City’s
3 carbon reduction goals, prepare our City and community for intensifying
4 climate impacts, and prioritize actions that provide co-benefits leading to a
5 better Tacoma for all.

6 WHEREAS, in October 2008, pursuant to Resolution No. 37631, the City
7 Council adopted the City’s 2008 Climate Action Plan, establishing aggressive
8 greenhouse gas reduction goals and prioritized actions to reduce emissions, and

9 WHEREAS, in April 2016, pursuant to Resolution No. 39427, the City
10 Council adopted the Environmental Action Plan which centralizes existing City
11 goals and policies, establishes prioritized strategies and actions for improving
12 environmental quality, and establishes five-year indicator targets to assess
13 progress annually, and

14 WHEREAS, in December 2019, pursuant to Resolution No. 40509, the City
15 Council declared, relating to the reality of climate change, that these threats require
16 immediate actions to minimize harm to current and future generations and therefore
17 constitutes a public emergency, and expressing the City Council’s support of
18 initiatives that mitigate the impacts, and

19 WHEREAS, in June 2020, pursuant to Resolution No. 40622, the City
20 Council affirmed the City Council’s dedication and commitment to comprehensive
21 and sustained transformation of all of the institutions, systems, policies, practices,
22 and contracts impacted by systemic racism, and
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1 WHEREAS, in April 2021, pursuant to Resolution No. 40776, the City
2 Council committed to reducing the City’s municipal carbon footprint by restricting
3 the use of natural gas and new fossil fuel for existing City buildings and future City
4 capital investments, encouraging other local jurisdictions to do the same, and
5 assessing impacts for imposing the same restrictions on new commercial and
6 residential construction, and
7

8 WHEREAS, since the Climate Emergency was declared, Washington State
9 has suffered extraordinary losses of life and livelihood due to extreme wildfire
10 smoke and heat events, exacerbating the inequalities experienced by our frontline
11 communities struggling with COVID-19 and the economic recession, and
12

13 WHEREAS as outlined in the Climate Emergency Resolution, the Plan and
14 Strategy establishes feasibility, cost, timeline, targets, scope, strategy, actions, and
15 funding mechanism, includes actions that support the One Tacoma Comprehensive
16 Plan and other relevant planning and policy documents, and commits to equity and
17 social justice, and
18

19 WHEREAS community and municipal specific prioritized actions are needed
20 to implement the City’s climate and public health, housing, safe transportation,
21 livable wage jobs, and equity goals, and
22

23 WHEREAS input was sought from an unprecedented diversity of voices,
24 including advisory committees, internal and external stakeholders, the Sustainable
25 Tacoma Commission, the Environmental Justice Leaders Workgroup, and the
26 general public, and



1 WHEREAS the City has, over time, developed numerous environmental and
2 health policies and goals which are contained in a variety of sources, such as
3 Tacoma 2025, Shared Vision, Shared Future, the One Tacoma Comprehensive
4 Plan, Transportation Master Plan, Climate Risk Assessment, Tacoma Power
5 Conservation Plan, Transportation Electrification Plan, Affordable Housing Action
6 Strategy, Urban Forestry Management Plan, Sustainable Material Management
7 Plan, and a number of City Council resolutions, and

9 WHEREAS actions set forth in the Plan are categorized into six strategies to
10 achieve a better Tacoma in 2030: (1) Better Together, (2) Better Living, (3) Better
11 Breathing, (4) Better Resource Use, (5) Better Opportunities, and (6) Better
12 Prepared, and

14 WHEREAS measurable targets and a process to report and monitor the
15 progress of these actions is needed to demonstrate the City's leadership; Now
16 Therefore,

18 BE IT RESOLVED BY THE COUNCIL OF THE CITY OF TACOMA:

19 Section 1. That the City Council does hereby adopt the 2030 Climate Action
20 Plan ("Plan") and 2030 Climate Adaptation Strategy ("Strategy"), as set forth in
21 Exhibit "A" attached hereto and on file in the office of the City Clerk, to guide action
22 and investments, and monitor progress toward reaching identified targets, said
23 Plan and Strategy to be substantially in the form of the documents on file in the
24 office of the City Clerk.

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Section 2. That annual Plan and Strategy progress reports shall be produced and presented to the City Council and the public.

Section 3. That updates may be made to the Plan and Strategy as new information becomes available and progress is made on identified goals.

Adopted _____

Mayor

Attest:

City Clerk

Approved as to form:

Chief Deputy City Attorney



TACOMA CLIMATE ACTION PLAN

Actions for a Better & More Just
Tacoma 2021-2024

DRAFT



This Plan describes a pathway for Tacoma to reach its target of net-zero emissions by 2050. It describes the importance of taking transformative climate action now, our people-first approach centering equity and anti-racism, Tacoma’s climate action progress, climate strategies to guide us through 2030, and critical actions for 2024 to start us on our path.

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Land Acknowledgment

ʔukʷədiid čəł ʔuhigʷəd txʷəl tiit ʔa čəł ʔal tə swatxʷixʷtxʷəd ʔə tiit ʔuyaləpabš. ʔa ti dxʷʔa ti swatxʷixʷtxʷəd ʔə tiit ʔuyaləpabš ʔəstəfəłil tulʼal tudiʔ tuhaʔkʷ. didiʔt ʔa həlgʷəʔ ʔal ti sləxʼil. dxʷəstəfəłils həlgʷəʔ gʷəl ʁuyayus həlgʷəʔ gʷəl ʁuʁaxʷad həlgʷəʔ tiit hədədəʔs gʷəl tiixdxʷ həlgʷəʔ tiit ʔiisəds həlgʷəʔ gʷəl ʁuʔalalus həlgʷəʔ gʷəl ʁutxʷəlšucidəb. xʷəla...b ʔə tiit tuyəlyəlabs.

We gratefully honor and acknowledge that we rest on the traditional lands of the Puyallup People. The Puyallup people have lived on this land since the beginning of time. They are still here today. They live, work, raise their children, take care of their community, practice their traditional ways and speak the Twulshootseed language – just as their ancestors did.

We recognize that this land acknowledgement is one small step toward true allyship and we commit to uplifting the voices, experiences, and histories of the Indigenous people of this land and beyond.

Source: Puyallup Tribe of Indians, Land Acknowledgment

See the Puyallup Tribe’s land acknowledgment spoken by Tribal members in their native Twulshootseed language: <https://youtu.be/KGnac8x-SIM>



Illustrations by community artist Saiyare Refaei

(p 1, 4-6, 9, 11, 21, 29-33)



Letter from Mayor, City Manager, & Utility Director





Why Tacoma Needs a Climate Action Plan

Our climate has reached a point of crisis. Here we are living through unprecedented heat, extreme downpours, wildfire smoke, and other impacts, with their severity increasing year-by-year. In 2019, Indigenous and youth climate strikes demanded more City climate action. In response to community concerns, the Tacoma City Council declared a climate emergency. This Plan sets climate strategies and actions that get us on track to address the climate emergency by 2030. The science is clear - we need to act urgently.

Climate change is not the only crisis our community is facing. Therefore, City Council asked staff for climate solutions that advance other community priorities – like public health, economic opportunities, social justice, and recovery from the COVID-19 pandemic. On top of these needs, our community is growing – we need to accommodate more people and offer more services. This is the context we are living in, and so it is the context we are planning in.

WHAT DO WE MEAN BY 'NET ZERO EMISSIONS'?

Net zero emissions are achieved by eliminating GHG (greenhouse gas) emissions from activities carried out within the city. The goal is to first get as close to zero emissions as possible, and then to offset any emissions that are left with an equivalent amount of carbon removals. Carbon can be removed from the atmosphere through direct capture and storage technologies, or from reclaiming and restoring natural lands.

In Tacoma, net zero emissions will be achieved by improving the systems and technologies for moving people around, building and operating buildings, producing and manufacturing goods, and disposing of waste.

Working toward a better Tacoma in 2030 and net-zero emissions in 2050, we plan to do our part to solve the climate crisis with strong investments in the immediate and long-term future while improving community health, safety, job opportunities, and equity. That's news we're happy to share: climate action can have many different benefits.

WHAT DO WE MEAN BY EQUITY?

Equity is when everyone has access to the opportunities necessary to satisfy their essential needs, advance their well-being, and achieve their full potential. ([Racial Equity Alliance](#))

Puyallup Tribal Leadership and Local Stewardship

The Puyallup Tribe has existed since creation as the aboriginal people who are the guardians of their lands and waters and is an independent sovereign nation. The Puyallup Tribe “is committed to a high quality of life for all its tribal members, seven generations and beyond, described by access to healthy, affordable housing, environmentally friendly transportation options, access to sustainable jobs, a rich cultural community that honors [their] ancestors and culture, and thriving ecological environment to sustain our salmon, orca, and other threatened wildlife.” The City of Tacoma “strive[s] to achieve an exceptional quality of life for every generation and leave a legacy of stewardship. We work together to achieve lasting and equitable prosperity; build safe, healthy, vibrant communities; and minimize our negative impacts in order to conserve the natural resources that sustain us.” Climate change threatens both organizations’ visions. We must act together to ensure a safe future together. This Tacoma Climate Action Plan commits the City to our shared community and a future that is more sustainable, just, and collaborative between the City of Tacoma and Puyallup Tribe of Indians.

In December 2019, the Puyallup Tribal Council demonstrated its continued vision, leadership, and commitment to protecting our Earth and future generations in [declaring a climate emergency](#) in coordination with Tacoma City Council. In its resolution, the Tribal Council emphasized reducing its greenhouse gas emissions, preparing for and managing climate impacts, and facilitating a just transition away from fossil fuels. The Puyallup Tribe acknowledges what is at stake with worsening climate impacts -- hotter average temperatures threaten our communities, air, lands, soil, waters, and all other life as well as traditional Puyallup hunting, gathering, and fishing grounds and historical village sites. In these and other ways, climate change threatens the material, cultural, and spiritual well-being of our communities.

A History of Local Pollution and Lessons for Future Regeneration

For thousands of years, indigenous communities stewarded Tacoma’s lands and waters. The natural environment thrived, species were abundant, food was available, and the air, soils, and waters were clean. In just the last 150 years, the colonization, development, and industrialization of Tacoma has seriously degraded our day-to-day life support systems, marginalized indigenous peoples, and resulted in extreme short-term gains for some people at great cost to other people, animals, and plants. Some industries and transportation have polluted and continue to pollute our air, soils, and waters, affecting culturally and economically important species like salmon as well as the health of our communities. A history of logging and lack of environmentally-conscious City policies have contributed to an unhealthy, underdeveloped tree canopy, particularly in Tacoma’s South End and East-side. Wintertime wood smoke pollution [once affected all of Tacoma-Pierce County](#) until public sector intervention facilitated widespread wood stove change-outs less than a decade ago. While we have made some progress addressing pollution, other pollution continues to worsen.

“For future generations to meet their needs... we need to think about the economy in terms of environment and social needs... to include non-human and life-giving entities like bodies of water, mountains, watersheds...”

Tacoma community member

Today, greenhouse gas (GHG) pollution threatens the well-being of our interdependent web of life — for generations. Climate-warming gases are causing and worsening “natural” disasters. We must face the facts and strengthen our path towards environmental regeneration and restorative justice. Black, Indigenous, and People of Color (BIPOC) communities are valued role models and collaborators as we improve our stewardship and seek this new path for our communities.

ENVIRONMENTAL REGENERATION AFTER MORE THAN 100 YEARS OF CONTAMINATION

After more than 100 years of industrial pollution, Tacoma’s Thea Foss and Wheeler-Osgood waterways were burdened with more than 1 million cubic yards of contaminated sediments, to the point that they were categorized by the Environmental Protection Agency (EPA) as heavily polluted Superfund sites. In 2006, the City of Tacoma and our community decided to shoulder much of a \$105 million clean-up of these waterways. With help from the State of Washington and others, the City made great progress in cleaning these waters and continues to protect them from pollution today ([City of Tacoma](#)). Additionally, while not a city-led effort, the [Port has cleaned up most of the waterways](#) in Commencement Bay and the nearshore along Ruston Way, and participated in habitat restoration on over 200 acres.



COVID Recovery and the Just Transition

In 2020, the COVID-19 pandemic nearly halted Tacoma’s economy. Since the initial shutdown, there have been waves of economic and health impacts blunted by public health and social welfare interventions. It has become clear that the pandemic-recession disproportionately harms communities of color, low-income families, small business owners, and other frontline communities – the very same communities which have been historically underserved by the City. COVID-19 teaches us important lessons for the climate crisis: that we must prioritize frontline communities; that we must be well prepared for and invest appropriately for crises we see coming; that government has a unique and central role in crisis planning and response; and that, amid crisis, government and communities can and must act urgently, collectively, innovatively, and transformationally to promote our community’s welfare.

We think these lessons can inform a community resilience- and equity-focused approach to climate action. We can decrease our emissions to enjoy many other benefits, like good jobs, less traffic, cleaner air, more quality housing, and community health and safety. Indeed, these are opportunities we need now more than ever as we recover from COVID-19. Our approach to anti-racism, through a just transition away from fossil fuels, must bring greater benefits to and reduce burdens for our BIPOC and other frontline communities. This Plan lays out a path to realize these outcomes.

“...food forests and community gardens... electric buses and rail... jobs programs, and affordable housing... as a start”

Tacoma community member

WHAT DO WE MEAN BY A JUST TRANSITION?

Shifting our economy away from fossil fuels and other extractive practices without leaving anyone behind. A new, just economy prioritizes living wage jobs in green sectors, human rights, and protection of our life-giving natural systems.

MAYOR WOODARDS CALLS FOR A GREEN AND EQUITABLE RECOVERY FROM COVID-19

In 2020, [Mayor Woodards joined hundreds of other U.S. mayors](#) to call for “bold action [from Congress] to protect our planet and build a more just economy in the wake of the COVID-19 pandemic”

- Climate Mayors

TACOMA'S ANTI-RACIST SYSTEMS TRANSFORMATION POLICY

[Resolution 40622](#) affirms Tacoma City Council's dedication and commitment to comprehensive and sustained transformation of all of the institutions, systems, policies, practices, and contracts impacted by systemic racism. It also expresses the City Council's commitment to a comprehensive transformation process that will establish new practices based on community and expert opinion as well as past reform efforts, centering the voices of those most impacted by systemic racism.

Climate Action and Social Justice

Tacoma has not been a place of equal opportunity in the past. For our climate work, it has been important to acknowledge and work from the knowledge that some communities have been denied socio-economic opportunities, made more vulnerable to climate impacts, and underrepresented in City decision-making processes. Our Climate Action Plan intends to be a tool to serve **overburdened** and **frontline communities'** needs and priorities, beyond reducing emissions and building resilience against climate impacts.

"I think preparing workers and investing in green jobs will make Tacoma a location where those businesses can come and thrive."

Tacoma community member

OVERBURDENED COMMUNITIES

The EPA describes [overburdened communities](#) as "Minority, low-income, tribal, or Indigenous populations or geographic locations in the United States that potentially experience disproportionate environmental harms and risks. This disproportion can be as a result of greater vulnerability to environmental hazards, lack of opportunity for public participation, or other factors." (U.S. Environmental Protection Agency)

FRONTLINE COMMUNITIES

Frontline communities tend to experience inequity in multiple ways. They tend to be underrepresented, underserved, or made vulnerable; experience lower quality of life outcomes before COVID-19; or now experience worse impacts from the COVID-19 economic and health crisis. Frontline communities also include those expected to experience the first and worst consequences of climate damage. We prioritized frontline communities in our engagement and plan development processes. Frontline



community members include individuals from one or more of the following backgrounds:

- Black, Indigenous, and People of Color (BIPOC)
- Speak English as a second language
- Living with a low household income
- Ages 16-26
- LGBTQIA+
- Living with three or more generations in one home
- Living with more than one family in one home
- Living with a disability
- Immigrant or refugee
- Experiencing homelessness
- Completed formal education up to a high school/GEDI

Our Journey So Far: A Brief History of Tacoma Taking Action

With support and leadership from our community, the City of Tacoma formally started its climate journey in 2006 by forming a Green Ribbon Task Force to produce our first Climate Action Plan in 2008. Mayor Baarsma then joined a movement of over 1,000 cities across the country to pledge to reduce emissions in line with the international Kyoto Protocol.

To date, Tacoma-Pierce County communities have implemented meaningful climate action projects. During the Environmental Action Plan (EAP) from 2016-2020, we rescued over a hundred thousand pounds of food and added over 20% more community gardens in low income communities and communities of color; conducted public education about waste prevention, electric vehicles, and biking; increased home comfort while reducing energy bills for 1,833 households through energy efficiency assistance programs; and expanded urban forests across Tacoma's hottest neighborhoods by over 4,500 trees. However, the EAP goals and investments were not aggressive enough to get us onto a path for a net-zero emissions future. The City must significantly accelerate its efforts to reach the transformational pace and scale required to avoid a climate disaster.

WHAT DO WE MEAN BY TRANSFORMATIONAL?

Transformational can be described as causing a major change to something or someone, especially in a way that makes it or them better. In the context of climate action, it means quickly and drastically changing our value systems, behaviors, governance structures, financial practices, and technologies so that our society can thrive without disrupting our climate or destroying our natural world.

Figure 1. History of climate action milestones and events by the City of Tacoma.

-
- 2007** • The [South Sound Sustainability Expo](#) is created in collaboration with local colleges and universities, supported by the City of Tacoma
 - 2008** • Tacoma's 1st [Climate Action Plan](#) adopted by City Council
 - 2009** • Sustainability Managers hired by City of Tacoma and Pierce County
 - [Sustainable Tacoma Commission](#) created
 - 2010** • [86% of Tacoma's traffic signals converted to LED units to cut nearly 60 tons of carbon and save almost \\$73,000 per year](#)
 - City Council passed the [Mobility Master Plan](#), Tacoma's first comprehensive bicycle and pedestrian plan
 - 2011** • The [Center for Urban Waters](#), a LEED Platinum building, is built by the City of Tacoma following a 2010 municipal [Green Building Resolution](#)
 - 2012** • [Curbside residential food waste pick-up](#) begins in Tacoma
 - 2013** • Over [50 community gardens](#) established throughout Pierce County
 - 2014** • [1st DePave](#) project is organized in Tacoma at Sprague & 6th Ave
 - 2015** • [Local winter air quality improves](#): Tacoma finally meets EPA standard for fine particulate pollution due to a multi-year effort to reduce indoor wood burning
 - 2016** • Tacoma's [2nd Climate Action Plan](#) adopted by City Council
 - 225 kW of [community solar](#) installed by Tacoma Power
 - City street tree giveaways formalized as the [Grit City Trees Program](#)
 - 2017** • Mayor pledged to uphold [Paris Climate Agreement](#)
 - Tacoma's [Bring Your Own Bag](#) law goes into effect
 - 2018** • [East 40th Street](#) receives highest Greenroads® certification in the country. Improvements include new permeable roadway, biofiltration swales, shared use path, and 150 street trees.
 - 2019** • [Climate Emergency Resolution](#) adopted by City Council
 - [Tacoma Power launches new low income energy efficiency programs](#), including a zero interest deferred loan program, based on expanded income guidelines
 - 2020** • [Anti-Racist Systems Transformation Resolution](#) adopted by City Council
 - Publicly available electric vehicle charging stations [installed at 40 locations](#), with dozens more in the planning stages
 - 2021** • Tacoma's first cycle track opens on [E 64th St from Pacific Ave to Mckinley Ave](#).
 - [Decarbonization Resolution](#) adopted by City Council

Local Climate Impacts & Costs

As our climate warms, we must prepare for many [local impacts](#). In the summertime, we will experience more very hot days, longer dry periods without rain, less snowpack, lower stream levels, and more wildfire smoke. In the wintertime, we will see more extreme rainfall, contributing to flooding and landslides. These impacts can be particularly intense for our unhoused neighbors, outdoor workers, kids, seniors, pregnant people, low-income households, BIPOC community members, people with breathing or heart issues, as well as other species, like salmon and orcas. Sea level rise may also cause flooding, especially during high tides and storm surges, or damage important infrastructure near water's edge. The following graphic depicts these effects:

GLOBAL WARMING vs CLIMATE CHANGE

[Global warming](#) is the increase in the Earth's average temperature due to an excess of greenhouse gases trapping heat in the atmosphere. Climate change is the resulting "side effects" of this extra heat causing changes our natural systems. Climate change can look like more intense storms, melting glaciers, changes to rainfall patterns, or changes to agricultural growing seasons.



TACOMA'S FUTURE CLIMATE

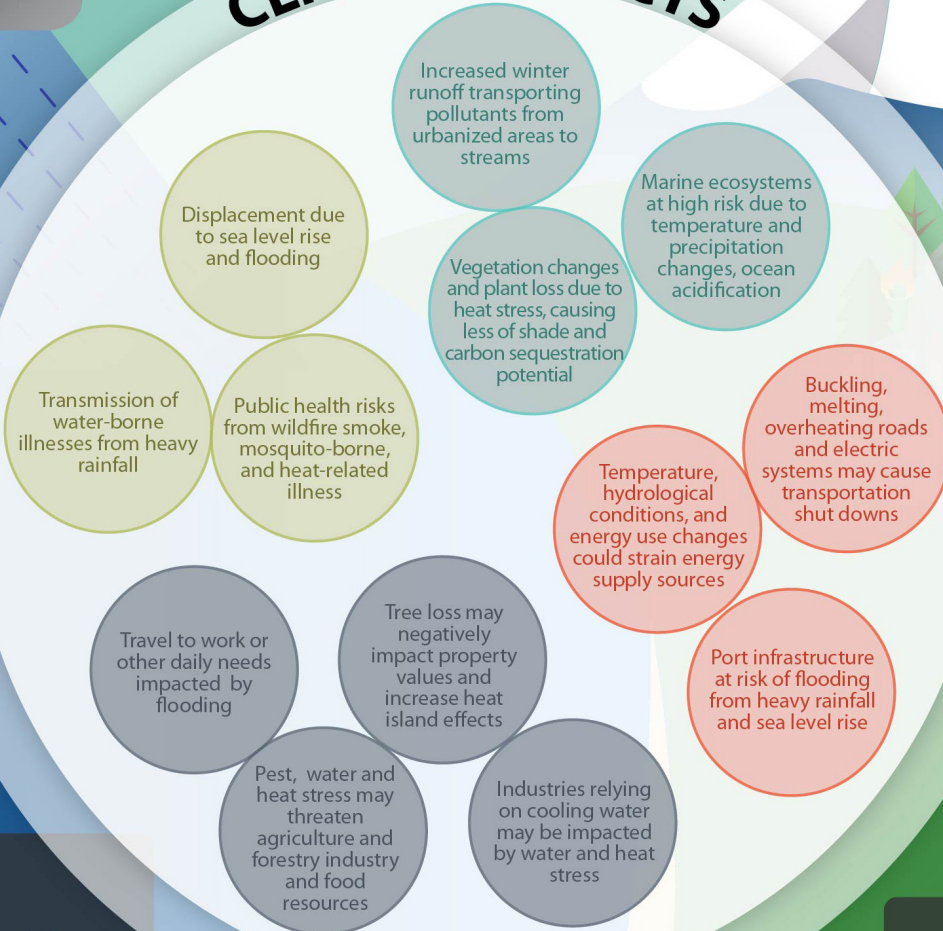
Flooding from extreme precipitation and storm surges

Coastal communities at high risk
Risk release of hazardous materials in vulnerable areas

Extreme heat and drought DRAFT

Increased heat-related illness in vulnerable groups
Greater urban heat island effect in areas with low canopy cover
Strain on electrical supply systems, causing outages

CLIMATE IMPACTS



Sea Level Rise

Low altitude sites at risk for saltwater intrusion, including Central Wastewater Treatment Plant

Roads in tideflat areas at high risk due to lack of protection from dikes or levees

Wildfires and smoke

Poor air quality of special concern for sensitive groups

Damage to critical infrastructure

Changes in water availability for water systems

Landslides

Areas along coastlines at higher risk

Damage to critical conveyance infrastructure, causing system failures

Figure 1. Tacoma's Future Climate, Cascadia Consulting Group, City of Tacoma Adaptation Strategy

An Example of Inequitable Climate Impacts: Urban Heat in Tacoma

[Extreme heat](#) – made worse by the “urban heat island” effect and climate change – is one of the [deadliest climate related challenges](#) in the United States. Urban heat islands occur in areas with large amounts of impervious surface with little green space, such as streets, sidewalks, parking lots, and buildings.

In Tacoma, urban heat islands increase maximum temperatures by as much as 6.2°F above the local baseline. Neighborhoods in Central and South Tacoma may be as much as 14 °F hotter than neighborhoods in North Tacoma. Temperatures above 82°F significantly increase the risk of cardiovascular diseases, respiratory illnesses, and heat stroke.

As our climate warms, we can expect [more extreme heat days](#) in Tacoma. Neighborhoods burdened with the worst extreme heat tend to also suffer from the worst economic and health inequality. In particular, we are concerned about seniors, kids, pregnant people, people with breathing or heart issues, low-income and BIPOC community members, outdoor workers, and our unhoused neighbors. This map shows how urban heat islands correlate with [Tacoma’s Equity Index](#). Low equity neighborhoods are those that have experienced a history of disinvestment and race- and income-based segregation. The City of Tacoma and other institutions, like the federal government, supported practices like [redlining and racial covenants](#) to control neighborhood development. This history has caused gaps in generational wealth, educational attainment, health, and access to essential, life-saving technologies and services like air conditioning, health care, and public transit. We must serve these neighborhoods first. ([Earth Economics](#))

“I believe focusing on reducing heat and the negative impacts of climate change on the most vulnerable communities is crucial.”

Tacoma community member

Costs of Inaction

While taking action to reduce emissions seems expensive, inaction is significantly more costly, to our economies, ecosystems, and human welfare.

Based on an incomplete analysis, our community faces \$250 million or more in potential economic costs of lost ecosystem services by 2080 due to climate change impacts, including worsening wildfires, reduced food production, lost recreational opportunities, and increased health and energy related expenses.¹

Climate impacts are already affecting the lives of Tacoma’s residents and will worsen if we do not act. The cost of climate impacts—or the loss of human life, reduction in quality of life, disruption of critical services, and loss of economic assets from natural hazards and extreme events under future climate change conditions—is \$3.05 billion by 2050.²

¹Source: Tacoma Climate Adaptation Strategy.

²Source: The Cost of Climate Change Inaction: An Examination of Outdoor Tourism & Recreation in Tacoma-Pierce County, Shayla Miles and Abby Perry-Johnson, Evergreen State College, May 2021.

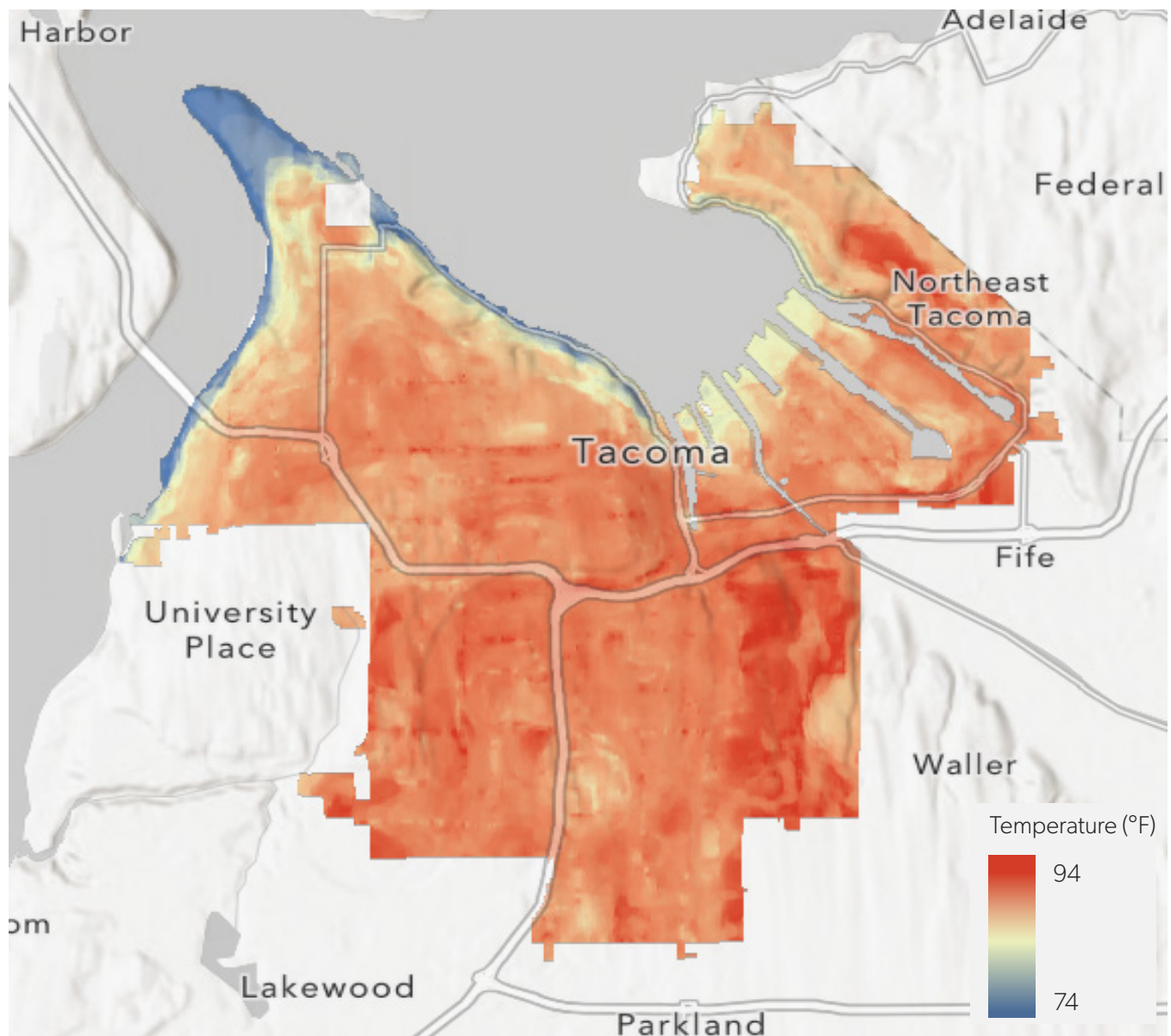


Figure 2. 3pm Temperatures in Tacoma in July 2018, [Tacoma Community Forestry storymap.](#)

“The price of not taking action, both in economic terms and in the potential cost of human health and life, particularly for Tacoma’s most vulnerable populations, is not only fiscally irresponsible but morally unacceptable.”

Past and Current GHG Emissions

CURRENT EMISSIONS IN TACOMA

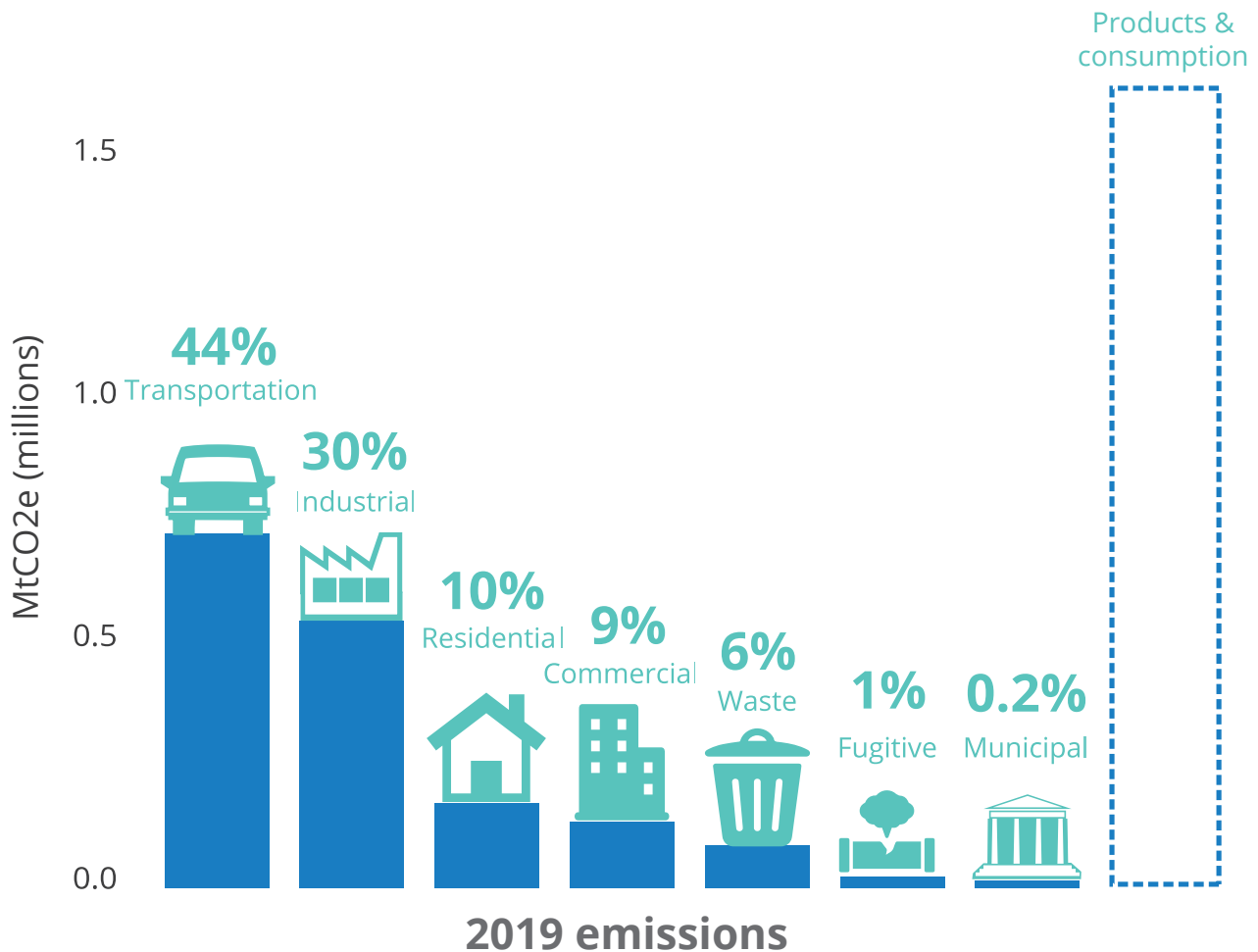


Figure 3. Emissions by sector for Tacoma, 2019

For 2019, Tacoma’s GHG pollution amounted to approximately 1.7 million metric tons of carbon dioxide equivalent emissions (MtCO₂e), or 7.8 MtCO₂e per person. The figure above shows that 44% of GHG pollution resulted from transportation – fossil fuels burned by cars, buses, trains, and trucks. Thirty percent of emissions came from industrial processes. Natural gas used to heat commercial, residential, and municipal buildings and their water accounted for 19% of the city’s emissions. By comparison, [Tacoma’s electricity is nearly carbon-free](#) (97%) now and working towards being 100% carbon-free by 2045. Six percent of Tacoma’s GHG pollution came from the decomposing organic materials at landfills, and 1% from leaks in natural gas and oil pipelines and systems (also known as fugitive emissions).

This assessment is only the GHG pollution that was created within the city of Tacoma. If we were to include GHG pollution from items produced outside Tacoma that we buy to eat or use, our GHG pollution would nearly double (Products & Consumption portion of bar graph). New technologies and the products we consume can have severe impacts to environmental health and local communities, often in frontline or developing countries.

Choosing a New Path

For a climate-safe and socially just future for Tacoma, we are committed to reaching net-zero emissions by 2050. This is in line with targets being set by many other communities across the U.S., and the global target needed to increase our chances of avoiding catastrophic climate change. Analysis shows that our current climate plans and policies don't get us nearly as far as we need to go, and that if no new action is taken we will only reduce our GHG pollution by 14% by 2050. We need to forge a new path that reduces our emissions by 33% by 2030 on our way to zero emissions in 2050.

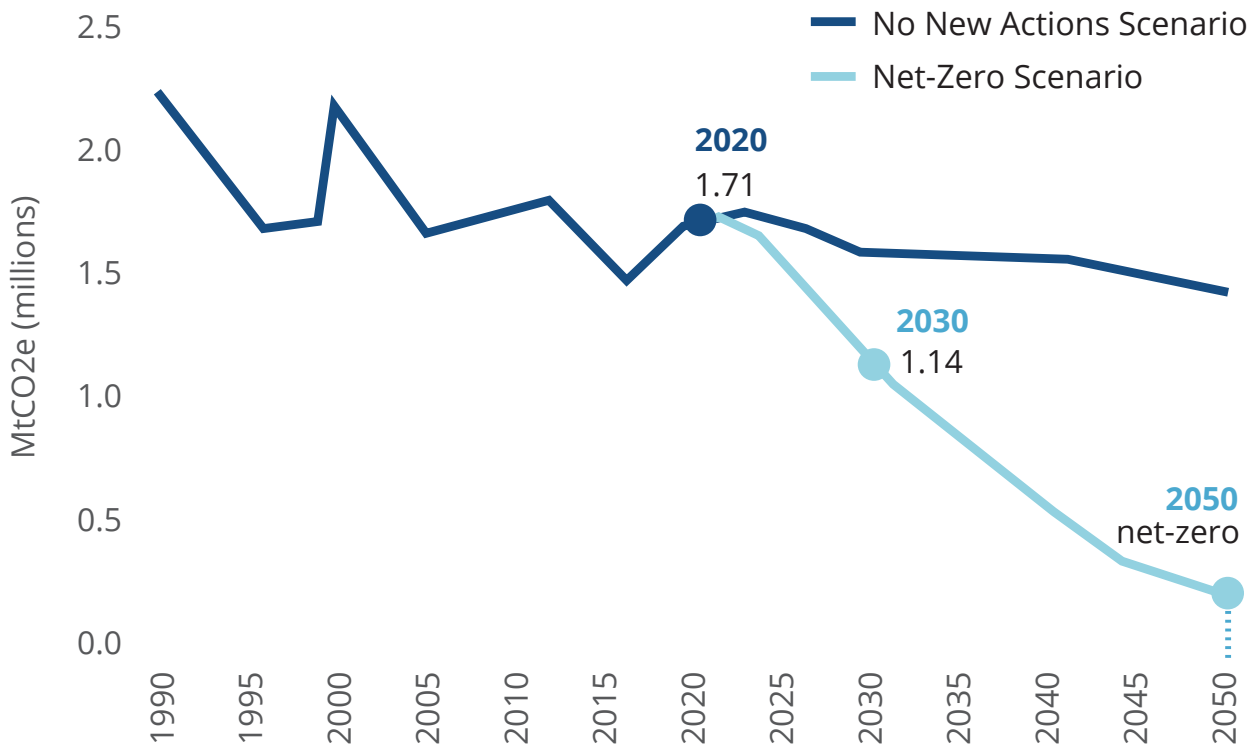


Figure 4. Tacoma's No New Action versus Net-Zero pathways

The Opportunity

Building a Sustainable, Equitable, and Prosperous Tacoma

What's New for 2021 Climate Action Planning

This is the City's 3rd climate action plan and much has changed since the first plan was released in 2008. Climate impacts that seemed distant then are ones we are experiencing now. Our ability to take action and make a meaningful impact also seemed distant. But there is [increasing evidence](#) that we can make investments to reduce vehicle miles traveled, encourage active transportation, and increase affordable housing. Technology is changing fast – there are now over [80 makes and models of electric vehicles](#) and [more jobs in clean energy than in fossil fuels](#) across the country.

Much has also changed in how we plan for action. We have learned that:

- We can make big changes quickly. Investing time and resources in transformational work cannot wait.
- Communities are willing to participate in climate change actions when they understand how impacts and benefits contribute to a better Tacoma.
- Accountability and transparency are important. Specific actions and measurable targets and outputs make accountability possible.
- The science and the moral cases are clear. Public leaders must make appropriate investments or risk hurting public confidence in institutions.
- Centering frontline communities must be a part of every strategy and action or else we risk worsening socio-economic inequalities. To be anti-racist, every policy, program, and practice must seek to reduce racial inequality.
- All actions provide opportunities to inform, educate, and engage with our communities. We must use these and other tools available to us, like regulations and incentives, to be effective.
- We cannot do this work alone. Tacoma must share resources and collaborate with local, regional, and national partners to achieve the pace and scale of transformation required.

“We need to support frontline communities, but that doesn’t mean leaning on them to provide all of the answers. That’s a lot to ask. We need everyone involved.”

Tacoma community member

Process Matters

Our climate action planning work took risks to break with past practices, diverging from traditional public input approaches onto a new path. We attempted new engagement methods with some success, and some shortcomings. We tried new models, including compensating community participants and partner organizations, particularly from frontline communities, in various roles. This contributed to a new, participatory and people centered process in the hopes of creating a more equitable and anti-racist climate action plan. Recognizing the limits of this process and Plan to transform our community, we are committed to continuous learning and advancing anti-racism in all of our work. In this Plan, from the design stage through implementation, all climate action policies and programs must prioritize affordability and equity outcomes, especially for communities most impacted by climate change.

SUMMARY OF ENGAGEMENT ACTIVITIES/CONTRIBUTORS

As an organization composed primarily of white staff members, we recognize the need to address power dynamics that can subtly or overtly shape engagement and planning processes.

To put people first during our planning process, we used three rounds of community engagement and prioritized input from frontline communities. We recruited 10 Environmental Justice Leaders to form a workgroup met monthly to provide guidance and feedback on the Plan and even write their own section. We also recruited and trained 33 Climate Justice Ambassadors who helped us reach frontline community members through their personal networks to provide interviews, personal stories, and survey responses. Finally, we partnered with frontline organizations to host gatherings with their communities to learn more and provide input. Hosts, Ambassadors, and EJ Leaders were paid a stipend for their contributions.



WHAT WE HEARD – PHASE I, II, & III COMMUNITY ENGAGEMENT REPORTS

Our first phase of community engagement focused on envisioning a sustainable, socially just Tacoma in 2030. Phase II engagement focused on community priorities and feedback for draft climate actions. The third phase of engagement primarily invited public comments on the newly available draft Plan. Detailed information about community engagement can be found in Appendix 7.

Overall, we engaged a diverse group of Tacoma community members and partners during Phases I and II, built new connections, and collaborated to build community climate knowledge.

What we heard reinforced past community calls for affordable housing, good transportation options, economic opportunities, community health, ecosystem restoration, other basic needs, and an intersectional climate action plan that serves social justice for the benefit of both current and future generations. This Plan is consistent with a long record of community planning and engagement processes, including [Community Survey \(2021\)](#), [One Tacoma Plan](#), [Tideflats Public Engagement Plan \(2021\)](#), [Affordable Housing Action Strategy](#), and the [Transportation Master Plan \(2015\)](#).

It is important to note that, despite our best efforts to reach frontline community members, it is clear from the demographic data we collected that we are often still hearing from a disproportionate number of white, high-income community members. By partnering with frontline serving community organizations to host workshops we were able to prioritize in-depth discussion feedback from frontline community members. 74% of workshop attendees who were able to participate in a short survey self identified as frontline community members. To center historically underrepresented community members, we have reviewed responses by demographic groups to focus on the priorities of BIPOC, low-income, youth, and other frontline communities. You will find community input in Section 7 as well as reflected in our climate actions in coming pages.

ENVIRONMENTAL JUSTICE LEADERS WORKGROUP (EJLW)

The Workgroup convened over the last year was a deliberate attempt to better and more deeply center voices that are not historically at the table for climate and policy discussions. We made the decision to design for quality over quantity of input. Unfortunately, the City did not meet expectations and what is necessary to truly move climate justice forward and strengthen frontline agency. We thank the EJ Leaders for their honesty and commitment and want them and everyone to know that the City will take responsibility to strengthen our anti-racism work and increase meaningful participation in climate justice actions and engagement.

Below is an excerpt of comments from members of the Workgroup:

“As it currently stands, the CAP does not adequately reflect EJLW’s direct input and stated priorities from the past year. We recognize and commend the City of Tacoma for taking a risk and branching out to change their public engagement strategies from the past. We strongly encourage them to continue down this path with some necessary course corrections. We thank you for seeing this need to incorporate our voices and now we demand that you listen to us:

structural, systemic and institutional change must happen now! And in order for communities' faith in municipal institutions to be restored and carried forward for the duration of this CAP, we must move toward a collaborative governance structure."

Implementing the Plan – Putting it All Together

The planning process is about centering frontline involvement, honoring their contributions, and getting to an equitable plan. Implementation of the Plan is how we actually deliver benefits to our community.

To best implement this Plan, we need to spend our time and resources on designing policies, programs, and projects with an equity lens and that address multiple community priorities. Our Plan's actions strive not only to reduce GHG pollution but also improve community health, safety, housing, transportation, green living wage jobs, and access to other essential services. Since climate change interacts with every part of our lives and community, we must work at these intersections.

With an ambitious and intersectional plan, we need to partner – regionally, nationally, and internationally – with trusted community leaders, prioritize actions in neighborhoods that have been made most vulnerable, and build community capacity and access to decision-making. Within and beyond city limits, we will rely on community, public, nonprofit, and private partners to share information and expertise, offer funding and other resources, and deliver services that make our communities better off. We are inspired by the commitment of our local public partners to aggressive climate action, and we are all accountable to each other and the public we must protect and serve. We are collaborating and supporting each other in this work. Section 2 lists dozens of partner organizations we plan to work with on climate actions. Our primary public partners and our local government leaders in Tacoma-Pierce County are: [Pierce Conservation District](#), [Pierce County](#), Tacoma Schools, Tacoma-Pierce County Health Department, Metro Parks, and [Port of Tacoma/Northwest Seaport Alliance](#). We strive to approach these partnerships with a spirit of humility and collaboration.

We approach this work with clear eyes and determination in our hearts: the pace and scale of action required will not be easy. Trying to balance City budgeting across our current emergencies while making long-term investments to ensure a sustainable future is challenging. By working together, acknowledging the tensions in our work, and changing systems that limit our capacity, we can avert the climate crisis and achieve the many community benefits that come with taking action.

"Make sure to get all neighborhoods involved, not just the most vocal ones. Seek out community leaders in all communities and ask THEM how to make [climate action] equitable."

Tacoma community member

"Action needs to happen at all levels by all departments at the government, local, state, and federal levels."

Tacoma community member

Drawing by Mickey Godfrey

The Work We Need to Do to Achieve a Better Tacoma by 2030

High Impact Actions

The following section lists a series of **2030 Strategies for a Better Tacoma**, based on the themes for better: togetherness, living, breathing, resource use, opportunities, and preparedness. These strategies are each supported by a set of high-impact, near-term mitigation and adaptation climate Actions to complete by the end of 2024. These Actions were developed based on input from community members, staff, and practitioners from numerous local organizations and judged based on the best available facts and science. There is no one solution to reducing our emissions. We need to implement all of these actions to achieve our emissions goal and improve the lives of our communities. Implementing all actions will require the rapid mobilization of significant amounts of resources. However, immediate action will also mean that the city will begin to see the many co-benefits and cost-savings from taking action sooner (for example, cleaner air and lower energy bills). To help jump-start the implementation of the full Plan, ten priority actions have been highlighted in bold below.

The actions in this section are considered **High Impact** because they:

1. Contribute to significant GHG reductions and/or climate resilience;
2. Center historically underserved voices in policy design, development, and implementation;
3. Deliver significant co-benefits, such as improved health, safety, economy and jobs, and affordable housing, that lead to greater prosperity and endure for the long term.

More details on all actions can be found in Section 2 (action numbers are matched to the ones listed here).

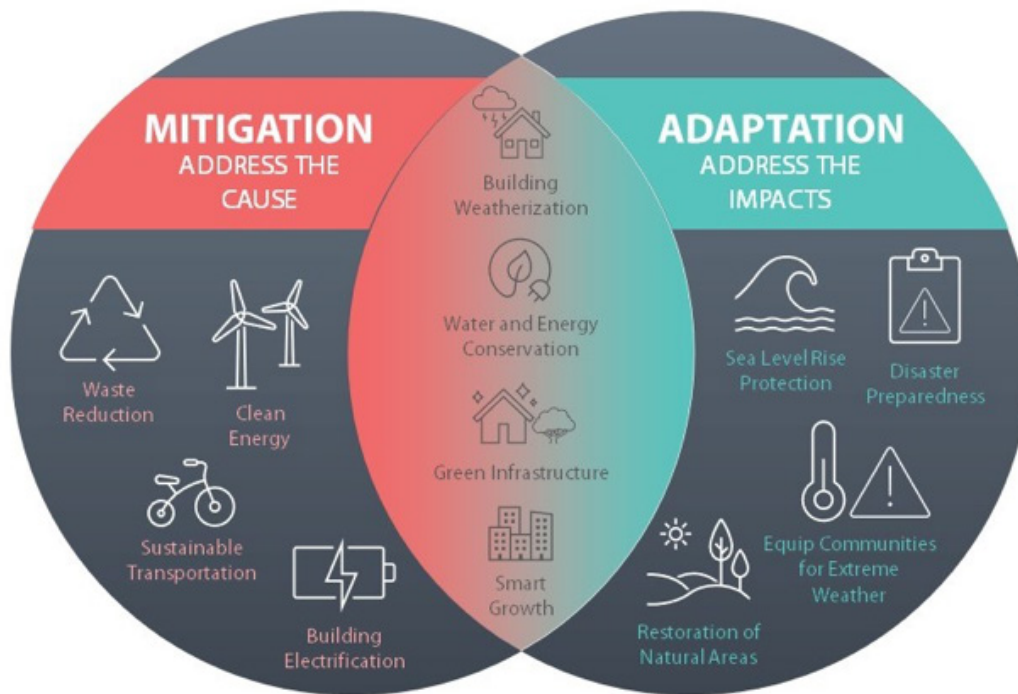


Figure 4. Climate Mitigation and Adaptation: What's the Difference?, City of Tacoma Adaptation Strategy

BETTER TOGETHER

By 2030, City of Tacoma, partners, and communities are equally invested in taking leadership on climate action to build resilient and connected neighborhoods.

Actions by 2024:

1. Prioritize engaging frontline communities in climate work.
2. Fund community participation and partners in waste prevention.
3. **Fund 10 community food access projects like community gardens, food forests, orchards, farms, food rescue efforts, or farmers markets.**
4. **Support community organizers to share expertise and promote climate action engagement.**
5. Increase advocacy for climate action at the State and Federal level.
6. Support development of a collaborative workgroup to help industries decarbonize through efficiency, electricity, and clean fuels.
7. Partner to tackle cross-jurisdictional, adaptation opportunities, including river management and flooding.

“Ensure that community food projects funded are within or in partnership with organizations with a track record of equitability in Tacoma and/or are BIPOC-led.”

Tacoma community member

BETTER LIVING

By 2030, Tacoma has abundant healthy, affordable, emissions free housing, abundant quality local food and green spaces, and safe, efficient, reliable transportation. We are all able to meet our daily needs without having to travel far.

Actions by 2024:

8. Improve regulations to make it easier to grow, make, and sell food.
9. **Build a complete, citywide network of sidewalks, safe and ADA-accessible intersections, bike connections and Safe Routes to School improvements by 2050.**
10. Increase staff capacity to collaborate on low carbon transit projects.
11. Increase partnerships and funding for active transportation and public transit programs and events that reduce barriers to using these modes and encourage their use.
12. Update street design guidelines and processes to make walking, biking, rolling, and riding transit easy and safe.
13. Actively implement the City's 2018 Affordable Housing Action Strategy by maintaining housing and making it affordable and resilient for residents to promote livability and avoid displacement.
14. **Support and create single and multi-family low carbon, healthy retrofit solutions**
15. **Improve energy codes to make commercial buildings efficient, low carbon, and healthy.**
16. Research and pilot home and commercial building energy scores to be shared with buyers.
17. **Incentivize green buildings, land use density, and mixed-use development with affordable housing near transit.**

“Focus on densifying neighborhoods without gentrifying them. Keep people in place! Especially BIPOC, and maintain cultural integrity of neighborhoods so community members do not become strangers in or are priced out of their own neighborhoods.”

Tacoma community member

BETTER BREATHING

By 2030, we are stewards of healthy natural spaces and honor our relationship with the land. Through increasing the use of active transportation and transit, and use of electrification and renewable energy, our air is free of pollution and healthy for our human and nonhuman residents.

Actions by 2024:

18. Preserve and expand healthy tree canopy.
19. Support Pierce Transit in developing a zero emission public transit plan.

“We need more public transportation, more routes, and more frequently run.”

Tacoma community member

- 20. Incentivize active transportation, transit, car sharing, and electric vehicles, and reduce parking minimums in new developments.
- 21. Fund electric vehicle and bicycle programs.
- 22. Partner to support zero emission innovation in marine, rail, and truck transportation.
- 23. Increase Tacoma's Urban Forestry team to care for more trees.

BETTER RESOURCE USE

By 2030, Tacoma is home to a thriving circular economy where materials are reused, and products are built to last and are repaired. We share with our neighbors and eliminate waste.

Actions by 2024:

- 24. **Develop and support programs for food waste prevention, rescue, and diversion to keep food out of the landfill and improve local food security.**
- 25. Reduce per-person water use during summer months.
- 26. Recognize green business achievements.
- 27. Increase commercial and industrial reuse and recycling through a marketplace.
- 28. Reduce construction and demolition waste through permit requirements.
- 29. Divert more clean wood waste and other materials at the Recycling and Transfer Center.
- 30. Add or improve low carbon and sustainability requirements in City investments and contracts.
- 31. Build GHG impact analysis into City budgets, projects, and plans.

“There needs to be better accountability on the waste stream.”

Tacoma community member

BETTER OPPORTUNITIES

By 2030, the community supports a healthy, innovative local economy with new opportunities for all people and businesses to thrive within our ecosystem.

Actions by 2024:

- 32. Partner to train nature stewards for employment and to restore green spaces.
- 33. Partner to retrain the workforce for well paying jobs in the green economy sector.
- 34. Research how to develop a community food hub, with space for food training, sharing, and business.

- 35. Use business taxes to encourage businesses to create more green job opportunities.
- 36. Amend zoning codes to encourage low carbon, resource-efficient, resilient, and businesses.
- 37. Research, identify, and prepare to recruit green industries and jobs that fit Tacoma.
- 38. Increase City staff capacity to grow green economy partnerships and resources.**

“At the city level, I think preparing workers and investing in green jobs will make Tacoma a location where those businesses can come and thrive.”

Tacoma community member

“Focus on job training in neighborhoods/ schools that are low income and minoritized. Ensure that there is a job pathway for trainees with entry level work and a clear path to careers/ education.”

Tacoma Community Member

BETTER PREPARED

By 2030, we are not only preventing carbon emissions but preparing our communities made most vulnerable for expected climate change impacts.

Actions by 2024:

- 39. Protect and restore biodiversity and habitat to be climate change ready.
- 40. Plant and maintain right-of-way trees to reduce heat and support neighborhoods and local businesses.**
- 41. Establish cooling/warming/clean air shelters in every neighborhood.
- 42. Partner to distribute clean air kits, including filter fans.**
- 43. Make communication materials and trainings about climate impacts and emergency preparedness accessible.
- 44. Assess, monitor, and prepare natural systems, infrastructure, and habitat for sea level rise.
- 45. Study flooding impacts and improve services, codes, and planning efforts.
- 46. Plan for future clean energy needs with adequate and equitable electricity distribution and transmission

“Part of what the city needs to do is coordinate efforts to ensure that the most vulnerable are protected against the worst impacts of climate change-excessive heat, wildfire smoke exposure, etc.”

Tacoma community member

A Better Tacoma: Stories from 2030

What does taking action on climate change mean for our daily lives? To illustrate what achieving climate actions and working towards our 2030 Strategies will mean for our communities, the following Stories are snippets of 2030 life in Tacoma. Sprinkled throughout the Stories are references to Actions by 2024.

These Stories are fictional. While we hope you find characters in the Stories relatable, any resemblance to real people is coincidental. For more information about specific actions, visit the linked action reference numbers.

STORY 1: MORNING COMMUTE

Dolores is just clearing the breakfast plates into the compost bin (24) when she checks the clock. The school bell will ring in 15 minutes, it's time to get Nadine on her way to class. Dolores helps her wheel her bike off of the porch and down the front path, gives a quick hug, and watches her

ride down the block to meet her friends. The trees planted (18) by a crew of forest stewards (33) cast a cool shade on Nadine and her classmates as they take the path to school (9).



Assured her grand-daughter will make it safely there on time, Dolores heads back inside to prepare for her own commute. Double-checking to make sure she has loaded cash onto her reduced fare ORCA card, she heads out the back door of their duplex.

At the end of the alley, Dolores crosses the protected bike lane (12) and joins several others at the bus stop (11). She missed her usual bus this morning but the next one arrives in 8 minutes (10) so she won't be late to work. While she waits, Dolores sees her neighbors cross the road heading towards the car share station (20, 21). She calls out and waves.

They hold up their picnic gear in response and call back, "We're heading to the mountains!" Dolores starts to reply, wondering which trail they will be hiking this time, but is cut off by the noiseless arrival of her bus (19). Dolores guides her walker up the bus ramp and finds her seat.

STORY 2: LUNCH WITH FRIENDS

Andrea sets the last box of apples down on the counter, wipes their brow, and peels off their work gloves. They have spent the morning gleaning fruit from right-of-way trees (40) around town and delivering them to restaurants (24). This is the last stop and Andrea is ready for lunch. They

peek out into the dining room and smile. Jo is already seated at a table for their lunch date!

“María will be here in a minute, she’s just getting off the Link (11) from campus,” says Jo as they pick up their menus. “How’s your new apprenticeship (32) going?”

“Honestly, so great! I’m learning so much about tree care (23). And I dropped off fresh apples and plums at the community food hub (34) today. I hadn’t been there before. Whatever they were making in the cooking class smelled delicious. I’m so hungry now!”

“Well, perfect timing!” replies Jo, seeing María walk in.

“Sorry I’m late,” María apologizes, “I was trying to get a few more sign-ups for tomorrow’s beach clean-up (4) after class. Are you coming?”



says Jo. “Next time though!” The server arrives and all three look up, still clueless as to what they’ll be ordering.

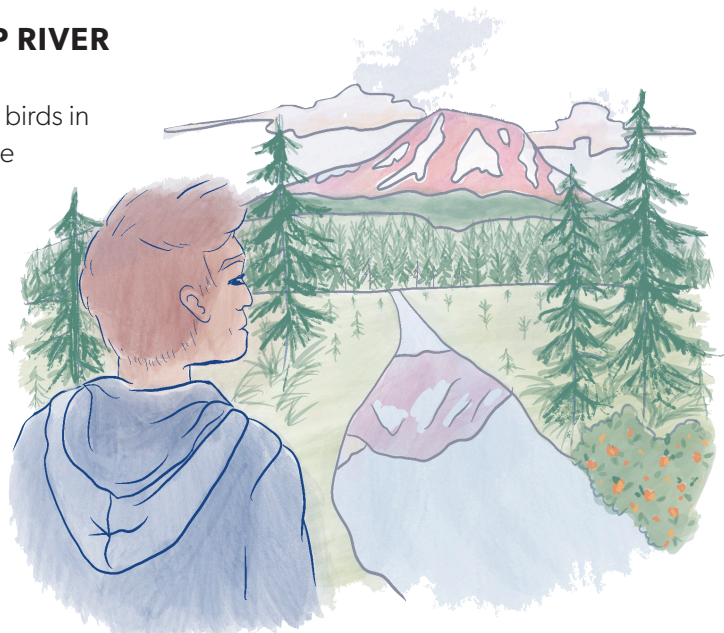
“Need another minute?” asks the server.

“Yes, please!” replies Andrea. They all laugh and open up their menus.

STORY 3: WORK DAY BY THE PUYALLUP RIVER

Carlos shuts the back of the truck closed, stirring the birds in the fir tree nearby. It’s cold out but it’s his favorite time of the day – prepping the crew trucks just as the sun is starting to rise. Today is a special day too. They have new crew members joining them, recent grads from the TCC landscaping and restoration program (32, 33). Julia, the crew manager, was able to hire more members due to the new green jobs incentive the City is offering (35).

It’s been almost 10 years since Julia and Carlos first visited the site as new crew members themselves. Julia will lead the new crew through a tour of the site and get them started planting



salmon berry and sedge along the river bank (39). Carlos is most excited for their Puyallup Watershed restoration partners (7) to join him to talk about water management and flood and erosion control (45). He wants his new crew to understand the land they are on. Just beyond their site is an organic farm (3, 8). They benefit from clean water for irrigation from the river and are protected from winter floods by the habitat restoration and bank stabilization the crew is working on (44). Last year Carlos worked with the farm owner to make sure their nutrient runoff isn't affecting the river ecosystem downstream and so now they're a recognized green business (26).

Carlos tosses Julia a set of keys. The trucks pull out of the lot and head to the river. Carlos watches Mount Tahoma turn pink with the rising sun and feels ready for the day ahead.

STORY 4: COFFEE AT THE COMMUNITY CENTER

Ray has moved his usual Tuesday morning coffee with friends to the Peoples Community Center, a cooling center (41), on this hot and smoky 94°F August day. He chats with Leilani and Rob over a game of cards. They discuss their weeks. Ray's grandchildren were just visiting from across town. Conversation keeps returning to the heat and the wildfires in the region. Ray shares that his grandson, Osmar, has asthma as he pats the filter fan (42) beside him. City staff were handing them out to homes that don't have air filters. They said this building was retrofitted a few years ago to be a space with clean air and an all-electric heating and cooling system (15). They also said that with his fixed income he could qualify for a ductless heat pump, which can provide home heating, cooling, and air filtration. He might just do it, since summers are hotter than they used to be.



Leilani shares they have a barbecue planned this weekend if the weather improves and the burn ban is lifted by then. With the heat and smoke, they plan to stay overnight in the cooling center. In a way, it reminds Rob of the summer camps he used to attend – food, social activities, and a recent blockbuster will be playing on the big screen in the community hall after dinner.

STORY 5: FIRST DAY ON THE JOB

Akash arrives to his first day on the job at Container Services Terminal (CST) with a mix of excitement and anxiety. His mom worked in the tideflats for years, serving on teams that moved countless containers from the huge oceangoing vessels that come to Tacoma. He takes pride in the idea that he will help bring food and cargo to and from Tacoma and the wider region.

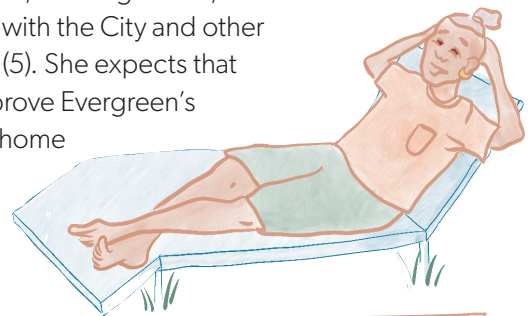
His supervisor, Theresa, explains that the organization has been around since 1939. It values not only its reputation as a reliable business partner, but as a responsible company with its roots in Tacoma. It has accomplished big reductions in emissions through innovation in its operations and has helped its shipping partners in truck and rail transportation reduce their emissions too.

And, it has a commitment to reduce emissions another one-third by the end of the decade. To meet their goal,

Theresa represents CST as part of a Tacoma sustainable manufacturing and industry collaborative (37, 38), which is a group of Tideflats businesses developing a cooperative approach to clean fuels (6, 46) and delivering port services to build their competitive edge internationally. Container

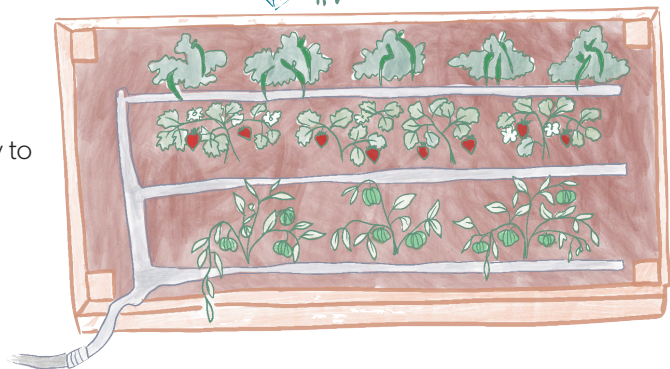


Services Terminal and the Port of Tacoma are committed to getting to net zero by 2050 to meet the commitments established in the Northwest Ports Clean Air Strategy. The company recently deployed shore power at its terminal so that vessels can turn off their engines while they are at berth and now they are working with the Port of Tacoma and Tacoma Power to explore innovate ways to deploy zero emission cargo-handling equipment. This will reduce emissions and noise, creating a safer, better working environment for waterfront workers. CST, in partnership with the City and other regional organizations, is helping shape national green port policy now (5). She expects that Akash can follow in her footsteps someday, helping to maintain and improve Evergreen’s services into the next generation. Working at CST means Akash can go home at the end of the day with good pay and satisfaction that he helped deliver the day-to-day goods everyone depends on. “This work is profitable without sacrificing fair pay and responsible environmental practices, and we want you to hold us to it”(37). Akash nods and smiles.



STORY 6: SATURDAY’S HOME PROJECTS

Sam is around the house for the weekend. There’s plenty to get done, and truth be told she likes home projects. The to-do list: add a garden bed, plant giant sequoia and blueberry seedlings from the Lincoln High School plant sale, and walk the contractor through the house energy audit. Sam begins with the garden bed. Reusing old

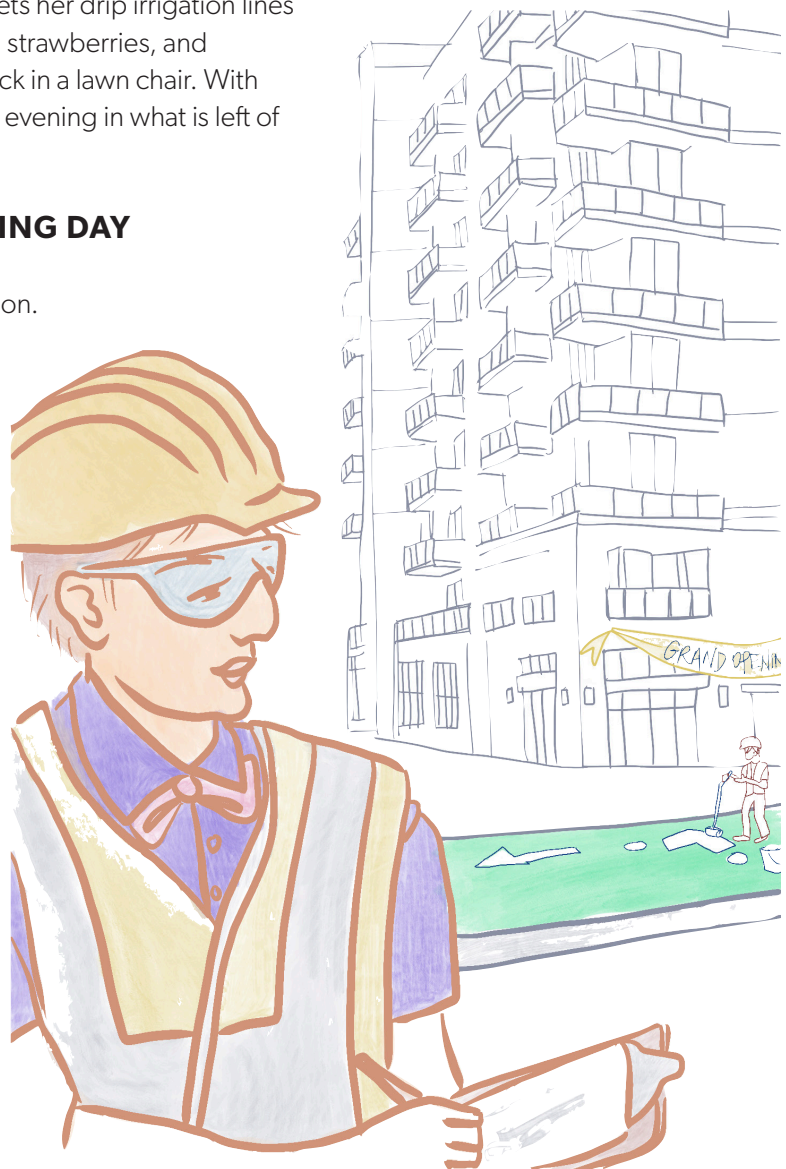


wooden fence boards (29), she digs into the soil using a shovel from the Tacoma Tool Library (2). Topping the new bed off with TAGRO soil amendments she moves onto places marked yesterday around the yard for the seedlings: two sunny spots with plenty of root space away from the fenced property line and other structures for the sequoias, and a place with partial sun near one of the cherry trees for the blueberry bush. With all the potential new produce, she might sell some of her extra fruits and veggies to neighbors (8).

Right on time at 1:00pm, the contractor, LaTasha, rings the doorbell. LaTasha asks about the insulation in the ceiling and walls, and then about the old cadet heaters. After touring the house LaTasha shares her notes on potential energy efficiency improvements and the additional comfort and bill savings they would bring. She provides a website where Sam can find affordable City loans and incentives for them (14). “If you’re thinking of selling some day, improving your home’s energy score (16) would really add some value” LaTasha explains. Sam says she’ll think about LaTasha’s recommendations, but that she loves living in Lincoln and isn’t thinking about selling soon. “Those upgrades will help keep you happy and comfortable here for years, too! By the way, I was trained in home energy audits while still in high school at Lincoln!” LaTasha responds. After chatting about the neighborhood, it’s time for LaTasha to leave. Thanking her, Sam returns to the backyard. She sets her drip irrigation lines (25) on a short timer, glances at the young beans, strawberries, and tomatillos in the old garden bed, and then sits back in a lawn chair. With everything done, Sam is ready for a lazy Saturday evening in what is left of the springtime sun.

STORY 7: WORKING TOWARD OPENING DAY

AJ is the property manager at Pacific Avenue Station. With its 4 floors of housing above street-level businesses, Pac Ave Station is the tenth building they have managed since graduating from UWT in 2017. It’s also the one AJ is most excited about. To develop this building, the regional company asked AJ to explore the latest construction standards and opportunities in Tacoma. He recommended durable, low-carbon green building materials (28), efficient technologies, and the inclusion of affordable housing units (13), which helped the company access financial incentives and better serve the neighborhood. Working closely with the City and Spaceworks, some of the commercial space downstairs has been set aside for local start-ups (36). Sitting on the #1 bus line, residents will be able to ride right into downtown for work, school, and weekend fun (17). This location means easy connections across town for residents and business tenants, and consistent interest in the units will mean low turnover costs for the company.



Pac Ave Station is on track to open in two months. AJ watches from the window of a nearly finished unit as construction trucks carry away recyclable construction materials (27) that will be sold and reprocessed into new construction materials. A team of City contractors works across the street. Beside a cement truck, they pour a new low-carbon concrete mix into place for a new sidewalk and transit stop (30, 31). AJ heads downstairs and into the bustle of the neighborhood – it's lunch time.

Holding Ourselves Accountable – Tracking Our Progress

In order to ensure transparency and accountability, each year we will develop a progress report and track **2030 Indicator Targets** (Section 3). These indicators are often easier to relate to than measurements of tons of GHG pollution and often show more immediate community impact. They are not perfect outcome measures, but they are currently trackable and more noticeable in our community. We will be tracking things like trees planted in neighborhoods, public electric vehicle charging stations installed, and miles of sidewalks built or repaired.

The [Sustainable Tacoma Commission](#) was established in 2009 to bring “accountability, transparency and vigilance to the long-term implementation of Tacoma’s Climate Action Plan”. This volunteer group meets monthly and provides a watchdog function and forum for the Plan’s implementation by monitoring progress on equitable implementation and engaging in regular communication with the City Council.

To implement each climate action, we will work with and empower communities using a range of engagement methods. At the same time, we must hold ourselves and other institutions accountable – those who have benefited most from a history of pollution and have the means to support our just transition must take the lead. It is our goal to both rebuild relationships and remain results-oriented to make good on promises to our community. We will also share our progress at an at least annual community meeting, focus on expanding our on-going relationships, and support the influence and leadership of youth and other frontline communities in climate action planning.

The 2030 Strategies for a Better Tacoma and 2030 Indicator Targets will guide our work over the next nine years. In addition to our yearly progress reports, we will update Actions every 3-4 years and check in with our stakeholders and implementation partners to make sure we are still prioritizing actions that are true to the community’s vision for a Better Tacoma and on track for net-zero emissions by 2050.

Financing Tacoma Climate Action

To achieve our climate action goals, residents, businesses, property owners, and all levels of government will need to make substantial investments in new infrastructure, programs, and incentives over the next 30 years. Making these investments helps everyone save in the long-run including, for example, through lower energy bills and lower maintenance costs on electric vehicles.

While it will likely take about \$2.5 billion collectively to achieve Tacoma’s 2050 climate goal, the total savings could easily exceed \$6.6 billion, resulting in a net savings of \$4.18 billion for our residents, businesses, and organizations (Section 4). With the savings, businesses and the City will have more money available to expand operations, hire employees, and develop other innovations to improve their energy and emissions performance. Those investments will lead to hundreds of new jobs, making Tacoma part of the transition to a green economy.

Additionally, spending on electricity keeps money in our local economy, since our electric utility is publicly owned. More dollars spent on fossil fuels, on the other hand, go to oil and gas businesses, many of which are located outside the city’s borders. If our community invests in a zero carbon pathway, by 2050 Tacoma could spend around \$66 million more per year with its local electric utility, and save up to \$643 million each year not paid to outside fossil fuel companies for a net savings of up to \$577 million annually.

“It’s time to start acting: do some pilots, some projects based on data and research available to get results, then adjust and continue accordingly.”

Tacoma community member

What You Can Do For Tacoma Climate Action

There are many individual choices we can make as consumers and community members to help reduce our GHG emissions. For Tacomans, it is particularly impactful to buy less stuff if we don’t need it; limit air travel; carpool, walk, bike, or take public transit instead of driving alone; eat a more plant-based diet and buy from local farmers; and choose electric, efficient options when changing our homes and vehicles. All of these actions add up and help encourage others to do the same.

That being said, the pace and scale of climate action that Tacoma needs ultimately depends on transformational changes to our institutions and systems. The previous sections have outlined what transformational steps the City and our community needs to take to mitigate and prepare for climate change. Indeed, this change also relies on all of us, as members of an engaged community.

“Again, and always, involve those directly affected. Take the time and effort.”

Tacoma community member

Here are a few ways you can help implement the Tacoma Climate Action Plan:

- 1. Hold the City accountable.** Show up at City Council meetings or contact your Tacoma City Council representative to let Council know that climate action is important to you and ask them to prioritize funding for climate action.

Find your Council representative here: www.cityoftacoma.org/government/city_council

- 2. Get involved in City decision-making and budgeting.** Participate on a City committee, board, commission, neighborhood council, or future participatory budgeting process.

Find open positions on committees, boards, and commissions:

www.cityoftacoma.org/commissions

Get involved in your neighborhood council:

www.cityoftacoma.org/neighborhoodcouncils

- 3. Connect with local public organizations to advocate** for more climate action, dense affordable housing, electrification, public transit, and pollution prevention.

Learn more about and engage with: Pierce County, Tacoma-Pierce County Health Department, Tacoma School District, Pierce Transit, Metro Parks Tacoma, Port of Tacoma, Washington State

Learn about local environmental events and opportunities by joining the EnviroNews email list:

www.healthybay.org/get-involved/environews-listserv/

“Make sure funding is available. Make sure personnel and resources are available to carry out identified programs.”

Tacoma community member

- 4. Talk to your friends, family members, and neighbors** about climate change, the local impacts we are experiencing, and the solutions available to us. Simple, everyday conversations can go a long way in increasing awareness and action on climate change.

Find resources on local climate change impacts: www.cityoftacoma.org/climate

- 5. Bring partners and resources to our shared cause** by engaging at the state and national level:

- County Council: [Representatives](#)
- State and national representatives: [Find Your District](#)
- Port of Tacoma Commission

Conclusion

This Plan charts Tacoma's path towards net zero GHG emissions by 2050. Our city has much to gain by implementing its Climate Plan, including more than \$4 billion in potential net savings, decreased vulnerability to climate disasters and impacts, attracting innovation and new businesses interested in taking part in the transition to a green economy, and more. Most of all, this Plan puts Tacoma's community members at its center, focusing on how the City's climate action efforts and investments can also help to improve the health and quality of life of Tacomans. It seeks to ensure that no community member is left behind in this transition, prioritizing efforts that will protect the most vulnerable to climate impacts and improve the living conditions of and create opportunities for marginalized groups.

***"Our future has trees in every neighborhood... [and] healthy, vibrant, and cohesive communities...
Neighbors helping neighbors to grow a greener, healthier, and more connected Greater Tacoma."***

Tacoma community member



Drawing by Tatyana, RU

Sections

SECTION 1 ENERGY AND EMISSIONS MODELING RESULTS (BASE YEAR, NO NEW ACTIONS AND LC SCENARIOS, INCLUDING MILEPOSTS)

SECTION 2 IMPLEMENTATION ACTIONS

SECTION 3 2030 INDICATOR TARGETS

SECTION 4 FINANCIAL ANALYSIS

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TACOMA COMMUNITY CLIMATE ACTION PLAN



DRAFT Sections

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SECTION 1, ENERGY AND EMISSIONS MODELING RESULTS

MODELING APPROACH

Modeling for Tacoma's Community Climate Action Plan was completed using population, building, transportation, and energy use data, analyzed in a model called CityInSight. This model calculates data on energy, emissions, and finances to allow for a deeper understanding of their relationships, and ultimately to help the City identify how it can best reach net zero greenhouse gas (GHG) emissions. Key features that help with this are that CityInSight allows for detailed analysis of the impacts of actions to reduce energy use and GHG emissions both year by year as well as through space (i.e. within different neighborhoods or traffic zones). To complement this modeling, Tacoma Power also regularly engages in more detailed energy modeling (at the hourly level), the results of which will be incorporated as a part of the goals of this Plan.

ACCOUNTING AND REPORTING PRINCIPLES

The City's GHG inventory and scenario modeling approach also correlate with the Global Protocol for Community-Scale GHG Emissions Inventories (GPC). The GPC provides a fair and true account of emissions via its principles:

Relevance: The reported GHG emissions shall appropriately reflect emissions occurring as a result of activities and consumption within the City boundary. The inventory will also serve the decision-making needs of the City, taking into consideration relevant local, state, and national regulations. Relevance applies when selecting data sources and determining and prioritizing data collection improvements.

Completeness: All emissions sources within the inventory (City of Tacoma) boundary shall be accounted for. Any exclusions of sources shall be justified and explained.

Consistency: Emissions calculations shall be consistent in approach, boundary, and methodology.

Transparency: Activity data, emissions sources, emissions factors and accounting methodologies require adequate documentation and disclosure to enable verification.

Accuracy: The calculation of GHG emissions should not systematically overstate or understate actual GHG emissions. Accuracy should be enough to give decision makers and the public reasonable assurance of the integrity of the reported information. Uncertainties in the quantification process should be reduced to the extent possible and practical.

MODELING APPROACH

The City went through a robust modeling exercise to develop a Net-Zero pathway that would allow us to meet our emissions target, the steps of which are illustrated in the figure below.

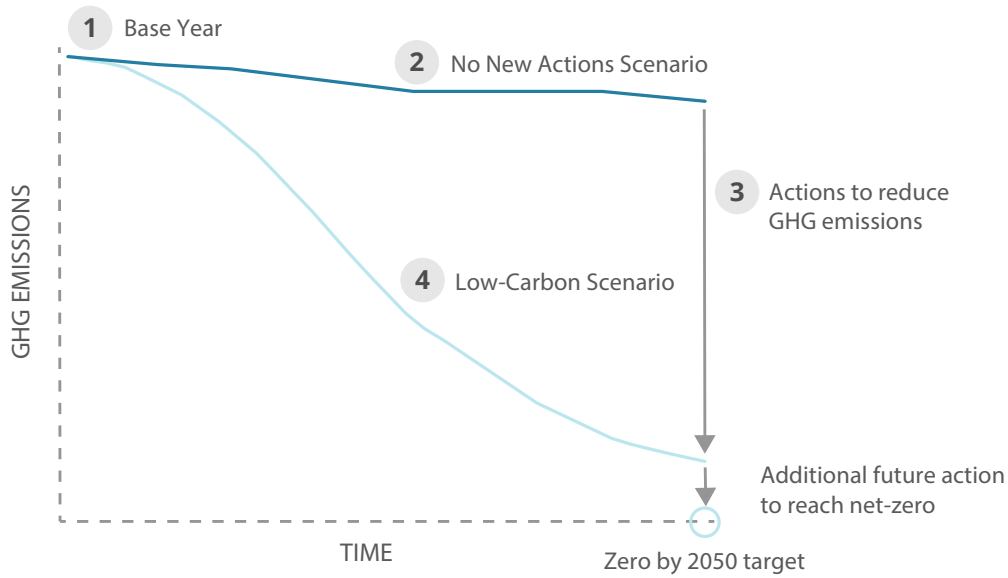


Figure 1. Modeling approach for Tacoma’s Net-Zero pathway.

The four key steps to developing Tacoma’s Net-Zero pathway were: (1) establishing a base year GHG inventory (2019 was used as it had the most recent and complete data), (2) modeling a No New Actions Scenario to show what emissions would occur while the City continues to grow and if its current plans are carried out, (3) undertaking research and engagement with the public and City staff on actions to reduce Tacoma’s emissions, and (4) modeling these actions in a Net-Zero Scenario.

BASE YEAR RESULTS

2019 ENERGY AND EMISSIONS

Below is a summary of Tacoma’s energy use and emissions by sector in 2019, discussed in more detail in the New Action section. Different forms of energy have different GHG emission intensities. Our ultimate goal is emission reduction.

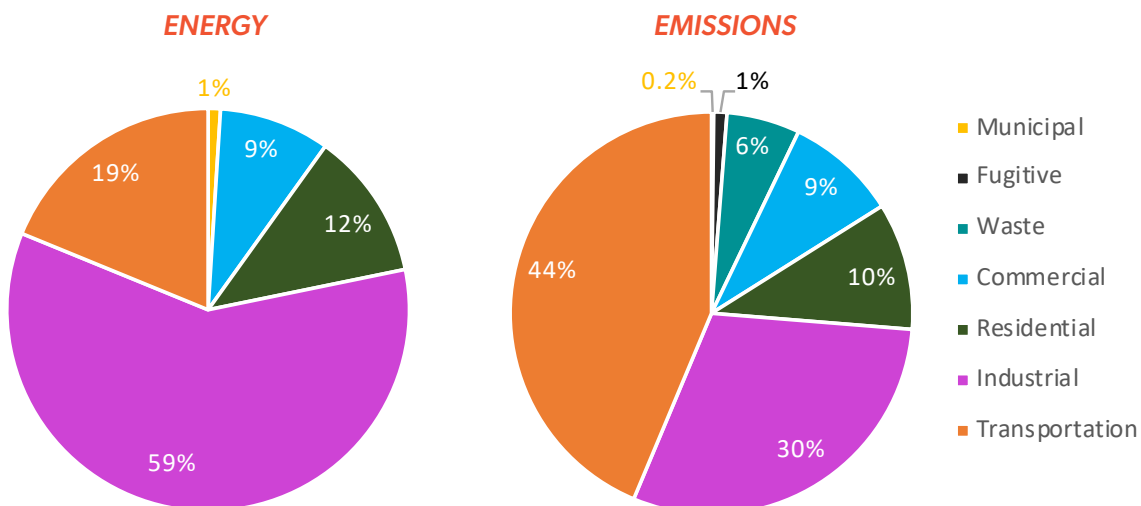


Figure 2. Energy and emissions by sector for Tacoma, 2019.

Tacoma's 2019 GHG emissions amounted to approximately 1.7 million metric tons of carbon dioxide equivalent emissions (MtCO₂e), or 7.8 MtCO₂e per person.

In 2019, industry accounted for 59% of Tacoma's energy use and 30% of its emissions. These included those from the refinery, gypsum plant, and the pulp and paper mill. The high (59%) proportion of industrial energy use compared to just 30% of emissions was primarily due to the use of wood at the pulp and paper mill, which was considered to be nearly carbon neutral.

Transportation accounted for 19% of Tacoma's energy use and 44% of its emissions, resulting from the use of gasoline and diesel for personal vehicles, commercial vehicles, city buses, and freight.

Commercial, residential, and municipal buildings together accounted for 21% of energy use and 19% of the city's emissions. The majority of this was from the use of natural gas and electricity to heat and cool buildings and water.

Six percent of Tacoma's emissions came from the decomposition of organic materials at its waste facilities, and 1% from leaks and losses in natural gas and oil systems (fugitive emissions).

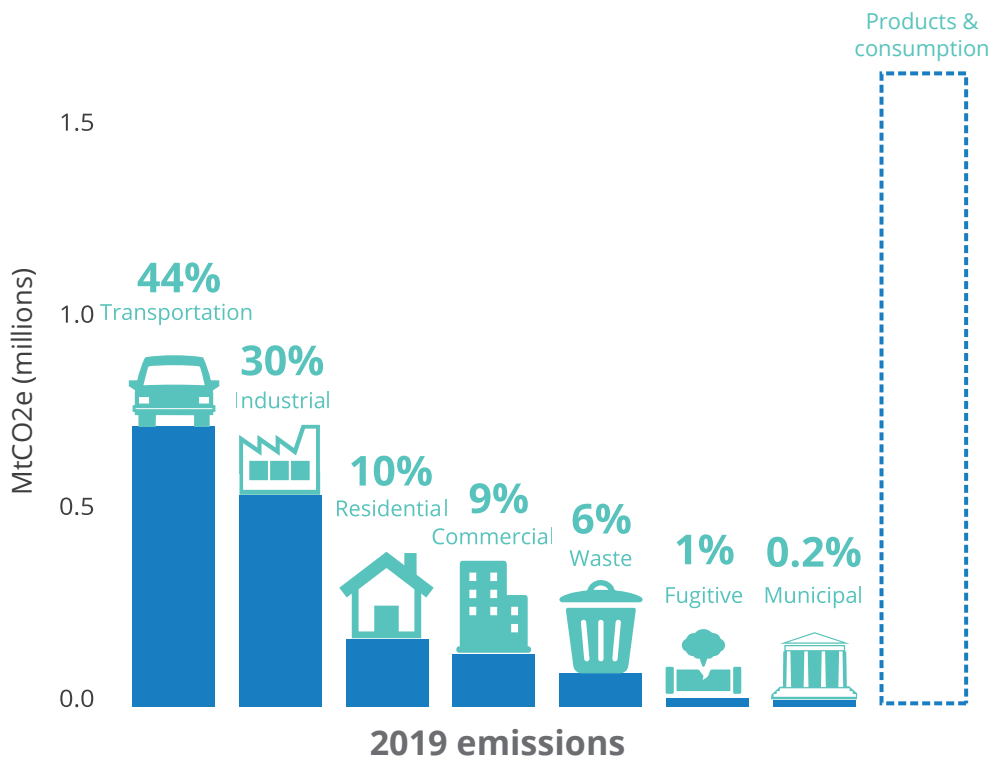


Figure 3. Emissions for Tacoma, 2019, including emissions from products and consumption.

The emissions discussed above are just those generated within Tacoma city limits. Figure 3 above shows that if we were to include emissions from the production and consumption of items from outside Tacoma, they would nearly double.

COMPARISON WITH PAST INVENTORIES

It is difficult to make an apples-to-apples comparison of past versus present GHG emissions inventories for Tacoma since the quality and availability of data has changed over time, as have

GHG accounting and reporting methodologies. It should be noted that [the same is true when comparing inventories across jurisdictions](#), where data sources, accuracy, and calculation methodologies may differ. The figure below shows approximations of Tacoma’s past (blue) emissions inventory results, adjusted to more closely match the methodology used for its recent 2019 (red) emissions inventory. With these adjustments, Tacoma has seen a modest decline of 25% between 1990 and 2019. From 2016 to 2019, on the other hand, emissions increased by 16% while [population only increased by 3%](#).

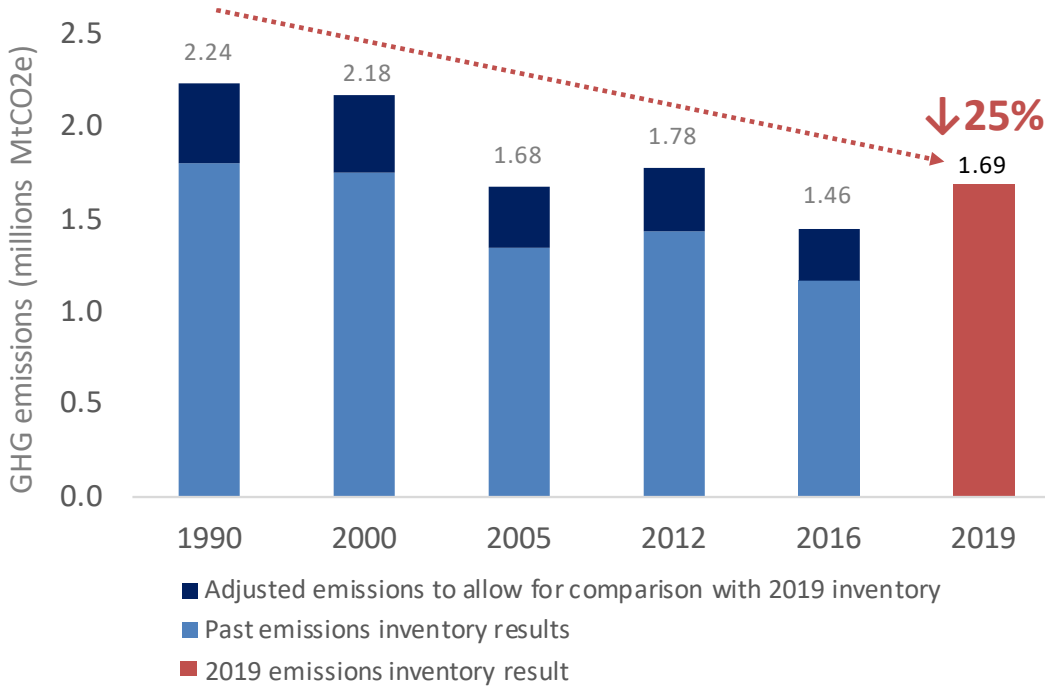


Figure 4. Past versus current GHG emissions in Tacoma.

NO NEW ACTIONS SCENARIO RESULTS

POPULATION AND DEMOGRAPHICS

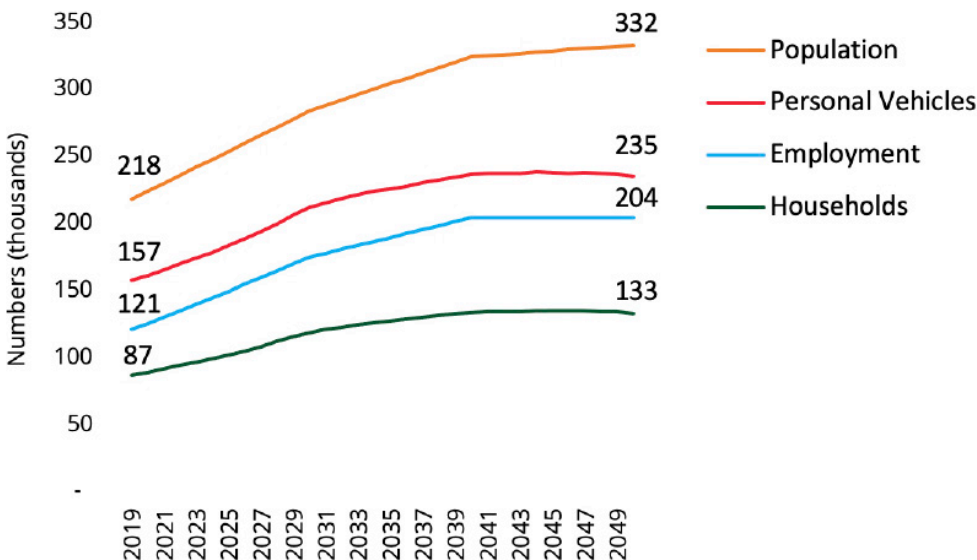


Figure 5. Key demographics for Tacoma from 2019 to 2050.

Table 1. Key demographics in 2019 and 2050.

	2019	2050	DIFFERENCE 2019-2050	% DIFFERENCE 2019-2050
Population	217,834	332,392	114,558	+53%
Personal vehicles	157,326	235,177	77,851	+49%
Employment	121,281	204,108	82,827	+68%
Households	87,016	143,340	56,324	+65%

Population trends, employment trends, vehicle ownership, and expected number of households were important components in modeling Tacoma's current (and estimating its future) energy use and emissions production. The 2019 American Community Survey was used to establish the city's base year (2019) population, household, and employment numbers, and the city's household travel survey was used to establish base year vehicles per household. City projections were then used for estimated growth to the year 2050. Based on these assumptions Tacoma's population is expected to grow at a steady rate until around 2040, after which it will remain relatively stable. A total increase by approximately 50% from 2019 to 2050 is expected. This is an increase of approximately 115,000 people (Table 1, Figure 5). Households are expected to scale with population growth, with 56,000 added over the time period. A total of 83,000 jobs are expected to be added between 2019 and 2050, with an increase to per-capita employment over the time period from 0.56 to 0.61 jobs per resident. Personal vehicle ownership is expected to follow a similar trend to that of household growth based on dwelling unit types. Tacomans owned 1.81 vehicles per household in 2019, which is expected to decrease slightly to 1.77 vehicles per household in 2050. The decrease is due to more infill and apartments being added in the City, which typically have lower vehicle ownership rates compared to single-family homes.

NO NEW ACTIONS PROJECTED ENERGY USE AND EMISSIONS

TOTAL AND PER-CAPITA ENERGY AND EMISSIONS

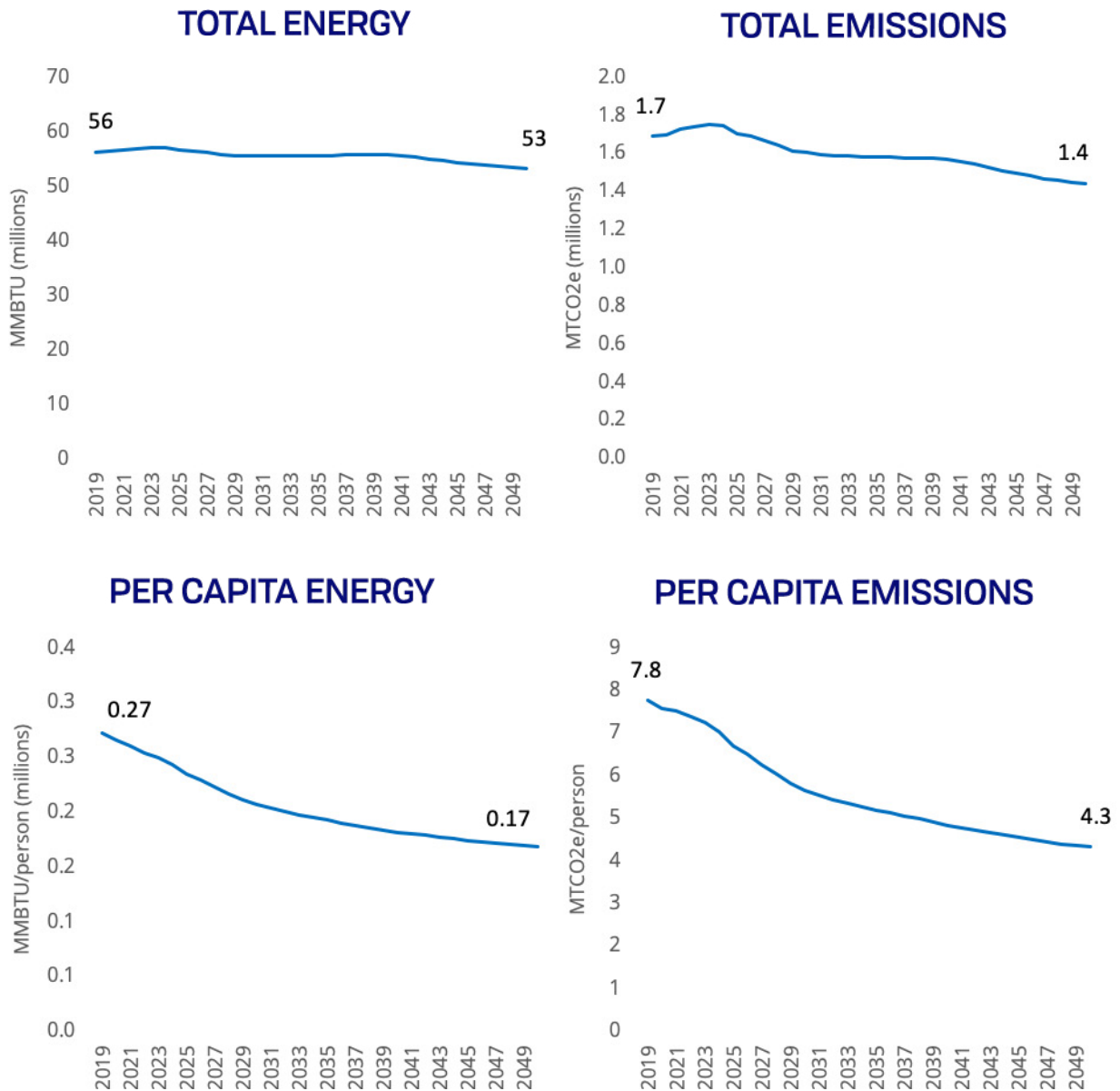


Figure 6. Projected yearly energy use (left) and emissions (right) for the No New Actions Scenario, 2019-2050.

Figure 6 shows the total energy use in Tacoma in 2019, and the projection to 2050. Energy use is expected to drop by approximately 3 million metric million British thermal units (MMBTU), a decrease of 6% compared to 2019. The decrease in per capita energy use is more pronounced, decreasing by nearly 40% over the time period (Figure 6). Total emissions decrease by 15% while per capita emissions decrease by 18%. Improvement to space heating/cooling and water heating demands, due in part to increased energy efficiency resulting from upper-level government regulations on appliances and the building code, are expected to decrease total city energy use despite population increases. Similarly, vehicle fuel efficiencies improve as old vehicles are replaced and electric vehicles’ market share increases. Figure 7 and Table 1 show the breakdown of energy and emissions by sector, further discussed in the following sections.

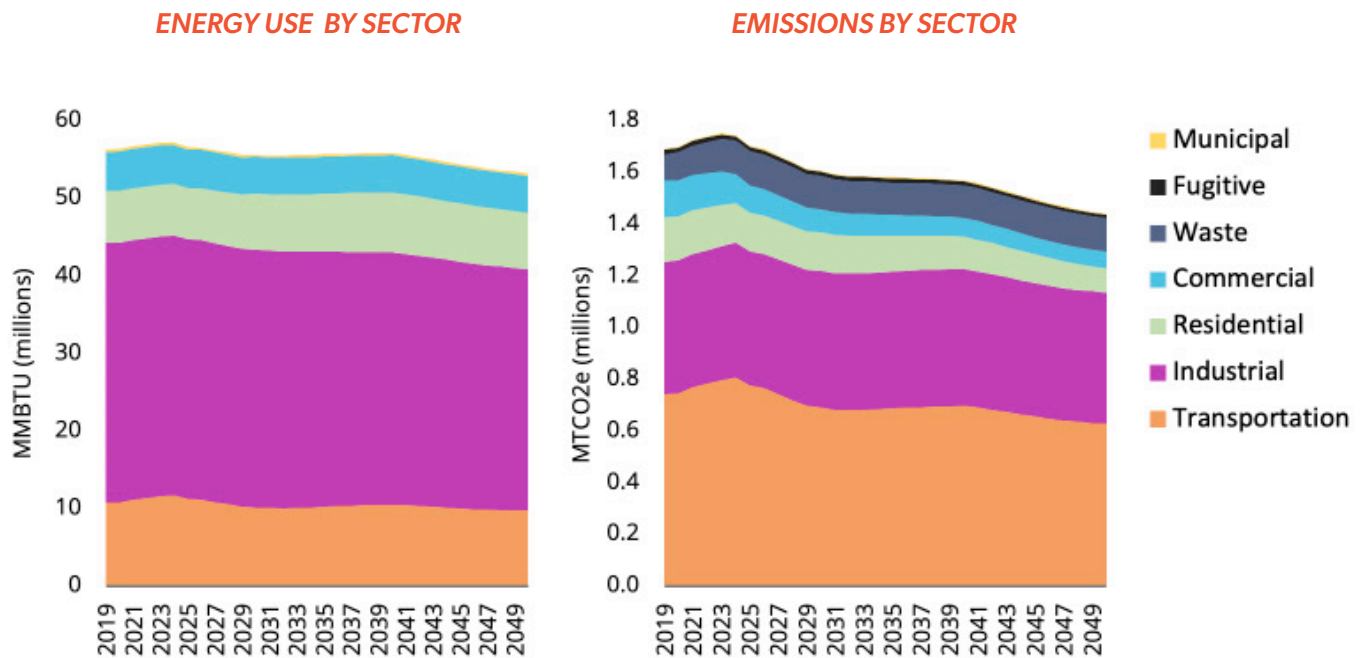


Figure 7. Projected community energy use and emissions by sector, 2019-2050.

Table 2. No New Actions Scenario energy consumption (MMBTU) by sector, 2019 and 2050.

	2019 (MMBTU)	SHARE OF TOTAL 2019	2050 (MMBTU)	SHARE OF TOTAL 2050	% CHANGE 2019-2050
TOTAL (MMBTU) >	56,324,924		53,214,042		-6%
Commercial	5,054,647	9%	4,764,550	9%	-6%
Industrial	33,560,446	60%	31,112,438	58%	-7%
Municipal	329,013	1%	289,275	1%	-12%
Residential	6,619,932	12%	7,299,516	14%	+10%
Transportation	10,760,886	19%	9,748,263	18%	-9%

Table 3. No New Actions Scenario emissions by sector, 2019 and 2050.

	2019 (MTCO2E)	SHARE OF TOTAL 2019	2050 (MTCO2E)	SHARE OF TOTAL 2050	% CHANGE 2019-2050
TOTAL (MTCO2E) >	1,691,149		1,441,104		-15%
Commercial	142,110	8%	65,001	5%	-54%
Fugitive	17,986	1%	15,041	1%	-16%
Industrial	511,021	30%	505,382	35%	-1%
Municipal	3,055	0%	3,944	0%	+29%
Residential	173,742	10%	93,781	7%	-46%
Transportation	743,150	44%	629,910	44%	-15%
Waste	100,085	6%	128,046	9%	+28%

INDUSTRY

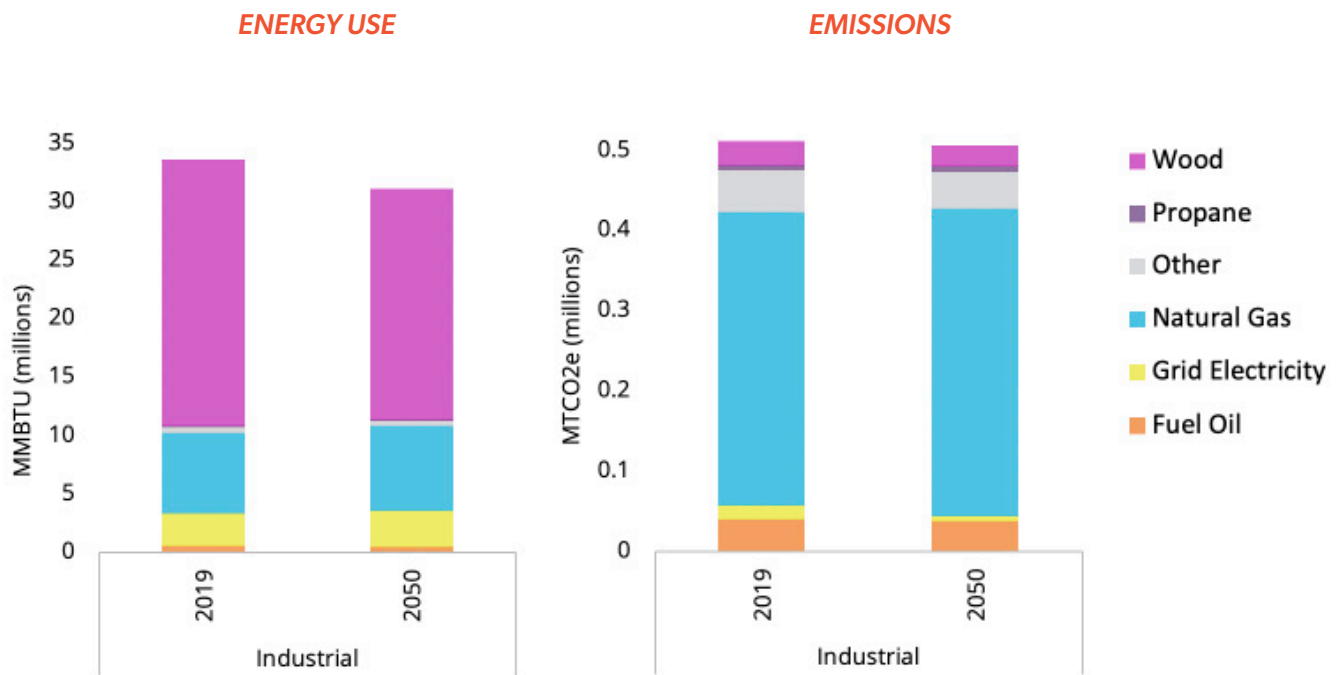


Figure 8. Industrial energy use and emissions by sector and fuel, 2019 and 2050.

Industry accounts for approximately 60% of Tacoma’s energy use, both in 2019 and in 2050 (Figure 8, Table 1). As discussed in the Base Year results section, industry makes up a lower proportion of emissions compared to energy due to wood use at the pulp and paper mill, which is considered nearly carbon-neutral per GHG accounting and reporting protocol. Note that industrial energy and emissions reported in this inventory include Tacoma’s large emitters (Georgia Pacific Gypsum, the oil refinery, and pulp and paper mill), for which data is available as they are required to report to the EPA, as well as building energy use for industrial accounts from the city’s natural gas and electricity utilities. Process energy and emissions from smaller industries have not been included due to data unavailability, nor has energy use for the LNG facility due to be operational in 2021. These should be analyzed and addressed as a follow up and in further iterations of this Plan.

With no new actions, industrial energy use and emissions are anticipated to decrease by just 7% and 1%, respectively over the next 30 years, owing to anticipated building code improvements for new buildings and slight improvements to existing technologies as systems get replaced or upgraded over time.

BUILDINGS

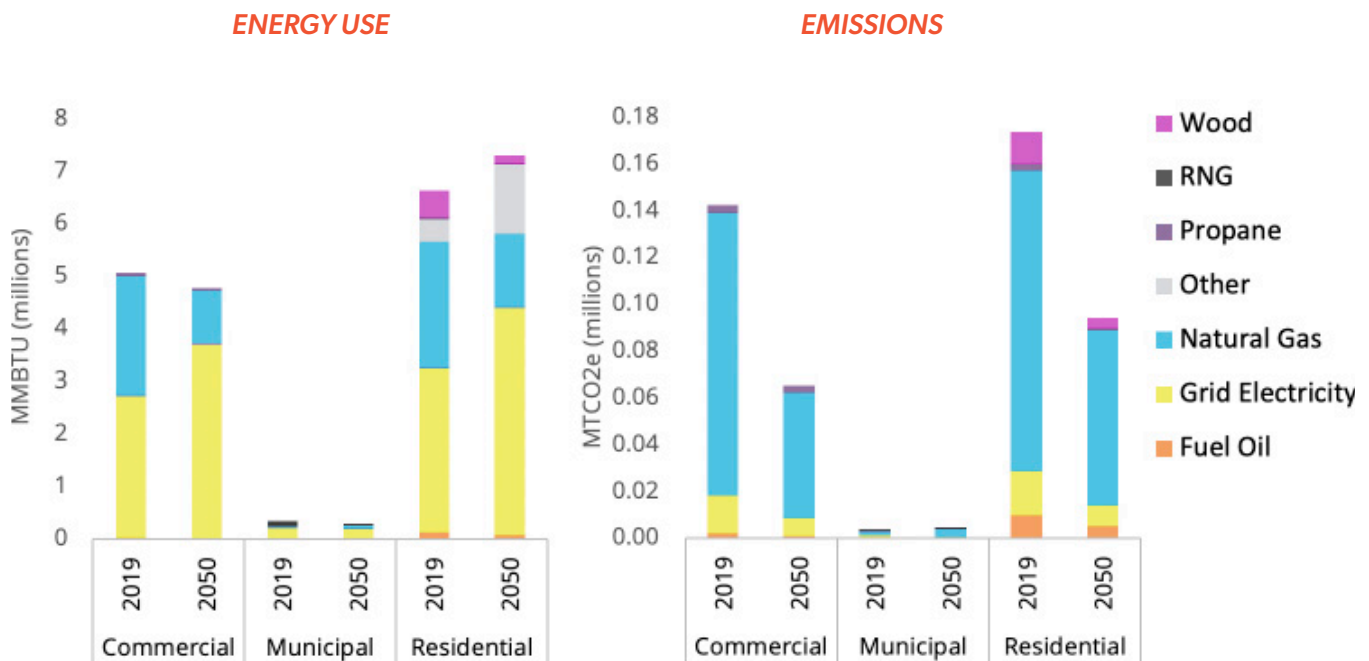


Figure 9. Buildings energy use and emissions by sector and fuel, 2019 and 2050.

Decreases in energy use are expected for commercial (6%) and municipal (12%) buildings from 2019 to 2050. These improvements are expected as regulations for existing buildings' energy performance take effect, including the Clean Buildings Act which is slated to come into play in 2026-2028. Performance of new non-residential buildings is also anticipated to improve with the State building code becoming more stringent over time. Similar improvements to building energy performance are anticipated for new and existing residential buildings, with average energy use per household decreasing by 28% from 76,000 MMBTU to 55,000 MMBTU. In this case, however, city growth outpaces efficiency improvements and residential energy use is anticipated to increase by 10%, indicating that net zero retrofit programs and building code improvements need be implemented sooner than currently planned.

Decreases in building emissions are more pronounced than building energy use, with emissions decreasing by 54% and 46% for commercial and residential buildings, respectively (Figure 9, right side). In both sectors, energy use from electricity increases (by 37% for commercial and 40% for residential buildings) while energy use from natural gas decreases (by 56% for commercial and 42% for residential buildings) as natural gas and other fossil fuel-based heating systems are replaced with electric heat pumps.

One other factor impacting building energy use is degree days, measures of how much heating and cooling is required for buildings based on the temperatures in a particular year. Figure 10 shows that as temperatures warm over the coming years, the need to heat buildings will decrease, while cooling needs will increase. In Tacoma, space and water heating (the green and dark blue bars in Figure 11) represent a much greater proportion of energy requirements and emissions than space cooling (light blue bars in Figure 11), therefore, the impact of a warming climate helps to decrease building energy consumption, for the time being.

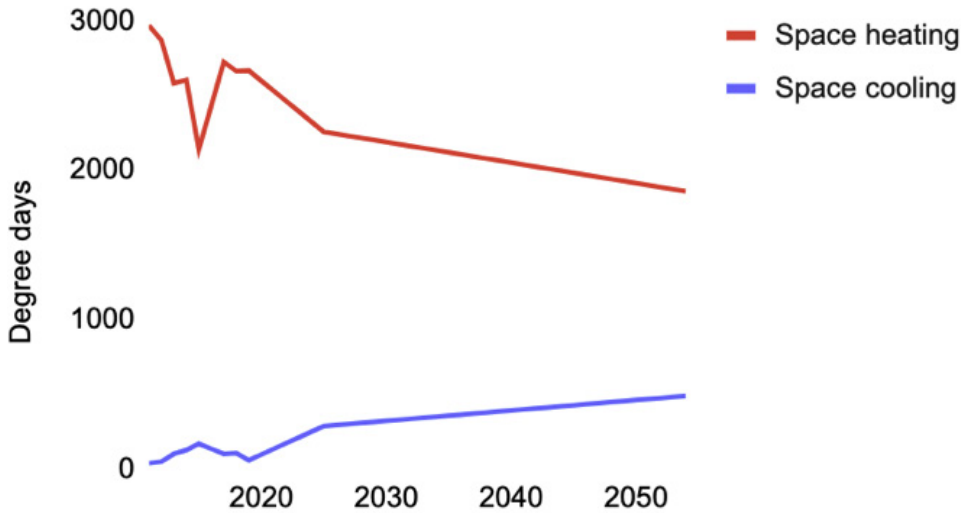


Figure 10. Heating and cooling degree days for Tacoma, 2011-2050.¹

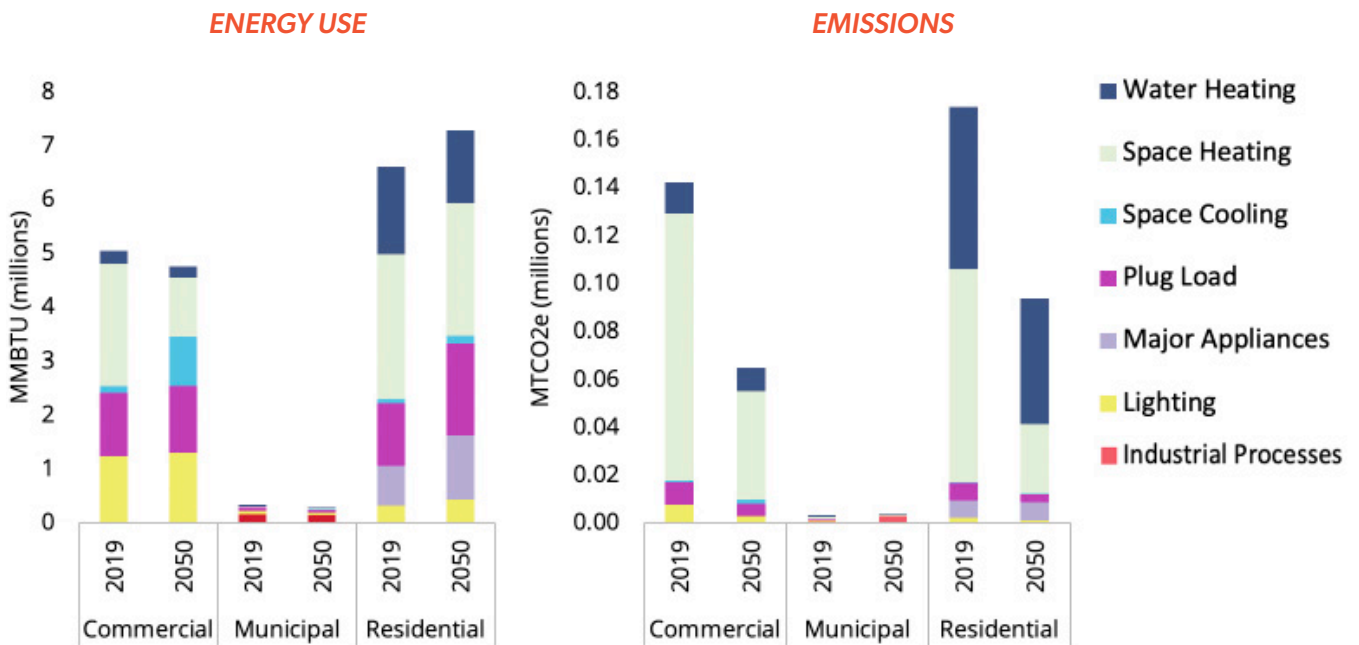


Figure 11. Building energy use by sector and end use, 2019 and 2050.

¹Climate Map (<http://www.climatewna.com/default.aspx>) for 47.25513° N, -122.44164° E and elevation of 74m. RCP 8.5 Average of CanESM2, CNRM-CM5 and HadGEM2-ES models

TRANSPORTATION

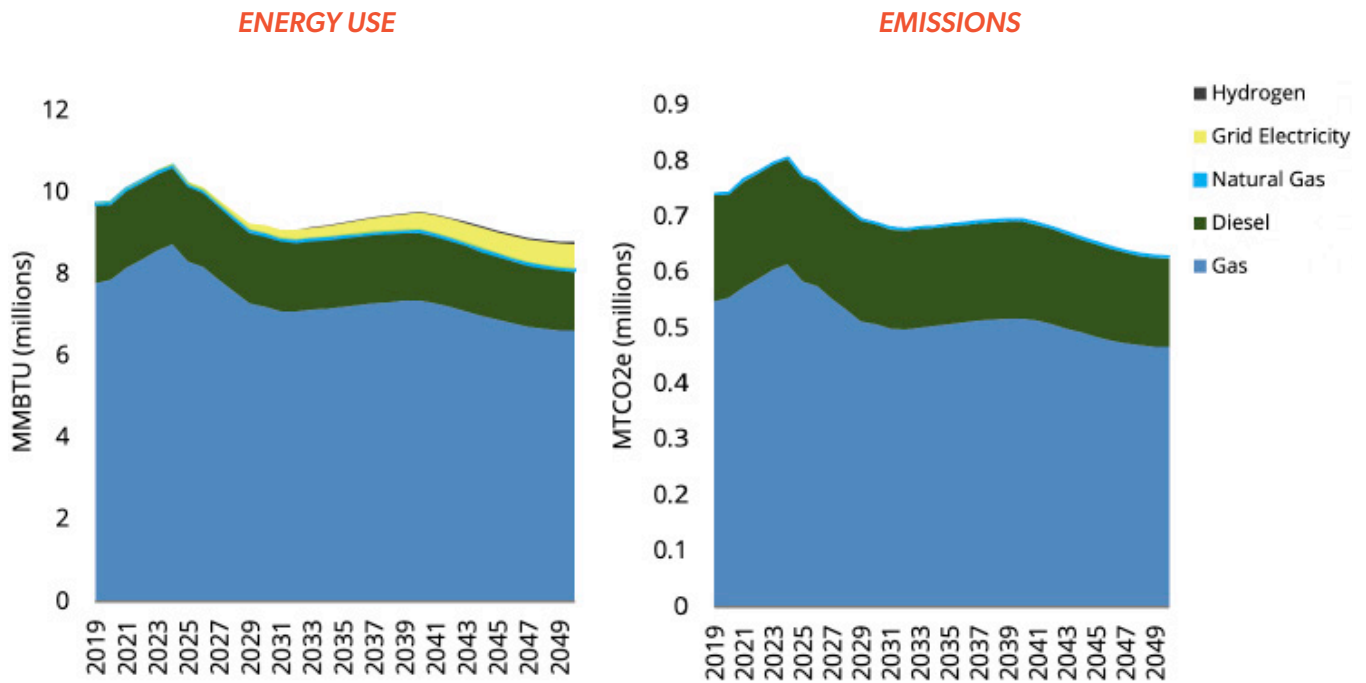


Figure 12. Transportation energy use and emissions, 2019-2050.

From 2019-2050, though the yearly personal vehicle miles traveled (VMT) in Tacoma is anticipated to decrease on average, the overall miles traveled is anticipated to increase as the city's population grows. Despite this, energy use for transportation is anticipated to decrease by approximately 10%, owing to modest improvements to transit and active travel mode shares, older vehicles being replaced with newer more efficient vehicles, and market-based uptake of commercial and personal use electric vehicles, which are more energy efficient than internal combustion engine vehicles. These improvements also result in a 15% decrease in emissions from transportation.

WASTE

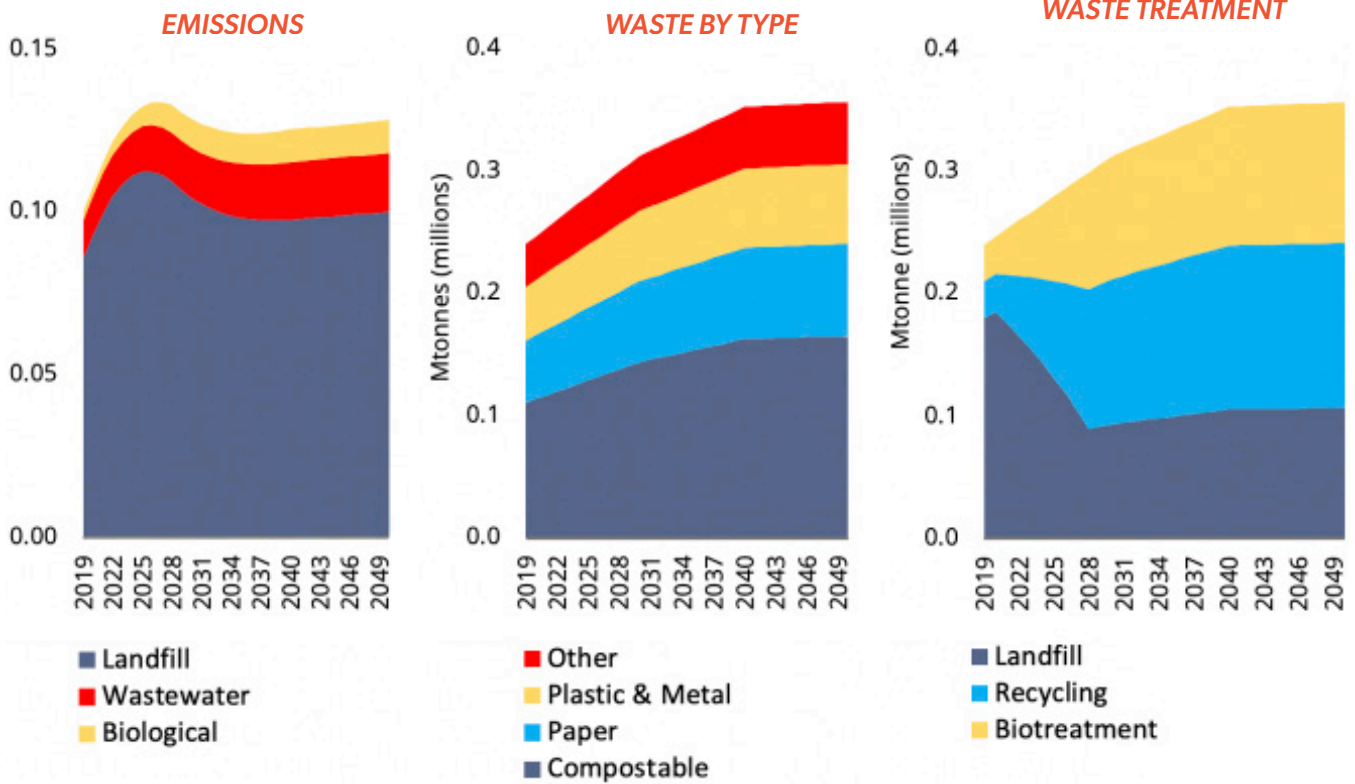


Figure 13. Emissions from waste (left), waste tonnage by type (middle), and waste treatment (right), 2019-2050.

Emissions from waste increase by 28% from 2019 to 2050. This increase occurs alongside population growth, which is in part balanced by increases in diversion, as the City meets its target of 70% by 2028 (from 23% in 2019). Emissions from waste increase from 2019-2025, decrease to the year 2035, and then continue to increase at a relatively steady rate to 2050.

ENERGY

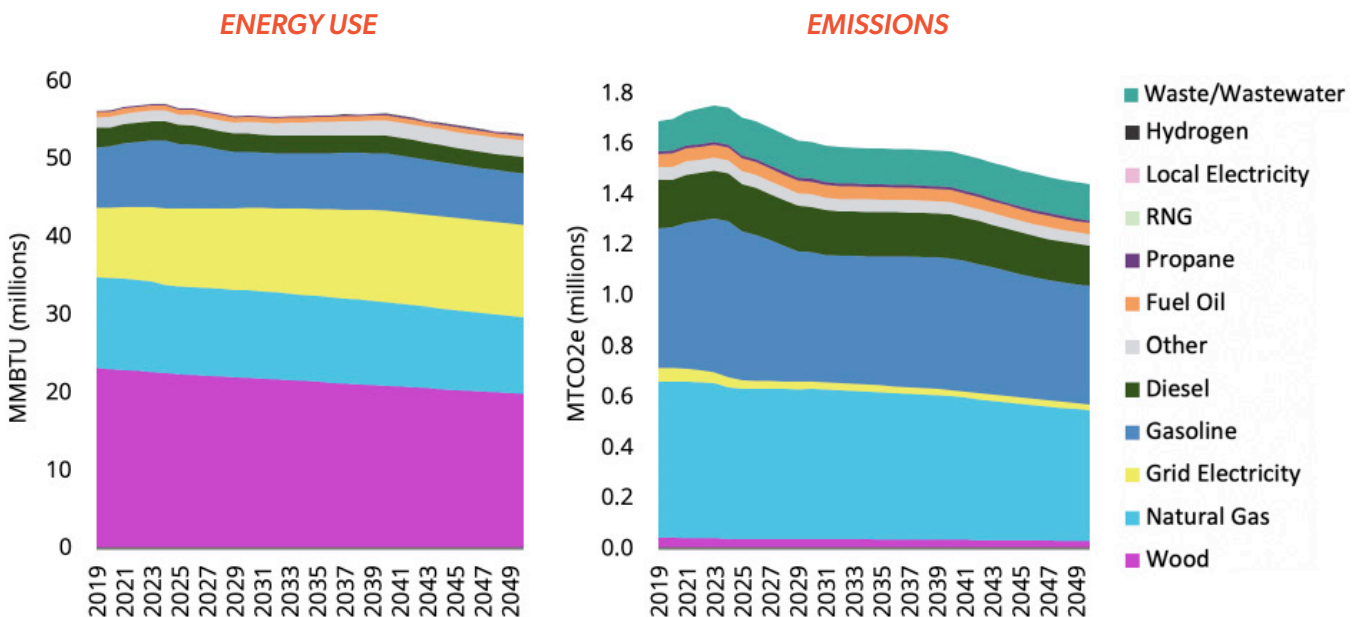


Figure 14. City-wide energy use (left) and emissions (right) by fuel type, 2019-2050.

Figure 14 Shows Tacoma’s energy use and emissions by fuel type. By 2050, grid electricity makes up 22% of Tacoma’s energy consumption, while accounting for just 2% of its total emissions. Under the No New Actions Scenario, electricity use increases by 22% from 2019 to 2050, by approximately 3.1 million MMBTU. Wood from the pulp and paper mill accounts for nearly half of the city’s energy use, but less than 1% of its emissions since it is considered nearly carbon neutral from a GHG emissions perspective.

NET-ZERO SCENARIO RESULTS

After the No New Actions Scenario was modeled, a Net-Zero Scenario was developed. In consultation with City staff, local technical teams, and others, a suite of target assumptions were established to help the city reach its ultimate target of net zero GHG emissions by 2050. These assumptions are listed in the tables at the beginning of each sector’s results section.

MODELING RESULTS

Table 1 below summarizes the Net-Zero Scenario modeling results by sector. The most significant emissions reductions potential is from the transportation sector, accounting for 52% of cumulative emissions reductions, followed by industrial improvements at 30%. This is shown in more detail in Figure 15, which breaks down the emissions reductions by sector and target area, which will be discussed further in the subsequent sections.

Table 4. Net-Zero Scenario modeling results summary.

SECTOR	GHG REDUCTION (MTCO ₂ E) RELATIVE TO 2050 NO NEW ACTION SCENARIO	CONTRIBUTION TO CUMULATIVE EMISSIONS REDUCTIONS (2019-2050)
Industry	462	30%
Buildings	172	15%
Transportation	633	52%
Waste Diversion and Reduction	70	3%
TOTAL	1,337	

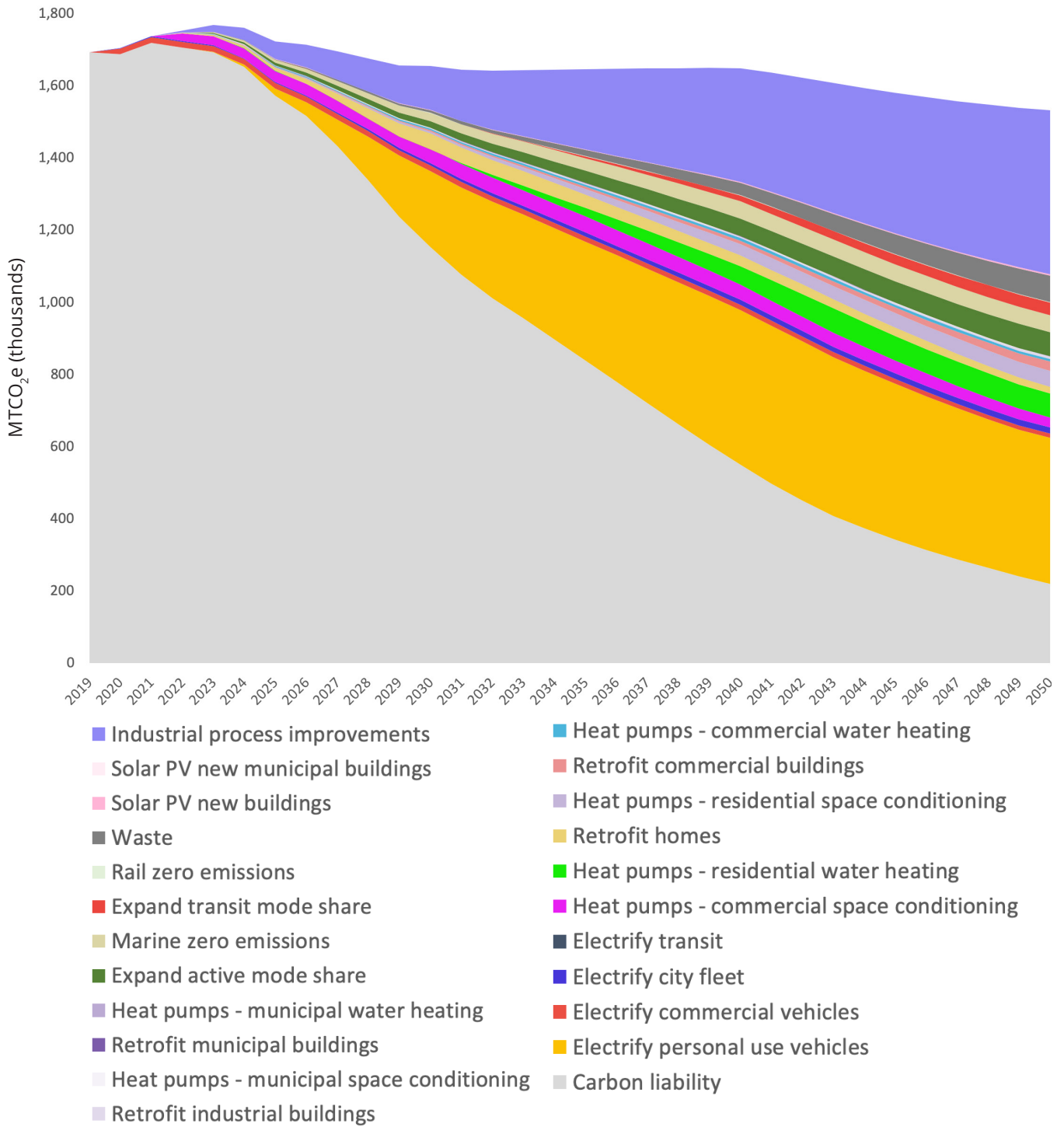


Figure 15. Scenario emissions and emissions reductions wedges from the Net-Zero targets.

NET-ZERO SCENARIO ENERGY AND EMISSIONS

The Net-Zero Scenario results in total energy decreases of 43% from 2019 to 2050, while emissions decrease by 89% (Figure 16). Figure 17 shows that by 2050, industry is responsible for 30% of Tacoma’s emissions, while waste is responsible for 37%. Thirty three percent of emissions in 2050 come from residual fossil fuels used in residential, commercial, and municipal buildings, as well as from vehicles, trains, and marine vessels that have not yet been switched to zero-carbon sources. For Tacoma to reach its net-zero target, these remaining emissions need to be addressed through additional actions such as: switching out remaining carbon-emitting technologies being used in buildings and transportation, capturing landfill emissions, and sequestering carbon through carbon capture and storage technologies as well as nature-based solutions.

A steep decline in emissions until 2030 (Figure 16, right) is a key component of the Net-Zero Scenario. This is needed in order for Tacoma to maximize cost savings from energy and emissions reductions, to put itself on track to achieve its target, to avoid the need for even more drastic measures to reduce emissions in the future, and to decrease the risk of catastrophic climate change.

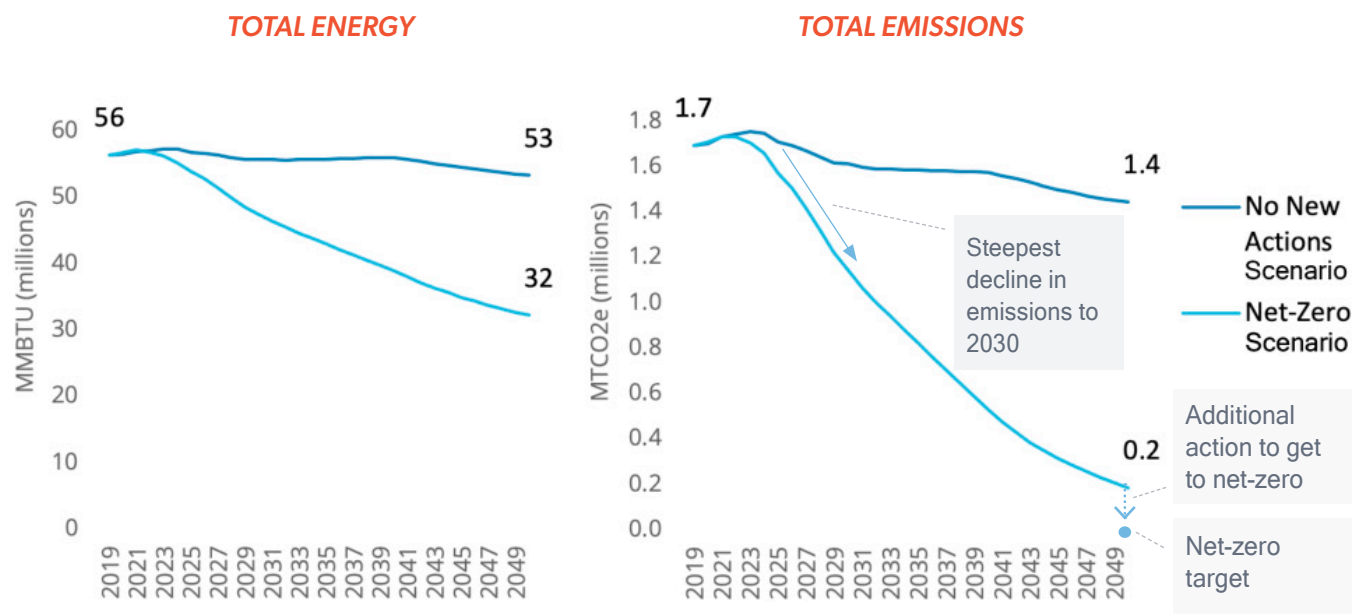


Figure 16. Projected yearly energy use (left) and emissions (right) for the Net-Zero and No New Actions Scenarios, 2019-2050.

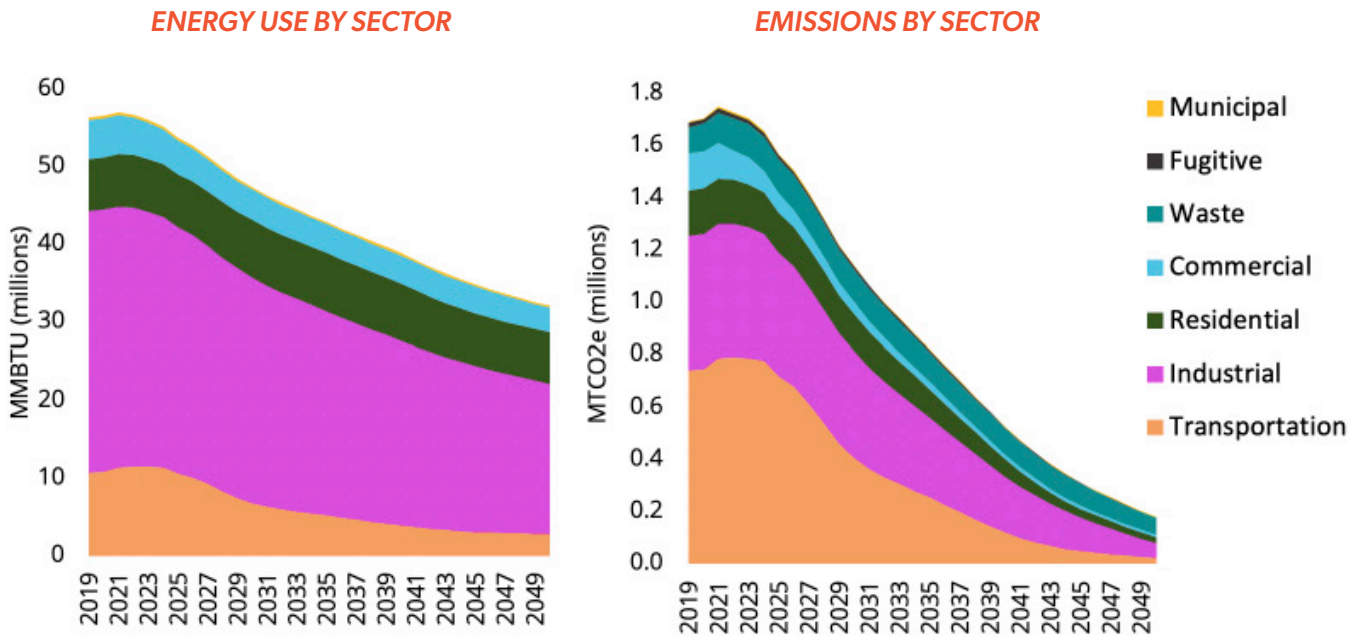


Figure 17. Projected community energy use and emissions by sector, 2019-2050.

Table 5. Net-Zero Scenario energy consumption (MMBTU) by sector, 2019 and 2050.

	2019 (MMBTU)	SHARE OF TOTAL 2019	2050 (MMBTU)	SHARE OF TOTAL 2050	% CHANGE 2019-2050
TOTAL (MMBTU) >	56,324,924		32,132,265		-43%
Industrial	33,560,446	60%	19,275,683	60%	-43%
Transportation	10,760,886	19%	2,852,814	9%	-73%
Commercial	5,054,647	9%	3,205,598	10%	-37%
Residential	6,619,932	12%	6,564,560	20%	-1%
Municipal	329,013	1%	233,611	1%	-29%

Table 6. Net-Zero Scenario emissions by sector, 2019 and 2050.

	2019 (MTCO2E)	SHARE OF TOTAL 2019	2050 (MTCO2E)	SHARE OF TOTAL 2050	% CHANGE 2019-2050
TOTAL (MTCO2E) >	1,691,149		181,187		-89%
Transportation	743,150	44%	24,857	14%	-97%
Industrial	511,021	30%	53,956	30%	-89%
Residential	173,742	10%	22,666	13%	-87%
Commercial	142,110	8%	9,265	5%	-93%
Waste	100,085	6%	67,119	37%	-33%
Fugitive	17,986	1%	930	1%	-95%
Municipal	3,055	0%	2,395	1%	-22%

INDUSTRY

2050 NET-ZERO SCENARIO ASSUMPTIONS	2050 GHG REDUCTION (MTCO2E) RELATIVE TO NO NEW ACTIONS	CONTRIBUTION TO CUMULATIVE EMISSIONS REDUCTIONS (2019-2050)
<ul style="list-style-type: none"> • 2% per year general efficiency improvements to industry • 75% decrease in refining and mining to reflect reduced demand • Fuel switching to electricity in 50% of process heating, 100% of machine drives, and 98% of building heating and cooling in industry by 2050; remainder is hydrogen 	462	30%

EMISSIONS

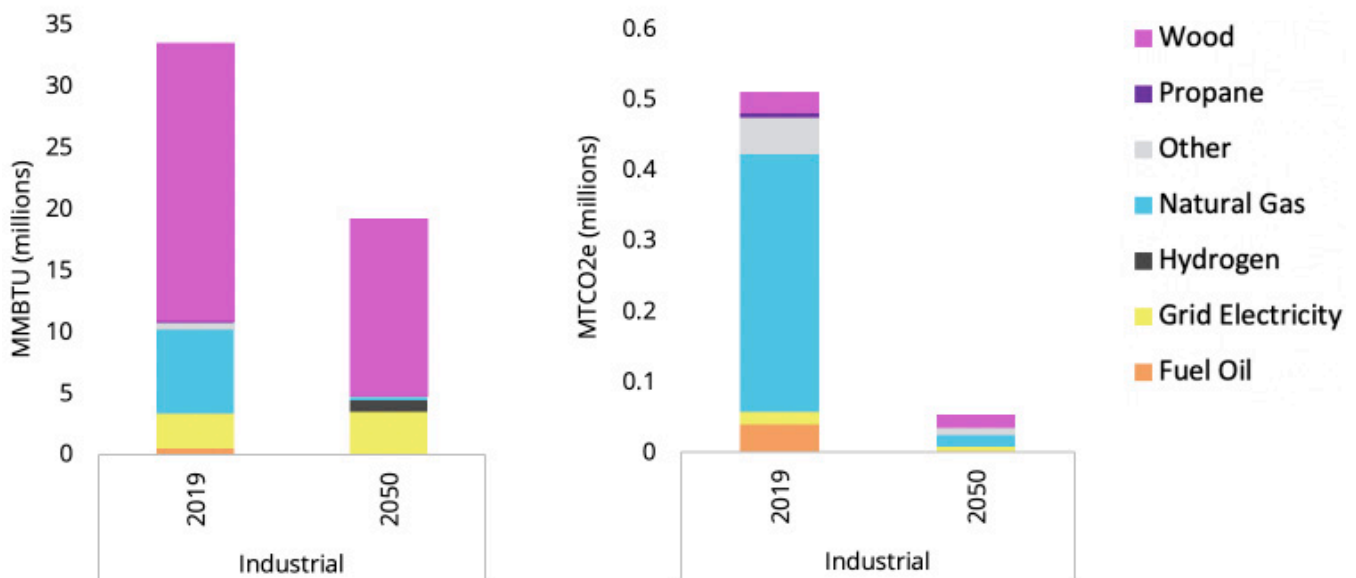


Figure 18. Industrial energy use and emissions by fuel, 2019 and 2050.

Industrial emissions are significantly reduced in the Net-Zero Scenario, by 89% from 2019 to 2050. These are achieved through efforts made across Tacoma's industrial sector that collectively lead to energy and emissions reductions. Efforts include efficiency improvements alongside fuel switching from fossil fuels to electricity and green hydrogen for process heating, machine drives, and building heating and cooling to nearly eliminate fossil fuel-based emissions. By 2050, industry accounts for 30% of Tacoma's emissions, 35% of which are from wood (pulp and paper mill), 31% from natural gas, 20% from other fossil fuels, and 13% from grid electricity.

BUILDINGS

NET-ZERO SCENARIO ASSUMPTIONS	2050 GHG REDUCTION (MTCO2E) RELATIVE TO NO NEW ACTIONS	CONTRIBUTION TO CUMULATIVE EMISSIONS REDUCTIONS (2019-2050)
<ul style="list-style-type: none"> • 100% of new buildings are built to net zero emissions standards by 2030 • By 2050, 5% of new residential buildings are single family, dwelling sizes decrease by 15% • Decrease sqft floorspace per employee by 42% • 98% of existing commercial buildings built before 2020 are retrofit to passive house standards by 2050; • 20% of existing industrial buildings built before 2020 are retrofit to passive house standards by 2050; • 98% of systems are converted to air source heat pumps by 2050 • No new natural gas in new buildings from 2020 onwards 	172	15%

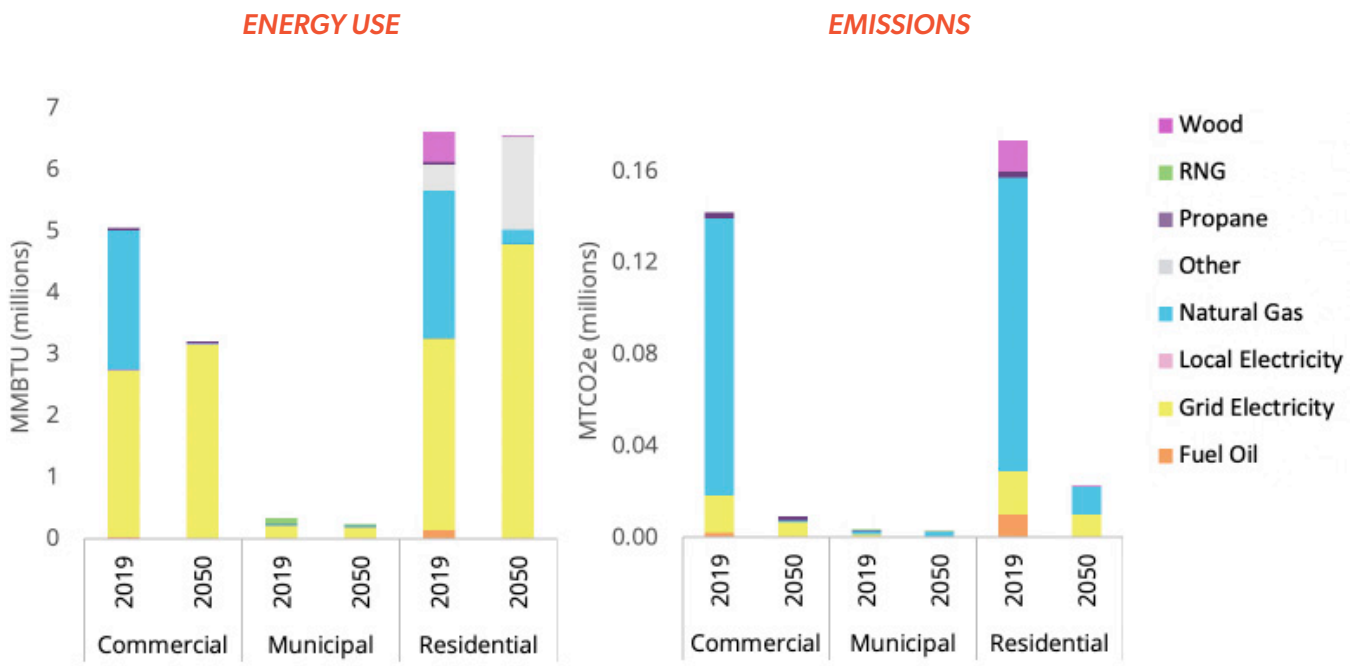


Figure 19. Buildings energy use and emissions by sector and fuel, 2019 and 2050.

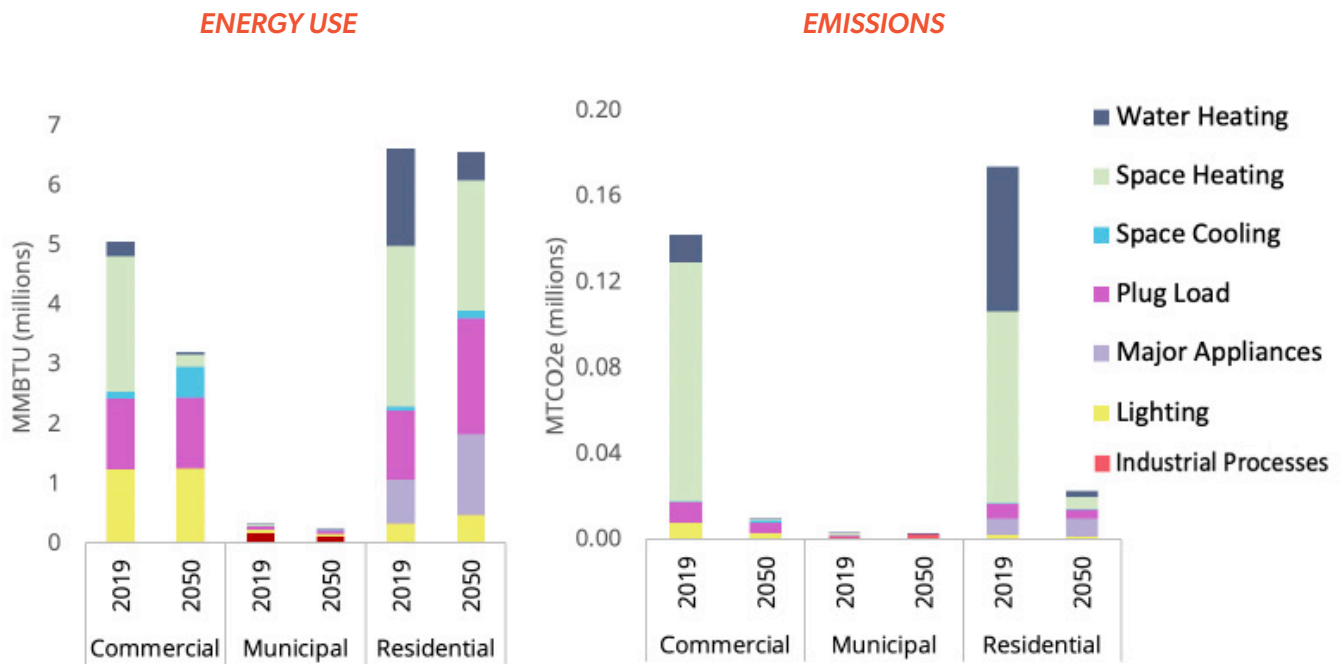


Figure 20. Building energy use by sector and end use, 2019 and 2050.

Figures 19 and 20 show energy use and emissions from buildings in the Net-Zero Scenario by fuel type and end use, respectively. Buildings’ emissions decrease by 89% overall, with commercial buildings decreasing by 93%, municipal by 22%, and residential by 87%. As space and water heating are responsible for the majority of building emissions in 2019 (nearly 90%), switching from fossil fuel-based heating systems to electric heat pumps represents the greatest opportunity for emissions reductions from buildings in Tacoma. Space cooling, which represents a smaller portion of Tacoma's energy use and emissions from buildings will also improve with the addition of heat pumps, however, this is overweighted by increased cooling demands as summer temperatures increase due to anticipated climate change. Increasing envelope efficiencies remain an important step in this effort to mitigate grid electricity consumption and demand as new systems are brought online.

TRANSPORTATION

2050 NET-ZERO SCENARIO ASSUMPTIONS	2050 GHG REDUCTION (MTCO2E) RELATIVE TO NO NEW ACTIONS	CONTRIBUTION TO CUMULATIVE EMISSIONS REDUCTIONS (2019-2050)
<p>ELECTRIC VEHICLES (EV)</p> <ul style="list-style-type: none"> • 100% of new personal vehicles sales are EV by 2030 • 100% new sales EV by 2030 for light-duty, 50% hydrogen/50% EV for new heavy duty sales by 2050 	444	37%
<p>TRANSIT AND TRAVEL BEHAVIOR</p> <ul style="list-style-type: none"> • Improve mode shares to reach 15% biking, 15% walking, and 19% transit by 2050 • Commercial vehicle strategies to reduce last mile delivery result in 15% reduction in VMT from 2020 by 2050 • 25% reduction in commuting due to increased work-from-home 	140	11%
<p>RAIL/MARINE</p> <ul style="list-style-type: none"> • All marine terminals are using shore power by 2040, and net-zero by 2050 • Rail fuel switching and/or efficiency improvements result in 100% emissions reductions by 2050; Alternative vehicles are 50% hydrogen/50% electric 	49	4%
TOTAL	633	52%

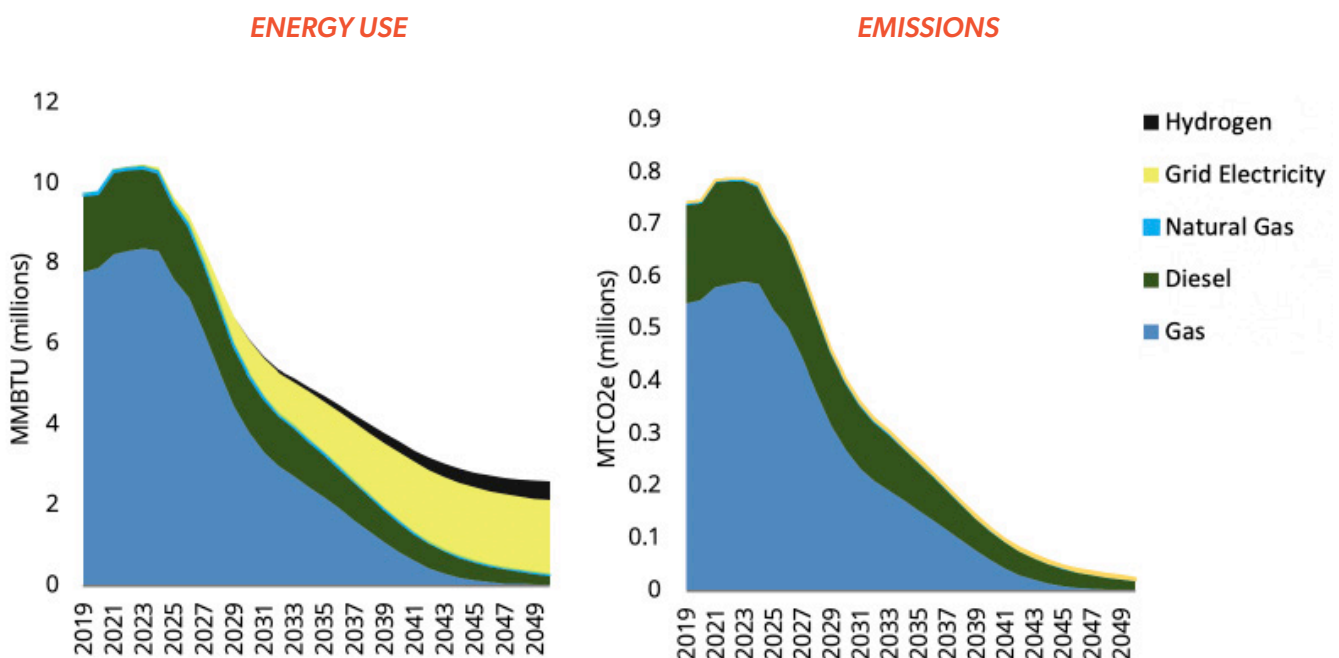


Figure 21. Transportation energy use and emissions, 2019-2050. No New Actions Scenario (top) and Net-Zero Scenario (bottom).

Transportation energy decreases by 73% and emissions by 97% in the Net-Zero Scenario. Figure 21 shows the near-elimination of gasoline as commercial and personal use internal combustion engine vehicles are replaced by electric and green hydrogen-based ones. This action alone is responsible for 37% of Tacoma’s modeled emissions reductions from 2019-2050. The majority of transportation emissions remaining in 2050 are from diesel used in heavy trucks, which the City anticipates will be more difficult to influence/control.

Vehicle electrification alone is responsible for 37% of Tacoma's total cumulative emissions reductions from 2019 to 2050 in the Net-Zero Scenario over the No New Actions Scenario.

The figures below show improvements to mode shares for internal trips in Tacoma, where personal vehicle use is reduced from 90% to 51% of trips. The lower two figures show trip distances and mode shares. In 2050 there are more miles traveled in Tacoma, due to a greater population, however, the uptake of active transportation and transit means that there are fewer personal use vehicle miles traveled overall by 2050. One item to note is that the modeling follows an accounting methodology that calculates all trips starting and ending in Tacoma, as well as half the distance of trips that start or end outside of Tacoma. This methodology does not calculate trips passing through Tacoma, which the City has less control over, however, .

By 2050, diesel from heavy trucks is responsible for 74% of emissions, with 17% coming from grid electricity.

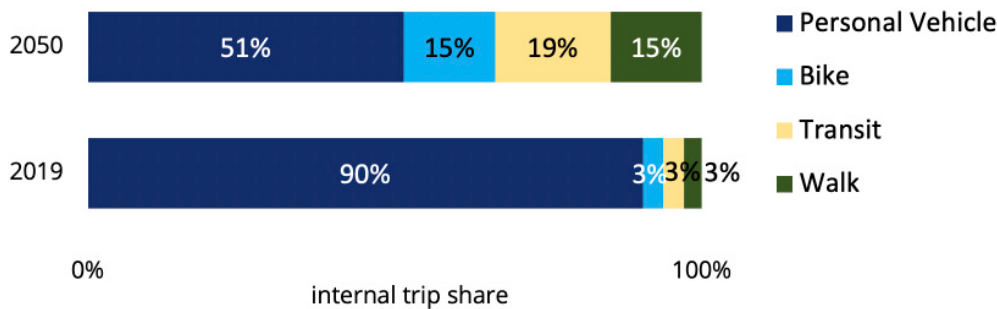


Figure 22. Mode shares for internal trips, Net-Zero Scenario, 2019 and 2050.

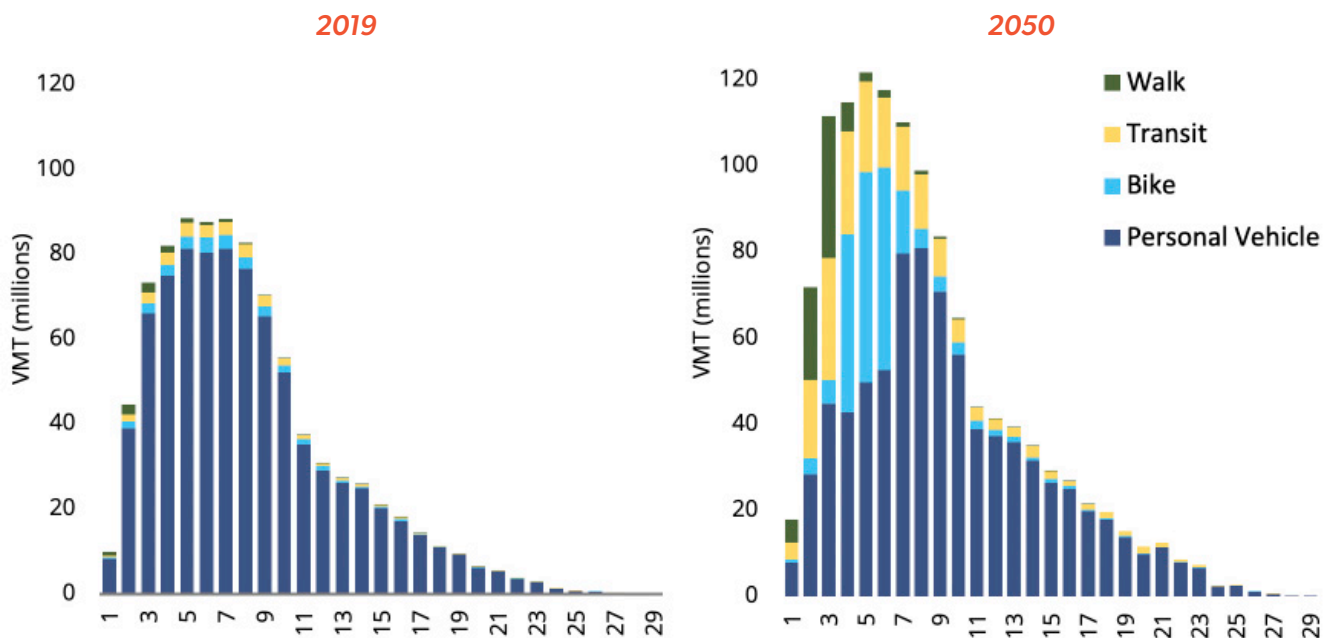


Figure 23. Vehicle miles traveled by trip distance and mode share in the Net-Zero Scenario, 2019 (left) and 2050 (right).

WASTE

NET-ZERO SCENARIO ASSUMPTIONS	2050 GHG REDUCTION (MTCO2E) RELATIVE TO NO NEW ACTIONS	CONTRIBUTION TO CUMULATIVE EMISSIONS REDUCTIONS (2019-2050)
<ul style="list-style-type: none"> Per capita waste generation reduces by 2% (of 2019 rate) each year to 2050 95% diversion from landfill by 2050 Increase methane capture and flaring to 100% by 2050 	70	3%

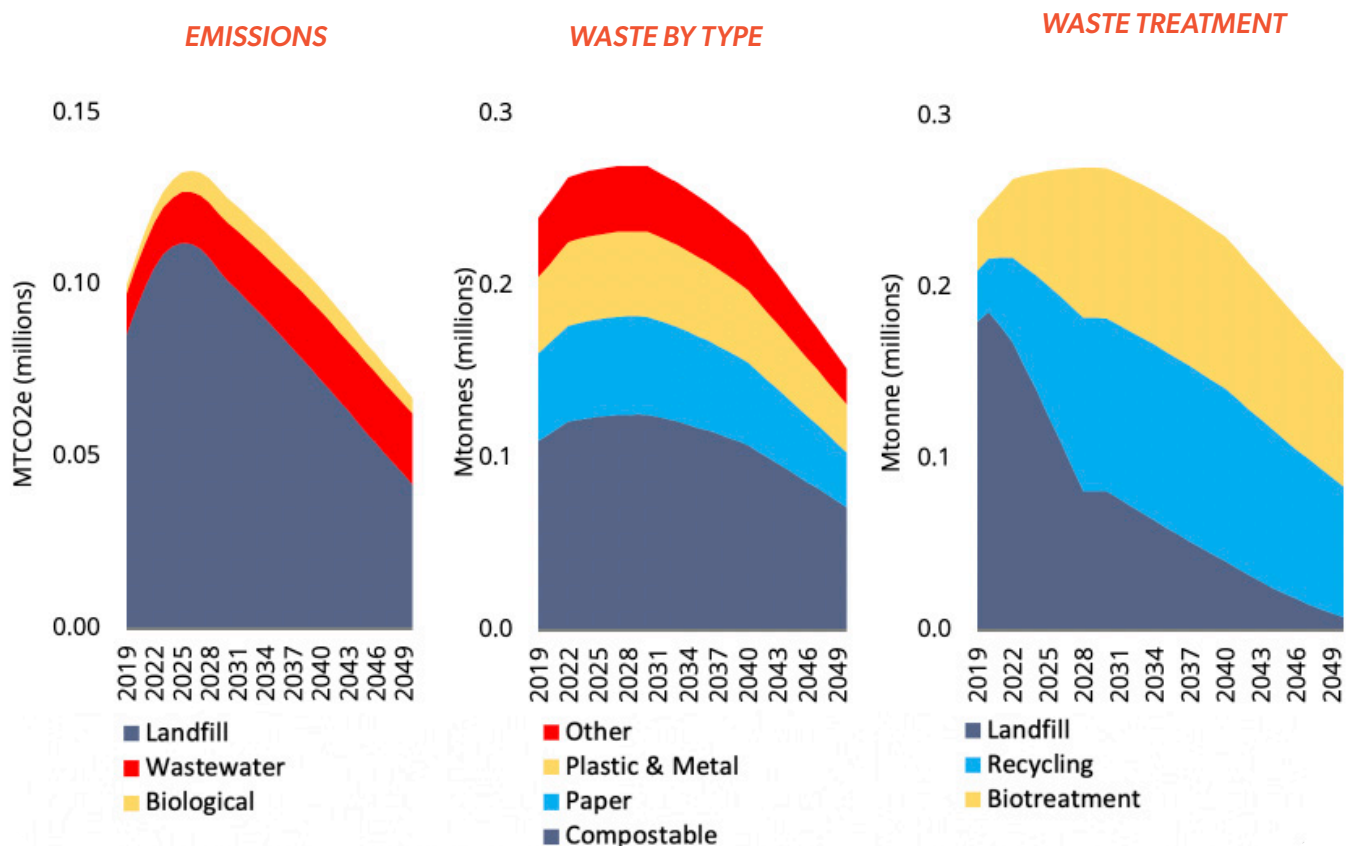


Figure 24. Emissions from waste (left), waste tonnage by type (middle), and waste treatment (right), 2019-2050.

Waste emissions decrease by 33% from 2019 to 2050 under the Net-Zero Scenario. Waste generation increases with population growth until 2028, after which point reduction efforts and a reduced rate of population growth cause it to decline. Increases in diversion from landfill and methane capture and flaring further reduce emissions, leaving 67,000 MtCO2e of emissions from waste in Tacoma by 2050.

ENERGY

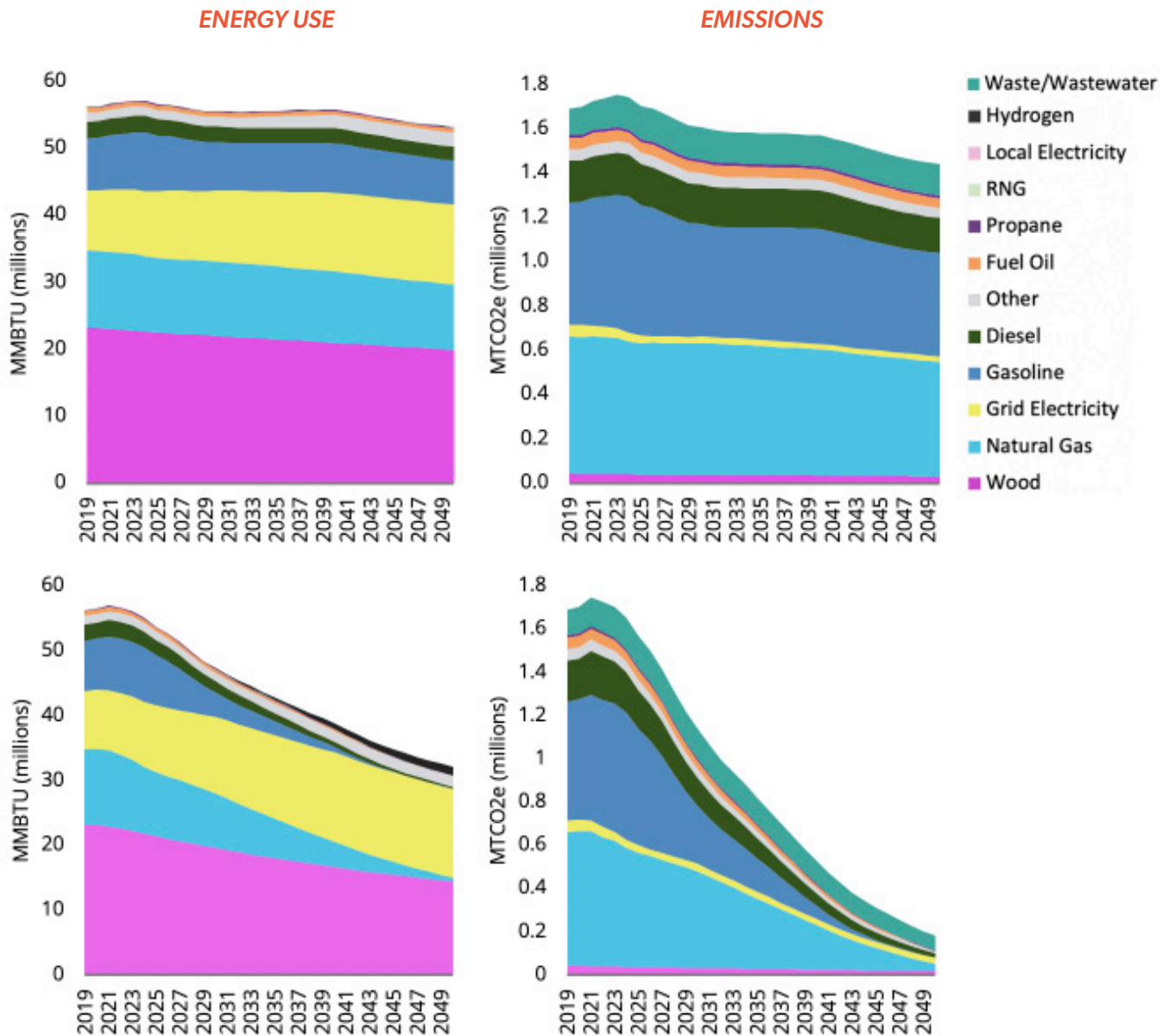


Figure 25. City-wide energy use (left) and emissions (right) by fuel type, 2019-2050. No New Actions Scenario is shown on top, and the Net-Zero Scenario on the bottom.

Figure 25 shows the comparison of energy use by fuel type for the Net-Zero Scenario (bottom) versus the No New Actions Scenario (top). Emissions reductions of 89% are achieved in the Net-Zero Scenario through efforts to **1) reduce** energy use and consumption (for example, improved travel behaviors, smaller building sizes, waste reduction), **2) improve** efficiency (for example, building retrofits, industrial technologies), and **3) switch** to carbon-free end use technologies (such as heat pumps, electric vehicles). This paradigm is particularly relevant to concerns about electrical grid capacity. Much of this concern can be mitigated if reductions and efficiency gains are made prior to switching fuels. Through these efforts, the Net-Zero Scenario results in just a 17% increase in electricity consumption over the No New Actions Scenario by 2050 (Figure 26). The use of electric vehicles can help to mitigate impacts on peak electricity demand, as vehicles

that are charged overnight can actually serve as batteries for building energy when not being used during the day.

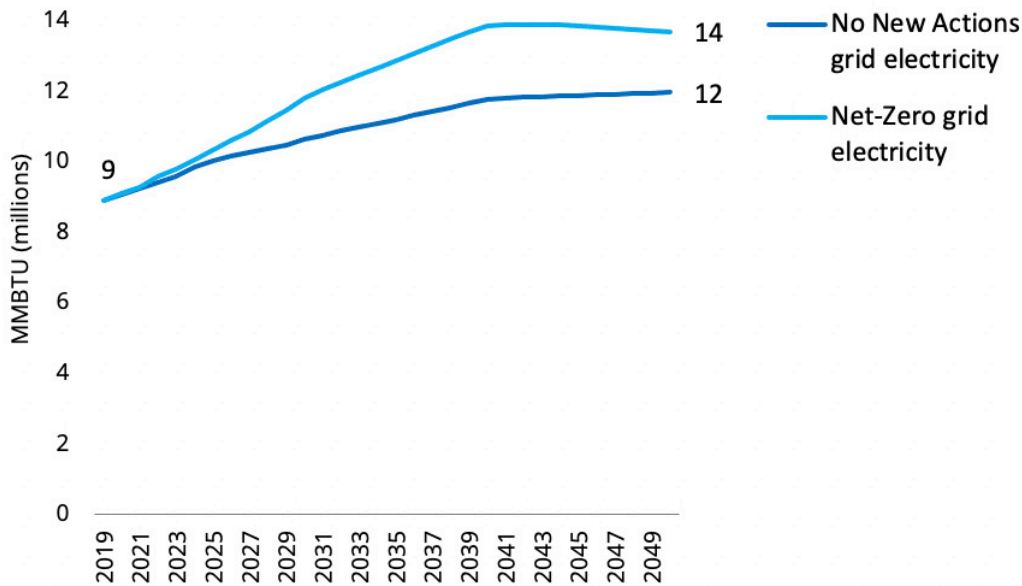


Figure 26. Grid electricity use in the No New Actions Scenario versus Net-Zero Scenario, 2019-2050.

DATA AND ASSUMPTIONS

Table 7. Key data and assumptions for the No New Actions Scenario. Note that the year 2019 was used for the base year. All assumptions and sources were reviewed with City Staff and Steering Committee members.

NO NEW ACTIONS SCENARIO ASSUMPTION		SOURCE
DEMOGRAPHICS		
Population & employment		
Population	Population grows according to City projections	Base year households from federal census 2019 American Community Survey for base year population and employment
		Population and employment growth to 2050 from City Planning for mixed use centers traffic zones (includes 35% decrease from regional projections); Growth in non mixed use center traffic zones allocated in proportion to growth in those zones in the Land Use Vision V2 projections

NO NEW ACTIONS SCENARIO ASSUMPTION		SOURCE
Employment	Employment grows according to City projections	
BUILDINGS		
New buildings growth		
Residential buildings	Buildings added alongside population growth; building types added based on zoning district of zone where population growth is happening Assumed half of new dwellings were replacing demolitions, and half were new builds	2019 buildings by type and zone from Pierce County Assessor (2019 ACS for control check) Housing type proportions (i.e. proportions of single family, semi-detached, townhouses, and apartments) by zone from the Land Use Vision Growth Projections and Urban Form Element One Tacoma Plan Assumption for half new builds and half replacements from Tacoma Planning
Non-residential buildings	Growth based on projected growth in employment	
New buildings energy performance		
Residential	2019-2020 100% of all new construction built to 2015 WSEC Used Washington average residential Energy Use Intensity (EUI) Code improvement schedules: 2021-2024: 2018 WSEC After 2024, improvements approximately every 4 years starting at 6% and gradually decreasing Performance under code improves by: 6% every code change, from 2018-2020, 2021-2024, 2025-2030 inclusive 3% every code change, from 2031-2034 2035-2038, 2039-2043 2% every code change thereafter 2044-2047, 2048-2050	2015 IECC/WA State Energy Code (WSEC) current code 2018 IECC/WSEC effective Feb. 1, 2021 2021 IECC/WSEC effective 2024 Residential New Construction Code Study (Northwest Energy Efficiency Alliance) Base year EUI for commercial and multi-res: Washing State Commercial Energy Code, Technical Roadmap

NO NEW ACTIONS SCENARIO ASSUMPTION		SOURCE
Multi-residential	Improvement steps to parallel residential	
Commercial and institutional	<p>New commercial improvement schedule- performance under code improves by: 6% every code change, from 2018-2020, 2021-2024, 2025-2030 inclusive</p> <p>3% every code change, from 2031-2034 2035-2038, 2039-2043</p> <p>2% every code change thereafter 2044-2047, 2048-2050</p>	<p>WA State Commercial Energy Code Technical Roadmap</p> <p>Washington State has set a legislative goal to reduce annual net site energy consumption for commercial buildings under the 2030 energy code by 70% relative to the 2006 Washington State Energy Code (WSEC)</p> <p>2030 Targets: Large office- 19.3 kBtu/sf Med office- 12.7 kBtu/sf Standalone retail- 17.4 kBtu/sf Secondary school- 15.9 kBtu/sf Mid-rise apt- 12.3 kBtu/sf</p>
Industrial	Industrial efficiency (minor) improvements according to U.S. Energy Information Administration (EIA) projections	Annual Energy Outlook 2020 Table 6 . Industrial Sector Key Indicators and Consumption
Existing buildings energy performance		
Residential	Existing building stock efficiency remains constant	<p>Baseline efficiency based on a combination of building archetypes, assessment data, and utility data</p> <p>The Clean Buildings Act (House Bill 1257) (Although as of Dec 2020 the EUI targets had not been announced)</p> <p>Proposed EUI targets by building type and climate zone were adopted in Oct 2020 under WAC 194-50 Table 7-2a Building Activity Site Energy Targets (EUI t1) (I-P Units) -Annex Z</p> <p>Compliance Schedule - section Z3.1 >220,000 sqft, June 2026 90,000-220,000 sqft, June 2027 50,000-220,000 sqft, June 2028</p> <p>Tacoma Power Conservation Plan 2020-2021</p>

NO NEW ACTIONS SCENARIO ASSUMPTION		SOURCE
Multi-residential	Existing building stock efficiency remains constant	
Commercial & Institutional	Existing Buildings >50,000 square feet to comply with The Clean Buildings Act starting in 2026	
Industrial	Assumed improvements same as for new industrial buildings (above) from U.S. EIA data	
End use		
	Baseline building equipment types/stocks held from 2019-2050	Residential Energy Consumption Survey (RECS) for baseline building equipment types
Space heating/	For new builds, assumed 75% of new heating systems were heat pumps; 25% natural gas	State Energy Data System (SEDS) for building equipment efficiencies
Water heating/	For stock turnover, assumed a small percentage of heat pump uptake	Tacoma Power Conservation Potential Assessment
Space cooling		Buildings energy systems simulator for baseline energy use by building/system type/fuel type (Canadian-based model, using City of Vancouver weather and buildings characteristics)
ENERGY GENERATION		
Low or zero carbon energy generation (community scale)		
Rooftop Solar PV	Existing solar photovoltaic (PV) 4127 kW (Q12021), included 569 different installations 2020-2021 Anticipated 660 net metering participants; 990 community solar participants	City provided 2019 PV Tacoma Energy Research & Development for Q12021 capacity 2020-2021 Conservation Plan p.26
Wind	None forecast	Tacoma Power 2020 Integrated Resource Plan

NO NEW ACTIONS SCENARIO ASSUMPTION		SOURCE
TRANSPORT		
Transit		
Expanded transit	<p>Transit is expanded as seen in Pierce County's Transportation Model</p> <p>Mode share 2019 / 2050 Bike 3% / 7% SOV 90% / 78% Transit 3% / 9% Walk 3% / 6%</p>	<p>Pierce County Trip Based Travel Model (EMME) trip lengths and types from 2019-2040 (home to work, school, other...)</p> <p>ClearPath for transit fuel use</p> <p>Puget Sound Regional Council, Regional Transportation Plan - Used the mode shares from this plan to adjust/calibrate the EMME model shares</p>
Electrify transit system	<p>None assumed. Note that Pierce County has a transit goal to electrify 30% of their vehicles (no date), therefore, moved this to Net Zero Scenario</p>	<p>Pierce County Transit Press Release for target electrification</p> <p>Base year (2019) transit fleet and fuel use from ClearPath</p>
Active transportation		
Cycling & walking infrastructure	<p>Active transportation infrastructure expanded as seen in Pierce County's Transportation Model</p> <p>Mode share 2019 / 2050 Bike 3% / 7% SOV 90% / 78% Transit 3% / 9% Walk 3% / 6%</p>	<p>Pierce County Trip Based Travel Model (EMME) trip lengths and types from 2019-2040</p> <p>ClearPath transit fuel use</p> <p>Puget Sound Regional Council, Regional Transportation Plan - Used the mode shares from this plan to adjust/calibrate the EMME model shares</p>
Multimodality for City Business	As above	As above
Private/personal transportation		
Electrify personal vehicles	<p>14% new sales by 2030; 23% 2050</p>	<p>EV data for Tacoma by zip code and point location saved as EV Tacoma Registration for baseline year</p> <p>EIA Energy Transportation Outlook for projected sales (Mountain Census Division)</p> <p>Note that the EIA projections were for 'alternative car sales', and EV-only numbers were in fact lower than those used for the No New Actions Scenario. Higher numbers were used, since most other national projections projected much greater numbers (for example, 28% by 2030).</p>

	NO NEW ACTIONS SCENARIO ASSUMPTION	SOURCE
Zero emissions commercial vehicles	<p>Assumed same EV penetration for light-duty vehicles as for personal vehicles</p> <p>Some electrification of heavy-duty vehicles (38% of new sales by 2050)</p> <p>Some uptake of hydrogen (12% of new sales by 2050)</p>	<p>Puget Sound Clean Air Agency July 2020 Report-</p> <ol style="list-style-type: none"> 1) All trucks zero emissions 2) Port drayage trucks all electric 3) Delivery vehicles all zero emissions <p>Note that there is no date specified for these targets.</p>
Vehicle miles traveled	<p>Personal vehicle miles traveled as seen in Pierce County's Transportation Model</p> <p>Assume that commercial vehicle miles traveled grows alongside commercial floorspace growth</p>	<p>Pierce County Trip-Based Travel Model (EMME) trip lengths and types for personal vehicle miles traveled 2019-2040</p>
Vehicle fuel efficiencies / tailpipe emission standards	<p>CAFE Fuel standards: Vehicle fuel consumption rates reflected the implementation of the U.S. Corporate Average Fuel Economy (CAFE) Fuel Standard for Light-Duty Vehicles, and Phase 1 and Phase 2 of EPA HDV Fuel Standards for Medium- and Heavy-Duty Vehicles.</p> <p>-----</p> <p>Light duty: 2015: 200gCO₂e/km 2025: 119 gCO₂e/km 2030: 105gCO₂e/km</p> <p>-----</p> <p>Heavy Duty: 20% reduction in emissions intensity by 2025 relative to 2015, 24% reduction in emissions intensity in 2030 relative to 2015</p>	<p>EPA. (2012) (CAFE standards). EPA and NHTSA set standards to reduce greenhouse gases and improve fuel economy for model years 2017-2025 cars and light trucks. Retrieved from</p>
Total vehicle ownership	<p>Personal vehicle stock growth alongside household growth</p>	<p>Household travel survey for base year vehicles per household</p> <p>Washington State 2019 vehicle registration for shares of vehicles by type (base year)</p> <p>EV data for Tacoma by zip code and point location saved as EV Tacoma Registration (overrode State registration data for EVs)</p> <p>Building growth projections from Land Use Vision used with base year vehicles per household to project future City vehicle stock</p>

NO NEW ACTIONS SCENARIO ASSUMPTION		SOURCE
Rail	Base year use held constant	Sound Transit use from Clearpath Amtrak assumed 4 trains per day going through Tacoma
Marine	Base year use held constant	Base year ferry use from ClearPath; freight use from Marine Emissions Inventory
WASTE		
Waste generation	Usage grew based on base year per capita waste generation	2015 City of Tacoma Waste Characterization Study
Waste diversion	Base year waste diversion rate 23% 2008 goal to divert 70% of solid waste by 2028	Base year (2019) diversion from Environmental Services Solid Waste Management Team Sustainable Material Management Plan
Municipal water	Facilities' energy use increased with population growth	Tacoma Water
Waste treatment	Current capture and flaring rates held constant (71%)	Methane recovered/flared from ClearPath
Wastewater	Volume grows with population 100% digester gas is captured with some flared and some used for boilers After 2021, some of the captured gas will be used as renewable natural gas (RNG) for vehicles	Base year data from City and ClearPath
INDUSTRY		
Industrial efficiencies	Base year efficiencies held constant	ClearPath to calibrate industrial fuel use Efficiencies from default values from North American Energy System Simulator model
EMISSIONS FACTORS		
Grid emissions factor	Assumed 2020 value increased by 75%	Mid-range increase based on modeled portfolios out to 2040, described in the Tacoma Public Utilities Integrated Resource Plan (page 113) Tacoma Power 2020 Integrated Resource Plan p.62 Figure 47 (updated Jan 2021)

GPC INVENTORY TABLES, 2019

The inventory table starting on the following page was produced in accordance with the accounting and reporting standards of the [Global Protocol for Community Scale Greenhouse Gas Inventories](#) (GPC). Below is a series of tables that briefly summarize the formats and specifications for GPC-compliant GHG inventories. For more details, please see *Chapter 4 - Reporting Requirements* of the GPC.

Table 8. Scopes for GHG inventory reporting according to the GPC.

Scope	Definition
1	GHG emissions from sources located within the city boundary.
2	GHG emissions occurring as a consequence of the use of grid-supplied electricity, heat, steam and/or cooling within the city boundary.
3	All other GHG emissions that occur outside the city boundary as a result of activities taking place within the city boundary.

Table 9. GPC's GHG inventory reporting frameworks. This inventory covers BASIC+ and follows the scopes framework.

Reporting Approach	Definition
City-induced framework	
BASIC	Stationary energy, in-boundary transportation, in-boundary generated waste.
BASIC+	BASIC sources, plus IPPU (industrial processes and product use), AFOLU (agriculture, forestry and other land use), transboundary transportation, and energy transmission and distribution losses.
Scopes framework	
General	Emissions are divided into scopes 1-3.
Territorial	Emissions generated within the city (scope 1 only).

Table 10. Notation key for missing data, and color codes for reporting frameworks.

Notation	Reason for exclusion	Row color	
IE	Included elsewhere (in another category)		Sources required for BASIC reporting
NE	Not estimated (reason provided)	+	Sources required for BASIC+ reporting
NO	Not occurring within the inventory boundary		Sources included in Other Scope 3
			Sources required for Scope 1 (territorial) total but not for BASIC/BASIC+ reporting

Table 11. Community-wide GPC inventory for Tacoma, 2019.

					IN TONS			
GPC REF NO.	SCOPE	GHG EMISSIONS SOURCE	INCLUSION	REASON FOR EXCLUSION (IF APPLICABLE)	CO2	CH4	N2O	TOTAL CO2E
I STATIONARY ENERGY SOURCES								
I.1 Residential buildings								
I.1.1	1	Emissions from fuel combustion within the city boundary	Yes		140,931	12,774	1,215	154,921
I.1.2	2	Emissions from grid-supplied energy consumed within the city boundary	Yes		18,215			18,215
I.1.3	3	Emissions from transmission and distribution losses from grid-supplied energy consumption	Yes		606			606
I.2 Commercial and institutional buildings/facilities								
I.2.1	1	Emissions from fuel combustion within the city boundary	Yes		127,340	84	140	127,563
I.2.2	2	Emissions from grid-supplied energy consumed within the city boundary	Yes		17,034			17,034
I.2.3	3	Emissions from transmission and distribution losses from grid-supplied energy consumption	Yes		567			567
I.3 Manufacturing industry and construction								
I.3.1	1	Emissions from fuel combustion within the city boundary	Yes		463,191	4,570	25,976	493,737
I.3.2	2	Emissions from grid-supplied energy consumed within the city boundary	Yes		16,728			16,728
I.3.3	3	Emissions from transmission and distribution losses from grid-supplied energy consumption	Yes		557			557
I.4 Energy industries								
I.4.1	1	Emissions from energy used in power plant auxiliary operations within the city boundary	No	NO				
I.4.2	2	Emissions from grid-supplied energy consumed in power plant auxiliary operations within the city boundary	No	NO				

					IN TONS			
GPC REF NO.	SCOPE	GHG EMISSIONS SOURCE	INCLUSION	REASON FOR EXCLUSION (IF APPLICABLE)	CO2	CH4	N2O	TOTAL CO2E
I.4.3	3	Emissions from transmission and distribution losses from grid-supplied energy consumption in power plant auxiliary operations	No	NO				
I.4.4	1	Emissions from energy generation supplied to the grid	No	NO				
I.5	Agriculture, forestry and fishing activities							
I.5.1	1	Emissions from fuel combustion within the city boundary	No	NO				
I.5.2	2	Emissions from grid-supplied energy consumed within the city boundary	No	NO				
I.5.3	3	Emissions from transmission and distribution losses from grid-supplied energy consumption	No	NO				
I.6	Non-specified sources							
I.6.1	1	Emissions from fuel combustion within the city boundary	No	NO				
I.6.2	2	Emissions from grid-supplied energy consumed within the city boundary	No	NO				
I.6.3	3	Emissions from transmission and distribution losses from grid-supplied energy consumption	No	NO				
I.7	Fugitive emissions from mining, processing, storage, and transportation of coal							
I.7.1	1	Emissions from fugitive emissions within the city boundary	No	NO				
I.8	Fugitive emissions from oil and natural gas systems							
I.8.1	1	Emissions from fugitive emissions within the city boundary	Yes		11	17,975		17,986

IN TONS								
GPC REF NO.	SCOPE	GHG EMISSIONS SOURCE	INCLUSION	REASON FOR EXCLUSION (IF APPLICABLE)	CO2	CH4	N2O	TOTAL CO2E
II TRANSPORTATION								
II.1 On-road transportation								
II.1.1	1	Emissions from fuel combustion for on-road transportation occurring within the city boundary	Yes		515,007	945	3,179	519,130
II.1.2	2	Emissions from grid-supplied energy consumed within the city boundary for on-road transportation	Yes		61			61
II.1.3	3	Emissions from portion of transboundary journeys occurring outside the city boundary, and transmission and distribution losses from grid-supplied energy consumption	Yes		172,848	254	1,299	174,401
II.2 Railways								
II.2.1	1	Emissions from fuel combustion for railway transportation occurring within the city boundary	Yes		894	2	109	1,005
II.2.2	2	Emissions from grid-supplied energy consumed within the city boundary for railways	No	NO				
II.2.3	3	Emissions from portion of transboundary journeys occurring outside the city boundary, and transmission and distribution losses from grid-supplied energy consumption	No	NO				
II.3 Water-borne navigation								
II.3.1	1	Emissions from fuel combustion for waterborne navigation occurring within the city boundary	Yes		43,206	82	5,265	48,553
II.3.2	2	Emissions from grid-supplied energy consumed within the city boundary for waterborne navigation	No	NE (insufficient data)				

IN TONS								
GPC REF NO.	SCOPE	GHG EMISSIONS SOURCE	INCLUSION	REASON FOR EXCLUSION (IF APPLICABLE)	CO2	CH4	N2O	TOTAL CO2E
II.3.3	3	Emissions from portion of transboundary journeys occurring outside the city boundary, and transmission and distribution losses from grid-supplied energy consumption	No	NE (insufficient data)				
II.4	Aviation							
II.4.1	1	Emissions from fuel combustion for aviation occurring within the city boundary	No	NO				
II.4.2	2	Emissions from grid-supplied energy consumed within the city boundary for aviation	No	NO				
II.4.3	3	Emissions from portion of transboundary journeys occurring outside the city boundary, and transmission and distribution losses from grid-supplied energy consumption	No	NO				
II.5	Off-road							
II.5.1	1	Emissions from fuel combustion for off-road transportation occurring within the city boundary	No	NE (insufficient data)				
II.5.2	2	Emissions from grid-supplied energy consumed within the city boundary for off-road transportation	No	NE (insufficient data)				
III	WASTE							
III.1	Solid waste disposal							
III.1.1	1	Emissions from solid waste generated within the city boundary and disposed in landfills or open dumps within the city boundary	Yes			85,540		85,540

					IN TONS			
GPC REF NO.	SCOPE	GHG EMISSIONS SOURCE	INCLUSION	REASON FOR EXCLUSION (IF APPLICABLE)	CO2	CH4	N2O	TOTAL CO2E
III.1.2	3	Emissions from solid waste generated within the city boundary but disposed in landfills or open dumps outside the city boundary	No	IE				
III.1.3	1	Emissions from waste generated outside the city boundary and disposed in landfills or open dumps within the city boundary	No	NO				
III.2	Biological treatment of waste							
III.2.1	1	Emissions from solid waste generated within the city boundary that is treated biologically within the city boundary	Yes			621	1,998	2,619
III.2.2	3	Emissions from solid waste generated within the city boundary but treated biologically outside of the city boundary	No	NO				
III.2.3	1	Emissions from waste generated outside the city boundary but treated biologically within the city boundary	No	NO				
III.3	Incineration and open burning							
III.3.1	1	Emissions from solid waste generated and treated within the city boundary	No	NO				
III.3.2	3	Emissions from solid waste generated within the city boundary but treated outside of the city boundary	No	NO				
III.3.3	1	Emissions from waste generated outside the city boundary but treated within the city boundary	No	NO				
III.4	Wastewater treatment and discharge							
III.4.1	1	Emissions from wastewater generated and treated within the city boundary	Yes				11,926	11,926

					IN TONS			
GPC REF NO.	SCOPE	GHG EMISSIONS SOURCE	INCLUSION	REASON FOR EXCLUSION (IF APPLICABLE)	CO2	CH4	N2O	TOTAL CO2E
III.4.2	3	Emissions from wastewater generated within the city boundary but treated outside of the city boundary	No	NO				
III.4.3	1	Emissions from wastewater generated outside the city boundary	No	NO				
IV INDUSTRIAL PROCESSES AND PRODUCT USE (IPPU)								
IV.1	1	Emissions from industrial processes occurring within the city boundary	No	NE (insufficient data)				
IV.2	1	Emissions from product use occurring within the city boundary	No	NE (insufficient data)				
V AGRICULTURE, FORESTRY AND LAND USE (AFOLU)								
V.1	1	Emissions from livestock within the city boundary	No	NO				
V.2	1	Emissions from land within the city boundary	No	NE (insufficient data)				
V.3	1	Emissions from aggregate sources and non-CO2 emission sources on land within the city boundary	No	NO				
VI OTHER SCOPE 3								
VI.1	3	Other Scope 3	No	NE				
							TOTAL	1,691,149

TACOMA COMMUNITY CLIMATE ACTION PLAN



Section 2

SECTION 2, NEXT MOVES


IMPLEMENTATION ACTIONS

We have developed 46 near-term, high impact Actions for the City to pursue by 2024. There is no one solution to reducing our emissions. The actions in this section are considered high-impact because they:

1. Contribute to significant GHG reductions and/or climate resilience;
2. Center current and historically underserved voices in policy design, development, and implementation;
3. Deliver significant co-benefits, such as improved health, safety, economy and jobs, and affordable housing, that lead to greater prosperity and endure for the long term.

We need to implement all of these actions to achieve our emissions goal, the many co-benefits, and significant cost-savings. We have highlighted 10 actions that will **jump-start implementation** of the full Plan, these are bolded in the following table. All actions provide opportunities to inform, educate, and engage with our communities. We must use these and other tools available to us, like regulations and incentives, to be effective. All actions must contribute to our anti-racist, just transition away from fossil fuels, and must be implemented to increase benefits to and decrease burdens for our BIPOC and other frontline communities.








Many of these actions will require further City Council action, whether that be approving funding or developing and approving legislation. This is just the list of prioritized high impact actions that will help the City Council achieve our climate goals. But implementing these actions will require additional authorization from our leaders. For each action, we have set 2024 Outputs and identified lead City departments, supporting departments and key partners, relevant Tacoma City Council priorities, other City plans and policies the action relates to, the estimated cost to implement, and whether it is a one-time or on-going cost. Additionally, we have chosen to highlight action links to three important topics - job opportunities, climate adaptation, and equity. These links, where relevant, are represented by symbols in the far right column of the Implementation Actions Table as: 💰 (jobs), 🌱 (adaption), and ⚖️ (equity).

#	STRATEGY FOR A BETTER TACOMA	ACTION	2024 OUTPUT	LEAD DEPT	COUNCIL PRIORITY	CITY COST ESTIMATE	JOB \$
				SUPPORTING DEPTS / KEY PARTNERS	TIES TO OTHER PLANS, POLICIES	ONE-TIME OR ONGOING ANNUAL COST	ADAPTATION 





NATURAL SYSTEMS AND LOCAL FOOD


Tacoma’s natural systems not only provide shade and cooling during extreme heat events, they help to filter water and reduce the severity of flooding events, improve air quality, and improve residents’ mental health. Strengthening and expanding local food and farms supports food security and resilience, reduces the energy and emissions required to transport food, and increases healthy food options in the city.

3	Together	Fund community food-growing or food-sharing projects, including community gardens, food forests, orchards, farms, or food rescue efforts; use suitable right-of-way and other public properties to address land access issues.	10 community food projects are funded with 2/3 of funding going to low or very low opportunity neighborhoods	Office of Environmental Policy & Sustainability (OEPS)	Access, health, livable wage jobs, community safety	\$100,000	
				CoT Real Property Services, Harvest Pierce County, other community partners	Comprehensive Plan, Economic Development Strategic Plan, Urban Forest Management Plan	One-time	
8	Living	Update and adjust municipal code to encourage small-scale urban agriculture, community food-growing projects, private gardening, and small-scale food making businesses; develop clear information about regulations, opportunities, and project checklists.	a) Agriculture and food business regulations are improved or established	Office of Environmental Policy & Sustainability	Access, Health, Livable Wage Jobs	<\$100,000	
			b) Informational materials have been developed, published, and distributed	Planning & Development Services Harvest Pierce County	Comprehensive Plan, Economic Development Strategic Plan	One-time	 

#	STRATEGY FOR A BETTER TACOMA	ACTION	2024 OUTPUT	LEAD DEPT	COUNCIL PRIORITY	CITY COST ESTIMATE	JOB \$
				SUPPORTING DEPTS / KEY PARTNERS	TIES TO OTHER PLANS, POLICIES	ONE-TIME OR ONGOING ANNUAL COST	ADAPTATION EQUITY  
18	Breathing	Integrate existing City asset management programs with urban forestry and natural system management strategies, to align project planning, construction, and maintenance efforts.	a) 5,000 City trees and natural systems classified and recorded as capital assets each year	Stormwater Mgmt	Access to Infrastructure	<\$100,000	
			b) Complete Watershed Action Plan prioritizing opportunities for tree and natural systems solutions	OEPS, Public Works, Metro Parks Tacoma, other community partners	Urban Forest Management Plan	Ongoing	
23	Breathing	Designate 8 FTEs, including existing staff and/or new hires, for management and care of Tacoma's urban forests. This includes a new arborist crew and new landscape architect.	8 FTEs (4 new) working on urban forestry initiatives	Office of Environmental Policy & Sustainability		\$500,000	
				Public Works, Planning & Development Services, Stormwater Mgmt, Pierce Conservation District, Metro Parks	Urban Forest Management Plan	Ongoing	
32	Opportunities	Partner to establish a job training program focusing on at-risk individuals such as young adults, recently incarcerated, and/or people experiencing homelessness, for urban forest and natural systems stewardship to facilitate the planting and/or care of 10,000 trees annually. (City-led and partnership plantings)	1st cohort of young adults trained	Office of Environmental Policy & Sustainability	Livable Wage Jobs	\$100,000 - \$500,000	  
				Stormwater Management, Metro Parks, Pierce Conservation District, other community partners	Urban Forest Management Plan	Ongoing	



#	STRATEGY FOR A BETTER TACOMA	ACTION	2024 OUTPUT	LEAD DEPT	COUNCIL PRIORITY	CITY COST ESTIMATE	JOB \$
				SUPPORTING DEPTS / KEY PARTNERS	TIES TO OTHER PLANS, POLICIES	ONE-TIME OR ONGOING ANNUAL COST	ADAPTATION 
34	Opportunities	Conduct a feasibility study for a community food hub, including a commercial kitchen, food processing, storage, and market and business space. In conducting the study, involve stakeholders, evaluate potential partnerships, consider micro-financing, and technical support approaches for new and existing food businesses.	Feasibility study is funded and stakeholders are involved	Community and Economic Development	Access, Livable Wage Jobs	\$100,000	
				Office of Environmental Policy & Sustainability, Real Property Services, Tacoma Pierce County Health Dept.	Comprehensive Plan, Economic Development Strategic Plan	One-time	
39	Prepared	Develop a climate change ready urban landscape and habitat strategy that includes: updated critical areas and biodiversity maps, inventory and analysis of high priority habitats for protections, code recommendations, goals for enhancements and new protections (purchases or easements), and public engagement.	Strategy developed	Planning & Development Services	Health	\$100,000-\$200,000	
				Office of Environmental Policy & Sustainability, Stormwater, Public Works, Puyallup Tribe, Pierce Conservation District, Port of Tacoma, other community partners		One-Time	



#	STRATEGY FOR A BETTER TACOMA	ACTION	2024 OUTPUT	LEAD DEPT	COUNCIL PRIORITY	CITY COST ESTIMATE	JOB \$
				SUPPORTING DEPTS / KEY PARTNERS	TIES TO OTHER PLANS, POLICIES	ONE-TIME OR ONGOING ANNUAL COST	ADAPTATION EQUITY 
40	Prepared	Establish, fund, and implement right-of-way tree maintenance program focused in high heat, low & very low opportunity equity neighborhoods. Include policy, protocols, and standards.	Program established and 3,000 trees actively maintained	Office of Environmental Policy & Sustainability	Health, Community Safety	\$500,000	 
				Stormwater Mgmt, Public Works	Urban Forest Management Plan	Ongoing	
44	Prepared	Assess conditions of seawalls, piers, revetments, shoreline infrastructure, open spaces, parks, and habitat to identify length of service, repair, and maintenance. Work with partners to develop a Sea Level Rise Master Plan and monitoring program to track sea level and shoreline changes at key locations (e.g., Tideflats, Ruston Way, Titlow, Foss) to determine needed adaptation actions.	a) Sea Level Rise Master Plan	Public Works, Environmental Services	Access, Community Safety	\$100,000 - \$500,000	
			b) Built and Natural Asset Baseline Condition Assessment c) Monitoring Plan	Puget Sound Partnership, higher education institutions, Metro Parks, Port of Tacoma, Puyallup Tribe, Tacoma Public Utilities Transmission & Distribution	Capital Facilities Plan, Shoreline Master Plan, Critical Areas Protection Ordinance and Comprehensive Plan	One-time	

#	STRATEGY FOR A BETTER TACOMA	ACTION	2024 OUTPUT	LEAD DEPT	COUNCIL PRIORITY	CITY COST ESTIMATE	JOB \$
				SUPPORTING DEPTS / KEY PARTNERS	TIES TO OTHER PLANS, POLICIES	ONE-TIME OR ONGOING ANNUAL COST	ADAPTATION 



MOBILITY AND LAND USE




44% of Tacoma’s 2019 emissions came from transportation. An equitable and sustainable transportation system must prioritize active transportation and transit. Increasing active travel and transit modes and infrastructure can ensure safe and equitable access to jobs, schools, and services city-wide, reduce collisions that injure or kill our residents, and create healthier, more connected communities. Vehicle electrification is also a critical element to meet our climate change goals and offers significant GHG emissions, which would both help put the city on track to meeting its net zero target and significantly improve the quality of air that Tacomans breathe.


9	Living	<p>Develop and implement a plan to fund, prioritize, and complete the City’s network of sidewalks, curb ramps, Safe Routes to School improvements, and bike connections by 2050, new funding sources could include voter approved initiatives (Streets Initiative), impact fees, General Fund, REET, parking in lieu fees, federal and state grants/allocations surface parking tax, among others.</p>	<p>Funding Plan complete and new funding sources secured</p>	<p>Public Works</p>	<p>Access, Community Safety</p>	<p>\$500,000 one-time for plan (annual implementation approx. \$60 million/year to reach 2050 goal)</p>	 

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				SUPPORTING DEPTS / KEY PARTNERS	TIES TO OTHER PLANS, POLICIES	ONE-TIME OR ONGOING ANNUAL COST	ADAPTATION EQUITY
10	Living	<p>Increase staff capacity to coordinate on transit projects and implement the green transportation hierarchy, which prioritizes the movement of people over the movement of cars with pedestrians, bicyclists, and transit riders as the top priorities. Coordinate land use changes with high-capacity transit investments to support transit-oriented development.</p>	<p>a) Internal review of processes and barriers to transit projects being completed</p> <p>b) Staff members hired to manage transit coordination activities and land use changes</p> <p>c) Pilot station area plans with land use proposals to support high-capacity transit</p> <p>d) Develop corridor designs to support high capacity transit and active transportation connections along planned routes</p>	Public Works, Planning & Development Services	Access	\$100,000 - \$500,000	
				Pierce Transit, Sound Transit, other community partners	Transportation Master Plan		
11	Living	<p>Increase staffing and funding for community programming that provides easy entry opportunities for community members to access active transportation and transit (i.e. open streets events, InMotion residential outreach programs, e-bikes for essential workers, micromobility access, play streets, parklets, etc). Prioritize equity when developing and supporting projects and initiatives.</p>	<p>a) Community engagement has been undertaken to identify desired programs</p> <p>b) Staff member hired to manage active transportation programs, events, and partnerships</p> <p>c) 5 programs / initiatives supported and user surveys positive</p>	Public Works	Access	\$100,000 - \$500,000	 

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				SUPPORTING DEPTS / KEY PARTNERS	TIES TO OTHER PLANS, POLICIES	ONE-TIME OR ONGOING ANNUAL COST	ADAPTATION EQUITY
12	Living	Update City policies and practices to design and implement streets that are safe, equitable, and accessible. Update the Design Manual to reflect best practices in active transportation and transit design and safety for all road users. Strengthen internal policies to require Complete Streets implementation on all projects that impact the street, including repaving, chipsealing, and re-striping projects.	Design Manual updated Internal policies updated and implemented	Public Works	Access, Community Safety	<\$100,000	\$
				Pierce Transit, Sound Transit	Transportation Master Plan		
17	Living	Improve land use density bonuses and tax credits to require efficient zero carbon energy and green building certification.	Land use zoning codes and multifamily tax credits updated	Planning & Development Services	Housing	<\$100,000	
				Community and Economic Development-Housing	Affordable Housing Action Strategy		
19	Breathing	Provide support to Pierce Transit to develop a zero emission transit plan and help Pierce Transit compete effectively for state and federal funding opportunities.	Plan developed and being implemented	Tacoma Power	Access	<\$100,000	
				Pierce Transit, Sound Transit, Public Works	Tacoma Power Transportation Electrification Plan		

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				SUPPORTING DEPTS / KEY PARTNERS	TIES TO OTHER PLANS, POLICIES	ONE-TIME OR ONGOING ANNUAL COST	ADAPTATION EQUITY 
20	Breathing	Continue to update zoning and development standards to ensure that new development supports active transportation, transit ridership, and integrated public and private urban design that minimizes parking requirements and parking management strategies to meet City affordability and sustainability goals.	Best practices in active mobility and people-centered design are clearly outlined in the code or Design Manual	Planning & Development Services	Access	<\$100,000	
				Public Works, Tacoma Power	Community and Economic Development Strategy		
21	Breathing	Seek federal and state grant funding to support electric vehicle and e-bike use in low and very low opportunity neighborhoods.	Two thirds of EV and e-bike grant-funded programs and projects in Tacoma adopted in low and very low opportunity areas	Office of Environmental Policy and Sustainability, Public Works, Tacoma Power	Access	\$1 million - \$10 million	
					Tacoma Power Transportation Electrification Plan		

#	STRATEGY FOR A BETTER TACOMA	ACTION	2024 OUTPUT	LEAD DEPT	COUNCIL PRIORITY	CITY COST ESTIMATE	JOB \$
				SUPPORTING DEPTS / KEY PARTNERS	TIES TO OTHER PLANS, POLICIES	ONE-TIME OR ONGOING ANNUAL COST	ADAPTATION 
22	Breathing	Support zero emission technology innovation in the marine, trucking and rail sector.	a) 5 projects initiated in the Tideflats	Tacoma Power Tacoma Rail	Access	>\$10 million	\$
		a) Actively partner with NW Seaport Alliance and Port of Tacoma on projects.	b) Strategy developed	Northwest Seaport Alliance, Port of Tacoma, WSDOT, Tacoma Manufacturing Industrial Council, and WA Truckers' Association	Tacoma Power Transportation Electrification Plan, Northwest Ports Clean Air Strategy		
41	Prepared	Coordinate with partner agencies to expand public access to cooling and air quality relief centers within every neighborhood. Ensure adequate distribution of water and N95 masks for unhoused community members.	Each neighborhood has climate resilient public spaces accessible and open during unhealthy events	Emergency Management, Neighborhood and Community Services	Community Safety, Health	\$100,000 - \$1 million	 
				Tacoma Public Library, Metro Parks, Tacoma Public Schools, Tacoma-Pierce Co. Health Department, other community partners	Emergency Management Plan		



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				SUPPORTING DEPTS / KEY PARTNERS	TIES TO OTHER PLANS, POLICIES	ONE-TIME OR ONGOING ANNUAL COST	ADAPTATION EQUITY
45	Prepared	Conduct a study focusing on flooding impacts to critical roads, other infrastructure, and steep slopes due to increasing intense rainfall events. Integrate findings into City development codes, emergency management, and capital planning.	Flooding vulnerability study completed	Environmental Services, Public Works	Community Safety	\$100,000	
				Emergency Management, Planning & Development Services, Pierce County, FEMA, the Port of Tacoma, US Army Corps of Engineers	Transportation Master Plan, Pierce County Flood Plan, Capital Facilities Plan, Planning & Development Services Strategic Plan	One-time	


BUILDINGS AND ENERGY




In 2019 buildings accounted for 20% of Tacoma’s GHG emissions. Key actions to reduce Tacoma’s emissions from buildings include switching natural gas heating systems to electric heat pumps, retrofitting existing buildings, and ensuring that new buildings meet net zero standards.

6	Together	Work with existing networks and organizations to create and support Sustainable Industrial and Manufacturing Collaborative/Roundtable. Assist in development of low-carbon transition opportunities for existing businesses including funding, incentives, technical assistance, and education on electrification, new fuels and technology.	Collaborative Roundtable developed and active	Community and Economic Development	Livable Wage Jobs	<\$100,000	
				Office of Environmental Policy and Sustainability, Tacoma Power, Port of Tacoma, Manufacturing Industrial Council, Dome District, Puget Sound Energy	Tideflats Subarea Planning Process, Community and Economic Development Strategy	Ongoing	

#	STRATEGY FOR A BETTER TACOMA	ACTION	2024 OUTPUT	LEAD DEPT	COUNCIL PRIORITY	CITY COST ESTIMATE	JOB \$
				SUPPORTING DEPTS / KEY PARTNERS	TIES TO OTHER PLANS, POLICIES	ONE-TIME OR ONGOING ANNUAL COST	ADAPTATION 
13	Living	Aggressively implement Affordable Housing Action Strategies for a) Creating More Units of Housing near transit-oriented development, b) Keeping Housing Affordable for All and in Good Repair	Complete Home in Tacoma Phase 1 and 2	Community and Economic Development-Housing	Housing	>\$10 million	
				City Manager's Office, Planning & Development Services, Environmental Services, Tacoma Public Utilities, Housing partners	Affordable Housing Action Strategy	Ongoing	

#	STRATEGY FOR A BETTER TACOMA	ACTION	2024 OUTPUT	LEAD DEPT	COUNCIL PRIORITY	CITY COST ESTIMATE	JOB \$
				SUPPORTING DEPTS / KEY PARTNERS	TIES TO OTHER PLANS, POLICIES	ONE-TIME OR ONGOING ANNUAL COST	ADAPTATION EQUITY
14	Living	<p>Collaborate with private and public partners to prioritize, support, and create residential and commercial building retrofit solutions with:</p> <p>a) Increased access and awareness to codes, loans and incentives for energy efficient heating/cooling, windows insulation, and decarbonization to repair, reuse, and repurpose existing buildings;</p> <p>b) Seek grant funding to pilot single and multifamily decarbonization retrofit program. Prioritize funding for rentals and income-qualified individuals;</p> <p>c) Ensure existing repair and rehabilitation programs prioritize low carbon, healthy, and efficient appliances and equipment.</p>	<p>a) Communication Plan developed to promote local energy efficiency incentives, codes and decarbonization programs. Roundtable established with local realtors and local banks</p> <p>b) Program for residential decarbonization established, funded and marketed by City and collaborating with and using the existing resources of Tacoma Public Utilities Energy Efficiency programs to ensure that new electricity loads are efficient</p> <p>c) 30 buildings retrofit, 2/3 of these are in low opportunity equity neighborhoods</p> <p>d) Staff training on codes, energy efficiency programs, and decarbonization programs established; 10 new collaborations created</p>	Office of Environmental Policy and Sustainability, Community and Economic Development-	Affordable Housing, Livable Wage Jobs	\$1 million -\$2 million	
				Planning & Development Services, Tacoma Power, Tacoma Housing Authority, Tacoma-Pierce County Health Department, and community partners	Affordable Housing Action Strategy, Historic Preservation Program	One-time	 


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				SUPPORTING DEPTS / KEY PARTNERS	TIES TO OTHER PLANS, POLICIES	ONE-TIME OR ONGOING ANNUAL COST	ADAPTATION 
15	Living	Improve commercial energy codes to reduce most fossil fuel use. Require enhanced efficiency and health standards in coordination with Regional Code Council.	Codes Adopted by Council	Planning & Development Services	Affordable Housing, Health	<\$100,000	
				Office of Environmental Policy and Sustainability, Tacoma Power	Decarbonization Resolution	One-time	
16	Living	Explore residential carbon score and commercial benchmarking and disclosure. Include retro commissioning requirements. Review other jurisdictions and plans for best practices and draft a program for Tacoma.	Program is being implemented that leads to measures being taken	Office of Environmental Policy and Sustainability	Affordable Housing	<\$100,000	\$
				Tacoma Power		Ongoing	
25	Resource Use	Using data from new advanced water meter infrastructure, communicate and educate residents and businesses about water consumption patterns and probable leaks. Encourage and support timely leak repair.	Reduction in water leak adjustments for both residential and commercial customers Reduced per-person water use during the summer months	Tacoma Water	Operational effectiveness	<\$100,000	
					Water Conservation Plan	Ongoing	


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				SUPPORTING DEPTS / KEY PARTNERS	TIES TO OTHER PLANS, POLICIES	ONE-TIME OR ONGOING ANNUAL COST	ADAPTATION 
42	Prepared	Work with Health Dept to provide filter fans for at-risk community members to assist in mitigating wildfire smoke in their homes and businesses.	2,500 fans distributed	Office of Environmental Policy and Sustainability	Health	<\$100,000	 
				Health Dept, Emergency Mgmt, Neighborhood and Community Services, other community partners	Emergency Management Plan	Ongoing	
46	Prepared	Include in 2024 Tacoma Power Integrated Resource Plan analysis of a scenario consistent with the City of Tacoma's "Net-Zero Scenario" to ensure adequate electricity supply for transportation electrification, electrification of building heating, and electrification of industrial process load. Include in the Integrated Resource Plan any analysis from Tacoma Power's Transmission and Distribution Section investigating ways to upgrade or manage the distribution system to enable electrification.	Updated 2024 Integrated Resource Plan Report that identifies Tacoma Power's preferred resource portfolio expected to meet a wide range of potential future demands while maintaining resource adequacy and ensuring equitable distribution of costs and benefits	Tacoma Power Power Management, Transmission and Distribution	Access	\$100,000 - \$500,000	
				Tacoma Power-Long Term Planning	Tacoma Power Integrated Resource Plan	One-time	

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				SUPPORTING DEPTS / KEY PARTNERS	TIES TO OTHER PLANS, POLICIES	ONE-TIME OR ONGOING ANNUAL COST	ADAPTATION EQUITY

CONSUMPTION AND MATERIAL MANAGEMENT

Waste and wastewater were responsible for 6% of Tacoma’s emissions in 2019. Emissions from the consumption and production of goods used in the city but produced elsewhere would likely double the city’s entire emissions if they were to be accounted for. Key actions in this area include ramping up waste reduction and recycling efforts and creating new opportunities for residents and businesses to participate in a circular economy.

2	Together	Increase financial support for partners and community groups leading on waste prevention actions. Seek out and develop new opportunities to reach more diverse community members and organizations.	10 new partnerships established and partners rate our support "good" through annual survey	Solid Waste Management		\$100,000	
				Office of Environmental Policy and Sustainability, other community partners	Sustainable Materials Management Plan	Ongoing	 
24	Resource Use	Increase food waste prevention and diversion programs and projects including food labels, infrastructure, ordinances, incentives, and food rescue supported by increased staff capacity.	Waste Prevention staff position created	Solid Waste Management		\$200,000	
				Office of Environmental Policy and Sustainability, Community and Economic Development, Planning & Development Services, Tacoma PC Health Dept, Pierce Co., Dept of Ecology, other community partners	Sustainable Materials Management Plan	Ongoing	

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				SUPPORTING DEPTS / KEY PARTNERS	TIES TO OTHER PLANS, POLICIES	ONE-TIME OR ONGOING ANNUAL COST	ADAPTATION EQUITY 
24	Resource Use	Develop program to ban food waste from garbage.	Ban established; enforcement plan effective and equitable	Solid Waste Management		\$100,000	
				Office of Environmental Policy and Sustainability	Sustainable Materials Management Plan	One-time	
27	Resource Use	Support industrial symbiosis through creation of online market exchange, convening of industrial stakeholders, and conducting outreach to businesses.	50 businesses registered on platform and 200 exchanges occurred	Solid Waste Management, Office of Environmental Policy and Sustainability	Livable Wage Jobs	<\$100,000	\$
				Community and Economic Development	Community and Economic Development Strategy	Ongoing	
28	Resource Use	Reduce construction and demolition waste stream by: a) Requiring recycling of recoverable C&D materials when market capacity is established. Actively seek out opportunities and partnerships. b) Establishing deconstruction requirements as part of the demolition permit process.	Lbs of salvaged materials	Planning & Development Services	Livable Wage Jobs	<\$100,000	\$
				Solid Waste Mgmt, Code Enforcement, Pierce County, Land Recovery Inc Services, Schnitzer Steel, Waste Management Northwest, WestRock	Sustainable Materials Management Plan	One-time	




#	STRATEGY FOR A BETTER TACOMA	ACTION	2024 OUTPUT	LEAD DEPT	COUNCIL PRIORITY	CITY COST ESTIMATE	JOB \$
				SUPPORTING DEPTS / KEY PARTNERS	TIES TO OTHER PLANS, POLICIES	ONE-TIME OR ONGOING ANNUAL COST	ADAPTATION EQUITY
29	Resource Use	Enhance safe strategies for diverting high GHG impact reusable and recyclable materials from the waste stream at the Tacoma Recycling and Transfer Center.	Tons of GHGs from pulled and diverted materials	Solid Waste Mgmt	Operational Effectiveness	<\$100,000	
					Sustainable Materials Management Plan	Ongoing	

GOVERNANCE AND ENGAGEMENT



Governance and engagement are the single most important effort to ensuring Tacoma’s net zero pathway actions are implemented. The City will need to engage its own staff, residents, businesses, neighbors, visitors, and other levels of government to provide guidance on and be part of the uptake of its net zero actions. Effectiveness and equity in implementation will depend on promoting participatory and empowering approaches to climate action.

1	Together	Ensure all climate action related stakeholder groups and community engagement efforts are inclusive of the communities most impacted by the climate crisis.	Relationships prioritized so recruitment is easy 10 deep climate action relationships with frontline organizations or stakeholder groups established	Office of Environmental Policy and Sustainability	Belief and Trust	<\$100,000	
				Sustainable Tacoma Commission, other community partners		Ongoing	
4	Together	Provide community and youth-serving organizations and climate justice leaders with education, tools, materials, compensation, professional development, and technical assistance to effectively engage and share their expertise.	Ongoing relationships nurtured and stipends provided for expertise 25 community members trained in climate action and civic engagement 10 civic climate action events led by Climate Ambassadors	Office of Environmental Policy and Sustainability	Belief and Trust	<\$100,000	
				Media and Communications Office, other community partners		Ongoing	

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				SUPPORTING DEPTS / KEY PARTNERS	TIES TO OTHER PLANS, POLICIES	ONE-TIME OR ONGOING ANNUAL COST	ADAPTATION EQUITY
5	Together	Increase county-wide, regional, statewide, federal, and international policy coordination and advocacy on climate work.	a) Identify and prioritize opportunities for active statewide leadership on local climate solutions	City Manager's Office	Livable Wage Jobs, Health	<\$100,000	
			b) Adopted Comprehensive Plan update that aligns with Vision 2050 Multi-county Planning Policies				
			c) Advocate for county-wide planning policies that support GHG reduction, climate adaptation, population and employment growth near transit, and focus housing and employment in existing urban areas.	Tacoma Public Utilities, Office of Environmental Policy and Sustainability	Council Legislative Manual	Ongoing - but minimal additional costs	

#	STRATEGY FOR A BETTER TACOMA	ACTION	2024 OUTPUT	LEAD DEPT	COUNCIL PRIORITY	CITY COST ESTIMATE	JOB \$
				SUPPORTING DEPTS / KEY PARTNERS	TIES TO OTHER PLANS, POLICIES	ONE-TIME OR ONGOING ANNUAL COST	ADAPTATION EQUITY
7	Together	Continue to support climate adaptation stakeholder team by collaborating with other agencies and institutions to tackle cross-jurisdictional information needs and adaptation opportunities. Continue to engage in and support regional efforts within the Puyallup River watershed basin to consider river management related to floods, sediment, agriculture, and infrastructure protection.	Convene County-wide adaptation group quarterly.	Office of Environmental Policy and Sustainability	Access, community safety	<\$100,000	
				Environmental Services, Public Works, Environmental Services, Planning & Development Services, Emergency Management, Tacoma Public Utilities, Puyallup Tribe, Port of Tacoma, Railroads, Pierce County, FEMA, US Army Corps of Engineers, Tacoma Pierce County Health Department, Metro Parks, and other property owners	Climate Adaptation Strategy (draft)	Ongoing - but minimal additional costs	  






#	STRATEGY FOR A BETTER TACOMA	ACTION	2024 OUTPUT	LEAD DEPT	COUNCIL PRIORITY	CITY COST ESTIMATE	JOB \$
				SUPPORTING DEPTS / KEY PARTNERS	TIES TO OTHER PLANS, POLICIES	ONE-TIME OR ONGOING ANNUAL COST	ADAPTATION EQUITY
30a	Resource Use	Seek opportunities to eliminate fossil fuel reliance where solutions are available and meet business needs in all agreements and contracts entered into by the City.	a) Contracts and agreements amended where cost effective for carbon reduction and business practicable	Finance Department, Tacoma Employee Retirement Services	Health	<\$100,000	
			b) Annual analysis report of retirement investment fossil fuel holdings, investment focus, and advocacy included evaluation of Environmental, Social, and Governance (ESG) consistent with City's fiduciary responsibilities	Office of Environmental Policy and Sustainability, Environmental Services, Public Works, Tacoma Venues and Events, Tacoma Public Utilities	City-wide Contracts, Retirement Board, Sustainable Purchasing Policy	Ongoing - but minimal additional costs	
31	Resource Use	Develop a GHG and climate impact analysis for incorporation into budget, capital, and work plans at the departmental level.	Department Resource Conservation and Climate Plans developed and implemented	Office of Environmental Policy and Sustainability	Organizational Culture	<\$100,000	
			Formal processes for considering climate change in projects and budgets developed and active	Office of Management and Budget, Planning & Development Services, Tacoma Public Utilities		Ongoing - but minimal additional costs	

#	STRATEGY FOR A BETTER TACOMA	ACTION	2024 OUTPUT	LEAD DEPT	COUNCIL PRIORITY	CITY COST ESTIMATE	JOB \$
				SUPPORTING DEPTS / KEY PARTNERS	TIES TO OTHER PLANS, POLICIES	ONE-TIME OR ONGOING ANNUAL COST	ADAPTATION EQUITY
43	Prepared	Co-create communications with the city, county, and frontline communities around climate events and health, access to emergency resources and warnings, and training and materials to prepare for emergency events and health impacts while reducing access and participation barriers.	Coordinated communication plan developed with active frontline engagement	Media and Communications Office, Emergency Management, Tacoma-Pierce Co. Health Dept., Puyallup Tribe	Belief and Trust	<\$100,000	 
				Office of Environmental Policy and Sustainability, other community partners		One-time	

GREEN ECONOMY

Supporting the city’s transition to a green economy will allow Tacoma to prosper by attracting new businesses and encouraging innovation. **A key area for this is in the industrial sector, which accounted for 30% of Tacoma’s 2019 emissions.** For a socially just, green economic transition we need to support those transitioning out of fossil fuel jobs and focus on recruiting and retaining frontline community members to new, skilled, living-wage green jobs.

26	Resource Use	Provide green businesses with recognition and technical support for their participation in the EnviroStar program and other similar efforts.	EnviroStar businesses doubled	Utilities, Office of Environmental Policy and Sustainability	Livable Wage Jobs	<\$100,000	
				Community and Economic Development Department, WA Ecology Lean & Green Impact WA		Community and Economic Development Strategy	

#	STRATEGY FOR A BETTER TACOMA	ACTION	2024 OUTPUT	LEAD DEPT	COUNCIL PRIORITY	CITY COST ESTIMATE	JOB \$
				SUPPORTING DEPTS / KEY PARTNERS	TIES TO OTHER PLANS, POLICIES	ONE-TIME OR ONGOING ANNUAL COST	ADAPTATION EQUITY 
30b	Resource Use	Incorporate green and equity elements into land development RFP/RFBs.	All new agreements incorporate sustainability elements	Community and Economic Development Department	Livable Wage Jobs	<\$100,000	
						Ongoing	
33	Opportunities	Research and partner with existing training programs (higher education, R&D, workforce training) to increase opportunities, re-skilling, and up-skilling.	2 new or expanded training and development programs active	Community and Economic Development	Livable Wage Jobs	<\$100,000	 
			2/3 of those enrolled are frontline community members	University of Washington Tacoma, Tech & Community Colleges, Workforce Central, Tacoma Manufacturing and Industrial Council, other community partners	Community and Economic Development Strategy	Ongoing	
35	Opportunities	Amend green jobs tax credit to potentially include change in credit amount and industries or types of work and workers eligible.	Tax credit amended	Community and Economic Development	Livable Wage Jobs	<\$100,000	
			Profiled in Community and Economic Development materials	Finance Department	Community and Economic Development Strategy	Ongoing	

#	STRATEGY FOR A BETTER TACOMA	ACTION	2024 OUTPUT	LEAD DEPT	COUNCIL PRIORITY	CITY COST ESTIMATE	JOB \$
				SUPPORTING DEPTS / KEY PARTNERS	TIES TO OTHER PLANS, POLICIES	ONE-TIME OR ONGOING ANNUAL COST	ADAPTATION EQUITY
36	Opportunities	Conduct zoning and development standard review for industrial lands to promote clean and green industrial development and to ensure consistency of industrial uses with policies for economic development, public health, and environmental enhancement and protection.	Tideflats Subarea plan adopted and scope of work and funding approved for South Tacoma Manufacturing and Industrial Center plan.	Planning & Development Services	Livable Wage Jobs	<\$100,000	
				Community and Economic Development, Tacoma Power, Port of Tacoma, Pierce County, City of Fife, and Puyallup Tribe of Indians	Community and Economic Development Strategy , Container Port Element, Tacoma Municipal Code 13.06.070.D: South Tacoma Groundwater Protection District		

#	STRATEGY FOR A BETTER TACOMA	ACTION	2024 OUTPUT	LEAD DEPT	COUNCIL PRIORITY	CITY COST ESTIMATE	JOB \$
				SUPPORTING DEPTS / KEY PARTNERS	TIES TO OTHER PLANS, POLICIES	ONE-TIME OR ONGOING ANNUAL COST	ADAPTATION EQUITY
37	Opportunities	Complete a Green Economy Study. The study will define green manufacturing and other types of businesses/industries that are involved in the Green Economy; identify specific high wage positions, compensation and education or skill requirements, research and development and innovation opportunities, factors that will support the growth and development of the Green Economy, site selection conditions as well as Tacoma and the region's competitive advantages; and pinpoint key business/industrial expansion and recruitment targets. Sectors for evaluation could include marine-related industries, clean fuels, green building materials, and clean material markets.	Green Economy study completed and an implementation plan developed Marketing materials developed and outreach conducted to expand and attract green economy companies to Tacoma	Community and Economic Development	Livable Wage Jobs	\$250,000	
				Tacoma Public Utilities, Economic Development Board, Tacoma Maritime Innovation Incubator, Tacoma Manufacturing and Industrial Council	Community and Economic Development Strategy	One-time	
38	Opportunities	Designate or hire Green Economy Specialist to coordinate green economy actions and support partners and businesses.	Green Economy Specialist active Increase knowledge, tools and capacity among City business liaison staff regarding green resources.	Community and Economic Development	Livable Wage Jobs	\$150,000	
				Office of Environmental Policy and Sustainability, Utilities	Community and Economic Development Strategy	Ongoing	

TACOMA COMMUNITY CLIMATE ACTION PLAN



Section 3

SECTION 3, 2030 INDICATOR TARGETS

Table 1. 2030 indicator targets for tracking progress towards Tacoma’s net zero emissions by 2050 target.

CATEGORY	BETTER STRATEGY	INDICATOR	2020	2030 TARGET
NATURAL SYSTEMS & LOCAL FOOD	BREATHING	Exceed national average per capita rate spent on tree care	\$1.57/capita	\$6.05/capita
		Increase tree planting and care in high heat, very low and low opportunity equity neighborhoods	--	25,000 trees planted
		Increase acres of actively managed open space ecosystem habitat by 24%. Protect 6% more acres.	76.35 acres managed 498 acres protected	94.5 acres managed 530 acres protected
	LIVING	Increase natural heat Island intervention projects in hottest neighborhoods by 100%	19 projects	38 projects
	TOGETHER	Increase the number of community food projects, including community gardens, food forests, orchards, farms, food rescue efforts, and farmers markets by 10%	85 projects	94 projects
BUILDINGS & ENERGY	LIVING	Reduce fossil fuel energy use from buildings by 33%	24 million MMBTU	16 million MMBTU
		Increase number of green certified: a) commercial buildings by 332% and b) housing units by 247%	43 commercial certifications 2,039 housing units certified	143 commercial certifications 5,039 housing units certified
		Increase number of preserved housing units and new affordable units created	--	2,300 affordable housing units preserved 6,000 new units created

CATEGORY	BETTER STRATEGY	INDICATOR	2020	2030 TARGET
MOBILITY & LAND USE	LIVING	Eliminate fatalities and serious injuries from collisions by 2035 to achieve Vision Zero (reduce by 66% by 2030)	92 fatalities/serious injuries	31 fatalities/serious injuries
	BREATHING	Increase public electric vehicle charging locations by 5 times, especially in low and very low opportunity equity neighborhoods	40 locations city-wide 23 in low and very low opportunity areas	200 locations city-wide, 125 in low opportunity areas
	LIVING	Increase bicycle infrastructure miles by 80%	78 miles	140 miles
		Increase miles of sidewalks by 14%	969 miles	1,105 miles
		Increase number of ADA-compliant curb ramps by 78%	6,000 ramps	10,667 ramps
		Increase City of Tacoma active transportation and transit staffing to reach League of American Bicyclists gold-level staffing target	2 staff	7 staff
		Increase compact, complete, walkable neighborhoods		80% of residents live in a 20 minute neighborhood
CONSUMPTION	RESOURCE USE	Decrease per-capita waste generation by 14%	4.8 lbs/capita	4 lbs/capita
		Increase metric tons of GHGs from diverted materials from Recycling and Recovery Center by 17%	7,288 MTCO ₂ e diverted	8,527 MTCO ₂ e diverted
GREEN ECONOMY	RESOURCE USE	Increase number of EnviroStar businesses by 5x	19 businesses	100 businesses
	OPPORTUNITY	Increase number of green jobs (as measured by tax credit) by 10x	25 jobs	250 jobs
GOVERNANCE AND ENGAGEMENT	TOGETHER	Community-led climate equity projects and programs		\$1,000,000 funded

TACOMA COMMUNITY CLIMATE ACTION PLAN



Section 4

SECTION 4, FINANCIAL ANALYSIS

A high-level financial analysis was undertaken to identify the community-wide costs, savings, net present value (NPV), and marginal abatement costs of the Net-Zero Scenario targets from 2020 to 2050. In both the No New Actions Scenario and Net-Zero Scenarios, expenditures are made and savings occur. The financial information presented here shows the incremental additional expenditures required and additional savings resulting from the implementation of the Net-Zero Scenario compared to those that are expected in the No New Actions Scenario.

SUMMARY OF COSTS AND SAVINGS

Modeling of costs and savings considered upfront capital expenditures, operating and maintenance costs (including fuel and electricity). The table below summarizes the expenditure types that were evaluated. One item to note is that the financial impacts of the recently-implemented state-wide cap-and-trade system are not included in this analysis, and therefore financial savings of the Net-Zero Scenario are likely to be even greater than those presented here.

Table 1. Categories of expenditures evaluated.

CATEGORY	DESCRIPTION
Building construction, retrofits, and equipment	Cost of dwelling construction and retrofitting (incl. equipment); operating and maintenance costs (non-fuel)
Building fuel	Energy costs for heating, cooling, and operating buildings, as well as for commercial and industrial production
Personal, commercial & municipal/transit vehicles	Cost of vehicle purchase; operating and maintenance costs (non-fuel)
Vehicle fuel	Energy costs for transportation fuel
Transportation infrastructure	Investments in expanding active transportation infrastructure
Waste diversion	Investments in increased processing/handling of recycled materials

Figure 1 shows costs and savings for Net-Zero Scenario actions compared to the No New Action Scenario. The costs, or investments, vary year-over-year, based on the timelines and levels of ambition of the targets. By 2050 the cumulative costs to implement the Net-Zero Scenario is \$2.49 billion, with \$6.67 billion in savings (at a discount rate of 3%). Once savings are applied, the result is a net savings of \$4.18 billion. It should be noted that capital investment for the Net-Zero Scenario targets end in 2050, however the NPV includes the energy, maintenance, and carbon costs savings as well as revenue projected over the full life of the measures, which in some cases extend as far as 2089. It should also be noted that a discount rate of 3% is used to reflect that which would be incurred for the government. Actual investments will be taken on by multiple players in addition to the government, including institutions, private businesses, and the public. Since these are often subject to higher discount rates, results are shown in the table below for both 3% and 6% rates. The figures in this report primarily show results for a 3% rate, as a more conservative estimate, and as it reflects the types of major investments that will be needed from government incentives/programs. Under both rate structures significant net savings are seen.

Table 2. Summary of Net-Zero Scenario financial metrics.

NET PRESENT VALUE OF THE ZERO CARBON SCENARIO		
FINANCIAL ESTIMATE	3% DISCOUNT RATE	6% DISCOUNT RATE
Total incremental capital investment (\$billions)	-\$2.49	-\$1.66
Total savings (\$billions)	\$6.67	\$3.41
Net savings from the Net-Zero Scenario (\$billions)	\$4.18	\$1.74
Average \$ saved for each ton of CO2e reduced	\$180	\$75

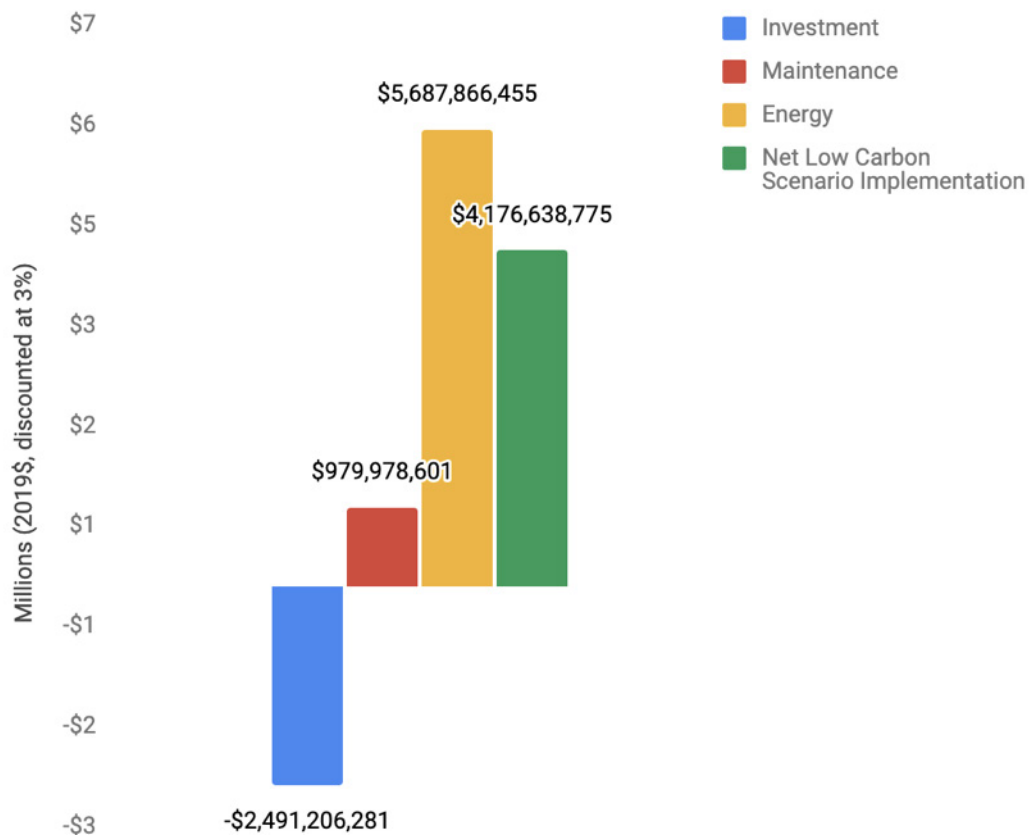


Figure 1. Net present value of costs (negative) and savings (positive) of Net-Zero over the No New Action Scenario.

CASH FLOW ANALYSIS

The annual City/Community costs, savings and revenue associated with fully implementing the targets in the Climate Action Plan are shown in detail in Figure 2, with capital expenditures shown in full in the years in which they are incurred. The capital expenditures in the early years gradually increase over time as targets’ ambitions increase. In early 2030, the net annual cost of

the Net-Zero Scenario levels off at around \$100 million per year.

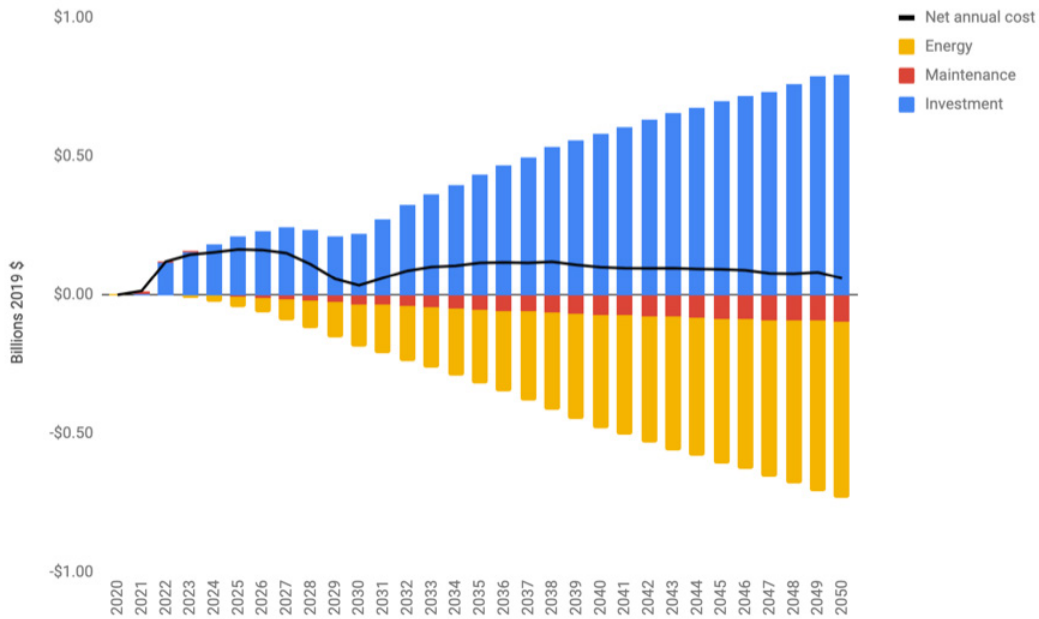


Figure 2. Capital expenditures (above the x-axis) vs. savings (below the x-axis) from the Net-Zero Scenario relative to the No New Actions Scenario, 2020-2050.

Figure 3 presents the same costs and benefits, but with the capital expenditures amortized over 25 years at 3%. This approach is likely to more accurately reflect actual approaches for financing the Net-Zero Scenario (where interest is both paid and earned on debts and savings). Annualized capital payments are outweighed by the savings as early as 2025.

Community savings steadily increase all the way through to 2050. This tapers off as the Scenario measures cease to be implemented after 2050; however, the City will likely continue with further actions down the road. By 2050, the annual net benefit of the Net-Zero Scenario reaches \$530

million in savings.

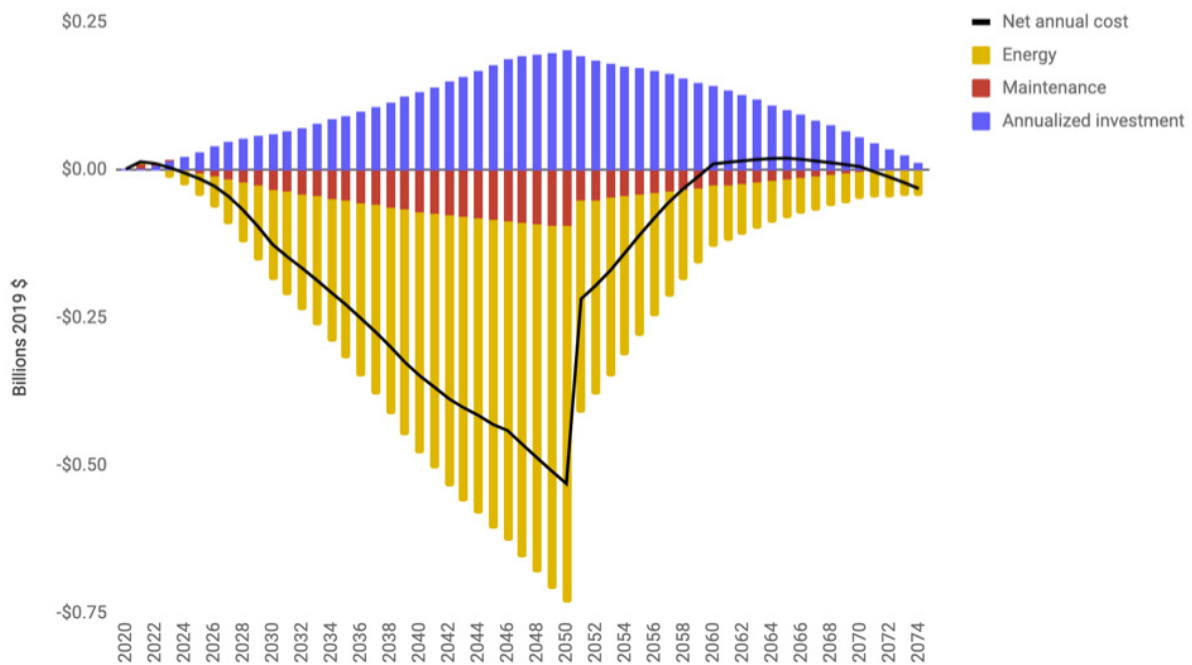


Figure 3. Annualized capital expenditures (above the x-axis) vs. savings (below the x-axis) from the Net-Zero Scenario relative to the No New Actions Scenario, 2020-2050.

MARGINAL ABATEMENT COSTS/SAVINGS

The abatement cost of an action is the estimated cost for that action to reduce one ton of greenhouse gas emissions (‘GHG’) and is calculated by dividing the action’s net present value (‘NPV’) by the total GHG emissions it reduces (tCO₂e) over its lifetime. Figure 4 shows the abatement costs/savings for the Net-Zero Scenario measures. The actions with the highest cost savings per ton of GHGs reduced are on the far left of the graph (below the x-axis), and the actions with the highest cost per ton of emissions reduced are at the far right (above the x-axis). The widths of each of the bars along the x-axis represent the total GHG emissions reduced by each action. In this case, electrifying personal vehicles and industrial process improvements generate the greatest amount of GHG emissions reductions of all of the actions (7,400 MtCO₂e and 6,900 MTCO₂e, respectively).

The highest cost for one ton of GHG emissions reduction is the expansion of active mode shares (i.e. increasing walking and cycling infrastructure) at \$4,071, followed by retrofitting homes at \$2,078. It should be noted that these high costs are in part due to the time sequencing of the actions in the model; in both cases these actions occur after significant GHG reductions to the source GHG being addressed have already occurred. In the case of walking and biking, the action is sequenced after the electrification of vehicles, so the GHG benefits appear to be less than they would be if no vehicle electrification occurs.

The lowest cost for GHG reductions applies to expanding transit mode shares (for example, through promotional programs), at an estimated net of \$788 in savings in fuel costs per ton of GHG emissions saved. Again, the extent of the savings seen is in part due to model sequencing,

where the savings are being calculated before new electric buses are being considered, therefore, the benefit appears greater than it otherwise would.

While the Marginal Abatement Cost Curve (MACC) below illustrates the financial profile of the suite of Net-Zero Scenario measures, it is an imperfect indicator, since (as illustrated above), many measures either impact or depend on another, and should not be considered for implementation individually. Another important message is that in order to achieve the City's target, all the actions need to be undertaken as soon as possible. While there can be a tendency to wait for technological improvements, this has the effect of reducing the value of the savings that can be achieved for households and businesses, and reducing potential new employment opportunities.

The MACC can be used as a tool to help consider important questions about implementation planning, including:

- Can high cost and high savings measures be bundled to achieve greater GHG emissions reductions?
- How can the City help reduce the costs of the high-cost actions by supporting innovation or by providing subsidies?
- Which actions both save money and reduce the most GHG emissions? These can be considered the big moves.
- Which actions are likely to be of interest to the private sector, assuming barriers can be

removed or supporting policies introduced?

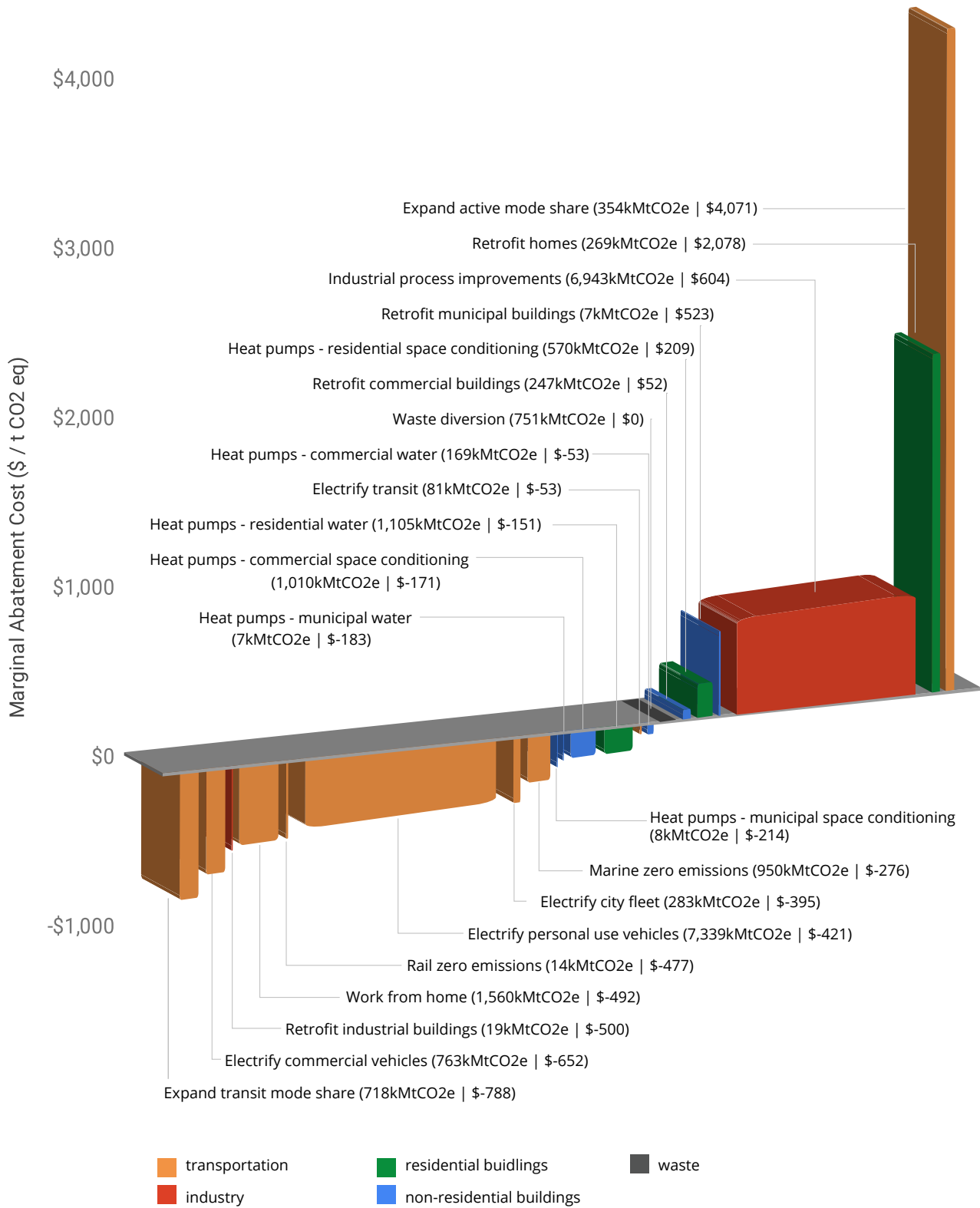


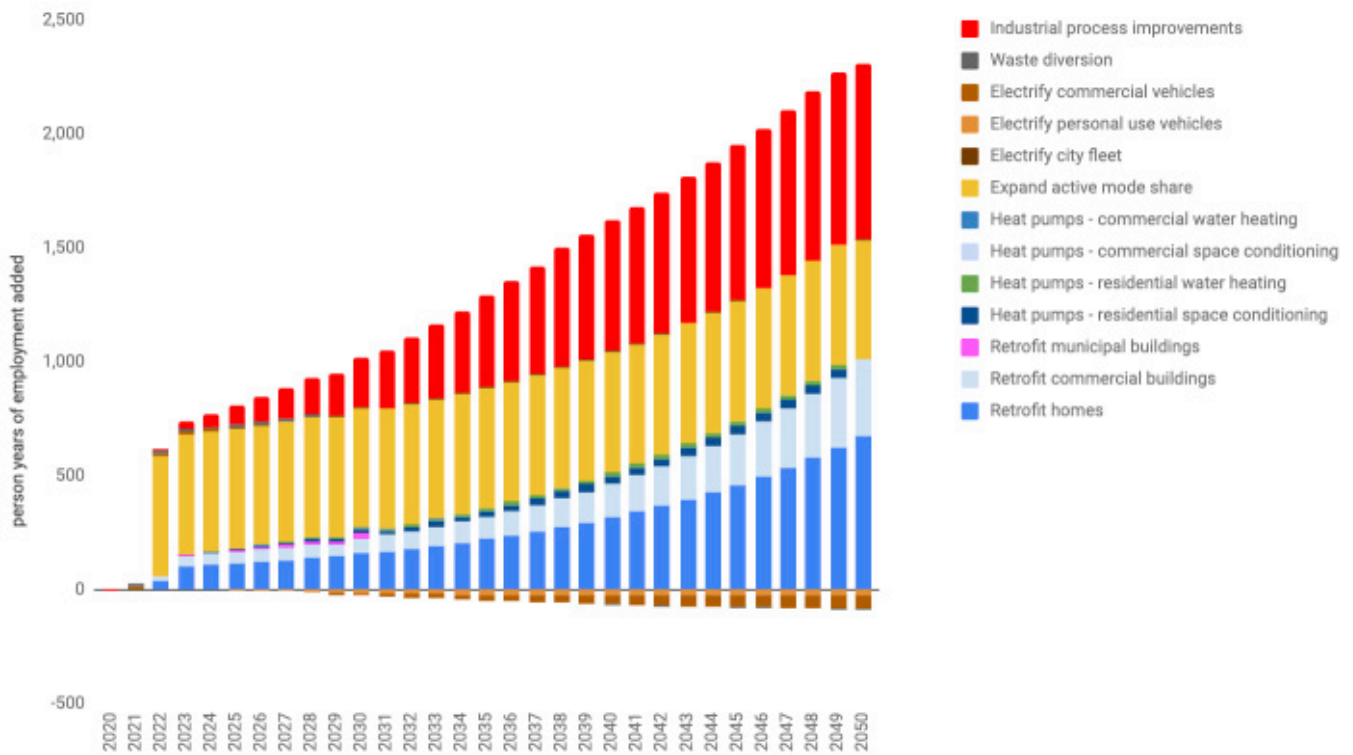
Figure 4. Marginal abatement savings (below x-axis) and costs (above x-axis) of

the Net-Zero Scenario measures.

NEW JOB OPPORTUNITIES

The investments in the Net-Zero Scenario result in increased employment. This includes new opportunities in design and construction of zero-carbon and resilient buildings, retrofits to existing buildings, installing active transportation infrastructure, improving industrial processes, and managing diverted waste. Some jobs will also be lost or will have to transition to other sectors as investments are shifted, for example, reduced operations and maintenance for electric vehicles compared to conventional ones. However, investments made across all sectors, create a net of approximately 40,000 person years of employment² in Tacoma from 2019-2050, an average of nearly 1,300 jobs per year.

The majority of jobs added are in the building sector, with significant retrofits (including heat pumps and water heating systems) targeted for all buildings. Investments in industrial improvements also generate a significant number of new jobs for the city, as new technologies are developed, manufactured, and/or installed. Increased investment in active infrastructure results in a significant increase to jobs as well, at approximately 530 per year.



² A person year of employment is equivalent to 1 person working a full-time job for 1 year. Person years of employment were calculated using known numbers of jobs created per dollar invested across different sectors, and applying these to the investments required to implement the actions in the plan.

TACOMA COMMUNITY CLIMATE ACTION PLAN



Section 5

SECTION 5, FUNDING OPTIONS

INVESTING IN A JUST, CLIMATE-SAFE TACOMA

THE CASE: TACOMA HAS A SHRINKING WINDOW TO INVEST BOLDLY IN CLIMATE JUSTICE.

Tacoma has reached a crossroads: we can do things the way we have always done them, or change the rules and mobilize extraordinary federal and state resources to get onto a lucrative net-zero path for 2030 and 2050. Today, the costs remain manageable, and the cost savings are dramatic. The benefits will always be immense. We can develop a competitive green economy, positioning ourselves for a 21st century renewal; protect livability, particularly for the poor and middle class; and avoid drastic future economic and human costs. Or, we can pass the socio-economic and environmental burdens to the next generation. Over time, conditions will worsen, adaptation will be more difficult, and it will become more costly to achieve the future we have in reach today. The scientific, financial, and moral cases are clear. **Large new investments in a climate-safe economy and high-functioning bureaucracy are both smart and urgent for Tacoma.**

The following approach to climate action resourcing is based on the premise that existing systems and resources have not solved and will not be sufficient to solve the socio-economic and climate crises we must overcome.

For a just, sustainable transition away from fossil fuels, the City can:

1. Transform existing budgets, expertise, and staffing to reduce socio-economic gaps, reduce greenhouse gas emissions, and improve resilience to climate impacts;
2. Obtain outside resources, including funding, financing, and revenues, to supplement current City resources;
3. Change our rules and enforce them to raise or offset costs for behaviors destructive to social equality and our climate;
4. Change others' rules so we have the tools and resources to solve the problem, such as through policy advocacy at the local, state, and federal level.

This Plan reflects decision-makers and administrators reimagining the way we deliver services for the public welfare. It challenges concepts of and standards for safety, health, our economy, and our environment. Its 46 actions would have the City make intersectional, cross-departmental investments that bring healthy, affordable housing; clean, reliable transportation; and green, good-paying jobs, among other co-benefits. These outputs and outcomes are not new in many cases – instead, climate action is a complement to Tacoma City Council's core priorities: public health, housing, access to services, safety, livable wage jobs, and trust in public institutions. In order to be successful, though, this Plan depends on also reimagining the way we resource our work – changing funding and implementation decisions to align our efforts and prioritize

investments that check more boxes, including reduced greenhouse gas emissions and improved preparedness to climate impacts. The following strategies and tools could address some of the resourcing needs for implementation of this Plan.

STRATEGIES AND TOOLS

1. REALIGN EXISTING RESOURCES: EXPENDITURES, EXPERTISE, STAFFING

Realign existing resources to improve organizational effectiveness.

- Move funding and staffing from low-demand services to climate action work
- Leverage one-time recovery funding, like American Rescue Plan funds, to improve community resilience:
 - Improve or build community centers for smoke and heat safety ([Duluth, MN](#))
 - Build or acquire healthy and sustainable affordable housing ([Seattle](#) and [King County, WA](#))
 - Implement a green job training and career pathways program ([Boston, MA](#))

2. OBTAIN OUTSIDE RESOURCES: FUNDING, FINANCING, AND REVENUES

Raise revenues and supplement them with outside resources to increase our capacity as we develop rule changes that empower a transformative pace and scale of climate action work.

A. Pursue Grant Funds for the City and Partnerships

- Complete necessary studies and assessments to be prepared to compete for new state funding from the 2021 [WA Clean Fuel Standard](#) and [Climate Commitment Act](#)
- Prioritize federal funding for ready climate projects and to make infrastructure projects climate-ready

B. Finance Climate-Focused Capital Projects and Support Sustainable Businesses

- Issue green bonds for enhanced climate-focused capital projects ([King County, WA](#))
- Allocate seed funding for a revolving loan program that finances climate upgrades for equipment and facilities ([King County](#) and [Snohomish County, WA](#))

C. Raise Revenues within Existing Rules

- Implement an [excess property tax levy](#) or multi-year [property tax levy lid lift](#) to fund enhanced climate-focused capital projects and support operations (Excess levy: [Kirkland](#), [Shoreline](#), [Tukwila, WA](#); Levy lid lift: [Seattle](#), [Pierce County](#), and [King County, WA](#))
- Increase franchise fees for natural gas utilities using the public right-of-way ([King County, WA](#))
- Implement appropriate [parking-related policies and fees](#) to promote business activity as well as active transportation and transit ([Seattle, WA](#); [Vancouver, BC](#))
- Pursue lawsuits against polluters to offset the costs to the public from their behavior ([Baltimore, MD](#); [San Francisco and Oakland, CA](#); [King County, WA](#); [Washington State](#))

3. CHANGE OUR RULES AND ENFORCE THEM

Charge fees to discourage socially and environmentally destructive behavior as well as offset the costs of development and growth. Fee valuations should be commensurate with the public value of affected assets, like our waterways, salmon, and tree canopy, the cost of administration, and additional necessary disincentives.

- Require permits and increase fines for tree removal ([Seattle](#))
- Institute fines for disposal of edible, compostable, and recyclable material ([Seattle](#))
- Increase transportation benefit district vehicle registration fees and sales tax to support active transportation, transit, and transit-oriented development ([Washington State cities](#))
- Implement [impact fees](#) for [multimodal streets](#), recreation facilities, and fire protection facilities ([Western Washington](#))
- Improve [business and occupation \(B&O\) tax credits](#) to encourage green jobs

4. CHANGE OTHERS' RULES TO ENHANCE OUR RESOURCES AND TOOLS

A transformative pace and scale of climate action work depends on changing rules that limit the capacity of the City of Tacoma to govern effectively and address climate change and socio-economic disparities.

- Support an increased [Pierce Transit sales tax](#) for more frequent, high quality services
- Advocate for policy changes from the Washington State Legislature:
 - Provide authority for utilities to develop incentives to customers to invest in clean, efficient appliances.
 - Develop a state [public bank](#) or [financial cooperative](#)
 - Raise property tax growth caps to align with growth and inflation
 - Impose a graduated income tax
 - Institute an [air quality surcharge](#)
 - Increase funding for active transportation and transit

Achieving climate action will require smart, urgent, and large new investments as well as a high-functioning bureaucracy. In its resourcing approach, the City of Tacoma should consider equity and effectiveness criteria in order to develop a [high-quality revenue system](#).

This entire Plan, including and beyond the 46 actions prioritized through 2024, must be implemented to get Tacoma on our net zero path. Anything less will be insufficient. However, to help jump-start implementation, ten highest priority actions have been highlighted below with cost estimates for the City and funding options:

Action Summary	Type of Action	City Cost Estimate*	Funding Options
3. Fund community food-growing or food-sharing projects, including community gardens, food forests, orchards, farms, or food rescue efforts; use suitable right-of-way and other public properties to address land access issues.	Community Support	\$100,000 annually	Fed. Recovery, GF, ES
4. Provide community and youth-serving organizations and climate justice leaders with education, tools, materials, compensation, professional development, and technical assistance to effectively engage and share their expertise.	Community Support	\$25,000 annually	GF, ES, grants
9. Develop and implement a funding plan to complete the City's bike and pedestrian network and Safe Routes to School improvements by 2050; new funding sources could include voter approved (Streets Initiative), impact fees, surface parking tax, etc.	Planning & Infrastructure	\$500,000 for plan, \$60m annually	Plan: GF
14. Collaborate with private and public partners to prioritize, support and create residential and commercial building retrofit solutions with: a) Increased access and awareness to codes, loans and incentives for energy efficient heating/cooling, windows insulation and decarbonization; b) Seek grant funding to pilot single and multifamily decarbonization retrofit program. Prioritize funding for rentals and income-qualified individuals.	Community Support & Programs	>\$2,000,000	Fed. & State grants or allocations, GF
15. Improve commercial energy codes to reduce most fossil fuel use, and require enhanced efficiency and health standards in coordination with Regional Code Council.	Policy	\$50,000	GF
17. Improve land use density bonuses and tax credits to require efficient zero carbon energy and green building certification.	Policy	N/A	

Action Summary	Type of Action	City Cost Estimate*	Funding Options
24. Develop program to ban food waste from garbage.	Staff & Programs	\$150,000 annually	Fed. Recovery, ES, grants
38. Designate or hire Green Economy Specialist to coordinate green economy actions and support partners and businesses. Increase knowledge, tools & capacity among City business liaison staff regarding W green resources.	Staff & Programs	\$150,000 annually	Fed. Recovery, GF, ES, Fed. & State grants or allocations
40. Establish, fund, and implement right-of-way tree maintenance program focused in high heat, low & very low opportunity equity neighborhoods. Include policy, protocols, and standards.	Programs	\$500,000 annually	GF, ES, grants
42. Work with the Health Department to provide filter fans for at-risk community members to assist in mitigating wildfire smoke in their homes and businesses.	Community Support	\$30,000 annually	GF, grants

Table key: Fed. = federal (for federal government); GF = General Fund; ES = Environmental Services Department

*City cost estimates are one-time costs unless stated otherwise

TACOMA COMMUNITY CLIMATE ACTION PLAN



Section 6

SECTION 6, PLAN CONTRIBUTORS

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Jim Gawel, University of Washington

Nicole Faghin, Washington Sea Grant

HOST GROUPS & PARTNER ORGANIZATIONS

Asia Pacific Cultural Center

Latinx Unidos South Sound

Oasis Youth Center

Puyallup Watershed Initiative Just and Healthy
Food System Community of Interest

Rainbow Center

Sunrise Tacoma

Tacoma Ministerial Alliance

Tacoma Urban League

Tribal Community Group

University of Puget Sound Class

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Emily Pinckney

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Margaret Schwertner

Nikie Walters

CITY OF TACOMA COMMITTEES, BOARDS, AND COMMISSIONS

Bicycle-Pedestrian Technical Advisory Group

Historic Preservation Commission

Human Rights Commission

Landmarks Preservation Commission

Mayor's Youth Commission of Tacoma

Planning Commission

Sustainable Tacoma Commission

Tacoma Area Commission on Disabilities

Tacoma Arts Commission

Tacoma Creates Advisory Board

Transportation Commission

CITY OF TACOMA NEIGHBORHOOD COUNCILS

Central Neighborhood Council

North End Neighborhood Council

South End Neighborhood Council

West End Neighborhood Council

OTHER STAKEHOLDERS GIVING COMMENTS

Citizens Climate Lobby

Downtown on the Go

Landmarks Preservation Commission

Manufacturing Industrial Council for the South Sound

Pierce Transit

Planning Commission

Port of Tacoma

Puget Sound Energy

U.S. Oil and Refining Company

WestRock Company

THANK YOU!

And a big thank you to the 1,001 community members who gave their input and time to this climate action planning process.

TACOMA COMMUNITY CLIMATE ACTION PLAN



Section 7

SECTION 7, COMMUNITY ENGAGEMENT SUMMARY

Phase I, Phase II, & III Community Engagement Reports follow here.

TACOMA COMMUNITY CLIMATE ACTION PLAN



Section 7 — PHASE I

PHASE I COMMUNITY ENGAGEMENT REPORT

EXECUTIVE SUMMARY

In response to City Council Resolution No. 40509 declaring a climate emergency in Tacoma and Resolution No. 40622 calling for anti-racist systems transformation, the [climate action planning process](#) aims to center historically underrepresented and underserved community voices towards a comprehensive climate action plan update to the 2016 Environmental Action Plan.

In partnership with Citizens for a Healthy Bay (CHB), we have developed a phased approach to community engagement for the climate action planning process. As a local environmental justice non-profit organization, CHB brings expertise in the natural sciences, environmental policy, and community collaboration and advocacy.

PHASE I ENGAGEMENT PURPOSE

The first phase of community engagement focused on:

- Building and deepening local relationships and partnerships
- Empowering community excitement, expertise, and creativity
- Activating community members and partner networks
- Training and educating community members to increase community resilience and leadership
- Understanding and prioritizing the voices of communities that are underrepresented, underserved, and made vulnerable to climate change

PHASE I ENGAGEMENT ACTIVITIES

Phase I engagement activities included:

- Establishing a community Environmental Justice Leaders Workgroup (EJ Leaders) to help steer climate action planning, engagement, and Plan content development
- Collecting community input using interviews, surveys, and visioning activities
- Facilitating community Climate Ambassadors (Ambassadors) to help collect input, build relationships, and provide climate change education

PHASE I ENGAGEMENT METHODS & AUDIENCES

With help from community Climate Ambassadors, we collected community input using interviews, surveys, and visioning activities. All activities were modified to comply with Covid-19 safety concerns and were flexible to meet the needs of Ambassadors. Some of this input was gathered as part of staff presentations on Tacoma's climate impacts and Ambassador-facilitated discussions on climate change. Some was collected without broader education on climate change via emails and social media posts. Demographic data was collected through voluntary reporting to track how successfully we reached different Tacoma communities.

All community responses were read thoroughly. Key ideas were identified in the responses and then grouped into themes to find the number of times each broad theme was mentioned.

We chose to look at the responses by demographic groups of interest to ensure historically underrepresented community voices were heard. This resulted in top themes for the overall group of respondents, Black, Indigenous, and People of Color (BIPOC) respondents, low income (less than \$50,000/year) respondents, and youth (under 25 years of age) respondents.

PHASE I COMMUNITY INPUT THEMES

Looking at the community input collected, several top themes emerged. Most top themes received a similar percent of total responses across all demographic groups. However, specific demographic groups mentioned certain themes noticeably more or less. For example, the Barrier, Lack of access to essential services that fulfill basic needs and provide the resources to thrive, was mentioned 4% and 3% more by BIPOC and Low Income respondents respectively relative to the All respondents group.

SUSTAINABILITY PRIORITIES	BARRIERS TO SUSTAINABILITY	COMMUNITY CONCERNS
<ul style="list-style-type: none"> Tacomans need access to urban green spaces and forests to recreate, recharge and mitigate climate impacts We need a healthy ecosystem free of pollution to protect human and nature welfare We need low carbon and active transportation systems to meet our climate action goals and connect our city All Tacoma residents need the security of housing 	<ul style="list-style-type: none"> Lack of support for government leadership and influence from special interest groups Current social norms and values that do not prioritize sustainability and care Lack of access to essential services that fulfill basic needs and provide the resources to thrive Lack of incentives for businesses to adopt sustainable practices and take responsibility for their environmental impact 	<ul style="list-style-type: none"> I am concerned about inequity and injustice in the community I am concerned about homelessness and access to housing I am concerned about pollution in the community and the health of our ecosystem I am concerned about climate change impacts and the impact of fossil fuel industries on our community

DATA ANALYSIS CONSIDERATIONS

Phase I community input collection emphasized relationship-building and the depth and quality of input over quantity. This initial engagement serves as a building block for stronger partnerships and participation from our EJ Leaders, Ambassadors, and other community members during Phase II.

We leveraged the social networks of Ambassadors, EJ Leaders, and partners to reach community members we usually do not hear from. We also heard more broadly from the Tacoma community through social media posts, newsletters, and emails to community members. Though we heard from a diverse group of respondents and attempted to prioritize hearing from our historically underserved and underrepresented groups in Tacoma, the input we collected was not accurately representative of Tacoma citywide demographics nor was it analyzed for statistical significance.

LESSONS AS WE APPROACH PHASE II

Phase II (February – June 2021) will focus on developing strategies and actions to meet our

climate goals and serve anti-racism. We will need to continue building new relationships and deepening existing relationships with community leaders, community groups, and partner organizations. With demographic data from Phase I in mind, we plan to focus our efforts to hear from more diverse communities. Among other strategies, we plan to lead more workshops hosted by partners and Ambassadors, leveraging our engagement and subject matter expertise and their social networks. We are also considering casual staff hours-style mini-events and more one-on-one interviews. The depth and quality of input from our EJ Leaders will continue to be valuable.

CONCLUSIONS

We successfully engaged a diverse group of Tacoma community members and partners during Phase I, built new connections, and fostered community climate literacy. What we heard reinforces past community calls for an intersectional climate action plan that serves social justice and improves access to basic needs, community health, and ecosystem function for the benefit of both current and future generations. Developing strategies and actions in a robust and equitable Plan to meet this vision will require flexibility and adaptation to meet community needs and engage authentically, particularly with underrepresented and underserved communities.

BACKGROUND

The City of Tacoma (City) defines sustainability as “the City and its citizens meet current needs without compromising the needs of future generations, such that environmental, social, cultural, and economic considerations are balanced and integrated in a day-to-day, decision-making manner” (Resolution 38247). In line with this definition and envisioning an equitable, healthy, and vibrant community for all, the City has taken action to reduce greenhouse gas emissions for a sustainable future.

In 2008, the City developed its first Climate Action Plan. This Plan committed Tacoma to reducing its community-wide greenhouse gas (GHG) emissions by 80% from 1990 levels by 2050, in line with the reduction goals stated in the international Kyoto Protocol. In 2016, the Environmental Action Plan (EAP) replaced the Climate Action Plan. The EAP outlined nearly 70 actions to implement across six sectors of sustainability through 2020. Sustainability sectors included buildings and energy, transportation, materials management, natural systems, air and local food, and climate resiliency. Beside their climate and environmental impacts, actions were vetted for a mix of co-benefits- their additional benefits to community needs like social equity, health, affordability, and the local economy. The City of Tacoma and Tacoma Public Utilities were responsible for leading implementation in collaboration with partner organizations and community members. Annual reports tracked progress across actions. On December 31, 2020, the EAP expired. Expert analysis concludes that, accounting for action taken through 2020 and projecting out to 2050, taking no new actions would lead to only a 14% reduction in Tacoma’s GHG emissions based on 1990 levels.

To replace the EAP and determine a path for climate action that achieves a climate-safe and socially just future for Tacoma, the City has collaborated with local partners and community members. Across a three-phase, year-long planning process from September 2020 – September 2021, the City will coordinate development of a new climate action plan and community engagement:

Table 1. Outline of climate action planning timeline and main objectives.

PHASE	ACTIONS	TIMELINE
1	Understanding Community Priorities <ul style="list-style-type: none"> • Collect baseline data • Model carbon pollution emissions 	September 2020 - January 2021
2	Strategy and Action Planning <ul style="list-style-type: none"> • Identify technical opportunities, community benefits 	February - June 2021
3	Plan Release and Adoption <ul style="list-style-type: none"> • Center equity in Plan • Deliver ambitious and achievable draft plan 	July - September 2021

PHASE I COMMUNITY ENGAGEMENT OVERVIEW

The purpose of Phase I engagement was to build and deepen community relationships and partnerships, activate and train community climate leaders, and understand community sustainability priorities, barriers, and concerns. We also wanted to prioritize and uplift the voices of communities that are historically underrepresented, underserved, and made vulnerable to climate impacts.

For Phase I of community engagement, the City pursued an approach that:

- **Adapted engagement safely to the COVID-19 pandemic**, moving engagement online
- **Leveraged the energy, creativity, and connections of community participants**
- **Emphasized quality** by focusing participation from **frontline communities**, building relationships, and seeking greater depth in community input
- **Promoted equity** by compensating frontline community members who participated and connected their social networks to this process
- **Deployed a mix of engagement methods**, including new partnerships, presentations, visioning activities, interviews, surveys, social media, and one-to-one outreach

In support of this engagement approach, the City contracted with [Citizens for a Healthy Bay](#) (CHB) to recruit and support community member participation. Citizens for a Healthy Bay is a local environmental justice non-profit organization with expertise in the natural sciences, environmental policy, and community collaboration and advocacy. Community participants served in two compensated roles: Climate Ambassadors (Ambassadors) and the Environmental Justice Leaders Workgroup (EJ Leaders).

During Phase I, we endeavored to use linguistically- and culturally-accessible communications and engagement methods, including translation and interpretation services to recruit and support participants. Community participants, called Climate Ambassadors, helped gather input on community priorities and concerns from members of their social network, also educating community members about local climate impacts and planning efforts. We also recruited a group of community members to serve as an Environmental Justice Leaders Workgroup to learn about and make recommendations for Tacoma's climate action planning process. They began meeting monthly in October 2020 and are working towards writing a chapter of the final Plan.

Both community participant roles serve to center frontline communities' needs and interests. We describe frontline communities as those that tend to experience inequity in multiple ways, whether being historically underrepresented, underserved, or made vulnerable; experiencing lower quality of life outcomes before COVID-19; or now experiencing worse impacts from the COVID-19 economic and health crisis. Frontline communities also include those expected to experience the first and worst consequences of climate damage. Frontline community members include individuals from one or more of the following backgrounds:

- Black, Indigenous, and People of Color (BIPOC)
- Speak English as a second language
- Living with a low household income
- Ages 16-26
- Lesbian, Gay, Bisexual, Transgender, Queer, Intersexed, Asexual, including those questioning their gender identity or sexual orientation (LGBTQIA+)
- Living with three or more generations in one home
- Living with more than one family in one home
- Living with a disability
- Immigrant or refugee
- Experiencing homelessness
- Completed formal education less than or up to a high school/GED level

COVID-19 CONSIDERATIONS

It is important to recognize that the climate action planning process was delayed several months due to the Covid-19 pandemic and Phase I engagement took place during a time of great stress for our community. We adapted all community engagement to adhere with Covid-19 safety regulations, moving all training and Workgroup meetings online and developing flexible engagement tools that could be used online or, much less frequently, safely in-person. It was challenging to build relationships virtually and to engage frontline communities most affected by the pandemic, the resulting recession, and with varying levels of internet access. To support our community participants, we offered additional training times, opportunities to catch-up on training and meeting content one-on-one, and were flexible with participants' contributions to make sure they were able to engage at the level that worked best for them. We also sought to address cost-barriers to people's participation. Though it is not equivalent to a stable income, we are grateful to have been able to provide frontline community participants with a stipend for their contributions to the planning process. Non-frontline community members and those connected to Tacoma but living and working outside Pierce County were also welcome to participate but were not eligible for stipends.

PHASE 1 COMMUNITY ENGAGEMENT METHODS & PARTICIPANTS

RECRUITMENT METHODS

Staff used a variety of methods to recruit EJ Leaders and Ambassadors from established and new social networks with the help of other City staff and partner organizations. Social networks were activated or established with the goal to engage frontline communities. Messaging emphasized a focus on environmental justice and highlighted compensation for frontline community members. Methods were virtual in compliance with Covid-19 safety requirements. Online engagement methods included emails, phone calls, e-newsletters, social media posts and direct messaging, City webpages, and application tools like Survey Monkey. Physical applications were offered and used in some cases. Language access relied on the City website's translation application and more generally a user's computer or mobile device translation application. Translation and interpretation services were also offered by request for application or other materials.

ENGAGEMENT TOOLS

Staff and community participants gathered community input through visioning activities, surveys, and interviews. These engagement tools asked community members to imagine Tacoma in the future, identify individual and community priorities, and barriers to progress. In their simplest formats, these tools included the following content:

VISIONING ACTIVITY FORMAT

The year is 2030. The place I live has _____.

To get home from my job, I _____.

In 2020, _____ was an issue in Tacoma.

Now that has changed because _____.

In 2030, I finally get to _____, because _____.

SURVEY QUESTIONS

When you imagine a sustainable Tacoma, what comes to mind?

What could keep us from getting there?

What are some concerns you have living in this community?

Thinking about Tacoma and our region, what climate change impacts are you most concerned about?

What would make it easier for you and others in the community to participate in the climate justice action planning update process?

Any other thoughts/questions/comments?

SELECTED INTERVIEW QUESTIONS

What do you think is going well in Tacoma right now?

What do you hope will be better in the future?

What are you most concerned about when you think about the future of the City or your neighborhood?

How does ____ issue impact you?

How do you think ____ issue can be overcome?

In the next 5 – 10 years, what do you think we can accomplish in Tacoma?

Each engagement tool included demographic questions for staff to broadly track whether we are reaching a diverse group of participants and adjust methods if necessary.

Staff and community participants involved in engagement were trained in the use of these tools.

Generally, staff sought to develop new processes, visit new venues, and empower new relationships to reach a more diverse audience than typically engaged through City planning efforts. These community participants and venues are detailed below:

CLIMATE AMBASSADORS

Climate Ambassadors serve to connect their social networks to our planning process. We received 39 Ambassador applications during recruitment and accepted all eligible applicants as well as EJ Leader applicants who were not selected for the EJ Leader role. This resulted in an initial group of 46 community members accepting an Ambassador role. Of this group, 33 Ambassadors completed all training and 19 Ambassadors were able complete Phase I engagement by gathering community input and educating community members about local climate impacts, planning efforts, and implemented actions.

Ambassadors used a mix of engagement approaches that reflected their strengths and relationships. While each could use City-developed engagement tools, they were encouraged to engage with family, friends, or neighbors safely and creatively. Some participants called old college friends, others talked to family across town, and still others organized COVID-safe community events or aid deliveries to share information and gather input.

Climate Ambassador Demographics

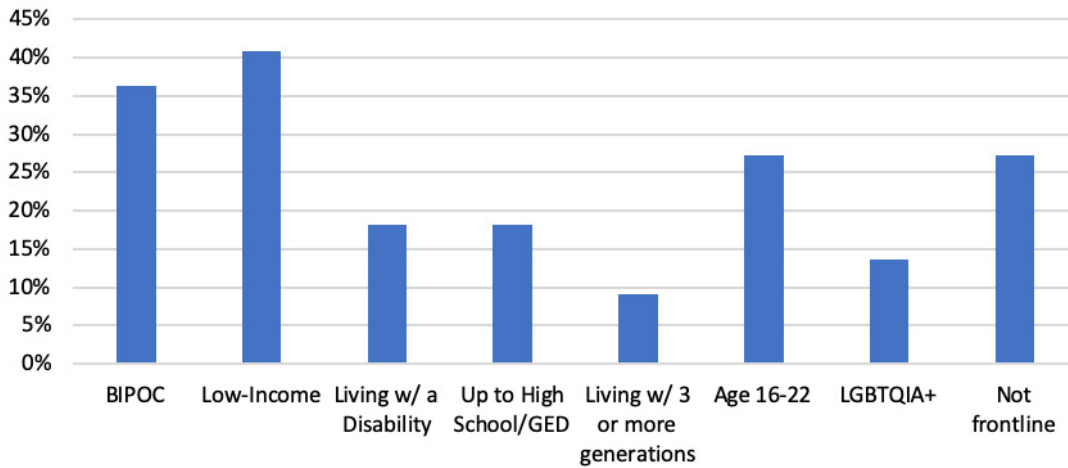


Figure 1. Demographic summary of Ambassadors who participated in collecting community input from their social networks and outreach.

Lessons from Phase I training and implementation activities will be leveraged in Phase II of Ambassador engagement as community priorities are turned into strategies and actions. Phase I Ambassadors will be invited to participate in Phase II, building from their success and relationships.

Beyond the input that Ambassadors facilitate through Phases I and II of the planning process, staff hope that their participation fosters appreciation, awareness, and involvement in future local environmental justice work.

ENVIRONMENTAL JUSTICE LEADERS WORKGROUP

Ten local Environmental Justice Leaders from frontline communities serve on our advisory Workgroup throughout the planning process to make recommendations for both engagement activities as well as strategies and actions that will go into the Plan. They will contribute content to the final Plan, including writing a unique chapter, equitable GHG reduction actions, and any other recommendations as they see fit. Their overall purpose is to advise the City on bold climate actions that meet the needs and interests of frontline communities.

Our 10 EJ Leaders were selected from an applicant pool of 41 and all identify as frontline community members. While Phase I work with the EJ Leaders focused on group development, training, and context-building, Phase II will involve regular recommendations from the Workgroup to staff about content to put into the draft Plan. For example, content includes guiding principles, strategies, and actions.

Beyond the adoption of a new Plan, staff hope that this process promotes two-way learning, new relationships, and empowers a cohort of local environmental justice leaders.

To ensure all EJ Leaders are able to participate equally in meetings and engage with meeting materials, we have been translating documents and have contracted with a local interpreter to assist one member who primarily speaks Spanish.

PRESENTATIONS TO CITY COMMITTEES, BOARDS, AND COMMISSIONS

We visited 13 City of Tacoma committees, boards, and commissions during Phase I to gather member input on community needs and interests. These community advisory bodies seek to reflect a breadth of stakeholders and make recommendations to staff and City Council about various topics. Often, members are well-connected through various organizational or community relationships, and beyond providing their individual input also served as a means to reach other social networks.

SOCIAL MEDIA OUTREACH

We leveraged various City and partner organization social media accounts to reach more community members. These included accounts on Facebook and Instagram administered by Tacoma Environmental Services, Tacoma Sustainability, and Citizens for a Healthy Bay, among others. Seven Facebook posts and five Instagram posts were created and shared from Tacoma Sustainability accounts and then subsequently re-shared by partner accounts. Engaging through paid social media posts was hindered substantially by budget constraints and social media policies active at the time of our engagement campaign.

Our highest performing post is featured below and was the only one shared to the Tacoma Government Facebook page. It featured language about social justice, climate justice, and community voice. The post reached 3,145 Facebook users, generated 69 link clicks (to the Story visioning activity), and was shared by 17 accounts. The other six Facebook posts averaged a reach of 350 users, 4 link clicks, and 3 shares per post. Our five Instagram posts reached an average of 252 users, 11 interactions, and 5 shares per post.

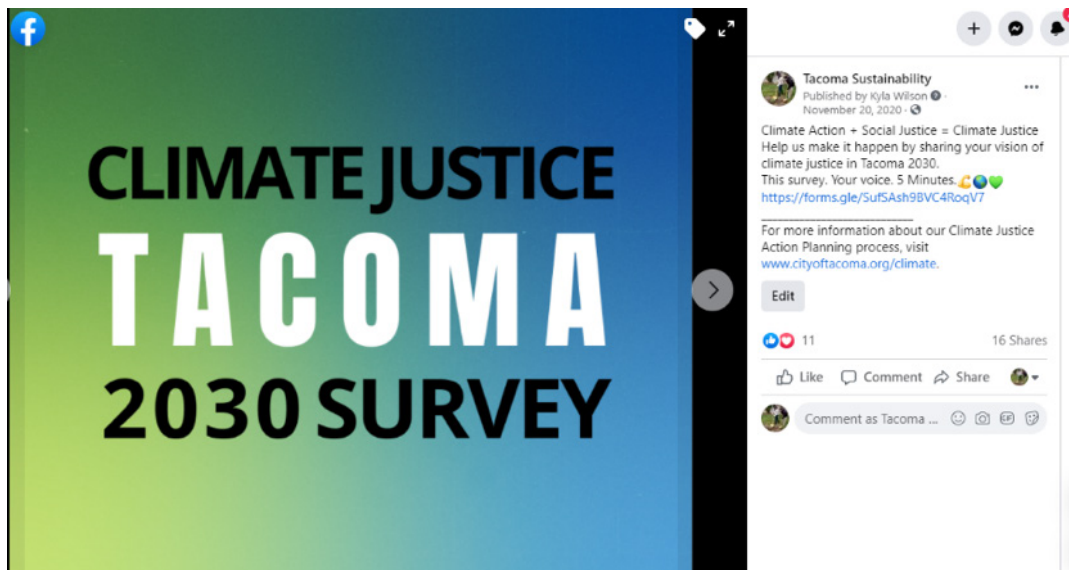


Figure 2. The social media post most shared and most successful at generating link clicks to the Story Activity

COMMUNITY INPUT & ANALYSIS PROCESS

Community engagement methods resulted in over 450 responses about community sustainability priorities, barriers to progress on sustainability issues, and general community concerns.

Community input will be used to:

- Prioritize actions and strategies for emission reductions based on community support and concern
- Identify actions and strategies that are important to all aspects of an equitable plan and our planning process but are not captured in the sector-based technical scope of climate actions
- Inform the EJ Leaders Workgroup’s Guiding Principles for when they write a section of the Climate Action Plan
- Inform other City plans and policies that fall outside the scope of the Climate Action Plan

PHASE I ENGAGEMENT RESULTS OVERVIEW

Leveraging the connections and knowledge of our community Ambassadors, EJ Leaders, and community members serving the City on committees, boards, and commissions, we collected input from 458 participants. While the format of each engagement tool varied, the majority of responses collected fell within three categories of response: Sustainability Priorities, Barriers to Sustainability, and Community Concerns.

Table 2. Summary of community participants involved in collecting input and the total number of responses collected using each engagement tool.

COMMUNITY PARTICIPANTS	
Climate Ambassadors	33
Environmental Justice Leaders Workgroup	10
TOTAL	43

RESPONSES BY ENGAGEMENT TOOL	
“Story” Community Member Visions	321
Survey Responses	128
Interview Responses	9
TOTAL	458

COLLECTING AND PROCESSING INPUT

Staff collected input with the help of community participants through visioning activities, surveys, and interviews. Each response was read thoroughly by a Staff person. While reading, staff developed a list of keywords to tag each response with, adapting the list of keywords to capture the meaning of each response in detail. This resulted in a total count of how many times each keyword was brought up by respondents. Related keywords were then grouped into broader themes. Total mentions of each theme were then compared across different demographic breakdowns.

Individual responses looked like:

- **Story Response 277:** In 2030 I finally get "to ride the light rail to Seattle" because "we funded transit."

- **Story Response 100:** In 2030 I finally get to "Not worry about my health and safety as the water and air is clean."
- **Survey Response 29:** "This community doesn't have a robust way to care for or anyone who is on the verge of poverty or mental health care for anyone living on the margins/vulnerable."

Here is an example of tagging individual responses with keywords and identifying themes:

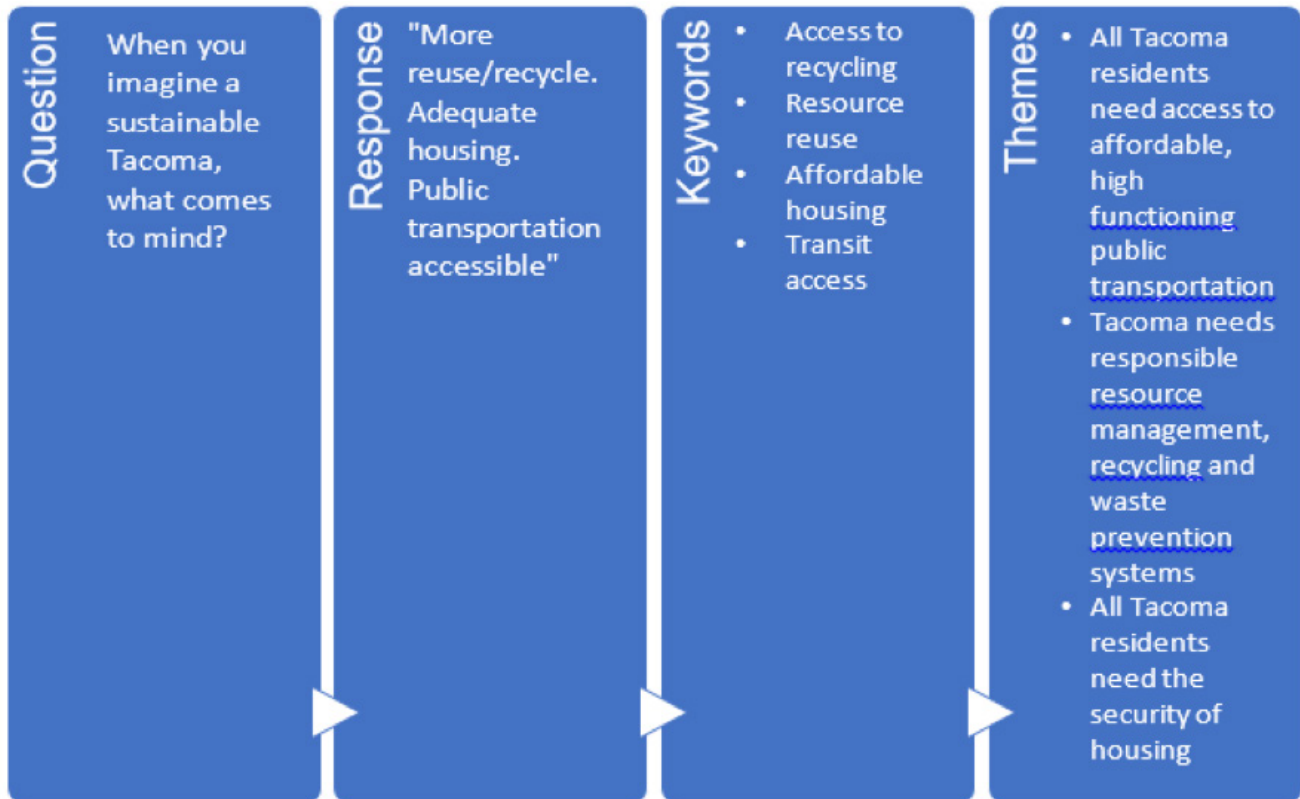


Figure 3. Flowchart of grouping community input results from Survey questions, Story answers, and Interviews into themes.

In this example, the question "When you imagine a sustainable Tacoma, what comes to mind?" asks the respondent about their sustainability priorities. Their response mentions access to recycling and resource reuse which fall into the broader theme: Tacoma needs responsible resource management, recycling and waste prevention systems.

The themes emerging from responses to Survey question 1 (When you imagine a sustainable Tacoma, what comes to mind?), Story answer 1 (The year is 2030. The place I live has _____), and Story answer 4 (Now that has changed because _____) as well as relevant Interview responses were grouped together into the Sustainability Priorities category. Themes from Survey question 2 (What could keep us from getting there?) and Interview responses make up the Barriers to Sustainability category. The final category, Community Concerns, includes the themes from Survey question 3 (What are some concerns you have living in this community?), Story answer 3 (In 2020, _____ was an issue in Tacoma.), and Interview responses.

Results from Story answer 2 (To get home from my job, I _____) and Survey question 4 (Thinking about Tacoma and our region, what climate change impacts are you most concerned

about?) were analyzed separate to avoid over emphasizing transportation related themes in Sustainability Priorities and climate change impacts in Community Concerns.

Results from Story answers 5 and 6 were often highly personalized responses about actions respondents would like to take in 2030. Though these responses do help frame the community’s vision for what life is like in 2030, they have been excluded from analysis of priorities, barriers, and concerns.

WHO WE HEARD FROM

In order to track how well we reached historically underserved, underrepresented and overburdened communities, we asked respondents several demographic questions including race/ethnicity, age, gender, household income (2019), homeownership, zip-code, and primary language spoken at home. Not all respondents chose to answer each of these demographic questions or preferred to self-describe. The following information about respondents reflect the 83% who chose to answer demographic questions.

For our analysis, we focused on our success at reaching three main groups:

- Black, Indigenous, People of Color (BIPOC) communities
 - Respondents who identified as Black/African, Native American/Alaska Native, Latinx/ Non-white Hispanics, Asian, Pacific Islander/Native Hawaiian, Middle Eastern/North African, and/or more than one of these races/ethnicities.
- Low Income respondents
 - Respondents whose household income was less than \$50,000/year.
- Youth respondents
 - Respondents less than 25 years old.

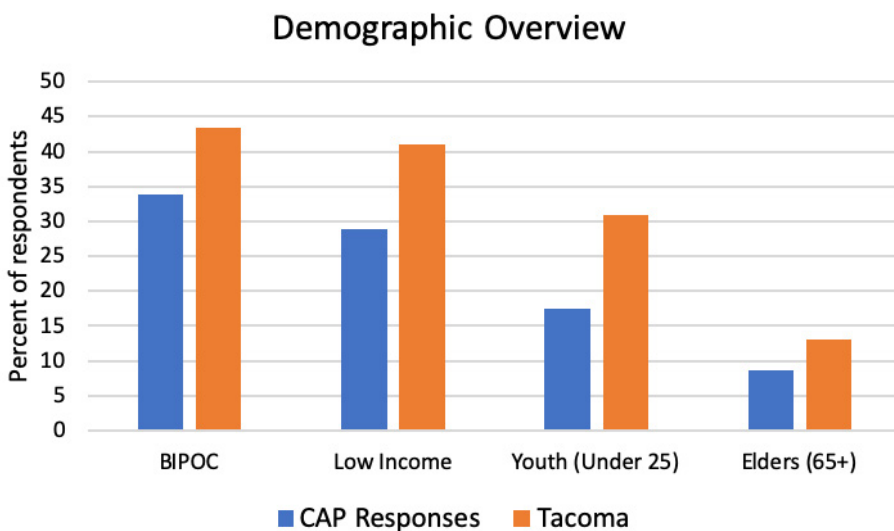


Figure 4. A summary of Climate Action Planning Respondent demographics in comparison to [Tacoma Census Projections](#).

It is important to note that we fell short of reaching a representative sample of Tacoma residents, particularly for the historically underserved groups BIPOC and Low Income. We know that the Covid-19 pandemic and recession is particularly challenging for these communities, and it tends to be exacerbated by unequal internet access. However, the percentage of Youth we reached is skewed because the [Tacoma census data](#) Youth percent includes residents aged 0-14 who were not a focus in our input gathering. For more details on age demographics, see Figure 7.

We heard from a diverse group of Tacoma community members; however, there is room to improve our outreach to key communities of color, low income community members, and some age groups to ensure equitable climate actions and strategies for the Plan. Effective engagement of diverse, frontline communities will depend on mitigating barriers and being flexible with peoples’ capacity to participate. On the other hand, it will also be important to value qualitatively rich input from fewer, well-connected individuals and service organizations rather than high levels of participation from communities that may be experiencing extraordinary day-to-day burdens.

BIPOC COMMUNITIES

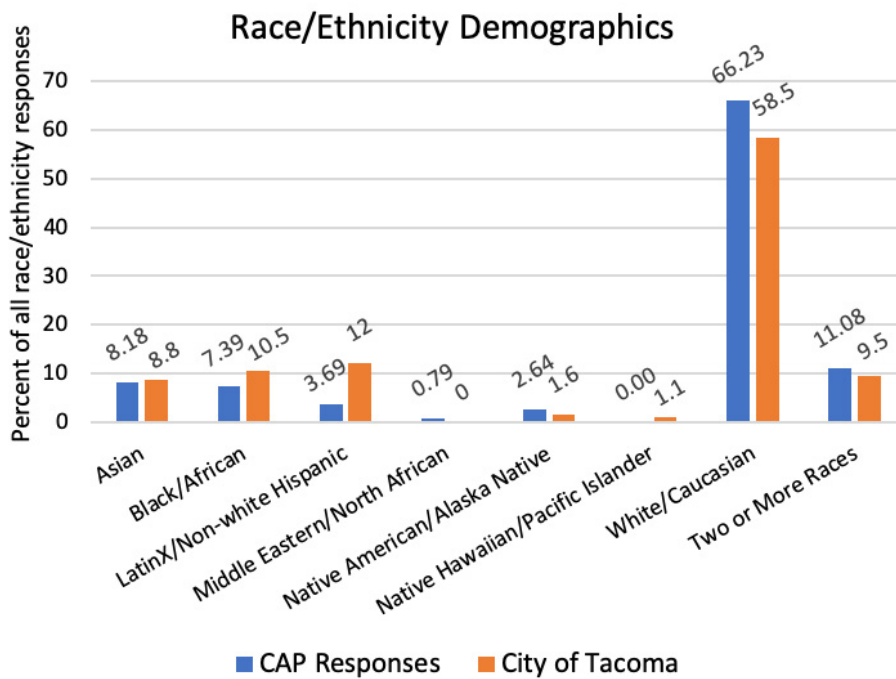


Figure 5. A complete breakdown of the 379 responses to the race/ethnicity demographic question. 17% of respondents chose not to answer or chose to self-describe. 11.1 % of respondents selected more than one race/ethnicity option. These responses are broken out in detail in Table 1.

Table 3. The total number of responses for each multi-racial/ethnic identity selected in response to the race/ethnicity demographic question.

TWO OR MORE RACE/ETHNICITY	# OF RESPONSES
Asian and White	7
LatinX/Non-white Hispanic and White	6
Pacific Islander/Native Hawaiian and White	5
Native American/Alaska Native and White	4
Native American/Alaska Native, LatinX/Non-white Hispanic, and White	3
Black/African, Asian, and White	3
Native American/Alaska Native and LatinX/Non-white Hispanic	2
Black/African, Middle Eastern/North African, and White	2
Pacific Islander/Native Hawaiian and Black/African	1
Pacific Islander/Native Hawaiian and Asian	1
Native American/Alaska Native, LatinX/Non-white Hispanic, and Black/African	1
Native American/Alaska Native and Asian	1
LatinX/Non-white Hispanic, Asian and White	1
LatinX/Non-white Hispanic and Black/African	1
Asian and Middle Eastern/North African	1
Black/African and White	1
Middle Eastern/North African and White	1
Asian, Pacific Islander/Native Hawaiian, Native American/Alaska Native, LatinX/Non-white Hispanic, Black/African, and White	1

Based on the race/ethnicity demographic results from Phase I, we know moving forward that we need to make more of an effort to reach BIPOC community members. Particularly, we need new strategies for reaching Tacoma’s Latinx/Non-white Hispanic community. This was the race/ethnicity with the greatest gap between our results and Tacoma census data.

LOW INCOME RESPONDENTS

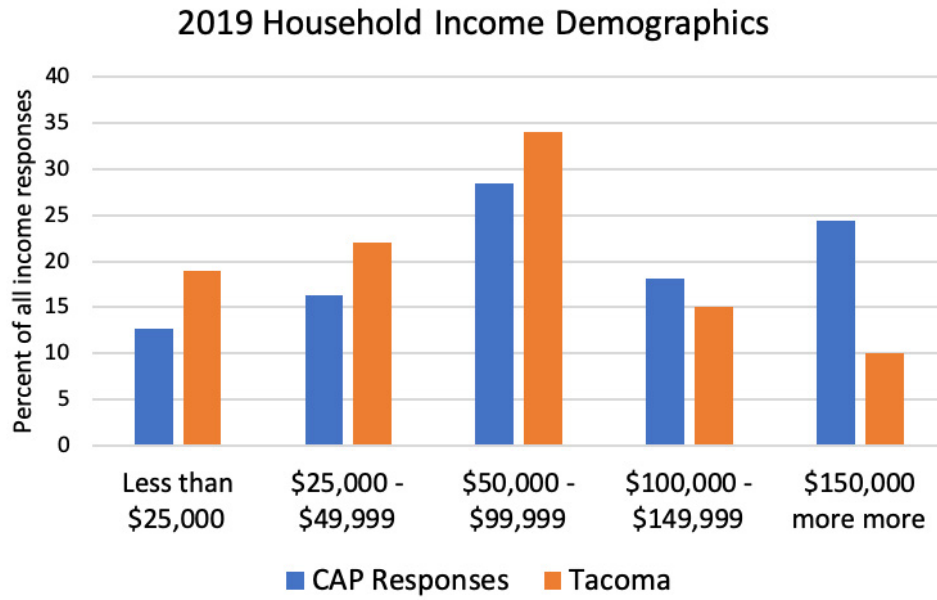


Figure 6. Responses to household income demographic question by income bracket. 17% of total respondents chose not to answer this question. The above percentages reflect only the 380 responses to this question.

Our community input results over-represent high income households. 41% of Tacoma households earn less than \$50,000 per year (*US Census Bureau, 2019*). Median household income is around \$62,000/year (*US Census Bureau, 2019*). Only 29% of Phase I climate action planning respondents had a household income less than \$50,000/year. During Phase II, we hope to reach more low income residents.

YOUTH RESPONDENTS

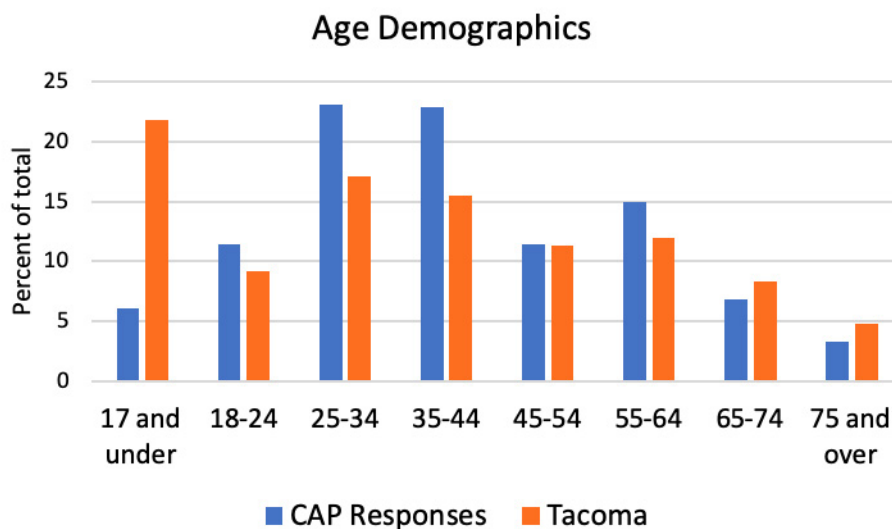


Figure 7. Responses to age demographic question by age bracket. 14% of total respondents chose not to answer this question. The above percentages reflect only the 394 respondents who answered this question.

The median age in Tacoma is 36 ([US Census Bureau, 2019](#)). The majority of our respondents were under 45 years old and most of our younger age brackets are over-represented in comparison to the Tacoma census data, except for those under 17. However, a more accurate comparison for our respondents who answered “under 17” may be to Tacoma’s 15-17 year old population, roughly 4% of the City’s total population. While a few of our Climate Ambassadors were high school age and maybe have collected input from their peers, we did not target younger children in our data collection which are included in the Tacoma 17 and under group.

We did not hear from as many community members 65 years old and over. Elders do face more health risk as the number of extreme heat days in Tacoma rises due to climate change. Our over-representation of younger age groups may be a result of the online nature and social media focus for much of our outreach and input collection due to Covid-19 safety concerns. 92.5% of those who did respond as 65 and over are also white. Therefore, we need to reach more BIPOC elders during Phase II to better represent Tacoma.

WHAT WE HEARD

SUSTAINABILITY PRIORITIES

In this category of responses, there were 94 unique response tags grouped into 22 themes and an additional ‘other’ category for response tags that were very general (ex. improved, sustainable) or either did not relate to other response tags to be grouped or have enough responses to be featured individually. For the complete list of themes and percent of responses for each by demographic group, see Supplemental Figures, Table 1.

Generally, there was agreement between the demographic groups on priorities for achieving a sustainable Tacoma. However, there were some variations in how often priorities were mentioned by each demographic group.

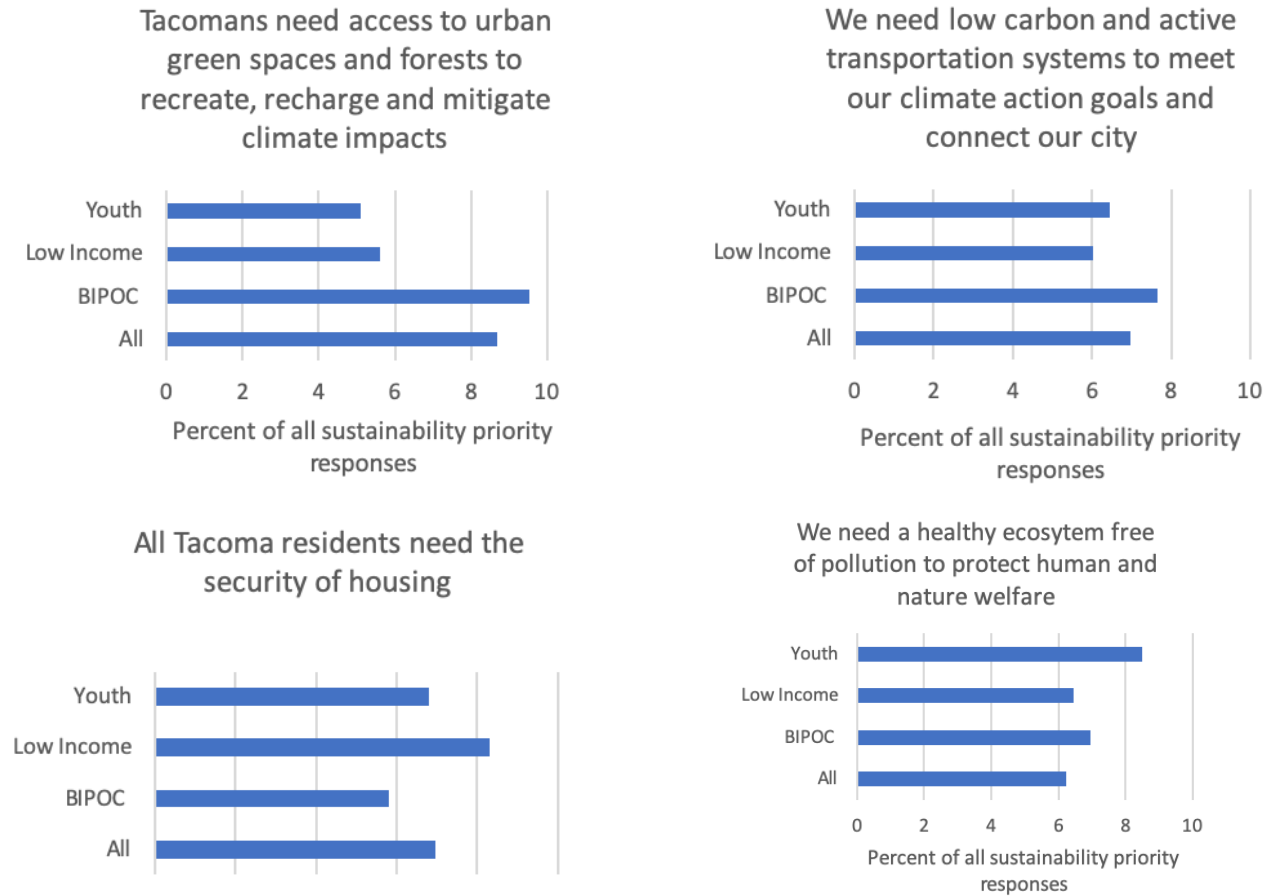


Figure 8. The top 4 sustainability priority themes with the percent of total responses for each theme by demographic group.

Some differences in top sustainability priorities are demonstrated in Graph 6. The theme Tacomans need access to urban green spaces and forests to recreate, recharge and mitigate climate impacts was mentioned more frequently by BIPOC community members in comparison to the other demographic groups. Youth respondents mentioned topics and ideas in the We need a healthy ecosystem free of pollution to protect human and nature welfare theme to a greater extent than other groups. Low income respondents mentioned housing access within the All Tacoma residents need the security of housing theme more than other groups.

Ideal Future Transportation Options

One of the Story answers asked respondents specifically about how they envision commuting to and from work in a sustain 2030 Tacoma scenario. The results of these responses complement the high interest in low carbon and active transportation options as well as access to affordable and reliable public transportation – another theme in the top 6 group of sustainability priorities.

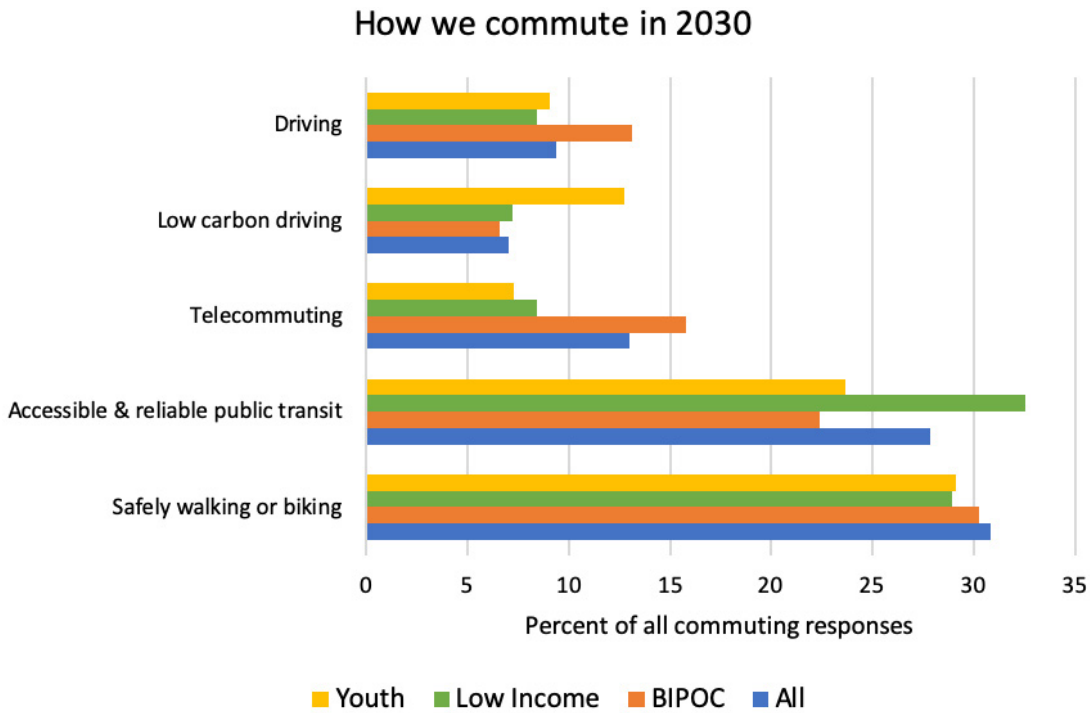


Figure 9. The top 5 themes on how we commute in 2030 with the percent of total responses for each theme by demographic group.

While close to 10% of respondents imagined they would still be driving (single occupancy vehicle) to get home from their job in 2030, close to 30% of respondents across all demographic groups mentioned walking or biking and safe pedestrian routes. Accessible and high function public transportation was of particular interest to low income community members.

Key takeaways

- Community members think of sustainability across social, economic, and environmental spheres in line with the City’s definition of sustainability (see page x).
- Access to nature/urban greenery, the health of our ecosystems, low carbon transportation options, and access to housing are all necessary components of a sustainable Tacoma.
- City walkability and bike-ability, both in terms of infrastructure and design for safe connections and opportunities to live and work in the same neighborhood, are important to the community.

BARRIERS TO SUSTAINABILITY

In this category there were 54 unique response tags grouped into 17 themes to capture responses from Survey question 2 and the Interviews. For the complete list of themes and percent of responses for each by demographic group, see Supplemental Figures, Table 2.

The top four Barriers to Sustainability were the same for all demographic groups, but there are some differences in prioritization between groups. The most frequently mentioned barrier by all demographic groups, and of particular concern to Youth respondents, was a lack of support and leadership from the government and the influence of special interest groups. A lack of cultural values and social norms that promote sustainability and a lack of incentives for businesses to take

responsibility for their impact and adopt sustainable practices were also top mentioned barriers. Low Income and BIPOC respondents were particularly concerned about the community’s lack of essential services and basic needs as a barrier to action.

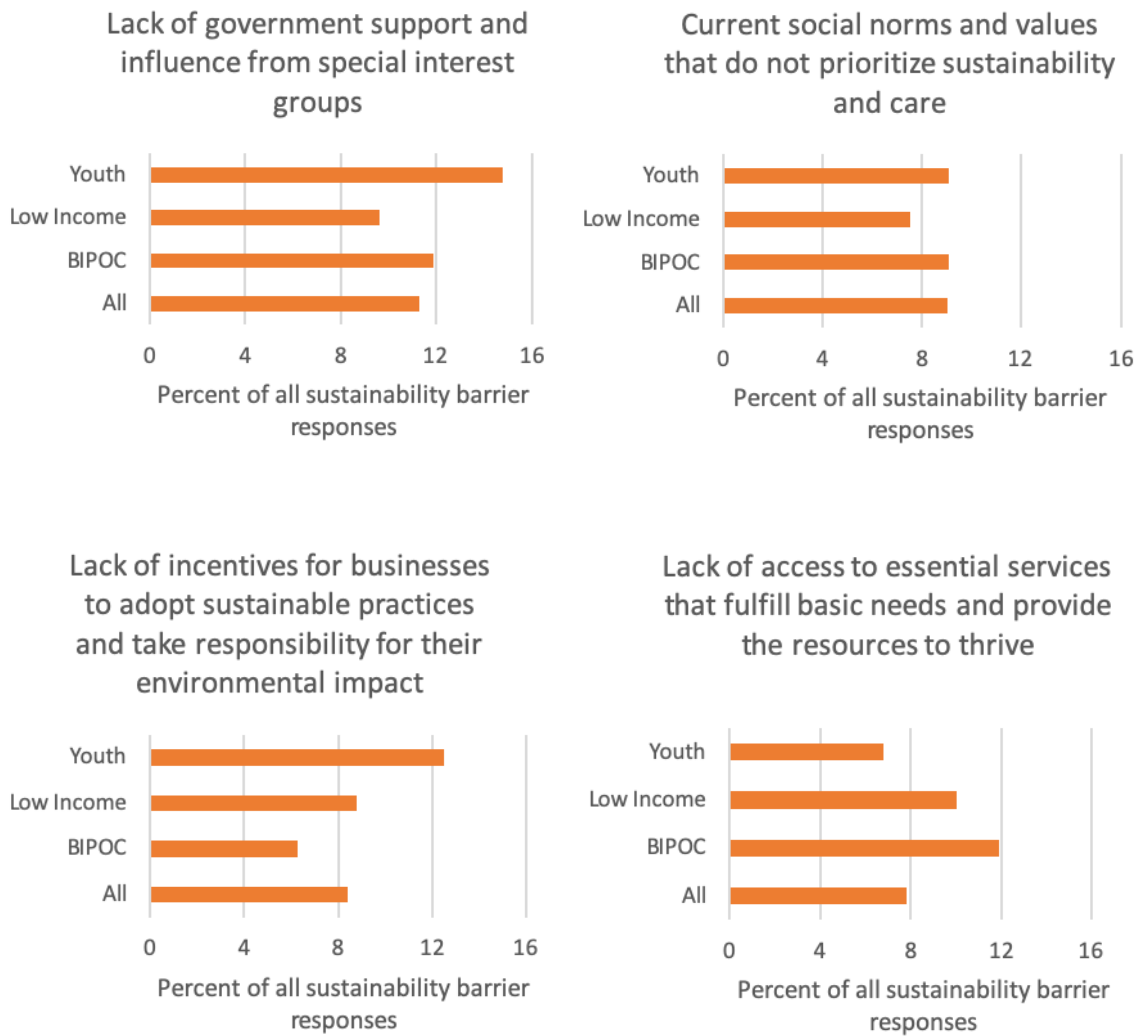


Figure 10. The top 4 barriers to sustainability themes with the percent of total responses for each theme by demographic group.

Key Takeaways

- We need to improve government accountability and transparency and demonstrate our leadership in climate actions.
- A lack of community resources and basic needs prohibits participation and achieving equitable sustainability and climate goals.
- We need to promote ethics of care at a personal and business level.

COMMUNITY CONCERNS

The design of all engagement tools was intentionally open-ended to allow for a diversity of responses. The climate action plan will influence many facets of life in Tacoma. In order to design

equitable actions and strategies, we felt it was important to be aware of broader issues in the community to avoid perpetuating inequitable systems and find co-benefits where possible. The question about community concerns was not specifically about climate action; however, sustainability concerns are reflected in the responses more so than in other City surveys of community concerns. This may be due to the climate action planning framing of all engagement.

96 unique response tags were grouped into 17 community concern themes. For the complete list of themes see Supplemental Figures, Table 3. Social issues like inequity, injustice, homelessness, and housing access were of high concern. Pollution and ecosystem health as well as impacts of climate change were also of high concern.

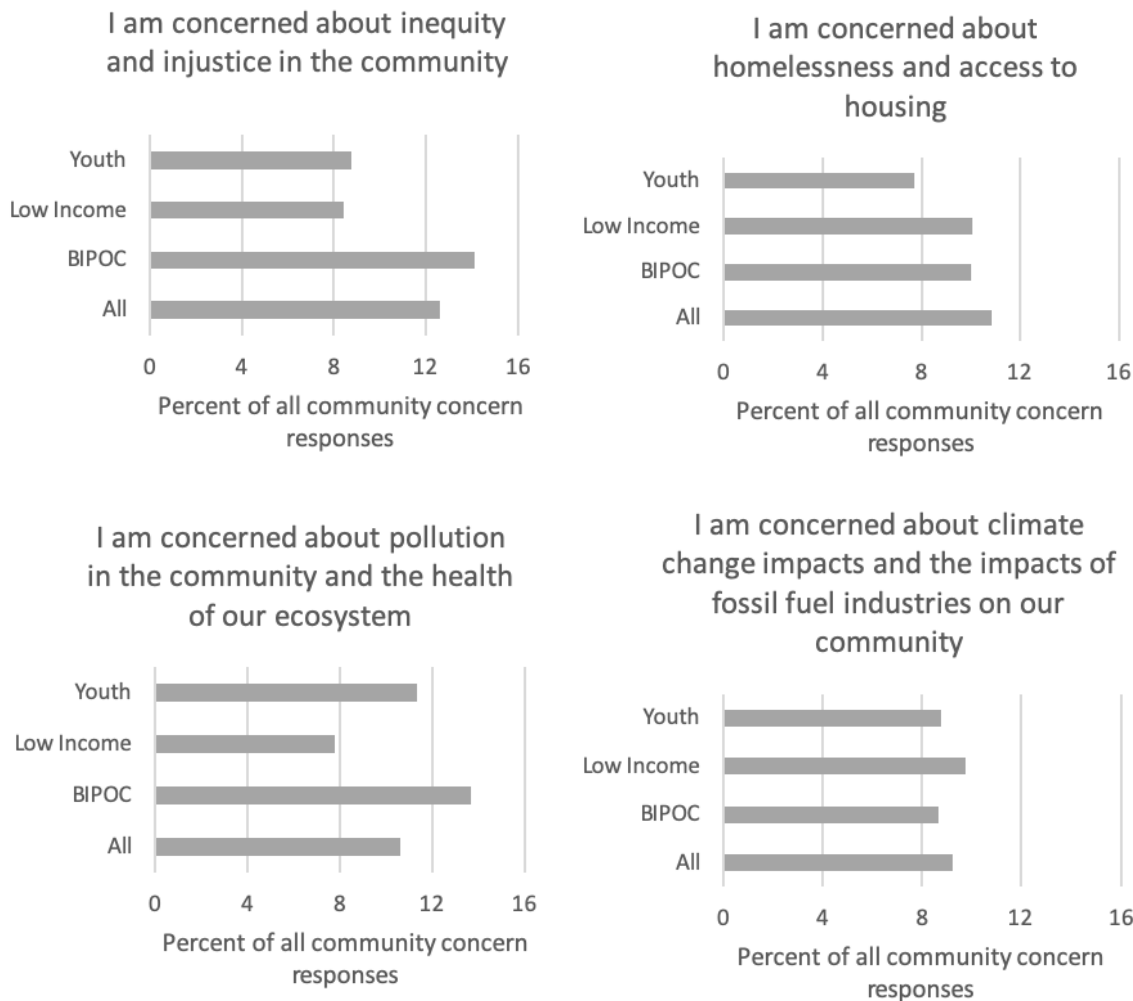


Figure 11. The top 4 community concern themes with the percent of total responses for each theme by demographic group.

CLIMATE IMPACTS OF CONCERN

Survey question 4 shared a list of climate change impacts we are experiencing and expect to experience more of in Tacoma and asked respondents about which climate impacts they were most concerned about. Concern about climate impacts and impacts from the fossil fuel industries in Tacoma was a top general community concern and the results below expand on respondents’ specific climate change concerns. The related impacts of air quality and forest susceptibility to wildfires were both top climate impact concerns. Recent wildfire events may have increased concern about air quality and human health. In 2018 and 2020, Tacoma experienced unhealthy air quality due to wildfires in California, Oregon, and both Eastern and Western Washington. Concern about impacts to wildlife and natural systems as well as freshwater availability were also frequently mentioned by all demographic groups. Youth and BIPOC respondents mentioned ecosystem impacts more than other demographic groups. Youth respondents were also particularly concerned about impacts to forest and the threat of wildfire.

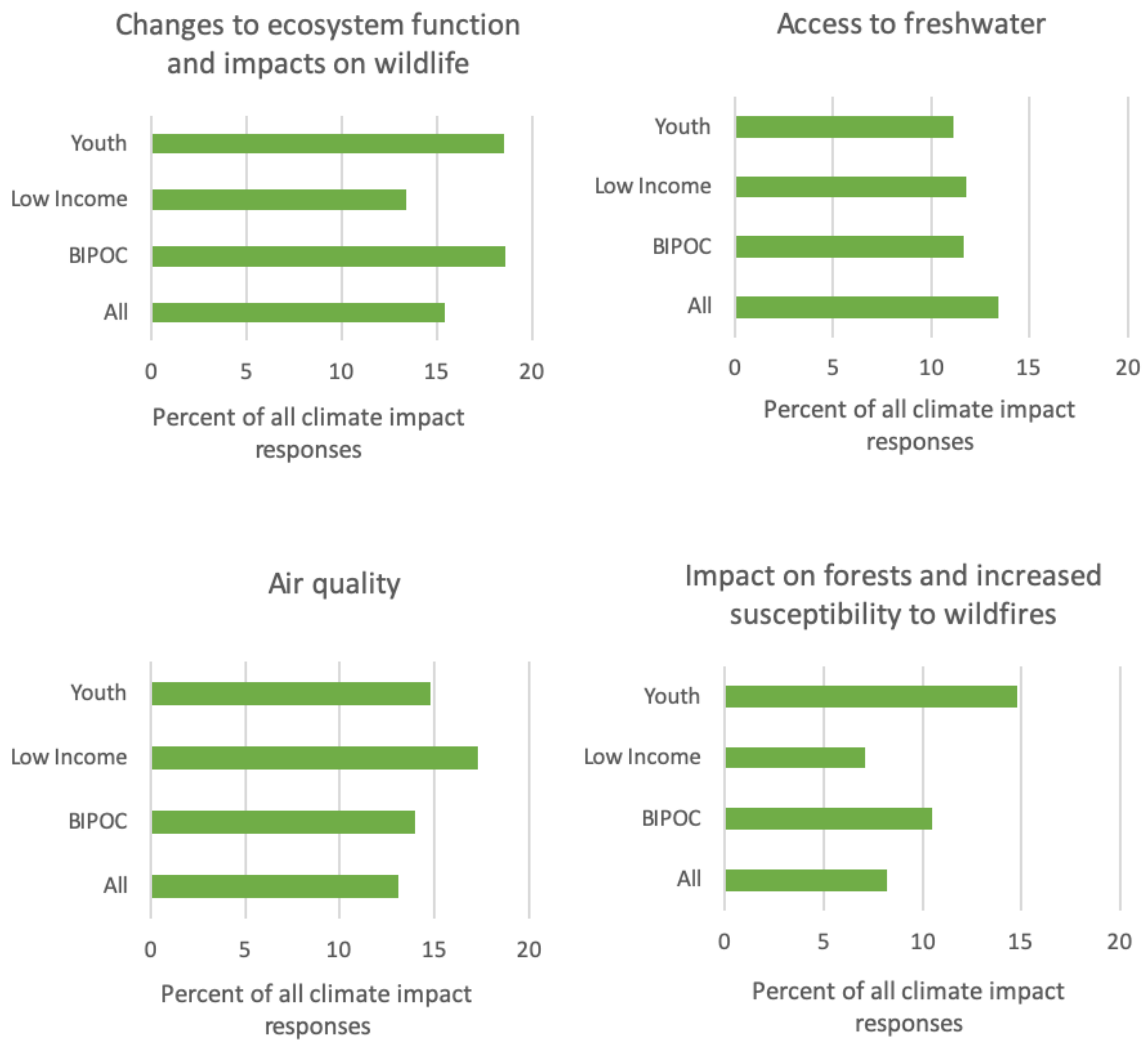


Figure 12. Top 4 regional climate impacts of concern with the percent of total responses for each demographic group.

Key Takeaways

- We need to continue addressing environmental and social justice issues related to the climate action plan.
- We need to focus on co-benefits to climate action and design strategies that address pollutants and housing affordability and availability.
- It may be beneficial to focus climate impact and benefits of climate action communication on protecting ecosystem function and forests, improving air quality, and ensuring freshwater availability.

COMMUNITY INPUT ON FUTURE ENGAGEMENT

We had 148 responses to Survey question 5 about how we can improve our community engagement. The most common response was feedback for general improvements to communication and publicity. Several tools such as surveys, events, social media, and emails were also mentioned. Additionally, a few values for community engagement were raised by respondents. These included centering community voice and community actions, improving government transparency and building trust.

Table 4. Top suggestions for facilitating future community input and participation in climate action planning by demographic group. Most mentioned responses are highlighted in green for each demographic group.

WHAT WOULD MAKE IT EASIER FOR YOU AND OTHERS IN THE COMMUNITY TO PARTICIPATE IN THE CLIMATE JUSTICE ACTION PLANNING UPDATE PROCESS?	ALL %	BIPOC %	LOW INCOME %	YOUTH %
General communication and publicity	16.89	16.28	16.67	24.00
Focus on community voice	6.76	2.33	5.00	4.00
Surveys	4.73	0.00	1.67	4.00
Social Media	4.73	6.98	3.33	0.00
Host online events	4.05	0.00	5.00	4.00
Emails	3.38	2.33	1.67	0.00
Host Events	3.38	4.65	3.33	0.00
Improve government transparency	3.38	2.33	3.33	4.00
Focus on community actions	2.03	4.65	0.00	12.00
Focus on building trust	1.35	4.65	3.33	0.00

Key Takeaways

- We need to be communicating more and more widely about climate action planning.
- Focusing on community actions and voice may help increase participation.
- Hosting online events and using social media can be useful tools for reaching the community, especially during the Covid-19 pandemic when in-person events cannot be organized.

SELECTED FEEDBACK FROM EJ LEADERS WORKGROUP

The EJ Leaders Workgroup is providing feedback during all three phases of climate action planning. An early draft of Phase I community input results were shared with the EJ Leaders. Selected feedback from EJ Leaders on the community input results as well as broader feedback on Phase I processes is included below.

- Socio-ecological work we do in Tacoma affects the traditional lands of the Puyallup Tribe. City planning needs to be in collaboration and consultation with Tribal leadership.
- Plan actions and strategies should focus on the inequitable impact of co-pollutants, on human health and future generations. Reducing GHG emissions by, for example, electrifying transportation, also reduces pollutants like particulate matter and ozone which disproportionately affect the health of low income residents and BIPOC communities who often live closer to major roads.
- The majority of Phase I results are related to impacts on human systems. This may be due to the anthropocentric framing of Interview, Survey, and Story questions. Our Plan should highlight the interdependency of natural and human systems and illustrate climate change's ecological impacts on other animals and plants.
- Our Plan should have transparent monitoring and reporting methods with greater opportunity for community leadership and participation.

DATA ANALYSIS CONSIDERATIONS

Though the respondents we reached during Phase I engagement and the input we gathered is not a representative sample of Tacoma citywide demographics and was not evaluated for statistical significance, it is important to keep in mind the purpose of Phase I. Our engagement process and community input collection had the additional goals of building community relationships and knowledge for future climate action. We intentionally emphasized depth and quality of input over quantity. This initial engagement serves as a building block for stronger partnerships and participation from our EJ Leaders, Ambassadors, and other community members during Phase II.

We would have liked to gather more BIPOC and low income community member responses in the Phase I community input. However, we hope the additional input and feedback we continue to receive from the EJ Leaders Workgroup will supplement what we missed in community input.

We are continuously learning through this new engagement and planning process. We have made progress through working with the social networks of Ambassadors, EJ Leaders, and partners to reach community members we usually do not hear from.

The responses we gathered through social media posts and email lists may have primarily come from respondents already aware of sustainability and climate change issues in Tacoma since they most likely connected with us through the Office of Environmental Policy and Sustainability or CHB resources. This may have influenced the results we found for top priorities, barriers, and concerns.

LESSONS LEARNED

Staff have identified various lessons from this new approach to engagement.

STRENGTHS

- Building from existing relationships
- Establishing new relationships
- Compensating frontline community member participation
- Empowering community excitement, expertise, creativity, and leadership
- Learning from path-breaking communities, including Fort Collins, CO, King County, WA, and Providence, RI, among others
- Building on linguistically and culturally accessible communications and engagement

ROOM FOR IMPROVEMENT

- Activating community member networks
- Training community participants for creative and insightful engagement
- Balancing community input processes with relationship-building and leadership development
- Hearing from and uplifting the voices of communities that are underrepresented, underserved, and made vulnerable

CONCLUSION

Towards building a robust and equitable climate action plan, Phase I engaged a diverse group of Tacoma community members and partners to better understand current sustainability priorities, barriers to sustainability, and general community concerns. We successfully established an EJ Leaders Workgroup of 10 frontline community members and trained over 30 community Climate Ambassadors. In collaboration with Ambassadors and partners, we gathered input from 458 community members. These responses reinforce the necessity for a socially just and intersectional climate action plan that can improve community health, access to basic needs, and ecosystem function for the benefit of future and current generations.

From what we have learned during Phase I of climate action planning, we will need to continue building relationships with community leaders, community groups, and partners and adapting our engagement techniques to reach historically underrepresented and underserved community members. The Covid-19 pandemic and recession will continue to burden some communities and community members worse than others, and internet access remains an issue. Staff will seek to emphasize quality over quantity to limit engagement burdens as well as continue to center equity.

SUPPLEMENTAL FIGURES

Table 5. Complete list of Sustainability Priorities Themes and the percent of total responses included in each theme for All respondents and our demographic groups of interest. Percentages greater than or equal to 6% are highlighted in green to show top themes for each demographic group.

SUSTAINABILITY PRIORITIES	ALL %	BIPOC %	LOW INCOME %	YOUTH %
Tacomans need access to urban green spaces and forests to recreate, recharge and mitigate climate impacts	8.69	9.51	5.60	5.10
We need low carbon and active transportation systems to meet our climate action goals and connect our city	6.95	7.66	6.02	6.46
All Tacoma residents need the security of housing	6.95	5.80	8.30	6.80
We need a healthy ecosystem free of pollution to protect human and nature welfare	6.22	6.96	6.43	8.50
All Tacoma residents need access to affordable, high functioning public transportation	5.95	6.96	6.85	6.46
Tacoma needs to end dependence on fossil fuels, prevent new fossil fuel infrastructure and investments, and to invest in renewable, clean energy sources	5.37	4.64	5.60	6.46
We need equitable and just transformation that centers those most vulnerable in our community	4.90	6.03	5.19	4.42
For a thriving Tacoma, We need more community resources, spaces, voices and partnerships	4.48	6.03	5.60	6.12
A thriving Tacoma is a place where people feel a sense of belonging and support from their community, where the community is diverse, and local arts and culture flourish	4.00	3.48	2.90	4.76
Tacoma's built environment needs to be thoughtfully planned to support emission reduction, sustainable resource use, and protect land	3.95	3.71	2.49	2.38
We need to support local urban farming and ensure access to healthy food for all	3.69	2.78	3.73	2.38
We need support for local decent paying job opportunities in Tacoma, including sustainable green jobs	3.64	3.02	3.73	5.44
Tacoma needs responsible resource management, recycling and waste prevention systems	3.53	4.64	5.39	5.78
We need to restore and protect our vital ecosystems, with special attention to Commencement Bay and the Tideflats	3.27	3.94	4.98	2.04
Tacomans need easy access to quality healthcare, including mental health and substance abuse support for healthy individuals and community	3.11	2.55	3.11	2.38
We need to act now to mitigate climate change impacts and adapt to a changing environment	2.32	2.09	2.07	4.42

SUSTAINABILITY PRIORITIES	ALL %	BIPOC %	LOW INCOME %	YOUTH %
Everyone needs access to high quality and affordable education, which should include environmental and climate science	2.00	2.55	2.07	2.04
We need a representative government that is transparent and accountable to the community	1.79	0.70	2.49	2.04
Police reform	1.37	0.70	1.24	1.02
In order to meet Tacoma's sustainability and climate goals we need real financial investment.	1.16	0.70	0.83	1.02
We need to invest in city infrastructure to prevent water pollution and ensure access to clean water.	0.95	1.16	1.45	0
Tacoma needs to be a safe place to live, work, and recreate	0.90	0.46	0.41	1.02
Other	14.81	13.92	13.49	12.93
TOTAL	100	100	100	100

Table 6. Complete list of Barriers to Sustainability Themes and the percent of total responses included in each theme for All respondents and our demographic groups of interest. Percentages greater than or equal to 6% are highlighted in green to show top themes for each demographic group.

BARRIERS TO SUSTAINABILITY	ALL %	BIPOC %	LOW INCOME %	YOUTH %
Lack of support for government leadership and influence from special interest groups	11.29	11.89	9.62	14.77
Current social norms and values that do not prioritize sustainability and care	9.03	9.09	7.53	9.09
Lack of incentives for businesses to adopt sustainable practices and take responsibility for their environmental impact	8.42	6.29	8.79	12.50
Lack of sufficient funding	8.21	7.69	5.86	9.09
Lack of access to essential services that fulfill basic needs and provide the resources to thrive	7.80	11.89	10.04	6.82
Historical representation and inequity that persist today, particularly a lack of acknowledgement of Indigenous rights and knowledge	7.19	5.59	8.79	6.82
Lack of community leadership and opportunities for collaboration between community groups, businesses, and government agencies	6.37	6.29	7.53	4.55
Our current economic system that perpetuates inequity and natural resource extraction	5.75	4.20	4.60	4.55

BARRIERS TO SUSTAINABILITY	ALL %	BIPOC %	LOW INCOME %	YOUTH %
Lack of strategic urban growth management and planning to reach our long term goals	5.13	3.50	3.77	3.41
Lack of access to affordable, efficient, and low carbon public transportation and active transportation options that prevent us from reducing single-occupancy vehicle use	4.31	4.20	4.18	3.41
Lack of action to reduce greenhouse gas emissions, divest from fossil fuel industries, and act on climate change	4.31	3.50	5.02	7.95
Lack of environmental awareness and curriculum in schools	3.70	6.29	3.77	2.27
Inequitable prioritization and allocation of resources to areas of need in Tacoma	2.87	2.10	2.51	5.68
Lack of regulations and systems to prevent pollution and protect our vital ecosystems for future generations	2.87	1.40	2.93	0.00
Lack of local employment opportunities with fair wages	2.46	4.20	2.93	2.27
Police Reform	1.64	2.80	2.51	1.14
Lack of available recycling and waste prevention systems	1.44	2.10	1.67	1.14
Other	7.19	6.99	7.95	4.55
TOTAL	100.00	100.00	100.00	100.00

Table 7. Complete list of Community Concern Themes and the percent of total responses included in each theme for All respondents and our demographic groups of interest. Percentages greater than or equal to 6% are highlighted in green to show top themes for each demographic group.

COMMUNITY CONCERNS	ALL %	BIPOC %	LOW INCOME %	YOUTH %
I am concerned about inequity and injustice in the community	12.59	14.09	8.44	8.76
I am concerned about homelessness and access to housing	10.86	10.00	10.06	7.73
I am concerned about pollution in the community and the health of our ecosystem	10.58	13.64	7.79	11.34
I am concerned about climate change impacts on our community and fossil fuel industries	9.22	8.64	9.74	8.76
I am concerned about access to essential services and basic needs	8.30	7.73	9.74	5.67
I am concerned about government leadership, willingness to take action, planning, and accountability	6.84	9.55	9.09	8.25

COMMUNITY CONCERNS	ALL %	BIPOC %	LOW INCOME %	YOUTH %
I am concerned about the impact of the Covid-19 pandemic	6.39	4.55	4.22	9.79
I am concerned about economic stability, poverty, and the distribution of wealth in the community	5.20	6.36	6.82	5.67
I am concerned about access to public transportation, active transportation, and low carbon transportation options in the community	4.38	3.18	2.27	4.12
I am concerned about safety in my community	3.56	0.45	3.25	3.09
I am concerned about policing in the community	3.56	4.09	4.55	5.67
I am concerned about inequitable new urban development in Tacoma	3.01	2.27	4.87	5.67
I am concerned about the influence of the private sector on our regulations and a lack of corporate responsibility for environmental impacts	2.10	0.91	2.60	2.58
I am concerned about City infrastructure, such as freeway construction and sidewalks	2.10	1.36	2.27	1.03
I am concerned about access waste prevention programs in the community	1.92	2.27	1.95	5.15
I am concerned about our community values and culture	1.28	1.82	2.60	2.06
I am concerned about urban greenery and access to green space	1.00	1.36	0.32	0.52
Other	7.12	7.73	9.42	4.12
TOTAL	100.00	100.00	100.00	100.00

TACOMA COMMUNITY CLIMATE ACTION PLAN



Section 7 — PHASE II

PHASE II COMMUNITY ENGAGEMENT REPORT

EXECUTIVE SUMMARY

In response to City Council [Resolution No. 40509](#) declaring a climate emergency in Tacoma and [Resolution No. 40622](#) calling for anti-racist systems transformation, Tacoma's climate action planning process aims to center historically underrepresented and underserved community members in developing a comprehensive climate action plan update to the 2016 Environmental Action Plan.

In partnership with [Citizens for a Healthy Bay](#) (CHB), we implemented a phased approach to community engagement. As a local environmental justice non-profit organization, CHB brings expertise in the natural sciences, environmental policy, and community collaboration and advocacy.

PHASE II ENGAGEMENT PURPOSE

The second phase of community engagement focused on:

- Building and deepening local relationships and partnerships
- Activating community members and partner networks
- Training and educating community members to increase community resilience and leadership
- Providing information and context for informed community feedback
- Understanding and prioritizing communities that are underrepresented, underserved, and made vulnerable to climate change
- Collecting feedback on draft actions and strategies for the climate action plan

PHASE II ENGAGEMENT ACTIVITIES

Phase II engagement activities included:

- Continued monthly Environmental Justice Leaders Workgroup (EJ Leaders) and Sustainable Tacoma Commission (STC) meetings to help steer climate action planning, engagement, and Plan content development
- Facilitating community Climate Ambassadors (Ambassadors) to help collect input, build relationships, and provide climate change education
- Collecting community input using online and in-person surveys
- Delivering information and collecting input through virtual informational presentations and interactive workshops

PHASE II ENGAGEMENT METHODS & PARTICIPANTS

To collect community input on draft strategies and actions for the climate action plan, we conducted nine workshops hosted by frontline community serving organizations, four workshops hosted by the City and CHB, two in-depth meetings with the Sustainable Tacoma Commission, and two in-depth meetings with the Environmental Justice Leaders. We also provided an online survey for community members unable to attend a Workshop to give detailed

feedback and gave presentations to City Committees, Boards, Commissions and Neighborhood Councils. We heard from 431 community members. 75% of workshop attendees and 45% of survey-takers who participated in demographic questions identified as Frontline community members. We reached a greater percentage of BIPOC (Black, Indigenous, People of Color) identifying community members during Phase II than Phase I but still felt short of a proportionate representation of Latinx/Non-white Hispanic and Asian community members.

METHOD	EVENTS GOAL	EVENTS RESULT	PARTICIPATION GOAL	PARTICIPATION RESULT
Workshops	14	17	315	152
Presentations	18	8	180	69
Surveys	3	2	350	205
Ambassadors	-	-	8	6
TOTAL	47	27	845	431

PHASE II COMMUNITY INPUT SUMMARY

We collected 323 responses to draft Big Move climate strategies and 199 responses to our more detailed survey containing draft climate actions. Our approach to climate action involves about a dozen high-level strategies that give guidance to numerous initiatives (actions) that are more specific and implementable. Similar to Phase I sustainability priorities, top strategies and actions were related to housing security, low carbon transit, healthy ecosystems, and local food access. Community members rated draft climate strategies in terms of how urgently each strategy should be implemented. This rating was on a scale of 1 (the strategy is “not at all urgent”) to 7 (the strategy is “very urgent”), with 4 as a midpoint. All of the Big Move climate strategies received an average urgency rating of 5 or higher (out of 7) deeming them “somewhat” to “very” urgent. We take this to mean that each strategy, on average, resonated with community members as necessary, useful, and important work for the City. Many written and verbal qualitative comments were collected in the survey and during workshops. Overall, comment themes included developing community leadership, listening to those most impacted, prioritizing benefits and reducing burdens for areas and community members most impacted, educational opportunities, divesting from fossil fuel, and improving access to transit and local food. Using the demographic data collected, we disaggregated survey responses to prioritize responses from frontline community members and key demographics relative to the averaged overall response. The following Top Draft Big Move Climate Strategies and Top Draft Climate Actions reflect the priorities of Frontline identifying respondents.

TOP DRAFT BIG MOVE CLIMATE STRATEGIES	BOTTOM DRAFT BIG MOVE CLIMATE STRATEGIES
Homes and buildings are healthy, affordable, resilient, and low carbon.	Neighbors share, reuse, and repair items easily in our thriving circular economy.
Zero emission transportation is affordable and available to all.	Summertime water is used wisely.
City supports better transit infrastructure that serves more Tacomans.	Healthy tree canopy is expanded where we need it most.

TOP DRAFT CLIMATE ACTIONS	BOTTOM DRAFT CLIMATE ACTIONS
Protect biodiversity and habitat with climate change ready urban landscapes, map and analyze critical areas, update codes, and involve community.	Fund active transportation infrastructure with a surface parking tax.
Increase access to local produce for diverse and low-income shoppers.	Develop a zero emissions ride share and delivery services roadmap by 2030 and demonstrate solutions with pilot projects.
Fund 10 community food projects, like community gardens, food forests, orchards, farms, or food rescue efforts.	Conduct a climate change vulnerability study of infrastructure and populations and integrate findings into City emergency management and planning.

DATA ANALYSIS CONSIDERATIONS

Being unable to reach a representative or statistically significant sample of Tacoma community members, we prioritized two major methods to equitable engagement and plan development: (1) deep, qualitative input processes for historically underrepresented and underserved “frontline” communities; and (2) disaggregation of community input by demographic data to improve our understanding of different communities’ needs and priorities. This approach to engagement aligns with the City’s policy to pursue anti-racist systems transformation of our processes, policies, programs, and services. Throughout this report, data reflecting community responses should be viewed through the lens of who is speaking.

LESSONS LEARNED

COVID-19 is a challenging period of life for many of our community members. Among other things going on, the pandemic-recession made it difficult for community members to participate. In response, we adapted our methods to meet community needs and safety priorities, while trying to make a complex plan accessible and participatory. Although it was challenging to get the quantity of participants we hoped for, we strengthened our planning approach by focusing on deep, qualitative input from frontline communities typically underrepresented and underserved by City processes.

Altogether, we feel that we were able to meet many of our goals: building or deepening new and existing relationships; educating community members about local climate emissions, impacts, and solutions; prioritizing frontline communities for their input on how to develop a more climate-safe, socially just Tacoma as we approach 2030; and developing climate actions and strategies that serve the needs of community members. Throughout the process, we sought and learned to be more flexible and accessible with our processes, such as simplifying our draft strategy and action language or improving our workshop methods. In reaching new community members with our process, we leaned on our valued community participants, including the partner organizations that served in a virtual “host” role, our Climate Ambassadors, and Environmental Justice Leaders Workgroup, among others.

CONCLUSIONS

Phase II community engagement focused on providing climate emissions, impacts, solutions, and engagement education to community to facilitate informed input on draft strategies and actions. We successfully reached a majority of frontline community members in our outreach

and will use their feedback to better center community needs in the draft climate action plan. Partnering with local frontline service organizations to host workshops for their communities and continuing to work with the Environmental Justice Leaders Workgroup and Climate Ambassadors were strengths of our second phase of community engagement. While many of the draft actions and strategies were well received by the community, there was some concern about the accessibility of our climate action framework. Going forward, we plan to reframe the climate strategies and actions to be even more people-centered; update actions and strategies to reflect the suggested changes we have received; and prioritize actions of greatest interest to community members.

BACKGROUND

The City of Tacoma (City) defines sustainability as a condition where “The City and its community members meet their current needs without compromising the needs of future generations, such that environmental, social, cultural, and economic considerations are balanced and integrated in a day-to-day, decision-making manner ([Res. 38247](#)).” In line with this definition and envisioning an equitable, healthy, and prosperous community for all, the City has taken action to reduce greenhouse gas emissions for a sustainable future.

In 2008, the City developed its first [Climate Action Plan](#). This Plan committed Tacoma to reducing its community-wide greenhouse gas (GHG) emissions by 80% from 1990 levels by 2050, in line with the reduction goals stated in the international Kyoto Protocol. In 2016, the [Environmental Action Plan](#) (EAP) replaced the Climate Action Plan. The EAP outlined nearly 70 actions to implement across six sectors of sustainability through 2020. Sustainability sectors included buildings and energy, transportation, materials management, natural systems, air and local food, and climate resiliency. Beside their climate and environmental impacts, actions were vetted for a mix of co-benefits, including social equity, health, affordability, and the local economy. On December 31, 2020, the EAP expired. As we begin to develop our third climate action plan, we have updated our understanding of Tacoma’s community-wide emissions and local climate impacts. Our scientific analysis concludes that, accounting for action taken through 2020 and projecting out to 2050, a business-as-usual approach (where no new actions are taken) would lead to only a 14% reduction in Tacoma’s GHG emissions based on 1990 levels. This is not enough to ensure a safe and healthy Tacoma for future generations.

In 2019, City Council declared a [climate emergency](#) in Tacoma and called for a new plan that would set climate strategies and actions that get us on a low carbon track by 2030 and works toward the goal of net zero emissions in 2050. Additionally, in 2020, City Council passed a [resolution calling for anti-racist systems transformation](#) across all City plans and policies. To determine a path for climate action that achieves a climate-safe and socially just future for Tacoma, the City has collaborated with local partners and community members in a [2020-2021 Climate Action Planning process](#).

From September 2020 to January 2021, City and [Citizens for a Healthy Bay](#) (CHB) staff partnered to conduct a first phase of community engagement focused on envisioning a better Tacoma in 2030, collecting stories and comments on community sustainability priorities, barriers to sustainability, and concerns. For more information about Phase I community engagement, see the [Phase I Community Engagement Report](#). Based on the feedback received during Phase I and the latest inventory of Tacoma’s climate emissions, City staff and partners drafted climate strategies and actions for a second phase of community input.

Table 8. Outline of climate action planning timeline and main objectives.

PHASE	ACTIONS	TIMELINE
1	Understanding Community Priorities <ul style="list-style-type: none"> • Collect baseline data • Model carbon pollution emissions 	September 2020 - January 2021
2	Strategy and Action Planning <ul style="list-style-type: none"> • Identify technical opportunities, community benefits 	February - July 2021
3	Plan Release and Adoption <ul style="list-style-type: none"> • Center equity in Plan • Deliver ambitious and achievable draft plan 	August - October 2021

PHASE II COMMUNITY ENGAGEMENT OVERVIEW

The purpose of the second phase of engagement was to continue building and deepening community relationships and partnerships, improve climate literacy and civic engagement in the planning process, collect feedback on draft climate actions and strategies that will help create a Plan that belongs to the community and reflects its needs, and prioritize and uplift the voices of communities that are historically underrepresented, underserved, and made vulnerable to climate impacts.

For Phase II community engagement, the City pursued an approach that:

- Adapted engagement safely to the COVID-19 pandemic, primarily engaging online
- Leveraged the energy, creativity, and connections of community participants
- Emphasized quality by focusing participation from frontline communities, building relationships, and seeking greater depth in community input
- Promoted equity by compensating frontline community members who participated and connected their social networks to this process
- Deployed a mix of engagement methods, including new partnerships, workshops, presentations, surveys, social media, in-person event tabling, and one-to-one outreach

To support this engagement approach during Phase II, the City continued working with CHB to support community member participation. CHB is a local environmental justice non-profit organization with expertise in the natural sciences, environmental policy, and community collaboration and advocacy. Community participants served in two compensated roles: Climate Ambassadors and the Environmental Justice Leaders Workgroup.

Several Climate Ambassadors (Ambassadors) from Phase I returned for Phase II to help gather feedback on draft climate actions and strategies through survey responses and to promote workshop attendance. The Environmental Justice Leaders Workgroup (EJ Leaders) recruited during Phase I continued to meet monthly to learn about and make recommendations for Tacoma's climate action planning process. They began meeting monthly in October 2020 and are working toward making recommendations as part of the final Plan.

Both community participant roles serve to center frontline communities' needs and interests. We describe frontline communities as those that tend to experience inequity in multiple ways, whether being historically underrepresented, underserved, or made vulnerable; experiencing

lower quality of life outcomes before COVID-19; or now experiencing worse impacts from the COVID-19 economic and health crisis. Frontline communities also include those expected to experience the first and worst consequences of climate damage.

The City defines frontline community members as individuals from one or more of the following backgrounds:

- Black, Indigenous, and People of Color (BIPOC)
- Speak English as a second language
- Living with a low household income
- Ages 16-26
- Lesbian, Gay, Bisexual, Transgender, Queer, Intersexed, Asexual, including those questioning their gender identity or sexual orientation (LGBTQIA+)
- Living with three or more generations in one home
- Living with more than one family in one home
- Living with a disability
- Immigrant or refugee
- Experiencing homelessness
- Completed formal education less than or up to a high school/GED level

COVID-19 CONSIDERATIONS

It is important to recognize that the climate action planning process was delayed several months due to the COVID-19 pandemic and both Phase I and Phase II engagement took place during a time of great stress for our community. During Phase II, we continued to adhere to COVID-19 safety regulations, keeping all Ambassador trainings and EJ Leader Workgroup meetings online and developing flexible engagement tools that could be used online or, much less frequently, safely in-person. It was challenging to build relationships virtually and to engage frontline communities most affected by the pandemic, the resulting recession, and varying levels of internet access. To support our community participants, we offered additional training times, opportunities to catch-up on training and meeting content one-on-one, and flexibility with participants' contributions. We also sought to address cost-barriers to participation. We budgeted to provide frontline community participants with \$300 stipends for 7-10 hours of contributions to the planning process; non-frontline community members were offered an optional \$50 stipend. This sliding payment scale reflects the different barriers to participation for and contributions provided by community members, including frontline community members historically underrepresented and underserved by our processes. People connected to Tacoma but living and working outside Pierce County were also welcome to participate but were not eligible for stipends. Improving our availability, using accessibility tools, and providing compensation all served to reduce some barriers to participation. It is also worth noting that in many cases virtual engagement methods were more accessible to community members who were balancing other responsibilities.

PHASE II COMMUNITY ENGAGEMENT METHODS & PARTICIPANTS

ENVIRONMENTAL JUSTICE LEADERS WORKGROUP

Ten local environmental justice leaders from frontline communities continued to serve on our advisory workgroup through Phase II. The EJ Leaders Workgroup was the first group to review and give feedback on draft climate strategies and actions for the plan. Their input helped inform the Phase II public survey design as we continued to refine the draft actions and strategy list. EJ Leader recommendations also helped reframe actions to be more community centered and easier to understand. They will continue providing feedback on the planning process and will contribute content to the final Plan. Beyond the adoption of a new Plan, staff hope that this process promotes two-way learning, new relationships, and empowers a cohort of local environmental justice leaders.

To ensure all EJ Leaders are able to participate equally in meetings and engage with meeting materials, we have been translating documents and have contracted with a local interpreter to assist one member who primarily speaks Spanish.

CLIMATE AMBASSADORS

Climate Ambassadors serve to connect their social networks to our planning process. Our second phase of community engagement, which concerned draft actions and strategies, required more specific survey questions and workshop activities than the broader visioning and community priorities of Phase I. This limited the role of Phase II Ambassadors to some extent since completing the Phase II survey took longer and required more background knowledge to give informed feedback. The Phase II Ambassador role involved sharing the Phase II survey with family and friends, tabling at a few events with CHB staff, and encouraging community participation in our in-depth climate action workshops. Six Phase I Ambassadors returned to participate in Phase II.

Ambassadors used a mix of engagement approaches that reflected their strengths and relationships. All Ambassadors received additional training to deepen their understanding of the planning process and the draft actions they would share with their networks. While each could use City-developed engagement tools, they were encouraged to engage with family, friends, or neighbors creatively. Many participants collected informed feedback via a web-based [Story Map](#), which provided background information prior to a survey. Ambassadors connected virtually with family, friends, neighborhood groups, and local organizations. Some Ambassador's also gathered feedback in-person, such as tabling at Tacoma Ocean Fest, where they engaged in conversation, shared physical copies of a survey, and used QR codes to direct participants to further opportunities. Ambassadors also had the opportunity to attend, promote, and assist staff at one or more Climate Action Workshops.

Additionally, Phase II Ambassadors had the opportunity to provide feedback on Phase II engagement tools before they were shared with the public. Beyond the input that Ambassadors facilitated through Phases I and II of the planning process, staff hope that their participation fosters appreciation, awareness, and involvement in future local environmental justice work.

ENGAGEMENT TOOLS

Staff and community participants gathered community input through surveys and workshops.

These engagement tools presented community members with an overview of climate change and local impacts, draft strategies, and, on the survey, detailed draft actions. The purpose was to gather informed feedback on climate strategies and actions.

Tacoma Climate Action Community Feedback Survey

Using ArcGIS StoryMap, staff created a website with all of the background information on climate action planning, climate impacts, and climate action strategies needed to give informed feedback on the [Tacoma Climate Action Community Feedback Survey](#). The website included a section with the Survey questions embedded in the page as well as links to register for a public Tacoma Climate Action Planning Workshop. This survey was shared by staff and community participants on social media and at outreach events, neighborhood council meetings, City commission, board, and committee meetings, and Tacoma Climate Action Workshops.

The survey included a couple of introductory questions about the participant's knowledge and feelings about climate change and then asked participants to rate the urgency of each Big Move climate strategy on a scale of 1 to 7 with 1 being "not at all urgent" and 7 being "very urgent." This was followed by a section for each of the climate action topical areas where participants were asked to choose their top three highest priority actions for each of the topical areas. Each topical area had 6 to 12 actions we could take between now and 2024 to stay on track for our goal of net zero greenhouse gas emissions in 2050. The seven topical areas were Natural Systems, Local Food, Buildings & Energy, Mobility & Land Use, Consumption & Materials Management, Green Economy, and Governance & Engagement. At the end of each topical area section there were several open-ended questions to give comments and more detailed feedback:

1. Optional: Why are the actions you chose most important to you?
2. How should the City carry out these actions to make them as equitable as possible?
3. Any additional comments or questions?

To track the success of our various outreach methods, we also included a question on how the participant learned about the Tacoma Climate Action Community Feedback Survey. The survey concluded with demographic questions so that we can measure our success at reaching underserved communities and center frontline communities in the climate action plan.

A shortened version of this survey was available in Spanish on the Tacoma Climate Action Community Feedback Survey website and shared with Climate Ambassadors and EJ Leaders for their use in collecting feedback on Big Move strategies for climate action.

Tacoma Climate Action Workshops

Thirteen 90-minute workshops were held in May and June. The workshops introduced the climate action plan, local climate impacts, and strategies before providing space for feedback and suggestions on the draft strategies. Nine of the workshops were co-hosted with local organizations that serve frontline communities including Asia Pacific Cultural Center, Latinx Unidos South Sound, Mayor's Youth Commission, Oasis Youth Center, Puyallup Watershed Initiative Just & Healthy Food COI, Rainbow Center, Sunrise Tacoma, Tacoma Ministerial Alliance, and Tacoma Urban League. Host organizations coordinated with staff to pick dates and provide recommendations for tailoring the workshop to be authentic, relevant, and accessible to their communities. Their guidance led to providing live Spanish interpretation, connecting strategies to the groups previously identified priorities, more visual presentations, and other individualized methods. These workshops were limited solely to the community the host organization serves

and reached a total of 70 participants.

The other four workshops were two general public workshops, one for the Puyallup Tribe and other indigenous peoples, and one business workshop, which focused on local, small, and minority- or women-owned businesses. The workshop for indigenous peoples was co-hosted with Danelle Reed, Puyallup Tribal member and EJ Leader. Attendance at these four totalled 46 participants, for an overall workshop participation of 116.

The Sustainable Tacoma Commission also participated in a longer format workshop in two sessions to review all of the draft actions during their May and June monthly meetings.

Presentations

In addition to full 90-minute workshops, shorter presentations that fit into the schedules of City neighborhood councils, commissions, boards, and committees. Presentations were made to four neighborhood councils (North End, South End, West End, and Central) and four City commissions in the second phase of engagement.

Given the limits of these groups' meeting agendas, our 20 to 30-minute presentations were meant to provide a baseline of information and opportunities for further input. Presentations informed audiences about the climate action planning process, local climate emissions and impacts, and potential climate solutions. Audiences asked questions, gave comments, and were invited to respond to our survey. Eight presentations were conducted, engaging 69 community members.

Social Media Outreach

We leveraged various City and partner organization social media accounts to reach more community members. These included accounts on Facebook and Instagram administered by Tacoma Environmental Services, Tacoma Sustainability, and Citizens for a Healthy Bay, and organizational partners. Five Facebook posts and three Instagram posts were created and shared from Tacoma Sustainability accounts and then subsequently re-shared by partner accounts. During Phase II we were able to allocate \$100 towards paid social media posts which greatly increased the reach and engagement on our posts.

Our highest performing Facebook post is featured below. The post was organically shared 23 times, reached a total of 2,967 Facebook users, and resulted in 287 post engagements. \$25 was spent boosting this post which helped us reach an additional 2216 Facebook users and generated 59 link clicks. It featured information about socio-economic impacts of climate change, an opportunity to inform City decisions and budget, and the \$20 raffled gift card incentive provided by CHB.

Our highest performing Instagram post reached 234 accounts, was shared 29 times, and generated 16 post interactions. This is approximately double the reach and interactions of our other Instagram posts.

Tacoma Sustainability
Published by Kyla Wilson · June 2 ·

Climate change is impacting our ecosystems, our communities, and our businesses – but it’s not impacting everyone equally. We need everyone’s voice to make sure Tacoma is making investments now for a better, more climate-safe future.

Give your input on Tacoma’s draft climate actions and strategies now through June 19th and enter to win one of twenty \$20 gift cards from [Citizens for a Healthy Bay!](#)

Your feedback will help direct City funding for the next 5-10 years!
Learn mo... [See More](#)

STORYMAPS.ARCGIS.COM
Tacoma Climate Action Community Feedback...
Tacoma Climate Action Planning 2020-2021 [Learn More](#)

2,967 People Reached 287 Engagements ↑ +6.5x Higher Distribution Score [Boost Unavailable](#)

Figure 1. Highest performing Facebook post promoting Phase II Community Engagement.

The image is a composite of two parts. The top part is a dark blue flyer with white text. It features a large white circle containing a colorful illustration of a sustainable community with a house, a car, a bicycle, a bus, a fish, and various plants. The text on the flyer includes the title 'Tacoma Climate Action Community Feedback', a survey link 'bit.ly/TacomaClimateActionFeedback', workshop dates 'June 12th, 1-2:30pm' and 'June 15th, 5:30-7pm', and a call to action 'Give your input and learn more now! Link in bio'. The bottom part is a screenshot of an Instagram post from the account 'tacomastustainability'. The post features a teal speech bubble with the text 'WHAT DOES A CLIMATE RESILIENT AND EQUITABLE TACOMA LOOK LIKE?' and an illustration of three diverse people. The post text asks for community input on climate-resilient and equitable future plans for Tacoma, mentioning direct funding for low-carbon actions. It includes a call to action to check the bio for more information and to register for a workshop or take a survey. The post shows it was liked by 'thechayahmovement and 27 others' and was posted on 'JUNE 4'.

Tacoma Climate Action Community Feedback

Survey:
bit.ly/TacomaClimateActionFeedback

Workshops:
June 12th, 1-2:30pm
June 15th, 5:30-7pm

Give your input and learn more now!
Link in bio

2020-2021 TACOMA CLIMATE ACTION PLANNING

WHAT DOES A CLIMATE RESILIENT AND EQUITABLE TACOMA LOOK LIKE?

tacomastustainability
Tacoma, Washington

tacomastustainability Fridays are for the future!
What does a climate resilient and equitable future for Tacoma look like to you?

This is your chance to help decide how the City with direct funding for low carbon, climate-safe actions that benefit all our communities for the next 5 to 10 years!

Check out the link in our bio to learn more about climate change in Tacoma, register for a community feedback workshop, or take the survey.

View Insights

Liked by thechayahmovement and 27 others

JUNE 4

Add a comment... Post

Figure 2. Highest performing Instagram post promoting Phase II Community Engagement. Post contained two images.

COMMUNITY INPUT & ANALYSIS PROCESS

Community engagement methods resulted in over 400 responses about priority climate strategies and actions and how we can ensure actions are implemented equitably. Community input will be used to:

- Prioritize actions and strategies for emission reductions based on community support and concern
- Inform the EJ Leaders Workgroup's contributions to the Climate Action Plan
- Inform other City plans and policies that fall outside the scope of the Climate Action Plan

PHASE II ENGAGEMENT OVERVIEW

Leveraging the connections and knowledge of our community Ambassadors, EJ Leaders Workgroup, and community members serving the City on committees, boards, and commissions, we collected input from 423 participants. We come to this number by avoiding double counting in instances such as where workshop attendees also provided a survey response. See types of participants broken out in the following tables:

Table 9. Summary of community participants involved in collecting input and the total number of responses collected using each engagement tool.

COMMUNITY PARTICIPANTS	
Climate Ambassadors	6
Environmental Justice Leaders Workgroup	10
Workshop attendees	139
Presentation Attendees	69
TOTAL	224

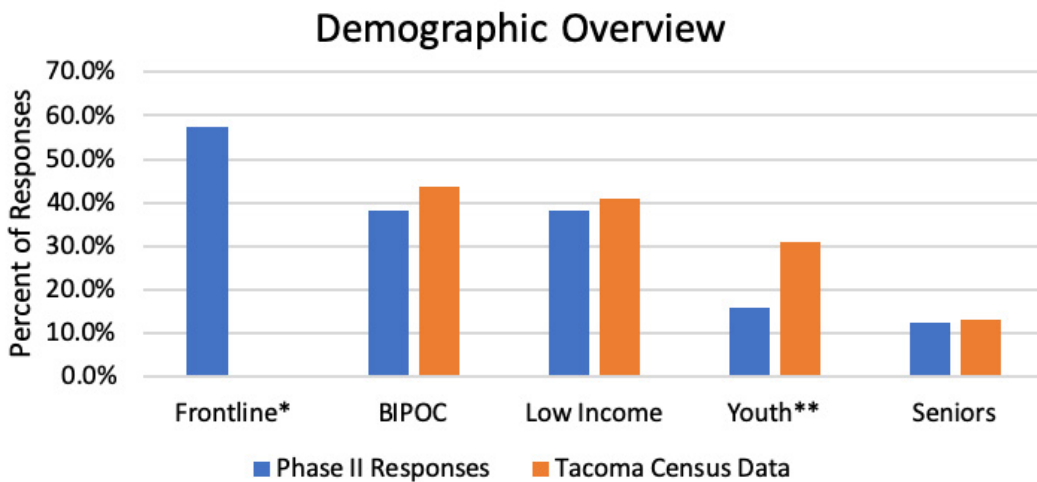
RESPONSES BY ENGAGEMENT TOOL	
Long format survey	199
Short format survey	124
TOTAL	323

WHO WE HEARD FROM

In order to track how well we reached historically underserved, underrepresented, and overburdened communities, we asked respondents several demographic questions including race/ethnicity, age, household income (2019), and whether or not they identified as a frontline community member. These questions were only asked on the online survey and with attendees at workshops with a live survey activity. Not all respondents or attendees chose to answer each of these demographic questions and, in accordance with the needs of specific host organizations, not all workshops had a live survey component. The following information only reflects the 52% of survey respondents and 75% of workshop attendees who chose to answer demographic questions.

For our analysis, we focused on our success at reaching four main groups:

- Black, Indigenous, People of Color (BIPOC) communities
 - Respondents who identified as Black/African, Native American/Alaska Native, Latinx/ Non-white Hispanics, Asian, Pacific Islander/Native Hawaiian, Middle Eastern/North African, and/or more than one of these races/ethnicities.
- Low income respondents
 - Respondents whose household income was less than \$50,000/year.
- Youth respondents
 - Respondents less than 25 years old.
- Frontline respondents
 - Respondents who self-identified as a frontline community member after reviewing the City’s definition of intersecting frontline identities.



**No census data available.*

***Census data includes those age 0 to 14, an age group that was not the focus of climate action planning.*

Figure 3. A summary of Climate Action Planning Phase II respondent demographics in comparison to Tacoma census projections.

It is important to note that we fell short of reaching a representative sample of Tacoma residents in survey responses, particularly for the historically underserved groups: BIPOC and Low Income. These demographic results may not fully represent the community members who participated in Phase II engagement though. Roughly 39% of respondents skipped the demographic questions, a significantly higher rate of no response than we received during Phase I engagement. We also received feedback from community members and Climate Ambassadors that the length of the long-format online survey discouraged them from completing all questions. Since the demographic questions were optional and the last section of the survey, it is possible that these factors led many to choose not to answer them. We know that the COVID-19 pandemic and recession is particularly challenging for these communities, and it tends to be exacerbated by unequal internet access. The percentage of Youth we reached is skewed because the Tacoma census data Youth percent includes residents aged 0-14, who were not a

focus in our input gathering. For more details on age demographics, see Figure 6.

We heard from a diverse group of Tacoma community members; however, there is room to improve our outreach to key communities of color, low income community members, and some age groups to ensure equitable climate actions and strategies for the Plan. To compensate for shortfalls in engagement with some frontline communities, we have broken out responses by demographics to get a better sense of their prioritized actions. We also developed Workshops to gather more qualitatively rich input from frontline individuals and service organizations. This builds on other engagement tools that may not reach community members as equitably, particularly community members that may be experiencing extra barriers to participation or extraordinary day-to-day burdens.

BIPOC RESPONDENTS

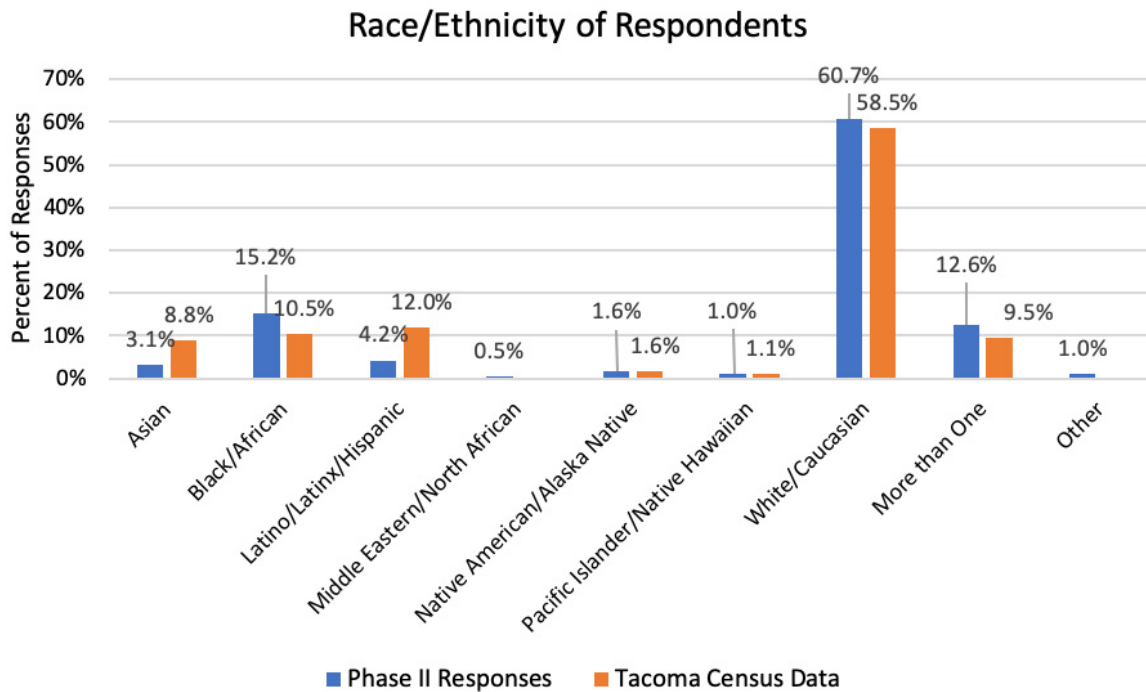


Figure 4. Responses to race/ethnicity demographic question by race/ethnicity. 39% of total survey respondents chose not to answer this question. The above percentages reflect only the 191 responses to this question. 12.6 % of respondents selected more than one race/ethnicity option. These responses are broken out in detail in Table 2.

Table 10. The total number of responses for each multi-racial/ethnic identity selected in response to the race/ethnicity demographic question.

TWO OR MORE RACE / ETHNICITY	# OF RESPONSES
Asian and White	5
Black/African and White	4
Middle Eastern/North African and White	3
LatinX/Non-white Hispanic and White	2
Pacific Islander/Native Hawaiian and White	1
Native American/Alaska Native and White	1
Middle Eastern/North African, Native American/Native Hawaiian, and White	1
Native American/Alaska Native and LatinX/Non-white Hispanic	1
Middle Eastern/North African and Other	1
Pacific Islander/Native Hawaiian and LatinX/Non-white Hispanic	1
Native American/Alaska Native and Black/African	1
LatinX/Non-white Hispanic, White, and Other	1
LatinX/Non-white Hispanic and Black/African	1

Again, 39% of survey respondents chose not to respond to this question so it may not give an accurate portrayal of Phase II community respondents. Additionally, some of our Workshops did not include a survey activity to collect demographic information because of language and technology barriers identified by Workshop hosts. In particular, our Workshop hosted by Latinx Unidos South Sound with 18 attendees and our Workshop hosted by Asia Pacific Cultural Center with 3 attendees are not represented in the above demographic data. So, while we did not reach many Latinx/Non-white Hispanic identifying community members with the Survey, we did hear comprehensive and detailed feedback on every facet of the draft climate strategies from many Latinx Unidos South Sound community members.

Working with host organizations and our other outreach methods did help us reach more Black/African identifying community members during Phase II than Phase I. During Phase I Black/African identifying community members were underrepresented in the survey results at 7.39% of respondents.

Based on the race/ethnicity demographic results from Phase II, we know moving forward that we need to make more of an effort to reach BIPOC community members. In particular, we need additional efforts to reach Tacoma’s Latinx/Non-white Hispanic communities and Asian communities.

LOW INCOME RESPONDENTS

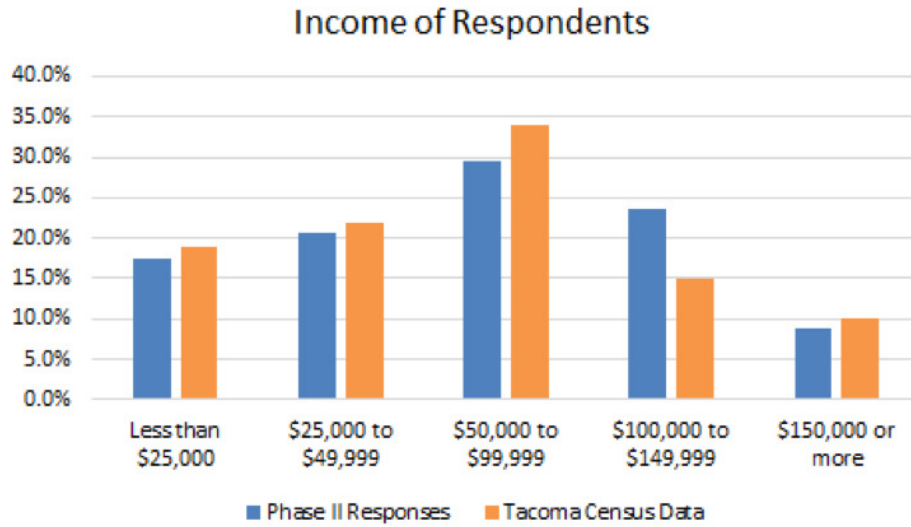


Figure 5. Responses to household income demographic question by income bracket. 38% of total survey respondents chose not to answer this question. The above percentages reflect only the 183 responses to this question.

Our community input results over-represent high income households. However, we did reach a close-to-representative percentage of Low Income community members (less than \$50,000/year) – 38.3%. Tacoma census data indicates 41% of Tacomans have an annual household income of less than \$50,000.

YOUTH RESPONDENTS

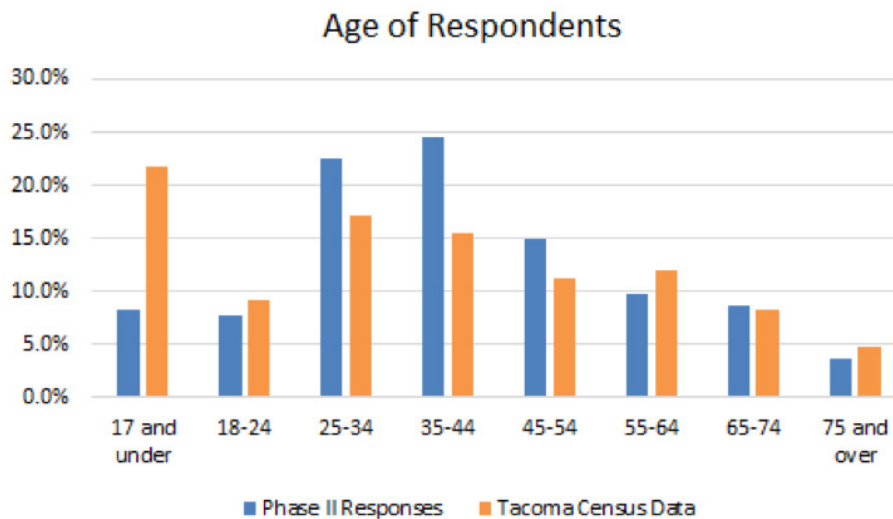


Figure 6. Responses to age demographic question by age bracket. 40% of total respondents chose not to answer this question. The above percentages reflect only the 195 respondents who answered this question.

The majority of our survey respondents and workshop attendees were between 25 and 44 years old. The median age in Tacoma is 36 (U.S. Census Bureau, 2019). We reached fewer youth during Phase II than Phase I despite working with youth-focused host organizations like the

Mayor’s Youth Commission, Sunrise Tacoma, and Oasis, particularly those between the ages of 18 and 24. This may be due to the time frame of Phase II input with students preparing for exams and summer break. While it appears we significantly underrepresented those under 17, a more accurate comparison for our respondents who answered “under 17” may be to Tacoma’s 15-17 year old population, roughly 4% of the City’s total population. We did not target younger children in our data collection which are included in the Tacoma 17 and under group census data.

We did not hear from as many community members 75 years old and over but we did improve our representation of 65 to 74-year-olds, a demographic that was underrepresented during Phase I Engagement. Elders generally face more health risk as the number of extreme heat days in Tacoma rises due to climate change. Our over-representation of younger age groups may be a result of the online nature of and social media focus for much of our outreach and input collection due to COVID-19 safety concerns.

FRONTLINE RESPONDENTS

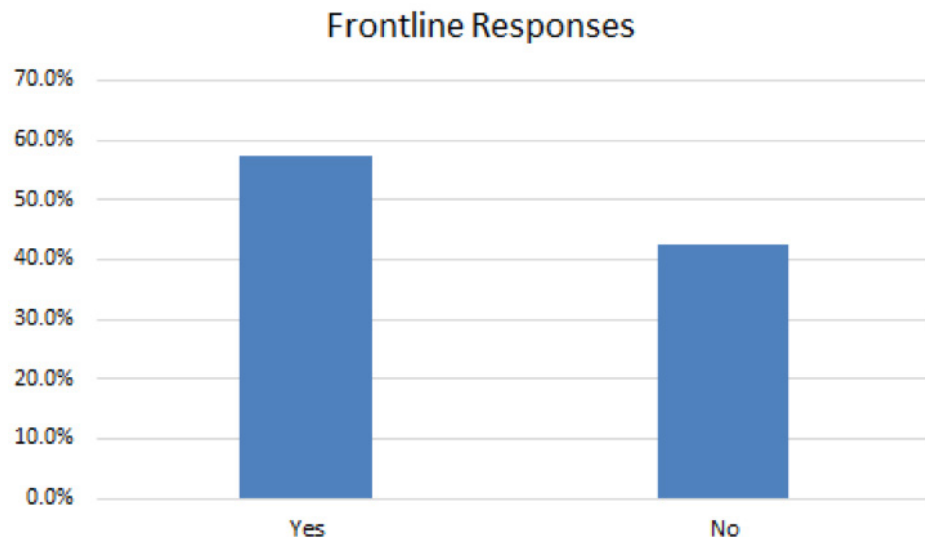


Figure 7. Response to frontline demographic question. 39% of total respondents chose not to answer this question. The above percentages reflect only the 195 respondents who answered this question.

More than half of our survey respondents and workshop attendees self-identified as frontline community members after reading the City’s definition of frontline communities. This was a new demographic question added for Phase II Engagement. 45% of online survey takers identified as frontline community members, whereas 74% of workshop attendees who participated in demographic questions identified as frontline community members. Partnering with frontline community serving organizations to host workshops likely helped us reach more frontline community members.

WHAT WE HEARD

In the following sections we will share survey responses, comments, and community feedback on each of the draft climate action topical areas as they were presented in the online survey and workshops. It is important to note that only 199 community members participated in the long-format online survey, which covered both Big Move Strategies and Next Move Actions. The other 124 survey responses relate to a shorter version of the survey only covering the Big Move Strategies, which was used during the Workshops and made available online, including in Spanish. In addition to survey responses, many comments were collected from open-ended questions in the online surveys and during Workshop discussions.

Of the 323 responses to the Big Moves, the average urgency to take action on all of them was above 5 (out of 7) and falling between “somewhat” and “very” urgent. However, there were variations in how urgent action on these Big Moves should be between demographic groups and favoring more urgent action on some Big Moves than others.

BUILDINGS & ENERGY

Average Urgency of Buildings & Energy Big Move: "Homes and buildings are healthy, affordable, resilient, and low carbon." (scale of 1 to 7)

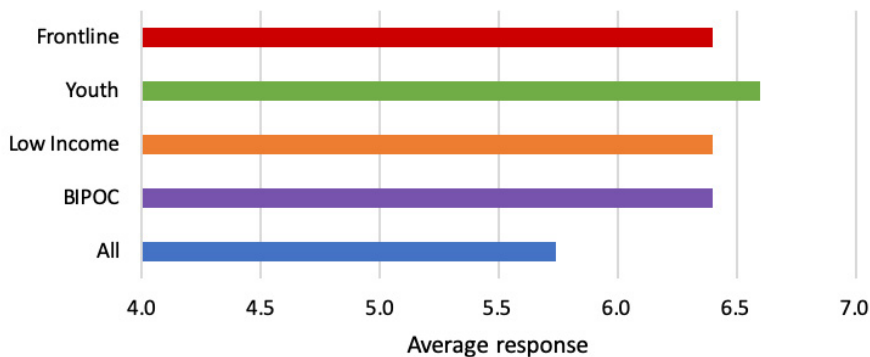


Figure 8. Average ratings of urgency to take action on the Buildings & Energy Big Move “Homes and buildings are healthy, affordable, resilient, and low carbon” for different demographic groups.

The Buildings & Energy Big Move “homes and buildings are healthy, affordable, resilient, and low carbon” was rated more urgent by all of our key demographic groups than the overall average of All respondents. It was rated most urgent by Youth. This was a top Big Move overall, and particularly for Frontline communities.

Average Urgency of Buildings & Energy Big Move:
 "Summertime water is used wisely."
 (scale of 1 to 7)

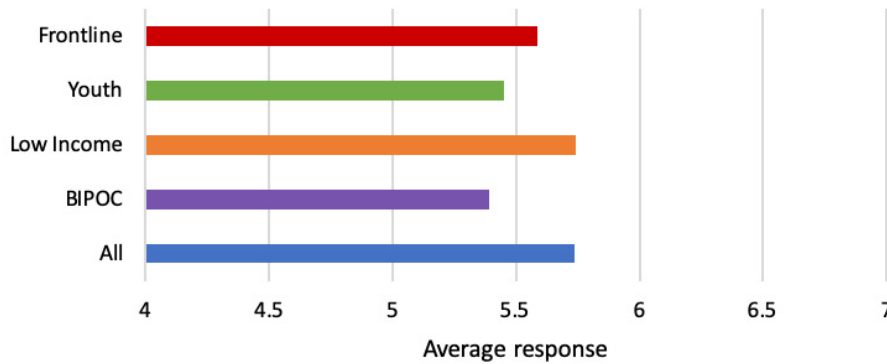


Figure 9. Average ratings of urgency to take action on the Buildings & Energy Big Move “Summertime water is used wisely” for different demographic groups.

The Buildings & Energy Big Move “summertime water is used wisely” was rated less urgent by respondents identifying at Frontline, Youth, and BIPOC than the group of All respondents. Though still considered urgent, this was one Big Moves rated with relatively lower urgency.

Priority Buildings & Energy Actions

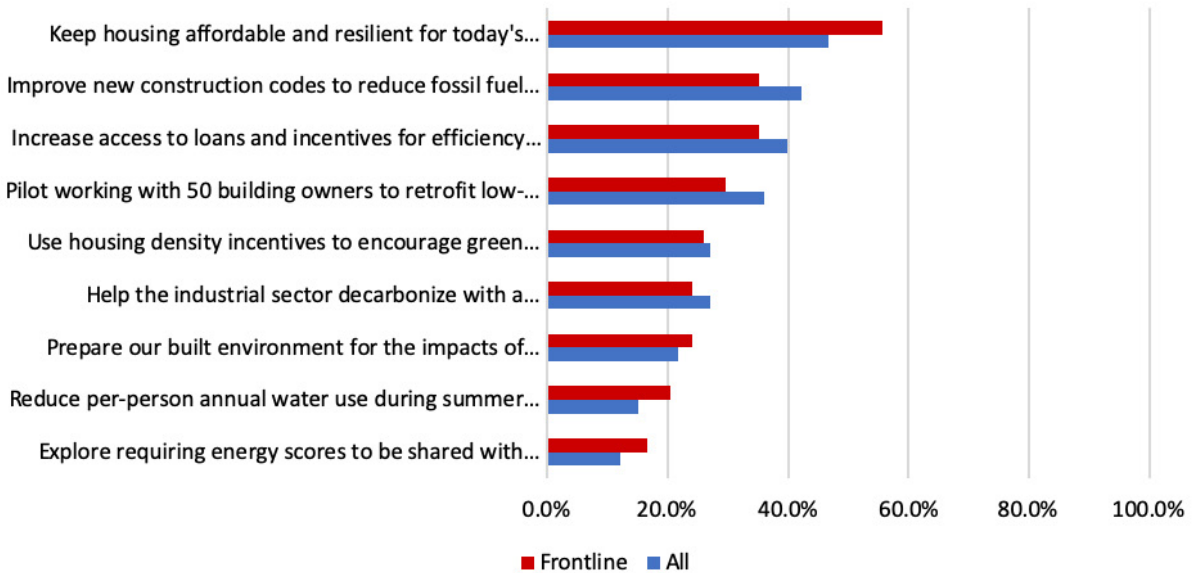


Figure 10. Priority Building & Energy Actions for Frontline community respondents and All respondents. Respondents were asked to select a maximum of three priority actions for this sector.

In line with the highly rated urgency of the Big Move “homes and buildings are healthy, affordable, resilient, and low carbon,” the top selected priority action for Buildings & Energy was “keep housing affordable and resilient for today’s residents by helping people stay in homes and keeping homes in good repair.” Over 50% of Frontline community members picked this action as one of their top three actions for Buildings & Energy. Improving new construction codes to reduce fuel use and increasing access to loans and incentives for energy efficiency were also top actions with over 30% of Frontline respondents choosing them as priority actions. Exploring building and home energy scores was the least popular action for this sector.

Qualitative Responses

Many of the comments we received regarding Buildings & Energy focused on equity implications like avoiding gentrification, prioritizing homes for those experiencing homelessness, keeping housing affordable for residents, and making sure our community members benefit rather than developers and corporate property managers. We also heard a lot of desire for City-led actions like incentives, regulations, and enforcement to make sure homes and buildings in Tacoma are healthy places to spend time, are prepared for climate impacts, and are low carbon. There is a great sense of urgency when it comes to housing issues. Several community members also identified the opportunity we have to take advantage of our relatively clean electricity and avoid future dependency on fossil fuels in our buildings and homes. Other specific comments included the need for culturally appropriate housing, making use of vacant or underutilized spaces, housing rights, and new opportunities for jobs created by investing in sustainable buildings and energy.

MOBILITY & LAND USE

Average Urgency of Mobility & Land Use Big Move: "Zero emission transportation is affordable and available to all." (scale of 1 to 7)

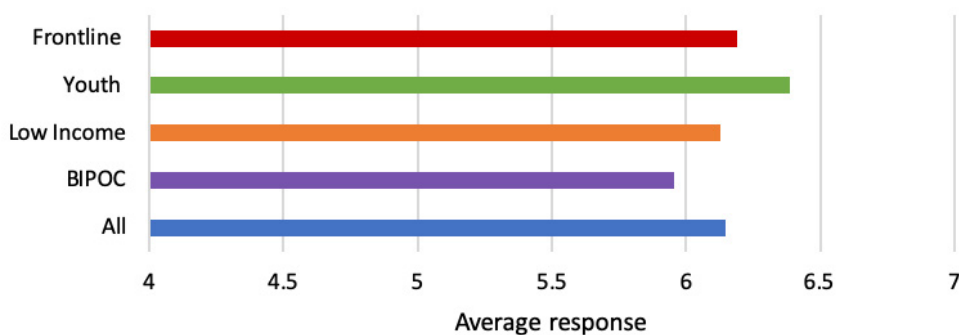


Figure 11. Average ratings of urgency to take action the Mobility & Land Use Big Move “Zero emission transportation is affordable and available to all” for different demographic groups.

The Mobility & Land Use Big Move “zero emission transportation is affordable and available to all” was rated most urgent by Youth, followed by Frontline community respondents. It was rated slightly less urgent by BIPOC community members in comparison to the group of All respondents. This was a top Big Move overall.

Average Urgency of Mobility & Land Use Big Move:
"Active transportation and resilient, people centered design is available and used in all neighborhoods."
 (scale of 1 to 7)

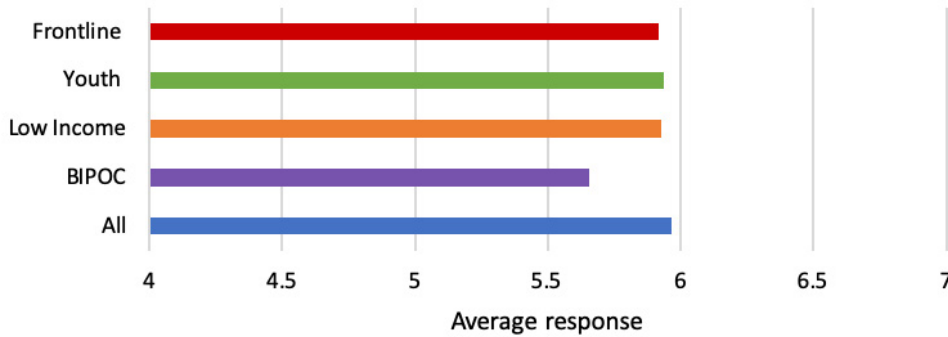


Figure 12. Average ratings of urgency to take action on the Mobility & Land Use Big Move “Active transportation and resilient, people centered design is available and used in all neighborhoods” for different demographic groups.

The Mobility & Land Use Big Move “active transportation and resilient, people centered design is available and used in all neighborhoods” was rated slightly less urgent by Frontline, Youth, Low Income, and BIPOC community members in comparison to the average for All respondents. This active transportation-focused Big Move was rated least urgent of the Mobility & Land Use Big Moves. This may mean that investments in transit and zero emission transportation are more urgent needs in our community. It’s also possible that the wording for this action item - which combined neighborhood design and active transportation, was less clear than other actions.

Average Urgency of Mobility & Land Use Big Move:
"City supports better transit infrastructure that serves more Tacomans."
 (scale 1 to 7)

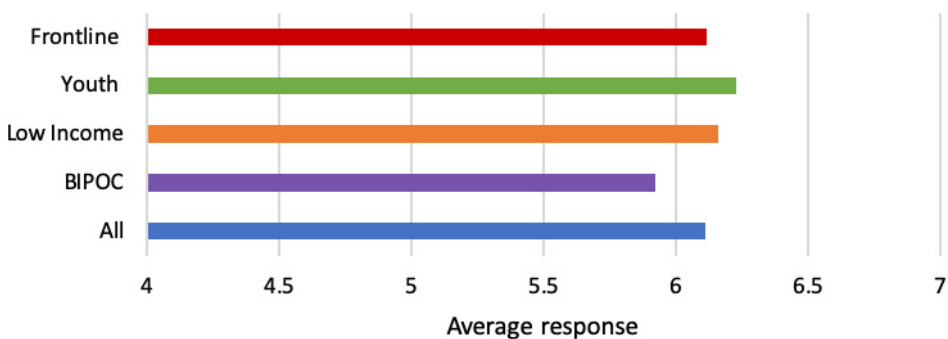


Figure 13. Average ratings of urgency to take action on the Mobility & Land Use Big Move “City supports better transit infrastructure that serves more Tacomans” for different demographic groups.

The Mobility & Land Use Big Move “City supports better transit infrastructure that serves more

Tacomans” was rated slightly more urgent by Frontline, Youth, and Low Income community members and slightly less urgent by BIPOC community members than the group of All respondents.

Priority Mobility & Land Use Actions

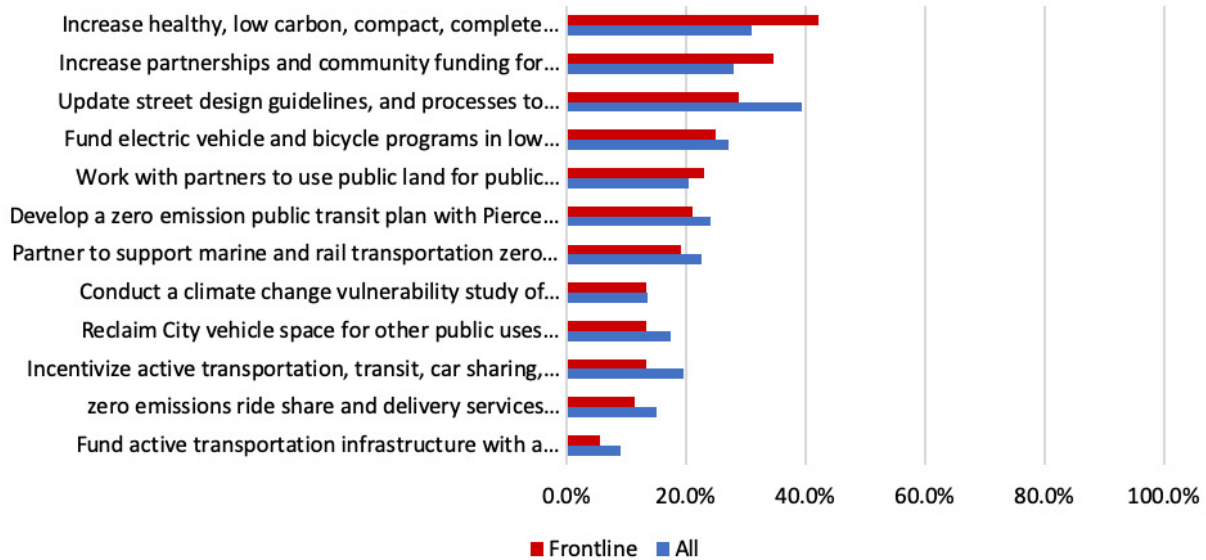


Figure 14. Priority Mobility & Land Use Actions for Frontline community respondents and All respondents. Respondents were asked to select a maximum of three priority actions for this sector.

Over 40% of Frontline community members selected “Increase healthy, low carbon, compact, complete communities along transit corridors and close to mixed use centers like business districts” as a priority action, making it the top action for this sector. Despite the lower average urgency of the active transportation Big Move, the second top priority action for Frontline communities was “increase partnerships and community funding for active transportation and public transit community programming to make it easier to use.” The third Frontline community priority action and top action for All respondents is to “update street design guidelines, and processes to make walking, biking, and transit use easier and safer.” The lowest priority action for Mobility & Land Use was the draft action to “fund active transportation infrastructure with a surface parking tax.” There was also little interest in the zero emission ride share and delivery services roadmap action.

Qualitative Responses

In response to Mobility & Land Use draft strategies and actions we received many comments from community members about the need for public transit to be convenient, reliable, and more frequent to feasibly replace cars and reduce vehicle miles traveled in Tacoma. We also heard many comments about bike lanes and sidewalks needing to be safe and connected for community members to feel comfortable walking, biking, or rolling. In some places, community members suggested roads be redesigned to slow traffic and make their neighborhoods feel safer. There was also a great deal of interest in low income housing situated near transit corridors. While some community members feel enthusiastic about electric vehicles (EVs), many expressed concern about the accessibility of EVs. We received many comments about EVs still being too expensive for most community members, even with subsidies, and the

impracticalities of charging EVs for renters and those living in multi-family units. We received one comment suggesting the City invest in an E-bike sharing program to make biking in Tacoma more accessible. We also heard a suggested transit improvement target for all homes to be within a five minute walk of a bus stop with buses running at a frequency of ten minutes.

NATURAL SYSTEMS

**Average Urgency of Natural Systems Big Move:
"Healthy tree canopy is expanded where we need it most."
(scale of 1 to 7)**

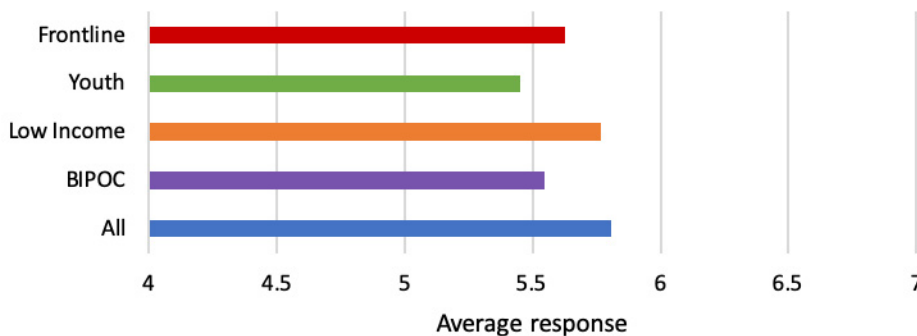


Figure 15. Average ratings of urgency to take action on the Natural Systems Big Move "Healthy tree canopy is expanded where we need it" for different demographic groups.

The Natural Systems Big Move "Healthy tree canopy is expanded where we need it most" was rated slightly less urgent by Frontline, Youth, Low Income, and BIPOC community members in comparison to the group of All respondents. Overall, this Big Move was given an average urgency lower than zero emission transit and healthy, low carbon homes.

**Average Urgency of Natural Systems Big Move:
"Tacoma's natural systems are diverse, protected, and resilient to our changing climate."
(scale of 1 to 7)**

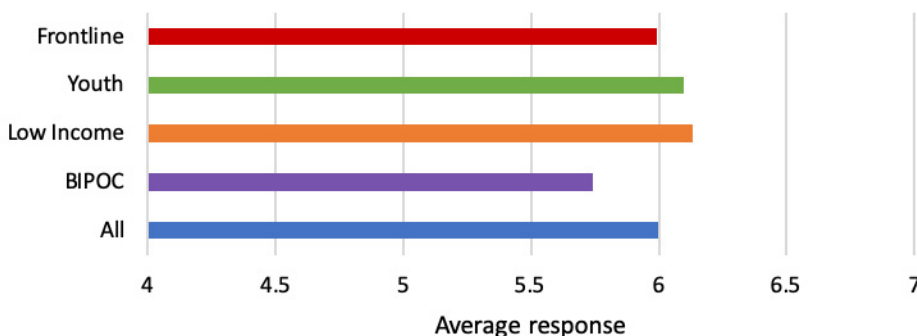


Figure 16. Average ratings of urgency to take action on the Natural Systems Big Move "Tacoma's natural systems are diverse, protected, and resilient to our changing climate" for different demographic groups.

The Natural Systems Big Move “Tacoma’s natural systems are diverse, protected, and resilient to our changing climate” was rated slightly less urgent by Frontline and BIPOC community members and slightly more urgent by Youth and Low Income community members in comparison to the group of All respondents.

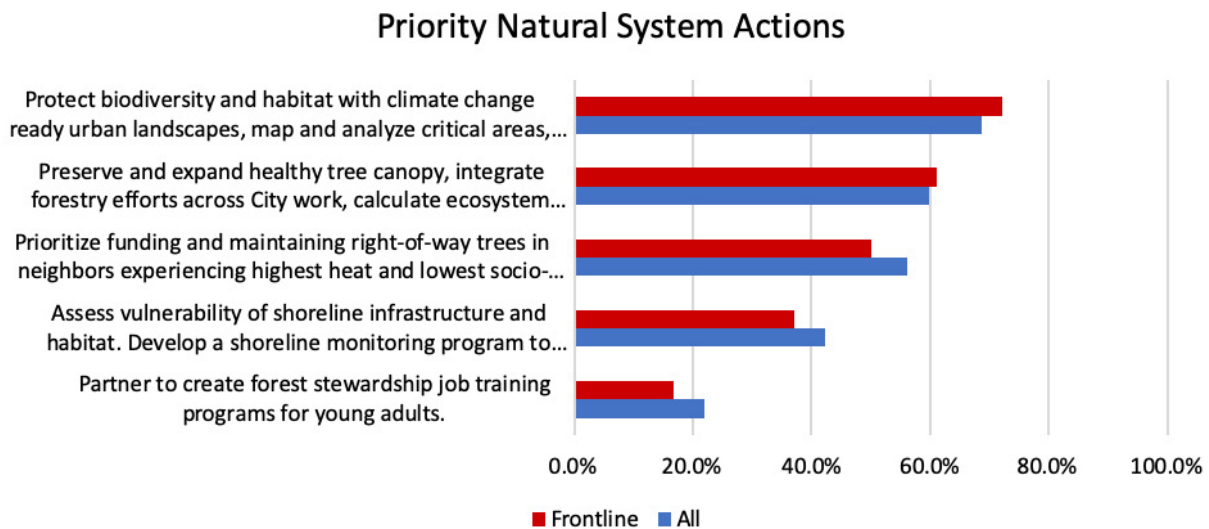


Figure 17. Priority Natural Systems Actions for Frontline community respondents and All respondents. Respondents were asked to select a maximum of three priority actions for this sector.

Although the Natural System Big Moves to protect biodiversity and expand tree canopy were not the highest urgency strategies for action, over 70% of Frontline community members selected the draft action to “protect biodiversity and habitat with climate change ready urban landscapes, map critical areas, update codes, and involve community” and over 60% of Frontline community members selected the draft action to preserve and expand healthy tree canopy as priority actions.

Qualitative Responses

We heard from many community members that protecting our natural systems is important because human welfare and nature’s welfare are inseparable. This is a community value that needs to be reflected in future habitat restorations and adaptations to climate change. We heard many comments about preserving, maintaining and planting trees, especially in neighborhoods experiencing the lowest tree canopy and the most urban heat. Habitat restoration is also an opportunity for economic equity, creating green jobs and access to food. Community members recognized that there are many benefits to Natural Systems draft actions like expanding tree canopy but that they are not the best way to make significant carbon emission reductions in the short term. We also heard a desire for City leadership and boldness in protecting natural systems and creating new stewardship opportunities. One Workshop participant mentioned that spending time outside of Tacoma makes it clear how many healthy trees there should be here.

LOCAL FOOD

Average Urgency of Local Food Big Move:
"Growing, making, and accessing healthy, local food is easy."
(scale of 1 to 7)

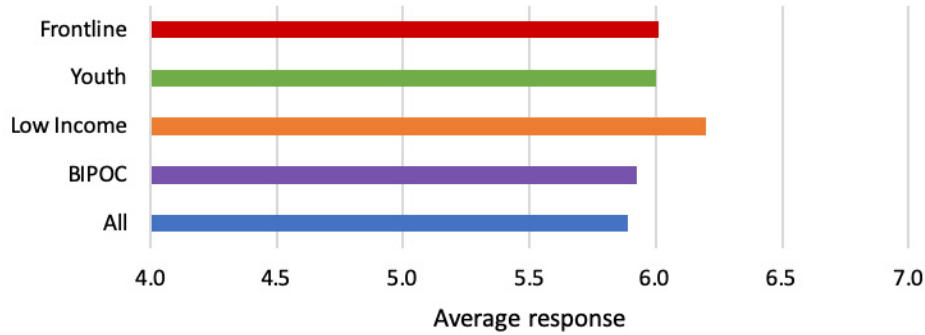


Figure 18. Average ratings of urgency to take action on the Local Food Big Move “Growing, making, and accessing healthy, local food is easy” for different demographic groups.

The average urgency rating of Local Food Big Move “growing, making, and accessing healthy, local food is easy” was relatively consistent across demographic groups with Low Income community members giving it a higher average urgency.

Average Urgency of Consumption & Materials Management Big Move:
"No food is wasted."
(scale of 1 to 7)

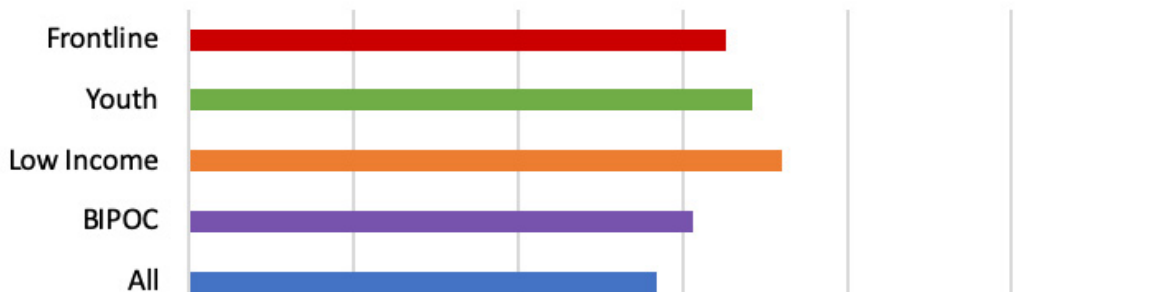


Figure 19. Priority Local Food Actions for Frontline community respondents and All respondents. Respondents were asked to select a maximum of three priority actions for this sector.

There are two clear top Frontline community priorities for local food actions: “Increase access to local produce for diverse and low income shoppers” and “Fund 10 community food projects, like community gardens, food forests, orchards, farms, or food rescue efforts.” The action with the lowest prioritization was to “Inventory public spaces available for community food projects.” This

may be because this action feels like something that should already be under way and doesn't directly impact access to food.

Qualitative Responses

In response to Local Food strategies and actions we heard several comments about access to healthy, nutritious food as a human right. Other comments mentioned the need to support and improve existing partners and explore new systems for food distribution like mutual aid. Many concerns were raised about food access issues like proximity to grocery stores, community gardens, and farmers markets and the need for local food actions to focus on where there is the greatest need for healthy local food in our communities. There were a mixture of responses on where climate actions should focus on growing more local food, including yards, new and existing community spaces, or Pierce County farmlands. While not necessarily a sector that greatly reduces Tacoma's climate emissions, many also viewed local food as an opportunity to create more local green jobs in agriculture. A couple of times the problem of culturally relevant foods at food banks was raised during Workshops. Ensuring community members receive foods they will eat can help reduce food waste and improve food access.

CONSUMPTION & MATERIALS MANAGEMENT

Average Urgency of Consumption & Materials Management Big Move: "No food is wasted." (scale of 1 to 7)

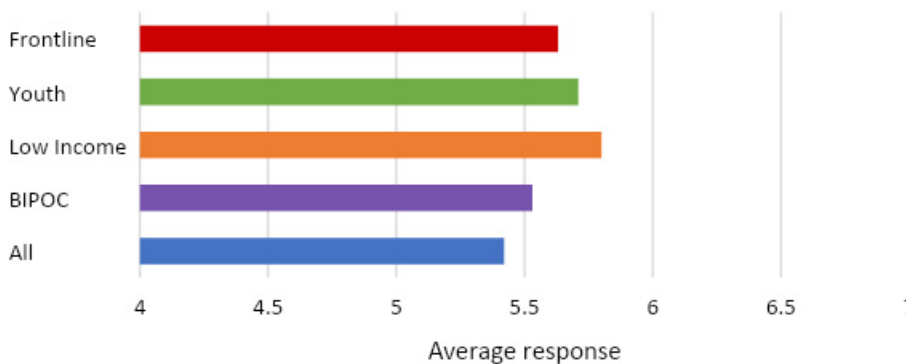


Figure 20. Average ratings of urgency to take action on the Consumption & Materials Management Big Move "No food is wasted" for different demographic groups.

The average urgency of the Consumption & Materials Management Big Move "No food is wasted" was higher for Frontline, Youth, Low Income, and BIPOC community members in comparison to All respondents. Particularly, for Low Income respondents, the average urgency was nearly one point higher.

Average Urgency of Consumption & Materials Management Big Move:
"Neighbors share, reuse, and repair items easily in our thriving circular economy."
 (scale of 1 to 7)

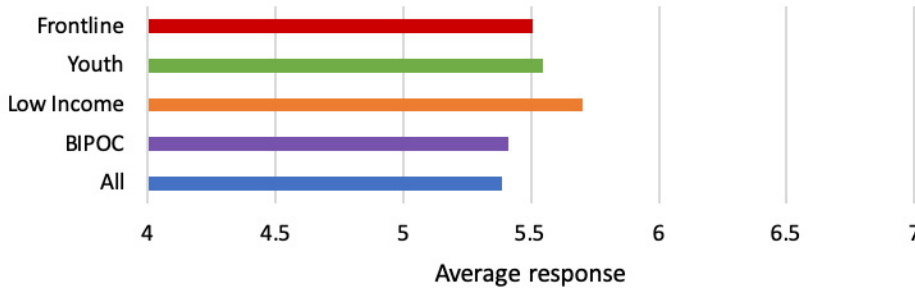


Figure 21. Average ratings of urgency to take action on the Consumption & Materials Management Big Move “Neighbors share, reuse, and repair items easily in our thriving circular economy” for different demographic groups.

The Consumption & Materials Management Big Move “Neighbors share, reuse, and repair items easily in our thriving circular economy” received very similar responses to “no food is wasted.” Again, Low Income respondents rated this Big Move strategy as higher urgency than other demographic groups.

Priority Consumption & Materials Management Actions

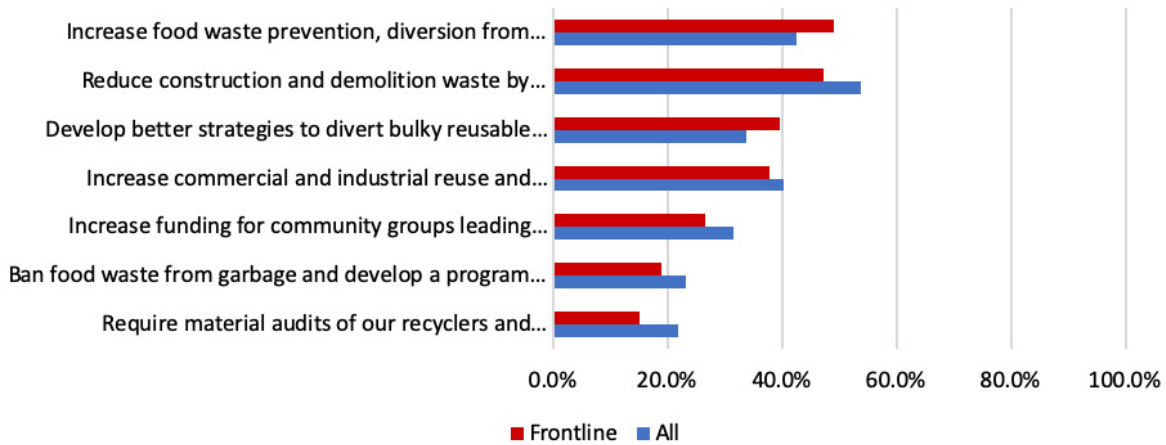


Figure 22. Priority Consumption & Materials Management Actions for Frontline community respondents and All respondents. Respondents were asked to select a maximum of three priority actions for this sector.

Nearly 50% of Frontline community members selected food waste prevention and reduced construction waste as top Consumption & Materials Management priority actions. Requiring audits of City of Tacoma recyclers and composters was prioritized least often. Despite the high interest and urgency of preventing food waste and diverting it from landfill, the draft action to “Ban food waste and develop a program to support its implementation” was the second lowest

priority action. This may be due to the punitive phrasing of the action and potential burden on residents.

Qualitative Responses

Regarding waste prevention, we received many comments that the City needs to regulate and target local industries and companies that are producing the most waste in implementing waste reduction programs and policies. For example, a few community members expressed a need to address commercial food waste from restaurants and grocery stores rather than focusing on residential food waste. Several community members also commented on avoiding punitive measures when it comes to residential food waste prevention in response to the draft action to ban food waste from garbage. Many community members also expressed a need for more education and communication on waste prevention, recycling, and composting. Residents feel unsure about how to recycle or compost correctly or feel that others are not doing so correctly. For limiting construction and demolition waste, we received many comments about limiting new development and instead encouraging retrofitting and construction material reuse. A couple of specific recommendations for materials management were made, including investing in a local recycling facility, particularly glass recycling, to create a more local market for recycled materials and increasing accepted compostable materials in our yard waste bins (accepting cardboard/paper and compostable food service ware).

GREEN ECONOMY

**Average Urgency of Green Economy Big Move:
"A prepared workforce helps existing and new innovative
businesses and industries lead our green economy
transition."
(scale of 1 to 7)**

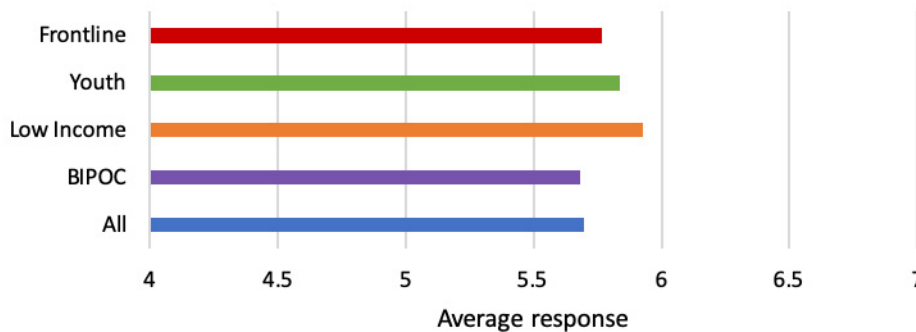


Figure 23. Average ratings of urgency to take action on the Green Economy Big Move "A prepared workforce helps existing and new innovative businesses and industries lead our green economy transition" for different demographic groups.

The average urgency of Green Economy Big Move "A prepared workforce helps existing and new innovative businesses and industries lead our green economy transition" was slightly higher for Frontline, Youth, and Low Income respondents than the group of All respondents.

Priority Green Economy Actions

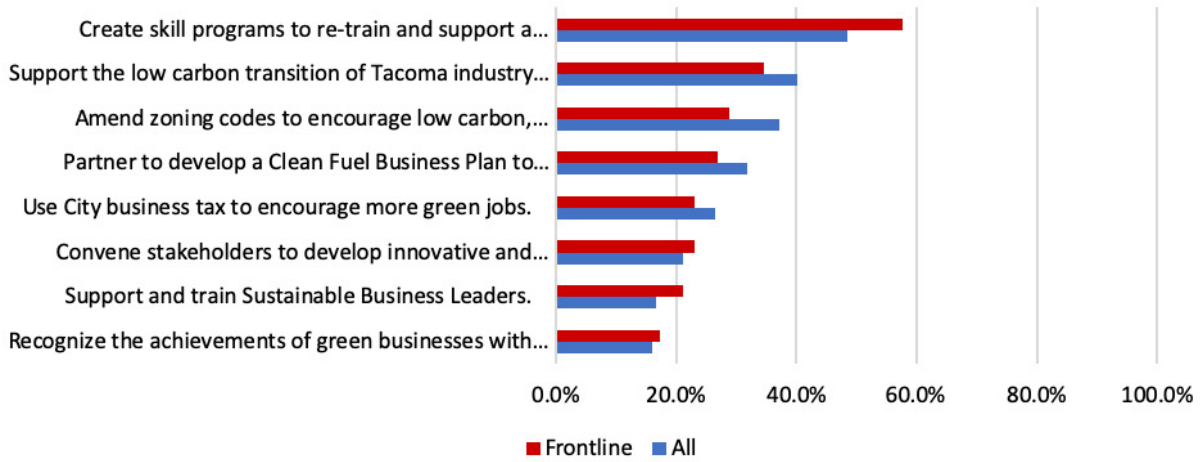


Figure 24. Priority Green Economy Actions for Frontline community respondents and All respondents. Respondents were asked to select a maximum of three priority actions for this sector.

With a significantly higher percentage of responses, the top Green Economy action for both All respondents and Frontline community members was to “Create skill programs to re-train and support a workforce prepared for the low-carbon economy.” This action had the most direct impact on community members rather than supporting businesses that will indirectly support green job growth and a low carbon transition.

Qualitative Responses

In line with the top priority action to create skill and retraining programs for a green economy, we received many comments about creating more diversity of training programs and making sure that these educational programs focus on accessibility to frontline community members. We received a specific suggestion to partner with trade schools and the Tacoma school district to implement green economy training programs. The Port and Tideflats as well as other marine activities were identified in many comments as key areas for change. Specifically, it was mentioned that we need a sustainable vision for the Port. It was also clear in many comments that helping our manufacturing and industrial sector transition to a green economy needed to focus on eliminating fossil fuel use, especially in the Tideflats, and that we need to eliminate any further expansion of fossil fuel industries in the Port.

GOVERNANCE & ENGAGEMENT

Average Urgency of Governance & Engagement Big Move:

**"Community members and partners share climate action leadership."
(scale of 1 to 7)**

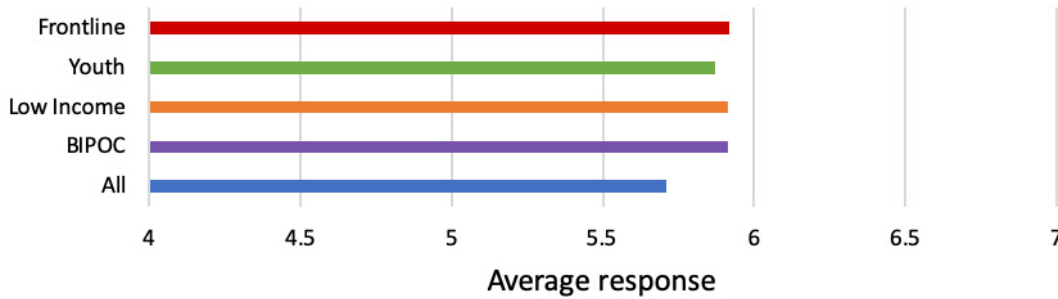


Figure 25. Average ratings of urgency to take action on the Governance & Engagement Big Move “Community members and partners share climate action leadership” for different demographic groups.

The average urgency rating for the Governance & Engagement Big Move “Community members and partners share climate action leadership” was consistent across key demographic groups and higher than the All respondents group.

Average Urgency of Governance & Engagement Big Move:

**"All City decisions and actions are made using a climate change lens."
(scale of 1 to 7)**

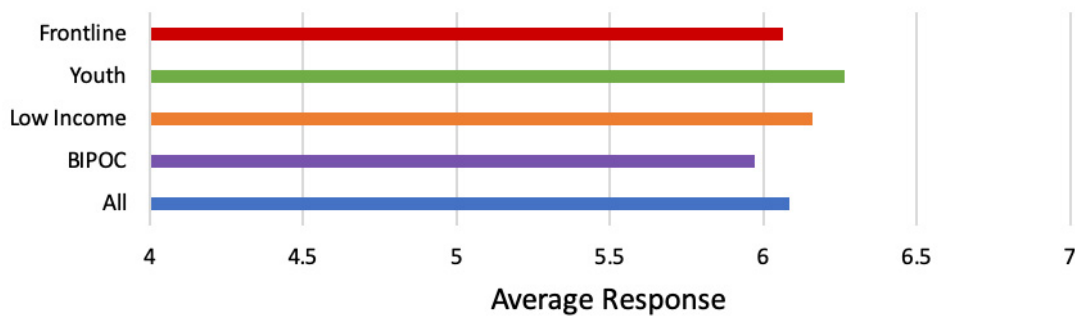


Figure 26. Average ratings of urgency to take action on the Governance & Engagement Big Move “All City decisions and actions are made using a climate change lens” for different demographic groups.

The Governance & Engagement Big Move “All City decisions and actions are made using a climate change lens” was a top Big Move strategy across all the sectors and was particularly urgent to Youth and Low Income community members. A Workshop attendee stated that this

strategy was the only Big Move that felt truly transformational.

Priority Governance & Engagement Actions

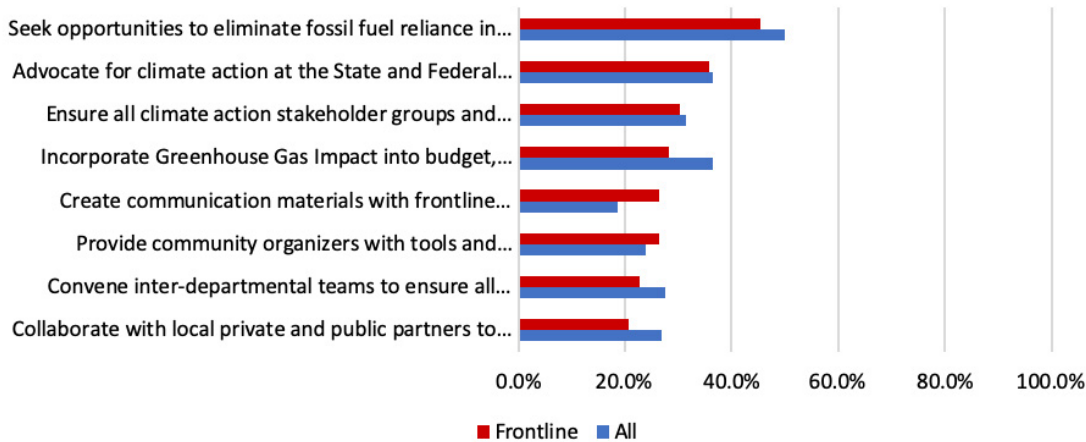


Figure 27. Priority Governance & Engagement Actions for Frontline community respondents and All respondents. Respondents were asked to select a maximum of three priority actions for this sector.

The top priority Governance & Engagement draft action for both All respondents and Frontline community members was to “Seek opportunities to eliminate fossil fuel reliance in investments and contracts entered into by the City” followed by the City advocating for climate action at the State and Federal level. Incorporating greenhouse gas impact into City budget decision-making analysis was also a top priority for All respondents but was prioritized less by Frontline community members. The lowest priority draft action is to “Collaborate with local private and public partners to tackle cross-jurisdictional information needs, adaptation opportunities and river management.”

Qualitative Responses

We received many comments throughout Phase II Engagement regarding equitable community engagement and specific feedback on Governance & Engagement strategies. There were three commonly mentioned themes.

1. It is vital that community is equally invested in climate action and is leading decision-making.
2. City staff members are not diverse and do not represent the diversity of Tacoma’s communities. This lack of representation is concerning and problematic when it comes to designing and implementing equitable climate actions.
3. City leadership needs to listen to community and pay members for their contributions. Several mentions of a new equity and/or climate change community-led advisory committee were made.

Additionally, one important edit to the Governance & Engagement Big Move “All City decisions and actions are made using a climate change lens” was suggested. A community member commented that this strategy should state “equity and climate change lens.”

ENVIRONMENTAL JUSTICE LEADERS WORKGROUP FEEDBACK

The Environmental Justice Leaders Workgroup reviewed all draft actions during Phase II. Their comments informed revisions to the framing of the plan and contributed to the decision to use storytelling to more clearly connect climate actions to their impact on residents' lives. Their feedback will continue to inform revisions to both the framing of the plan and specific draft actions. In general, the EJ Leaders were concerned that these draft actions, while potentially useful if implemented well to ensure equitability and community leadership, are not transformational enough and are still very City-driven. Some of the draft actions did not center community needs or lacked direct impact on Tacoma's daily lives. The EJ Leaders will continue to meet through October developing their own recommendations and, potentially, additional actions for the climate action plan and City Council.

DATA ANALYSIS CONSIDERATIONS

Though the respondents we reached during the second phase of engagement and the input we gathered is not a representative sample of Tacoma citywide demographics and was not evaluated for statistical significance, it is important to keep in mind the purpose of Phase II. In our second phase of engagement, we sought to center frontline communities, build or deepen relationships, and foster community leadership for future climate action. We also learned a great deal through this collaborative approach.

We made progress toward our Phase II goals by concentrating on deep qualitative input from and support for frontline groups. This includes our Environmental Justice Leaders Workgroup as well as our Ambassadors and partner organizations that brought their communities into the process. With this and other input, we have been able to focus on responses from frontline communities that need better representation and service.

Even with more traditional engagement methods – like online surveys, presentations, and workshops – we were able to ask optional demographic questions and then prioritize responses to bring more equitable representation into the plan development process. Disaggregating data by demographics is an important tool and a growing standard for cities. While we have not always collected the data to consider demographics, the representation of communities has always been a challenge and an opportunity in community planning processes. Indeed, some communities – such as highly educated, high-income, and white communities – have tended to be unfairly overrepresented in planning processes, where their perspectives and needs are prioritized.

We have tried to counter a tendency to over-represent these communities, because without active efforts the pattern will continue. For example, the responses we gathered through social media posts and email lists may have primarily come from respondents already aware of sustainability and climate change issues in Tacoma since they most likely connected with us through the Office of Environmental Policy and Sustainability or CHB resources. This may have influenced the results of Big Move strategy urgency and priority draft actions as well as the feedback we received in long-response survey questions and Workshop discussions. Specifically, the average survey respondent self-reported knowledge about climate change was 5.04 (maximum of 7), or "somewhat knowledgeable", and the average self-reported concern about climate change was 6.38 (maximum of 7), or "concerned"/ "very concerned." This high level of both knowledge about climate change and concern may not be representative of the general Tacoma public. To balance representation in our engagement and input processes, we looked at strategy prioritization by various demographic groups.

LESSONS LEARNED

Our planning and engagement activities occurred in a unique time and context. In particular, Covid-19 made day-to-day activities more challenging for many of our community members. We adapted our methods to meet community needs and safety priorities, while trying to make a complex plan accessible and participatory. Although it was challenging to get the quantity of participants we hoped for, we strengthened our planning approach by focusing on deep, qualitative input from frontline communities typically underrepresented and underserved by City processes. We recount some of the lessons we learned during this planning and engagement process below:

- Ultimately, key outcomes for engagement were met: new and existing relationships were built or deepened; community members were educated about local climate emissions, impacts, and solutions; frontline communities were prioritized for their input on how to develop a more climate-safe, just Tacoma as we approach 2030; and climate actions and strategies were largely shown to be of interest to and meeting the needs of community members.
- Context matters: Covid-19, summertime activities, students returning home, and virtual engagement fatigue were all matters of timing and behavior that affected the planning and engagement process; we sought to be flexible with and responsive to these challenges and dynamics.
- A comprehensive, cross-sector, local climate mitigation and adaptation plan is by its nature somewhat complex; while it should not be oversimplified, it can be made more accessible.
- Using a long, detailed survey enabled community members to better understand and engage with many of the elements of a climate action plan, but it also required significant amounts of input and was more challenging for Ambassadors to support.
- Virtual participation was difficult to estimate given Covid-19 and other contexts that community members were living through.
- Working with host organizations helped us reach more frontline community members and collect robust feedback; some hosts were excited to support this process, but may have needed additional support with marketing their event.
- While climate solutions may be somewhat technical in cases, they need to be framed in terms of strategies and actions that are understandable and relatable.
- Using storytelling and illustration can demonstrate how climate actions will improve daily life for our communities.
- Community members had mixed feelings with the planning timeline: while some thought solutions are fairly clear across years of climate planning and the need to act is very urgent, others wanted a slower process that gave more time for community members to learn even more of the science and do more work developing strategies or actions.

CONCLUSION

Working towards a community-based climate action plan that ensures a climate safe and just future for Tacoma, Phase II community engagement focused on providing climate emissions, impacts, and solutions education to community to facilitate informed input on draft strategies

and actions. To center frontline voices, we partnered with local frontline serving organizations to host workshops for their communities and continued working with the Environmental Justice Leaders Workgroup and Climate Ambassadors. Though we fell short of our outreach goals, over 50% of workshop attendees and survey respondents identified as frontline community members and provided rich, detailed feedback. Similar to the sustainability priorities we heard during Phase I, top priority strategies and actions include housing security, low carbon transit, healthy ecosystems, and local food access. All draft Big Move strategies were ranked urgent on average by Phase II engagement participants, but some draft actions were prioritized by more community members than others. Low priority actions are actions that will need revision or may not be of high enough impact to include in the final climate action plan.

While many of the draft actions and strategies were well received by the community, there was some concern about the accessibility of our climate action framework based on technical sectors and at times confusion about technical draft actions. Going forward, we plan to reframe the climate strategies and actions to be more people-centered, refine actions and strategies to reflect the suggested changes we have received, and prioritize actions of high interest to community members.

SUPPLEMENTAL FIGURES

BIG MOVE STRATEGIES	AVERAGE RESPONSE (SCALE OF 1 TO 7)				
	ALL	FRONTLINE	BIPOC	LOW-INCOME	YOUTH
	#	#	#	#	#
Healthy tree canopy is expanded where we need it most.	5.8	5.6	5.5	5.8	5.5
Tacoma's natural systems are diverse, protected, and resilient to our changing climate.	6.0	6.0	5.7	6.1	6.1
Growing, making, and accessing healthy, local food is easy.	5.9	6.0	5.9	6.2	6
No food is wasted.	5.4	5.6	5.5	5.8	5.7
Neighbors share, reuse, and repair items easily in our thriving circular economy.	5.4	5.5	5.4	5.7	5.5
Summertime water is used wisely.	5.7	5.6	5.4	5.7	5.5
Homes and buildings are healthy, affordable, resilient, and low carbon.	6.3	6.4	6.4	6.4	6.6
Zero emission transportation is affordable and available to all.	6.1	6.2	6	6.1	6.4
Active transportation and resilient, people centered design is available and used in all neighborhoods.	6.0	5.9	5.7	5.9	5.9
City supports better transit infrastructure that serves more Tacomans.	6.1	6.1	5.9	6.2	6.2
A prepared workforce helps existing and new innovative businesses and industries lead our green economy transition.	5.7	5.8	5.7	5.9	5.8
Community members and partners share climate action leadership.	5.7	5.9	5.9	5.9	5.9
All City decisions and actions are made using a climate change lens.	6.1	6.1	6	6.2	6.3

NEXT MOVE ACTIONS										
	ALL		FRONTLINE		BIPOC		LOW-INCOME		YOUTH	
Possible	199		54		23		25		7	
NATURAL SYSTEMS	#	%	#	%	#	%	#	%	#	%
Preserve and expand healthy tree canopy, integrate forestry efforts across City work, calculate ecosystem benefits of public trees, and map City trees.	82	60	33	61	15	65	17	68	5	71
Partner to create forest stewardship job training programs for young adults.	30	22	9	17	2	9	6	24	2	29
Prioritize funding and maintaining right-of-way trees in neighbors experiencing highest heat and lowest socio-economic opportunities.	77	56	27	50	13	57	19	76	3	43
Protect biodiversity and habitat with climate change ready urban landscapes, map and analyze critical areas, update codes, and involve community.	94	69	39	72	19	83	22	88	7	100
Assess vulnerability of shoreline infrastructure and habitat. Develop a shoreline monitoring program to track sea levels and prepare for rise.	58	42	20	37	7	30	7	28	3	43
None important / No response	4	3 31	1 0	2 0	2 0	0 0	0 0	0 0	0 0	0 0
	83									
	ALL		FRONTLINE		BIPOC		LOW-INCOME		YOUTH	
Possible	199		54		23		25		7	
LOCAL FOOD	#	%	#	%	#	%	#	%	#	%
Inventory public spaces available for community food projects.	26	13%	8	15%	2	9%	7	28%	0	0.0%
Improve regulations to make it easier to grow, make, and sell food.	73	37%	23	43%	11	48%	15	60%	4	57%
Fund research into how to develop a community food hub.	26	13%	12	22%	5	22%	5	20%	4	57%
Reallocate funding for food purchases for City activities and public meetings to prioritize healthy, low carbon food from minority and women-owned businesses.	46	23%	15	28%	8	35%	11	44%	3	43%
Fund 10 community food projects, like community gardens, food forests, orchards, farms, or food rescue efforts.	79	40%	36	67%	16	70%	17	68%	6	86%

Increase access to local produce for diverse and low-income shoppers.	92	46%	37	69%	20	87%	20	80%	4	57%
None important / No response	6 83	3% 42%	1 0	2% 0%	1 0	4% 0%	0 0	0% 0%	0 0	0% 0%
	ALL		FRONTLINE		BIPOC		LOW-INCOME		YOUTH	
Possible	199		54		23		25		7	
BUILDINGS & ENERGY	#	%	#	%	#	%	#	%	#	%
Reduce per-person annual water use during summer months through smart metering, leak detection, and timely repair.	20	10%	11	20%	5	22%	3	12%	2	29%
Increase access to loans and incentives for efficiency and clean energy in commercial buildings and homes, prioritizing renters and low-income.	53	27%	19	35%	9	40%	14	56%	3	43%
Improve new construction codes to reduce fossil fuel use by requiring high efficiency and health standards.	56	28%	19	35%	10	43%	12	48%	5	71%
Use housing density incentives to encourage green building certification and net zero emissions.	36	18%	14	26%	8	35%	8	32%	1	14%
Pilot working with 50 building owners to retrofit low-income multifamily homes to be low carbon, safe, and affordable.	48	24%	16	30%	8	35%	10	40%	3	43%
Explore requiring energy scores to be shared with home and commercial building buyers. Require commercial buildings to report their energy score.	16	8%	9	17%	3	13%	4	16%	2	29%
Help the industrial sector decarbonize with a collaborative workgroup to explore opportunities in efficiency and clean fuels.	16	8%	13	24%	6	26%	6	24%	1	14%
Keep housing affordable and resilient for today's residents by helping people stay in homes and keeping homes in good repair.	62	31%	30	56%	14	61%	14	56%	2	29%
Prepare our built environment for the impacts of climate change by providing guidance to residents and businesses and improving codes.	29	15%	13	24%	6	26%	10	40%	1	14%
None important / No response	3 83	2% 42%	0 0	0% 0%	1 0	4% 0%	0 0	0% 0%	0 0	0% 0%

	ALL		FRONTLINE		BIPOC		LOW-INCOME		YOUTH	
Possible	199		54		23		25		7	
MOBILITY & LAND USE	#	%	#	%	#	%	#	%	#	%
Develop a zero emissions ride share and delivery services roadmap by 2030 and demonstrate solutions with pilot projects.	20	10%	6	11%	3	13%	6	24%	1	14%
Partner to support marine and rail transportation zero emission innovation.	30	15%	10	19%	7	30%	5	20%	5	71%
Fund electric vehicle and bicycle programs in low opportunity neighborhoods.	36	18%	13	24%	9	39%	9	36%	3	43%
Increase healthy, low carbon, compact, complete communities along transit corridors and close to mixed use centers like business districts.	41	21%	22	41%	11	48%	11	44%	5	71%
Incentivize active transportation, transit, car sharing, and electric vehicles, and reduce parking minimums in new developments.	26	13%	7	13%	4	17%	4	16%	1	14%
Fund active transportation infrastructure with a surface parking tax.	12	6%	3	6%	1	4%	2	8%	0	0%
Reclaim City vehicle space for other public uses through piloting projects like bicycle parking, play streets, and small parks.	23	12%	7	13%	3	13%	2	8%	2	29%
Update street design guidelines, and processes to make walking, biking, and transit use easier and safer.	52	26%	15	28%	8	35%	4	16%	2	29%
Increase partnerships and community funding for active transportation and public transit community programming to make it easier to use.	37	19%	18	33%	10	43%	14	56%	3	43%
Conduct a climate change vulnerability study of infrastructure and populations and integrate findings into City emergency management and planning.	18	9%	7	13%	5	22%	6	24%	0	0%
Work with partners to use public land for public benefits like resilience hubs, green space, economic development, and housing opportunities.	27	14%	12	22%	8	35%	11	44%	0	0%

Develop a zero emission public transit plan with Pierce Transit.	32	16%	11	20%	5	22%	7	28%	1	14%
None important / No response	3 86	2% 43%	2 2	4% 4%	1 0	4% 0%	0 1	0% 4%	0 0	0% 0%

	ALL		FRONTLINE		BIPOC		LOW-INCOME		YOUTH	
Possible	199		54		23		25		7	
CONSUMPTION & MATERIALS MANAGEMENT	#	%	#	%	#	%	#	%	#	%
Increase funding for community groups leading waste prevention and reach more diverse community members and organizations to take part.	42	21%	14	26%	8	35%	11	44%	3	43%
Increase food waste prevention, diversion from landfill, and rescue through added infrastructure, projects, ordinances, and staff capacity.	57	29%	26	48%	14	61%	13	52%	4	57%
Ban food waste from garbage and develop a program to support its implementation.	31	16%	10	19%	2	9%	6	24%	2	29%
Increase commercial and industrial reuse and recycling by providing technical assistance and outreach for a material marketplace exchange platform.	54	27%	20	37%	12	52%	15	60%	3	43%
Reduce construction and demolition waste by requiring material recycling and deconstruction plans as part of the building permitting process.	72	36%	25	46%	11	48%	13	52%	5	71%
Require material audits of our recyclers and composters to better track waste diversion and increase accountability.	29	15%	8	15%	4	17%	2	8%	1	14%
Develop better strategies to divert bulky reusable and recyclable materials at the Tacoma Recycling and Transfer Center.	45	23%	21	39%	9	39%	11	44%	2	29%
None important / No response	3 86	2% 43%	0 1	0% 2%	1 0	4% 0%	0 0	0% 0%	0 0	0% 0%

	ALL		FRONTLINE		BIPOC		LOW-INCOME		YOUTH	
Possible	199		54		23		25		7	
GREEN ECONOMY	#	%	#	%	#	%	#	%	#	%
Create skill programs to re-train and support a workforce prepared for the low-carbon economy.	64	32%	30	56%	13	57%	17	68%	4	57%
Convene stakeholders to develop innovative and sustainable marine industries.	28	14%	12	22%	3	13%	6	24%	1	14%
Partner to develop a Clean Fuel Business Plan to recruit clean fuel businesses to Tacoma.	42	21%	14	26%	9	39%	10	40%	5	71%
Support the low carbon transition of Tacoma industry through a Sustainable Industrial and Manufacturing Collaborative.	53	27%	18	33%	9	39%	8	32%	4	54%
Amend zoning codes to encourage low carbon, resource-efficient, resilient, and just businesses.	49	25%	15	28%	9	39%	9	36%	2	29%
Support and train Sustainable Business Leaders.	22	11%	11	20%	3	13%	8	32%	1	14%
Recognize the achievements of green businesses with participation in programs like EnviroStar.	21	11%	9	17%	2	9%	1	4%	1	14%
Use City business tax to encourage more green jobs.	35	18%	12	22%	10	43%	7	28%	3	43%
None important / No response	6 86	3% 43%	2 2	4% 4%	2 1	9% 4%	1 0	4% 0%	0 0	0% 0%

	ALL		FRONTLINE		BIPOC		LOW-INCOME		YOUTH	
Possible	199		54		23		25		7	
GOVERNANCE & ENGAGEMENT	#	%	#	%	#	%	#	%	#	%
Advocate for climate action at the State and Federal level.	49	25%	19	35%	8	35%	10	40%	5	71%
Incorporate Greenhouse Gas Impact into budget, capital, and department level work plans.	49	25%	15	28%	13	57%	8	32%	5	71%
Convene inter-departmental teams to ensure all capital projects include multiple sustainability benefits.	37	19%	12	22%	5	22%	5	20%	1	14%
Seek opportunities to eliminate fossil fuel reliance in investments and contracts entered into by the City.	67	34%	24	44%	12	52%	14	56%	4	57%
Provide community organizers with tools and resources they need to share expertise and engage in City processes related to climate action.	32	16%	14	26%	3	13%	11	44%	3	43%

Ensure all climate action stakeholder groups and community engagement efforts are inclusive of frontline communities.	42	21%	16	30%	5	22%	11	44%	1	14%
Create communication materials with frontline communities about climate change impacts on health, emergency preparedness, and emergency event trainings.	25	13%	14	26%	11	48%	5	20%	2	29%
Collaborate with local private and public partners to tackle cross-jurisdictional information needs, adaptation opportunities and river management.	36	18%	11	20%	2	9%	5	20%	0	0%
None important / No response	5 86	3% 43%	1 1	2% 2%	1 1	4% 4%	1 0	4% 0%	0 0	0% 0%

TACOMA COMMUNITY CLIMATE ACTION PLAN



Section 7 — PHASE III

PHASE III ENGAGEMENT REPORT

PURPOSE & OVERVIEW

This public comment period provided opportunities for community members to review, suggest edits to, and more generally comment on the draft of the Climate Action Plan before it is developed into a final draft and delivered to Tacoma City Council. City Council may then suggest further potential edits before considering the Plan for adoption. The October 1 – October 20 public comment period followed two phases of engagement that served to (1) develop a sense of community needs and priorities and (2) establish a list of effective, equitable, and community-informed climate actions and investments. The Phase 3 input process involved virtual public meetings, online surveying, stakeholder engagement, and other methods. The input period drew comments from more than 112 community members, including letters of support or recommendation letters from 8 groups or organizations. This process builds on input from 889 of community members during Phase I and Phase II, spanning September 2020 – June 2021. Altogether, climate action planning has engaged 1,001 community members and counting!

ENGAGEMENT METHODS

The Phase III public input period depended on a mix of engagement methods, including virtual public meetings, social media promotions, online surveying, stakeholder engagement, emailing, and other communications. Social media promotion and emailing supported virtual stakeholder meetings, virtual public meetings, and online surveying. Stakeholders engaged during the public input period include Climate Ambassadors; the Environmental Justice Leaders Workgroup (EJLW); Frontline “Host” Organizations; City committees, boards, and commissions; local neighborhood councils, local environmental, housing, transportation, governmental, or industrial organizations; technical teams of staff and external service providers and academic experts; and the general public. Staff support focused on frontline community members, the EJ Leaders Workgroup, and Frontline “Host” Organizations to increase representation in the input process as well as deepen input heard from these stakeholders.

COMMUNITY ENGAGEMENT ACTIVITIES & PARTICIPATION RESULTS

More than 112 community members participated in the Phase III public input process, whether through the online public input form (which served as a survey), virtual stakeholder meetings, virtual public meetings, letter writing, or other comment communications. Results are reflected in the table below. Most participants gave comment through the online public input form. Several organizations or groups provided comment in written letters, including Citizens Climate Lobby, Citizens for a Healthy Bay, Downtown on the Go, Landmarks Preservation Commission, Manufacturing Industrial Council for the South Sound, Pierce Transit, Planning Commission, Port of Tacoma, Puget Sound Energy, Sustainable Tacoma Commission, U.S. Oil and Refining Company, and WestRock Company. [Commissions](#) are City-appointed community advisory bodies.

Table 1. Participation in the Phase III Public Input Process

	ATTENDANCE	RESPONDENTS
Online Public Input Form	-	60
Organization Meetings (4)	16	-
Virtual Public Meetings (2)	22	-
Email Comments	-	1
Letters	-	12
Social Media Comments	-	2
TOTAL	38	75

DEMOGRAPHICS

Of 60 total online public input form respondents, 29 self-identified as frontline community members – approximately 48% of input form respondents. Three Frontline “Host” Organizations participated in virtual meetings, including 14 frontline community members. The 10-member EJLW submitted a collection of comments as individual Workgroup members. Other Phase III engagement activities did not track frontline participation.

IDENTIFY AS FRONTLINE COMMUNITY MEMBER

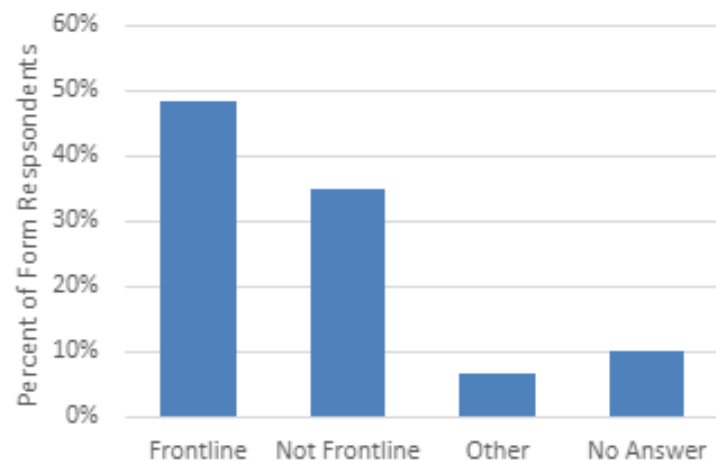


Figure 1. Percentage of Online Public Input Form Respondents that Identify as a Frontline Community Member

Forty-two percent of online public input form respondents self-identified as Black, Indigenous, or People of Color (BIPOC). The largest BIPOC groups included “two or more races or ethnicities” at 18% and “Latinx, Latine, Latino, or Latina” at 12%. According to [U.S. Census Bureau data](#), Tacoma’s BIPOC population makes up 35% of our community. Notably, 17% of respondents chose not to answer this question. Percentages are only based on those who did answer. Other Phase III engagement activities did not track race or ethnicity demographics.

RACE/ETHNICITY OF RESPONDENTS

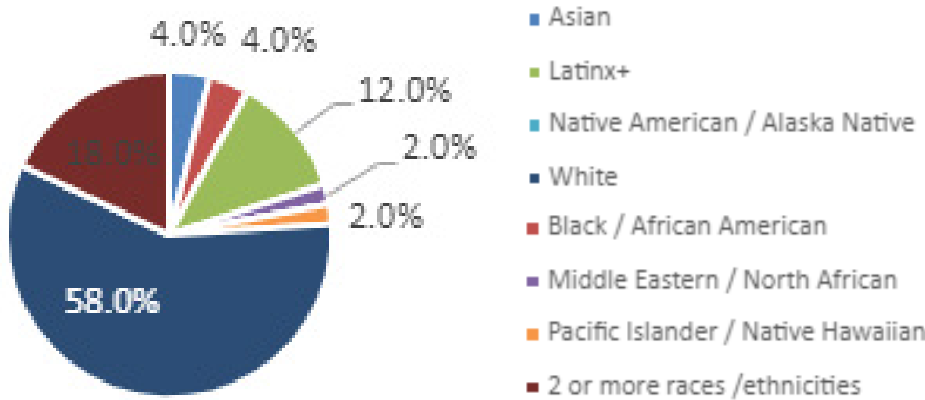


Figure 2. Race/Ethnicity of Online Public Input Form Respondents as Percentages*

*17% of respondents chose not to answer this question. Percentages are based on those who did answer.

Twenty-eight percent of online public input form respondents self-identified as having a household income of less than \$50,000 annually. An additional 33% has a household income \$50,000 to \$100,000 annually. According to [U.S. Census Bureau data](#), Tacoma’s household median income is approximately \$62,400 for an average household size of 2.5. [Approximately](#) 35% of Tacoma households have an income below \$50,000 annually, and an additional 33% of households have an income between \$50,000 to \$100,000 annually. Household size was not tracked. Notably, 28% of respondents chose not to answer this question. Percentages are only based on those who did answer. Other Phase III engagement activities did not track household income demographics.

HOUSEHOLD INCOME

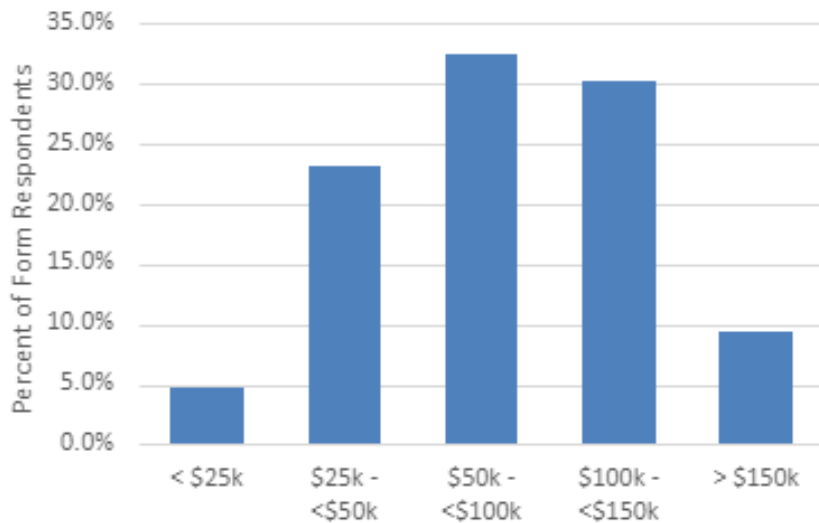


Figure 3. Household Income of Online Public Input Form Respondents as Percentages*

*28% of respondents chose not to answer this question. Percentages are based on those who did answer.

Thirty percent of online public input form respondents self-identified as younger than 25 years old and an additional 6% identified as 65 years of age or older. According to [U.S. Census Bureau data](#), 16% of Tacoma community members are [younger than 25 years old](#) and an additional 13% are 65 years of age or older. Household size was not tracked. Notably, 12% of respondents chose not to answer this question. Percentages are only based on those who did answer. One youth-based Frontline “Host” Organization, the Mayor’s Youth Commission, participated in virtual meetings, including 12 youth community members. Other Phase III engagement activities did not track age demographics.

AGE

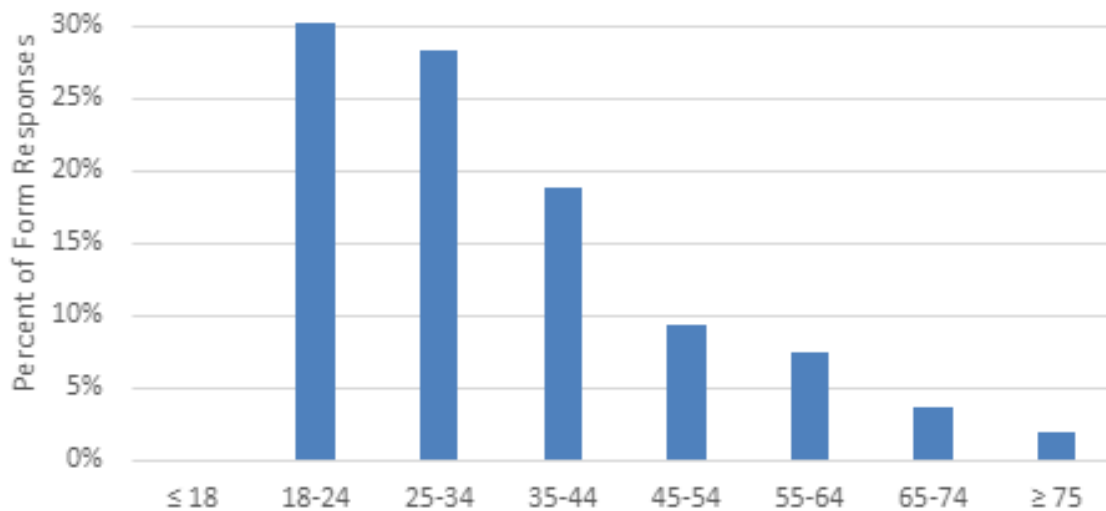


Figure 4. Age of Online Public Input Form Respondents as Percentages*

*12% of respondents chose not to answer this question. Percentages are based on those who did answer.

WHAT WE HEARD

Across input activities, staff heard the following input themes:

- That the Plan should be more detailed, measurable, and bold
- That the Plan should focus more on industry, whether to address emissions or provide additional engagement and support for businesses transitioning to a low carbon future
- That the Plan is important for leading our community in taking climate action
- That the Plan provides strong focus on social equity
- That the City, through the Plan and other work, should do more pollution prevention, protect natural systems, and develop green infrastructure solutions
- That many low carbon technologies exist and should be rapidly used now, while others need more development as we approach 2050
- That community members are interested in and concerned about funding, staffing, and follow through on implementation of the Plan
- That community members expect better transit and active transportation options from the

City and other public agencies tasked with these services

- That the Plan is related to, should build on, and go beyond other City and public plans and activities

The following paragraphs examine feedback heard through different engagement methods.

VIRTUAL PUBLIC MEETINGS

Two **virtual public meetings** were held on October 9th and October 12th to meet with stakeholders to discuss their comments regarding our draft Climate Action Plan in a live session. Both meetings were held outside regular working hours to accommodate for many working schedules and maximize attendance.

There was a total of 21 attendees for our virtual public meetings, and 11 people filled out our virtual poll to indicate whether there was a change in knowledge about the Climate Action Plan as a result of the meeting. Community members who came with limited knowledge about the Plan consistently indicated they learned from the meeting, as depicted in Figure 5 below.

VIRTUAL MEETING POLL RESULTS

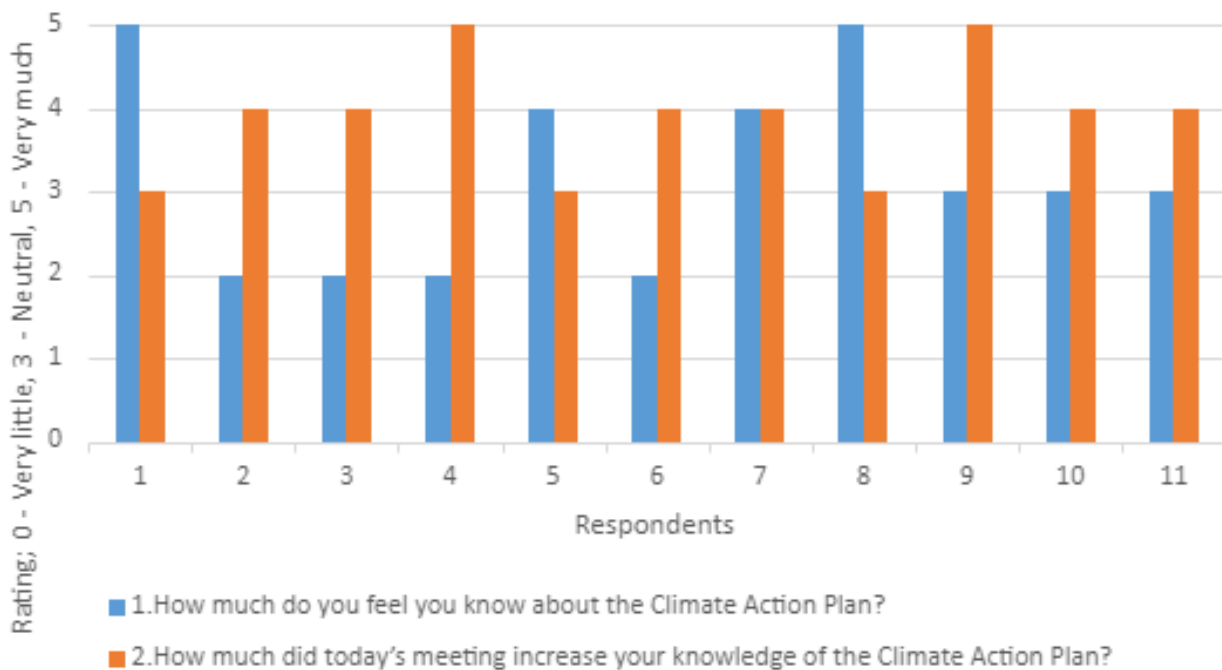


Figure 5. Figure 5: Change in knowledge of the Climate Action Plan in Virtual Public Meeting Attendees

More than 60% of our attendees noted an increase in their knowledge of the Climate Action Plan after the meeting. Attendees also pledged to continue to engage civically, whether by reviewing the Climate Action Plan, submitting the public comment form, contacting Tacoma City Council, or contacting their state or national representatives.

Table 2. Public Comments in the Virtual Public Meetings

OCTOBER 9 ATTENDEES: 9; ZOOM POLL RESPONSES:5	OCTOBER 12 ATTENDEES: 13; ZOOM POLL RESPONSES:6
PORTIONS OF THE PLAN COMMUNITY MEMBERS WERE EXCITED ABOUT	
<ul style="list-style-type: none"> • Tacoma Equity Index map 	<ul style="list-style-type: none"> • Partnership with the Puyallup Tribe • Focus on equity
COMMUNITY INTERESTS & CONCERNS	
<ul style="list-style-type: none"> • Tideflats Non-interim Regulations • Affordable housing • Transit access & CAP connection to Pierce Transit services • Partnership with local organizations and offices such as the South Tacoma Neighborhood Council and Office of Arts & Cultural Vitality • Green jobs • Funding to protect groundwater aquifer • Infrastructure maintenance, preservation, and retrofits 	<ul style="list-style-type: none"> • Educational engagement opportunities for students • Green jobs and equitable hiring practices • Collaborate with local public organizations to leverage shared funds and resources • Aligning funding with climate goals • Sustainable infrastructure and preserving infrastructure • Shift focus from high-level planning to specific actionable items and implementation details

Based on their questions and input, it was clear that most of the attendees were concerned with the implementation stage of the Climate Action Plan, shifting the focus from high-level planning to outlining specific actionable items. The topics of concern included affordable housing, accessible transit, infrastructure conservation, professional and educational development opportunities, and funding for the Plan.

ONLINE PUBLIC INPUT FORM

During the public input period, community members provided 60 **public input form responses**. The public comment forms also reflected similar concerns regarding the implementation of the Climate Action Plan that were shared during the virtual meetings. One-third of the comments shared discussed CAP implementation and accountability of actions and strategies. General CAP responses noted the importance of specific actions outlined in the plan, including mitigating climate impacts and decreasing emissions. 17% of respondents acknowledged the importance of forming partnerships with the local Puyallup Tribe and working with historically underrepresented frontline community members to prioritize climate action through a social equity lens. The fourth most common response by theme was regarding the preservation and expansion of existing infrastructure, such as buildings, and urban forests.

PUBLIC COMMENT FORM RESPONSES

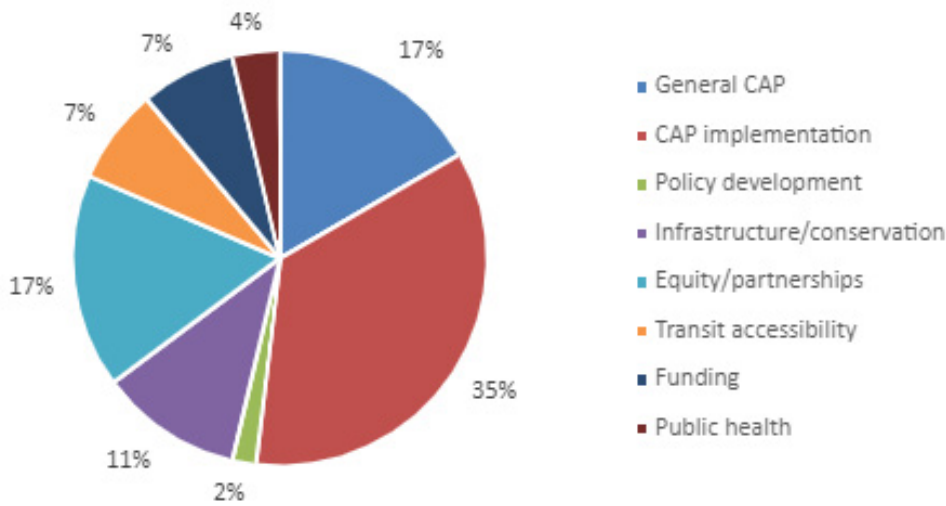


Figure 6. Public Comment Form Responses by Theme

Based on 60 online public input form responses, the draft Climate Action Plan received an average score of 5.4 in support of the Plan. Responses were based on a scale of one to seven, where one is “strongly against” the Plan and seven is “strongly in support of” the Plan. 58% of input form respondents expressed strong support for the Plan with a score of six or seven; 77% of respondents gave a score of five or greater in support of the Plan. Thirteen percent were against the Plan as drafted.

RANK YOUR SUPPORT FOR THE CAP

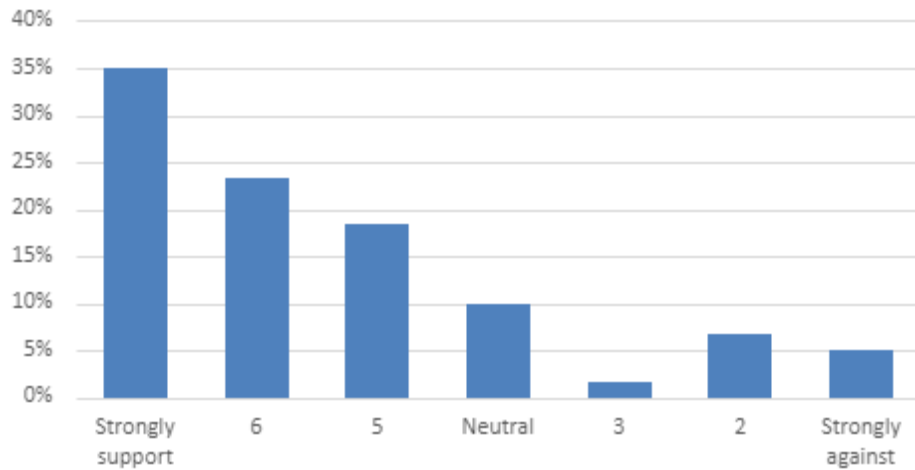


Figure 7. Percentage of CAP Approval from Online Public Input Form Respondents

ENVIRONMENTAL JUSTICE LEADERS WORKGROUP

The Environmental Justice Leaders Workgroup (EJLW), composed of frontline Tacoma community members, informed climate action engagement and planning processes through regular virtual meetings and other interactions with staff from September 2020 – October 2021. In the third phase of climate action planning and engagement, the Workgroup met to develop Workgroup and individual member comments for the Plan – which can be viewed in Section 8.

Together, the Workgroup provided one shared comment related to the engagement and planning processes as well as the final draft of the Climate Action Plan:

“As it currently stands, the CAP does not adequately reflect EJLW’s direct input and stated priorities from the past year. We recognize and commend the City of Tacoma for taking a risk and branching out to change their public engagement strategies from the past. We strongly encourage them to continue down this path with some necessary course corrections. We thank you for seeing this need to incorporate our voices and now we demand that you listen to us: structural, systemic and institutional change must happen now! And in order for communities’ faith in municipal institutions to be restored and carried forward for the duration of this CAP, we must move toward a collaborative governance structure.”

COMMENT LETTERS

Other stakeholder groups commenting on the Plan, whether through letters or in virtual meetings, generally communicated support for the Plan. Letters from some industrial businesses communicated concerns about regulations and technology development to support the transition away from fossil fuels through 2050.

LESSONS FROM PHASE III

Overall, staff have identified various strengths, challenges, and areas for improvement from the third phase of climate action planning and engagement.

STRENGTHS

- Staff were able to re-engage some Frontline “Host” Organizations and groups who are typically underrepresented and underserved by these processes
- Various organizations and groups have already provided comment letters on the draft, and likely more comments will be delivered as Tacoma City Council reviews and considers adoption of the Plan
- Despite a shorter Phase III timeline with more limited staff resources, participation in the public input process approached a representative sample of Tacomans when measuring for participation by BIPOC community members, low or moderate income households, and youth.
- Relationships with community members or partners helped bring participants into the process
- Community and staff are eager to see the City pivot from planning toward taking bold action and engaging community in the implementation process

CHALLENGES & AREAS FOR IMPROVEMENT

- Engagement with and supporting policy- and investment-shaping input from frontline community members that are historically underrepresented and underserved and expected to experience the first and worst impacts of the climate emergency
- Engagement with and input from businesses was more limited than desired

- Despite the urgency of climate and social equity action, some community members and stakeholders feel processes should slow down or be more continuous to improve community knowledge about City plans, policies, processes, and work

REFLECTIONS ON PHASES I – III OF CLIMATE ACTION PLANNING AND ENGAGEMENT

REFLECTIONS ON THE PROCESS AND WORK AHEAD

- Closing this stage of climate action and climate action planning work is both exciting and leaves us with a feeling of non-closure. It was more than a year-long public engagement and planning process supported by an additional year of preparatory staff work. It occurred against a backdrop of a global pandemic-recession, a social justice crisis, turmoil in America’s experiment in self-governance, and an urgent climate emergency.
- This process was informed through years of engagement, input, policy, and planning work. This looks like the relationships between community members, stakeholders, and staff or elected representatives. In addition, a collection of planning and engagement processes contributed to the discussions and thinking in this process; these processes include: the Tacoma Community Survey (2021), One Tacoma Comprehensive Plan (updated annually), Tideflats Public Engagement Plan (2021), Affordable Housing Action Strategy (2018), and the Transportation Master Plan (2015), among other processes.
- The climate emergency is here now. It impacts our communities today – and the impacts are uneven and inequitable.
- The problems and opportunities associated with climate change and climate action are in many cases very clear. This is a problem that has been well understood by the scientific community for decades, and the time to act is now. To protect a more equitable, livable future for our communities and coming generations – which cannot speak for themselves – we must act transformatively. Failure is not an option. We must try mightily.
- There is much more work to do building relationships, delivering on input and investments outlined in the plan, and finding the resources to deliver.
- The Plan’s success relies on the input and accountability provided by community, the recommendations and work of staff, partnerships, and decisions by elected representatives. In many ways, the climate emergency must be solved with technical solutions and investments underwritten by local democratic decision-makers.

STRENGTHS

- Emphasizing relationships and the quality of input through new engagement processes and participation roles, such as the Climate Ambassadors, EJ Leaders Workgroup, Frontline “Host” Organizations, and community partner Citizens for a Healthy Bay
- Developing new virtual civic engagement practices
- Piloting stipends for equitable community participation in planning processes
- Engaging a breadth of valued stakeholders, including frontline communities, staff, and external service providers across many departments and organizations

CHALLENGES & AREAS FOR IMPROVEMENT

- Building our understanding of our history of social and environmental injustices
- Improving language access consistently, such as by translating documents or providing content on the City's webpage, which can be translated to 100+ languages
- Improving community representation in staffing
- Balancing engagement and planning processes that must accompany efforts and investments that deliver on input we heard and benefits outlined in Plan
- Maintaining relationships through staffing turnover and a rebalance of time focused on Plan implementation
- Improving educational materials for civic engagement processes, balancing completeness of information with practical brevity

TACOMA COMMUNITY CLIMATE ACTION PLAN



Section 8

SECTION 8, ENVIRONMENTAL JUSTICE LEADERS WORK GROUP

ABOUT THE WORKGROUP

The Environmental Justice Leaders Workgroup (EJLW) informed climate action engagement and planning processes through regular virtual meetings and other interactions with staff from September 2020 – October 2021. The EJLW also indirectly contributed to the language of the Climate Action Plan through their comments. The Workgroup membership was limited to frontline community members and included:

Alexia Henderson	Dylan Tran
Monica Ghosh	Milly Vara
Ashley Mocerro-Powell	Aarin Wilde
Patricia Ortiz	Tera Williams
Danelle Reed	Michelle Woo

ENVIRONMENTAL JUSTICE LEADERS WORKGROUP COMMENT

Together, the Workgroup provided one shared comment related to the engagement and planning processes as well as the final draft of the Climate Action Plan:

“As it currently stands, the CAP does not adequately reflect EJLW’s direct input and stated priorities from the past year. We recognize and commend the City of Tacoma for taking a risk and branching out to change their public engagement strategies from the past. We strongly encourage them to continue down this path with some necessary course corrections. We thank you for seeing this need to incorporate our voices and now we demand that you listen to us: structural, systemic and institutional change must happen now! And in order for communities’ faith in municipal institutions to be restored and carried forward for the duration of this CAP, we must move toward a collaborative governance structure.”

- Environmental Justice Leaders Workgroup

INDIVIDUAL MEMBER COMMENTS

Some of the Workgroup's members wished to contribute individual comments about the engagement and planning processes, the final draft of the Climate Action Plan, and the Plan's implementation following adoption. These comments are attributed to individual Workgroup members below:

"165 years have passed since the Medicine Creek Treaty Council convened. 163 years have passed since the Medicine Creek Treaty was re-negotiated. Since the inception of the 1st Treaty Council the Medicine Creek Treaty Tribes honorably agreed to the terms while agreeing to co-habitat with their new neighbors, with the understanding that we as first peoples of these lands would continue to have access to our subsistence and ceremonial plants, fish, and animals. To this day the City of Tacoma continues to dishonor the Medicine Creek Treaty Tribes and Puyallup Tribes sovereignty every time it makes decisions that harms the social-ecological systems within the ceded areas of the Medicine Creek Treaty including but not limited to- Commencement Bay, Puyallup River, Tacoma Tidelands, and all lands and waters within the city's jurisdiction. Furthermore, the City of Tacoma continuously fails to dishonor the sovereignty of the Puyallup Tribe every time the City of Tacoma makes decisions that impact the climate without collaborating, consulting, and without the consent of the Puyallup Tribe."

- Workgroup members Patricia Ortiz and Danelle Reed*

*Patricia and Danelle wish to note that they do not speak for nor represent the opinion of the governing body of the Puyallup Tribe

"The other [issue] is the contamination that the government doesn't tell us about or put out information about. They don't tell us anything, about the airplanes from the military or the commercial airplanes. All of those things are damaging [to] us. They create a lot of contamination. They don't show it on the internet. Why? So we don't say anything. So we don't say anything, or know about it, and they will continue contaminating and we [will continue] getting sicker.

"My other [issue] is the deforestation of trees, that they come and they are taking those away from us. We are lacking that oxygen. People are cutting trees. It is something essential for human beings. If they need to cut those trees, then they should bring them back. Maybe not as big, but little by little [newly planted trees] will grow. They should not just cut and leave an empty space. There should be a balance. If I cut, then I will reforest again. And the other [issue] is the variation of certain trees. There is a balance. There shouldn't only be pines or oaks, there are more trees. Not only outside or in the parks, there are more areas around the houses or apartments. They should have more trees. We need that shade in the summertime. It's not the same as being inside your house in the air conditioning. Sitting outside looking at the kids running and [spending] time with family, it's not the same to be under an umbrella than to be under a tree."

- Workgroup member Milly Vara

“Although the Environmental Justice Leaders Workshop group does not feel as though the Climate Action Plan reflects the group’s direct input, we agreed upon some fundamental needs for the people of Tacoma. I personally believe that environmental Justice for Tacoma means equitable access to the necessities of quality life. It is important to prioritize the historically underserved communities to promote equity. We must improve food security, housing security, improving environmental health, and regulation of commercial and industrial environmental impacts. And above all else we need to recognize the sovereignty of the Puyallup Tribe. As the original stewards of this land, they should be consulted for environmental solutions and climate planning on tribal lands.

“This EJLW group was only commissioned for a one-year period and despite the many fundamental impediments to the progress of this group, time was the most limiting factor. Despite its’ limitations, EJLW was a good idea to improve community involvement and increase community trust in municipal entities. Though one year was not a sufficient amount of time for the EJLW to contribute to the Tacoma Climate Action plan in a meaningful way. To ensure equitable change this work must be continued by providing a forum to community members who have been historically underserved to discuss environmental justice and other related issues with the City. This forum should be a permanent fixture in climate planning of Tacoma and would act as watchdog, advisor and contributor, separate from Tacoma Sustainability Commission in that it would be comprised of frontline community members. By supporting the development of community led organizations, the City would create a pipeline of community leaders, spaces for conversation and resource sharing, and easier access to community involvement all of which would achieve the equitable improvements that the Climate Action Plan seeks to provide.”

- Workgroup member Alexia Henderson

TACOMA COMMUNITY CLIMATE ACTION PLAN



Section 9

SECTION 9, MUNICIPAL CARBON NEUTRALITY STRATEGY

WHY DOES THE CITY OF TACOMA NEED A MUNICIPAL CARBON NEUTRALITY STRATEGY?

The devastating impacts of climate change are manifesting locally. June 2021 heat dome extreme temperatures and elevated air pollution from increased regional wildfires are examples that impact the health of the City and the ecology that supports us. City elected officials have asked staff to deliver transformative solutions that reduce City greenhouse gas (GHG) emissions.

Leading-By-Example has been a hallmark of the City's work to mitigate climate change since adoption of 2008 Climate Action Plan (CAP) 1.0. This City-as-model approach was explicit in the development of actions and targets in the 2015 Environmental Action Plan (CAP 2.0). Lessons learned from the 2016 through 2020 include an overarching, clear plan goal that is valued by staff, and separate municipal operation specific actions into their own section.

With the adoption of Climate Emergency Resolution 40509 in December 2019, City leadership tasked the Office of Environmental Policy and Sustainability (OEPS) with updating the CAP. This included laying out a clear pathway to toward reaching the City's 2050 carbon reduction goals of municipal carbon neutrality.

While the City's municipal operations only make up less than 1% of total community-wide emissions, it is important that the City prioritizes reducing our own footprint. In addition to addressing climate change, there are multiple reasons that the City should pursue aggressive GHG pollution reduction goals. These reasons include:

- **Accountability:** Setting clearly defined goals and measuring progress is critical for making progress and building trust with our community
- **Innovation:** Investing in a clean energy future that promotes innovation, supports economic development, and fosters creativity in solutions
- **Cost Savings:** Conserving resources and reducing emissions saves money now and in the future
- **Health:** Reducing emissions and other types of air pollution has benefits for public health and safety
- **Leadership:** Setting ambitious goals can demonstrate success and inspire action by employees, other governments, and businesses

Implementing the staff directives in the climate emergency resolution led to a clear consensus that a Municipal Carbon Neutrality Strategy (MCN Strategy hereafter) needed to be developed for Municipal Operations. Working with Sustainability Tacoma Commission and Tacoma City Council (Council) leadership, a Decarbonization Resolution 40776 was adopted in April 2021.

Specific to Municipal Operations, the Decarbonization Resolution directs staff to:

- Exclude fossil fuel energy sources in heating, lighting, and to power all new buildings and major renovations
- Use low carbon fuels including renewable diesel, biodiesel, renewable natural gas, electrolytic hydrogen, and electricity derived or generated from sustainable and renewable resources. Exceptions or exemptions should only be allowed when insufficient reliable, resilience, technical, or cost-feasible options are available
- Inventory the City-owned facilities within the City Limit that use fossil fuels, evaluating for feasibility of retrofitting these buildings to low-emission sources by 2030. Evaluations should make use of existing reports, and recommendations prepared regarding feasibility and life-cycle costs
- Prioritize new fleet vehicles that are zero-emission, low-emission, or non-motorized vehicles with specific criteria for evaluation and selection, and
- Develop a plan to retrofit all City-owned parking facilities with electric vehicle charging stations by 2030

Building on the requirements of the decarbonization resolution, the MCN Strategy will guide Scope 1 and 2 emission reductions and help the City prepare for climate impacts through 2030, keeping us on track for carbon neutrality in 2050.

TRACKING OUR PROGRESS & PAST MUNICIPAL EMISSIONS

The City has been conducting inventories of emissions associated with general government and TPU operations within the City limits since 2005. Per international standards, government operations emissions are tracked for 5 Sectors: Fleet, Buildings, Streetlights/Signals, Water/Wastewater, and Employee Commute. Fleet includes all City-operated on-road vehicles and non-road equipment used for transport of goods and materials. Buildings include all facility types including infrastructure. Employee Commute includes emissions from how staff travel to work and is a Scope 3 emission source. Scope 3 emissions are indirect, meaning the City has less control over their production, unlike Scope 1 and 2 emissions. The MCN Strategy will focus on Scope 1 and 2 emission sources for the sectors Fleet, Buildings, Streetlights/Signals, and Water/Wastewater across departments.

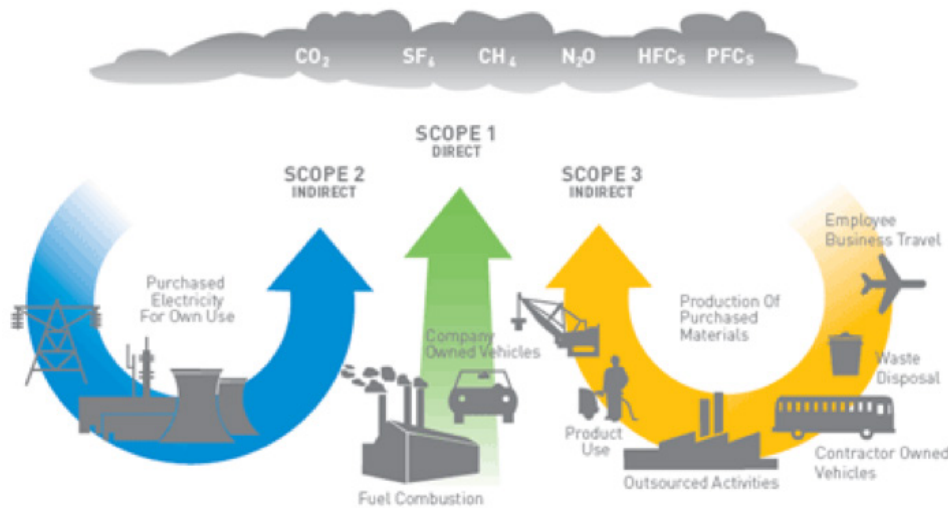


Figure 1. A graphic representation of the carbon footprint from the Life Cycle Initiative.

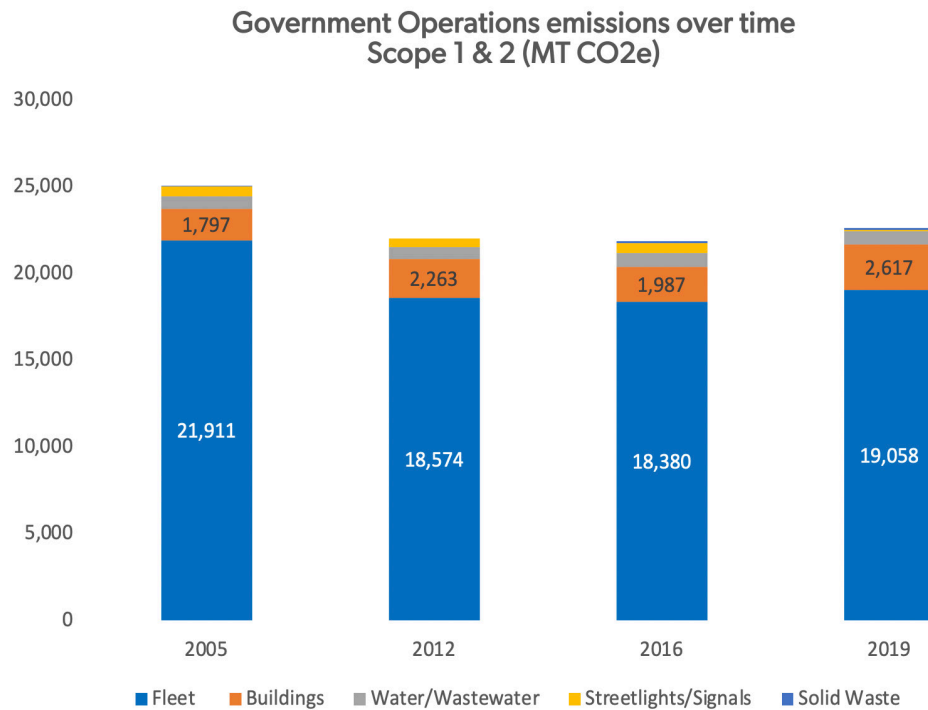


Figure 2. Government operation emissions over time.

To date, Government Operations has not made significant reductions to their emissions. Results from the 2019 GHG Emission Inventory show that Government Operations emissions decreased only 3% between 2005 and 2019. At 84%, Fleet was the highest contributing sector to municipal emissions in the 2019 Inventory followed by Buildings at 12% of emissions. While Fleet emissions have decreased by 13% since 2005, Buildings emissions have increased 46% since 2005 and 16% when compared to 2012.

BUILDING ON ACCOMPLISHMENT SINCE 2015

This MCN Strategy builds on significant progress towards 2015 Environmental Action Plan (CAP 2.0) targets and actions. Among the many noteworthy municipal operations accomplishments are:

- New positions per CAP 2.0 were established and hired – Resource Conservation Manager (GG), Facilities Conservation Manager (Tacoma Public Utilities), and Green Building and Resilience Specialist (City)
- Strategic Energy Management programs have been established in 4 facilities with high annual energy loads. In 2011, Environmental Services enrolled the Central Treatment Plant in Tacoma Power’s initial Industrial SEM administered by Energy Smart Industrial. The CTP’s Energy Management Team has worked continuously to produce significant year-after-year electricity savings. In 2018, three of the City’s facilities were enrolled in a pilot 2-year Commercial SEM program: the Convention Center, Police-Fleet campus, and TPU campus. Collectively these 4 facilities have saved nearly 13,000 MWh over 7+ years versus business-as-usual energy model. The aggregate average annual savings are approaching 2,850 MWh.
- Streetlights LED Replacement Project: Public Works and Tacoma Public Utilities worked together to replace 75% of City’s aging streetlights with new energy efficient LED fixtures. The project is forecast to save 11,500 MWh per year for at least 15 years.
- Fleet Decarbonization: More than 3% of City’s passenger vehicles are plug-in electrics. A transition is underway to shift from fossil to renewable diesel in existing fleet vehicles.
- Fleet CNG collection trucks and Renewable Gas Production: Environmental Services has coordinated the modernization of its solid waste collection trucks with production of marketable Renewable Natural Gas production at its wastewater treatment plant. Over one third of Solid Waste’ collection fleet updated from diesel to CNG trucks. Recent expansion of CNG fuel station capacity can support the full collection fleet. At City’s wastewater treatment plant, construction nearing completion of system to convert historically flared biogas into pipeline Renewable Natural Gas. Forecast upon completion, that up to 788 tons of carbon could be removed annually from diesel fleet vehicles.

COMMUTE TRIP REDUCTION

Employee commuting, in 2019 was ~31% of municipal operation emissions when including scope 3 sources.

Commute Trip Reduction program (CTR) has been promoted towards reducing staff traveling via Single Occupancy Vehicles (SOV). Employee Transportation Coordinators, Orca Cards, and Van Pool have been deployed towards reducing SOV, with modest success. At the onset of COVID-19 pandemic, the City responded with both an emergency Telecommuting directive, and formation of a cross-departmental task force to update policy and procedures.

The December 2020 bi-annual CTR survey revealed a more than 50% reduction in emissions from staff commuting. A new telework policy is being implemented as safe ways to return to workplace are established. With both hybrid and full-time telework options, City intends to maintain the many telework co-benefits including emissions reductions.

WHAT DOES THIS STRATEGY INCLUDE?

This MCN Strategy establishes both an overarching goal of carbon neutrality and specific initiatives towards achieving the City's stated 2030 and 2050 emission reduction goals. This MCN Strategy is Section 8 of the City's third Climate Action Plan with discreet goals to achieve by 2030, and actions to catalyze success for first 3 years (2022 – 2024).

This MCN Strategy empowers staff to take direct control of the carbon intensity associated with operational decisions and actions. This includes but is not limited to: city-owned facilities, fleet equipment, travel for City business, procurement of materials goods and services, and post-use management of all City-owned tangible property (i.e. materials, equipment, structures, and real estate).

In the earlier versions of the City's CAP, municipal actions and target addressed "low-hanging fruit" opportunities, which engaged a limited set of City staff. This MCN Strategy is directed at all levels of City management and involves all City staff decisions and actions.

MCN Strategy sets incremental 10-year carbon reduction targets through the year 2050 with an aspirational aim towards making City operations carbon-neutral by 2050 (Resolution 40509, Dec. 2019). Consistent with Washington State 2021 Energy Strategy, the City defines its 2050 municipal operations goal as 95% Carbon Neutrality of Scope 1 and 2.

2030 MUNICIPAL OPERATION TARGETS

- **Fleet** – Carbon Pollution reduction by **50% from 2020 levels**
- **Facilities** – Carbon pollution reduction by **30% from 2020 levels**
- **Employee Commuting Reduction** – Single Occupancy Vehicles only **65% of mix by 2030**
- **Employee Engagement** – **95%** of employees engaged

This MCN Strategy is the result of an on ongoing collaborative process. The City contracted with Sustainable Solutions Group (SSG), a consulting firm specialized in working with cities to address climate planning challenges. Working with Office of Environmental Policy and Sustainability staff, SSG organized a series of workshops to review past performance, address the challenges ahead, and identify potential solutions and existing barriers. Direct contacts with key management staff supplemented these workshops. As MCN Strategy began to take shape, more focused workshops with Fleet and Facilities stakeholders collated independent suggestions into consensus **prioritized actions identified by:**

- Climate benefit
- Feasible
- Alignment with other City policies and priorities
- Leadership and Partnership Opportunities
- Coordinating funding needed with budgetary process

The Action Table of this MCN Strategy has been reviewed and refined with stakeholder involvement.

The specific actions of this MCN Strategy are organized into 6 categories: 1) Fleet & Fuel, 2) Buildings & Infrastructure, 3) Investment, 4) Purchasing, 5) Organizational Capacity, and 6) Education & Engagement. Action Table presents 18 specific actions.

IMPLEMENTATION OPPORTUNITIES

Federal, state, and utility programs present both requirements and opportunities for improving municipal operations, including but not limited to:

- Clean Building Performance Standard (HB 1257, 2019, Commerce) – large commercial buildings for reduction of pollution from fossil fuel consumption through early adopter incentives and compliance with energy intensity targets.
- Clean Fuel Standard (HB 1091, 2021, Ecology) – requires fuel suppliers to reduce carbon intensity of transportation fuels, and stimulate economic development in low carbon fuel production. Includes purchasing credits for electric vehicle charging providers. Similar standards are already working in California, Oregon, and British Columbia
- Cap and Invest (SB 5126, 2021, Ecology) – caps emissions statewide and creates tradeable allowances. Funds to support climate change reduction and resilience activities
- Washington State range of existing programs for local governments that award grants and loans including, but not limited to: Electrified Transportation System (Commerce), Energy Retrofits for Public Buildings (Commerce), Clean Air & Climate (Ecology), LOCAL (Treasurer), Preparedness Grants for resilient facilities (Emergency Management Division), and Enterprise Services' Energy Program
- Utility incentives and rebates: a wide range incentives for high efficiency systems, energy conserving projects, and EV Charging are offered by Tacoma Power and Puget Sound Energy

PERFORMANCE METRICS TO DATE

An important principle of evidence-based decision making is establishing metrics which document historical patterns and track progress towards Climate mitigation goals. The following

presents key performance of Municipal Operations, especially fleet and facilities:

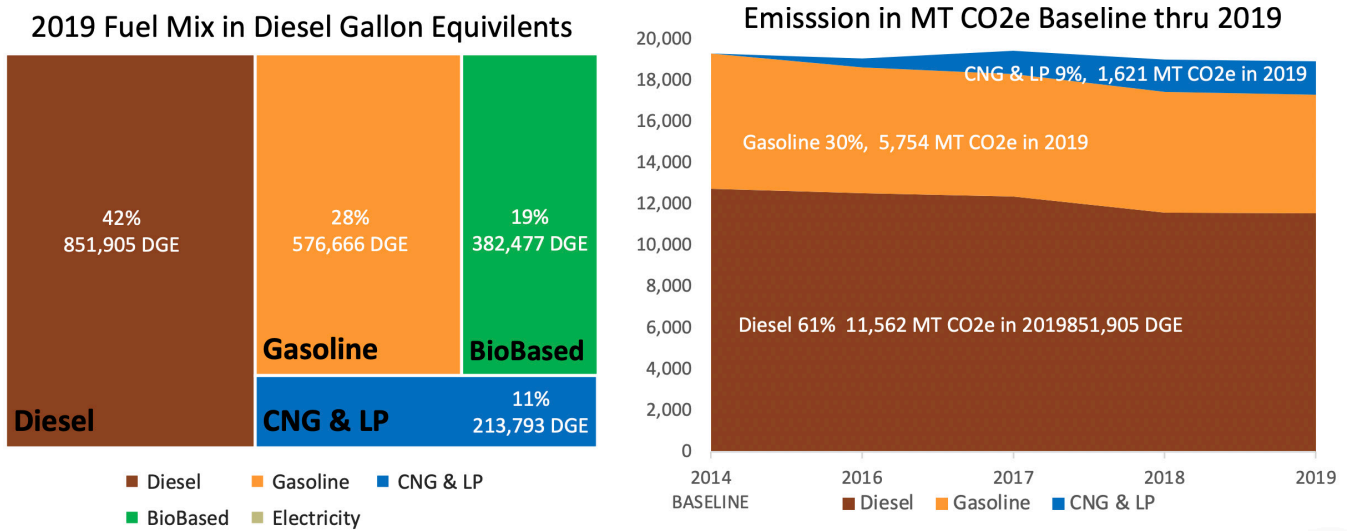


Figure 3. 2019 fuel mix vs emissions through 2019.

Diesel is 42% of the annual fuel volume and 61% of the emissions.

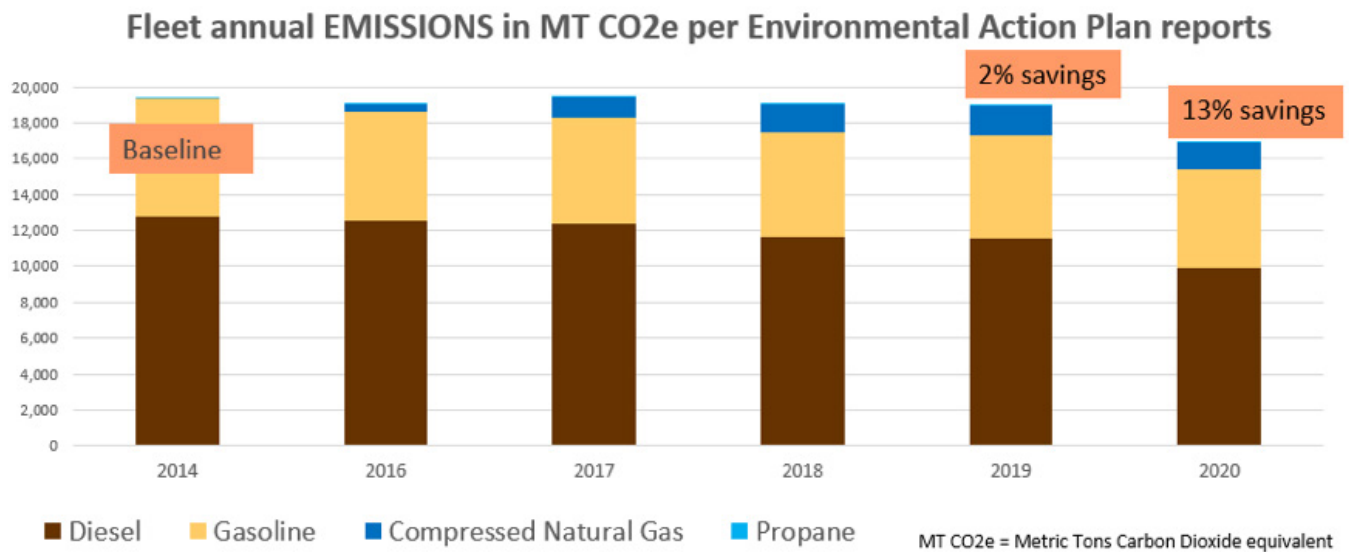


Figure 4. Fleet annual emissions in MTCO2e.

Diesel emissions have decreased, primarily through switch from fossil-based to renewable diesel.

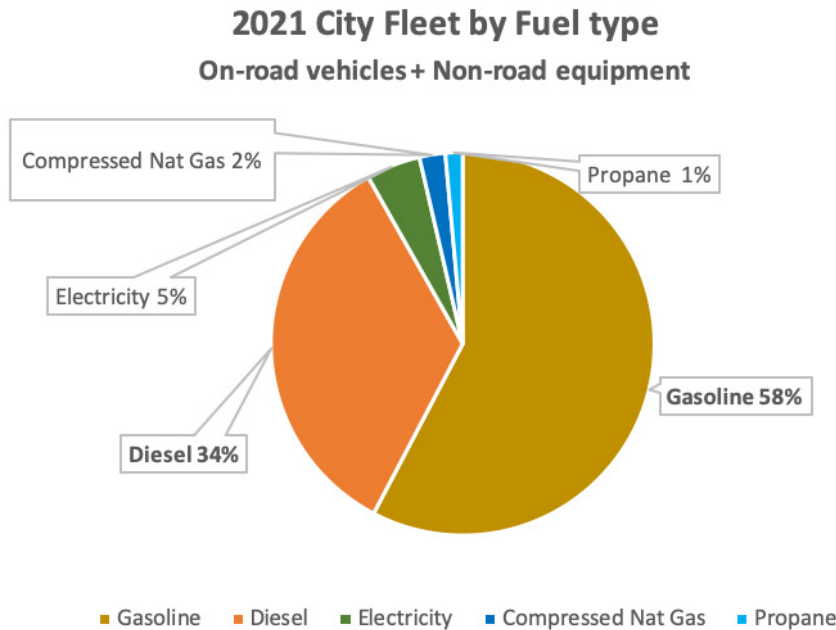


Figure 5. 2021 Tacoma city fleet by fuel type.

Gasoline burning vehicles are almost 60% of vehicles, but only 30% of emissions. Diesel burning vehicles produce 50% of emissions while only accounting for 34% vehicles.

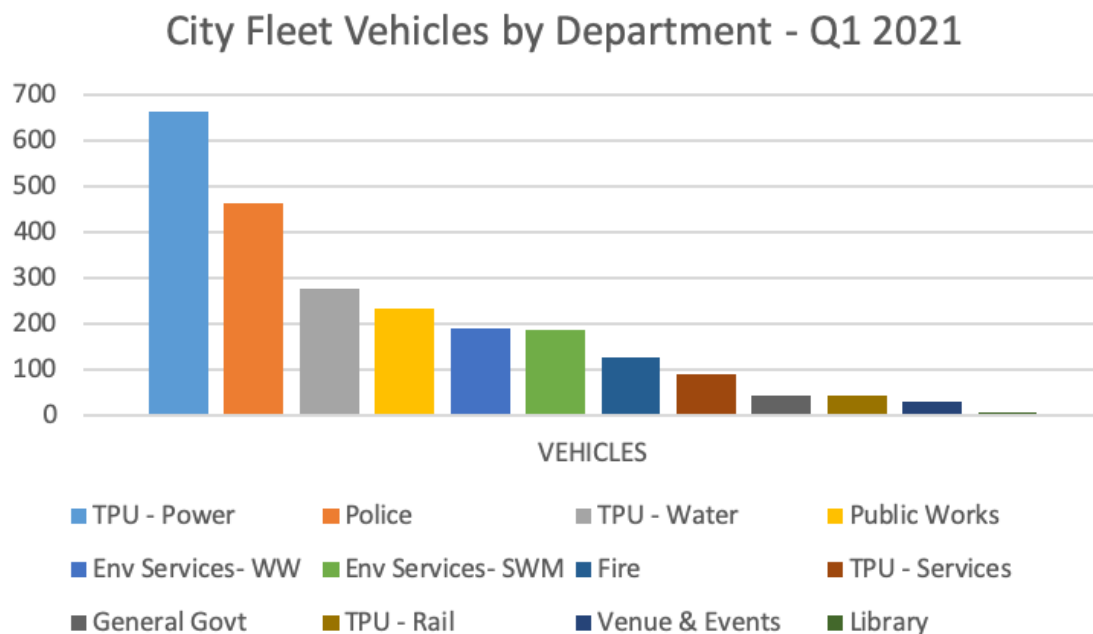
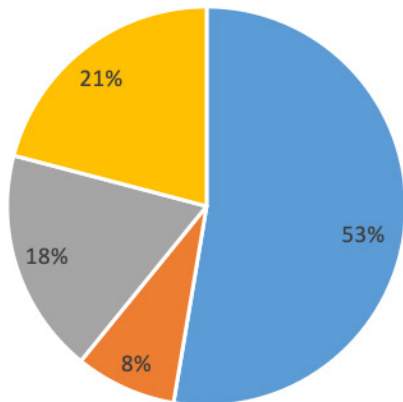


Figure 6. City fleet vehicles by department.

5 departments account for 86% of the fleet vehicles - Power, Police, Water, Environmental Services, and Public Works.

City Fleet Vehicles by Duty as of Q1 2021



■ Light Duty ■ Medium Duty ■ Heavy Duty ■ Non Road Vehicles

Figure 7. Fleet vehicles by duty.

While Light Duty Vehicles are 53% of vehicle inventory, almost all are gasoline burning, accounting for less than 30% of emissions. Majority of Heavy Duty and Non-Road vehicles are diesel burning and account for nearly 50% of emissions.

City Facilities Energy Use by Year, by Dept in million kBTUs

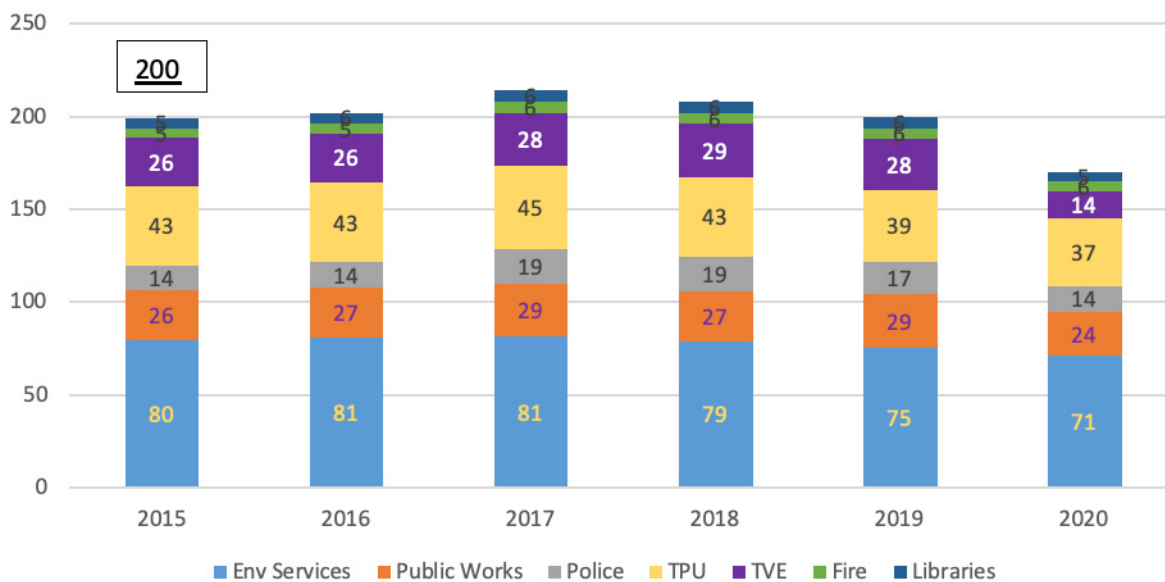


Figure 8. City facilities energy use by year.

Facilities energy in 2020 is 14% less than baseline. Lower occupancy from pandemic accounts for most of the reduction from 2019 (equivalent to baseline). Environmental Services ~ 40% of total primarily from 2 industrial waste water treatment plants.

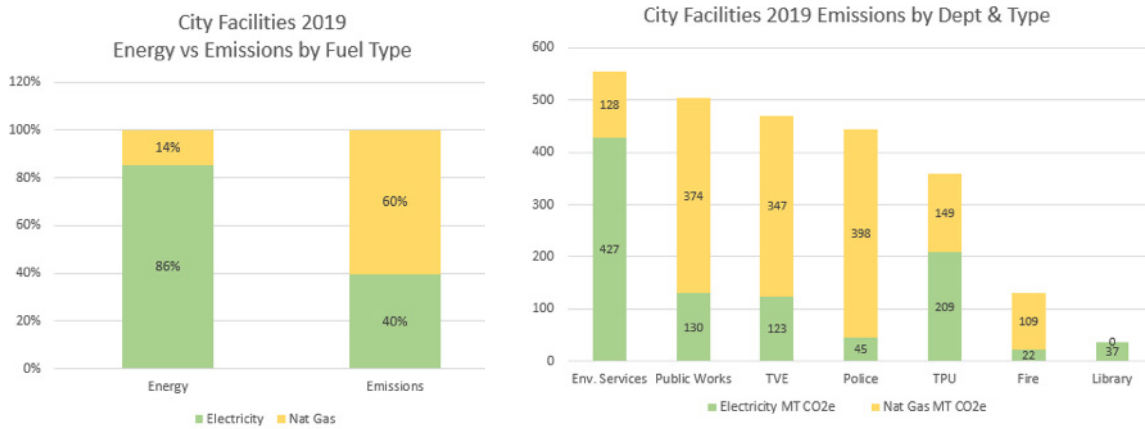


Figure 9. Top 15 City Facility Sites with Nat Gas annual use

Natural Gas has a carbon intensity 9 times higher than Tacoma Power electricity. Even though natural gas is only 14% of facility annual energy use, it is 60% of emissions. Police, Public Works, and Tacoma Venue and Events (TVE) because of their high ratio of natural gas emissions, have facilities that when converted to electricity will significantly reduce City’s facility emissions.

Table 1. Tacoma sites with natural gas use, number of buildings listed in brackets on the right.

2019 HI-TO-LOW	SITES W/ NAT GAS USE (# OF BUILDINGS)	2020 V 2019	SYSTEM TO CONVERT TO ELECTRIC
1st	Central Wastewater Treatment Plant (20)	-18%	Process loads
2nd	Police Headquarters	-11%	Space & Water
3rd	Tacoma Public Utilities campus (9)	-17%	Space at Mech Rm
4th	Convention Center	-42%	Boilers & Water
5th	Tacoma Dome	-36%	Boilers & Water
6th	Asphalt Plant	-38%	Process Heat
7th	Police Fleet Warehouse & Admin Building	-30%	Space & Water
8th	Recovery & Transfer Ctr - Admin Building	-75%	Space, Water, & Process
9th	Tacoma Water Buildings (3)	-5%	Space & Water
10th	Beacon Senior Center	-7%	Space & Water
11th	Tacoma Municipal Building complex (2)	-28%	Water Heater
12th	Streets Ground Maint & Shop (2)	+8%	Space & Water
13th	Center For Urban Waters (2)	-17%	Water Heater
14th	North End Wastewater Treatment Plant	+14%	Process loads

2019, rather than 2020, reflects typical historical occupancy, thus is a better baseline for comparing between buildings with high use. Eleven of the fourteen buildings with highest energy use have significant natural gas systems that can be converted to electricity, primarily through high efficiency heat pump technology.

Table 1. Municipal Carbon Neutrality Strategy 2022-2024 ACTIONS TABLE:
 These actions are to jump-start City achieving of 2030 goals

CATEGORY	ACTION	2024 OUTPUT	LEAD DEPT	SUPPORTING DEPTS	TIES TO OTHER PLANS, POLICIES	CITY INVESTMENT COST	ONE-TIME OR ON-GOING	OTHER RESOURCES NEEDED	KEY CONSIDERATIONS	ADDITIONAL BENEFITS & IMPACTS
Fleet & Fuels 1	Develop and publish quarterly report on fleet and fuel metrics, including idling telematics, with breakouts by Department and Division. Sourced from City's databases including SAP.	Reports developed and shared with supervisors as a continuous improvement and strategy action tool.	Fleet Mgmt, OEPS	IT	Fleet Decarbonization & Fuel Conservation PMP	Staff time for initial setup, ongoing analysis	On-going	Staff time and expertise	Communicate successes with staff	\$ Savings and better management
Fleet & Fuels 2	Expand bulk renewable fuel delivery at city facilities to the greatest extent needed.	Delivery established at all significant facilities.	Fleet Mgmt	Public Works, Env Services	Decarbonization Resolution	\$100 - 750k. Site work for storage tanks, premium \$/gal declining w/ LCFS	On-going	Onsite Storage and access	Premium fuel price will go down with LCFS	Reduced localized air pollution, maintenance savings

CATEGORY	ACTION	2024 OUTPUT	LEAD DEPT	SUPPORTING DEPTS	TIES TO OTHER PLANS, POLICIES	CITY INVESTMENT COST	ONE-TIME OR ON-GOING	OTHER RESOURCES NEEDED	KEY CONSIDERATIONS	ADDITIONAL BENEFITS & IMPACTS
Fleet & Fuels 3	Using results from the EV Siting Study, Expand EV charging infrastructure at all City priority fleet sites, use federal & low carbon fuel standard credits for funding.	EV charging at all key facilities.	OEPS	Fleet, Facilities, Tacoma Power	Decarbonization Res 40776	~\$100k - \$1M (match)	One-time with minimal yearly fees	Grant match funds, financing	Electrical capacity needed	Clean air and maintenance savings
Fleet & Fuels 4	Increase funding for fleet capital budget to accelerate replacement with low emission vehicles.	Increased funding over historic levels.	Fleet Mgmt/ Depts	OMB	Decarbonization Res 40776	Millions	On-going	Grant funding	Prioritize high use vehicles	Increased safety & reliability
Buildings & Infrastructure 1	Implement energy saving O&M policies, procedures & guidelines for each key facility/facility type.	All facilities staff understand & implement RCM policies, procedures & guidelines. Building performance data shared and discussed regularly.	All Facility Mgmt departments (PW, TPU, ES, & TVE)	OEPS, TPU	Resource Conservation Plan, Draft Muni Sus Facilities Policy. Sustainable Purchasing Policy	\$50K to \$500K per year (staffing, materials)	On-going	Utility led Strategic Energy Management programs	BOC training	Improved comfort, reduce maintenance & utility costs, move to pro-active maintenance

CATEGORY	ACTION	2024 OUTPUT	LEAD DEPT	SUPPORTING DEPTS	TIES TO OTHER PLANS, POLICIES	CITY INVESTMENT COST	ONE-TIME OR ON-GOING	OTHER RESOURCES NEEDED	KEY CONSIDERATIONS	ADDITIONAL BENEFITS & IMPACTS
Buildings & Infrastructure 2	Develop Opportunity Register for each NG facility. Typically low-hanging fruit items that can be addressed opportunistically.	Top 2 actions completed where appropriate for each facility (emphasize NG reduction). Facilities with impending retirement may be exempted.	All Facility Mgmt departments	OEPS	Draft Municipal Sustainable Facilities Policy	\$200K to \$750K per Year (contractors, 4 departments)	On-going with yearly updating	Sense by ESI may work for commercial buildings. GRIT for PM & GHG tracking, BOC training	Shared responsibility across staff of facility mgmt	Keep high priority actions highlighted
Buildings & Infrastructure 3	Building Tune-ups - one building per Department (ES, TPU, PW, TVE). Systematic process completed once every 5 years.	4 facilities tuned (recommissioned) with significant facilities staff involvement to sustain benefits.	All Facility Mgmt departments	OEPS	Municipal Green Building Res 38249	\$100K to \$500K	Initial 4 sites	Staff specialists, tune-up contractors, Smart Buildings Center to lead preview workshop	Building selection key to reducing emissions, interplay between staff and contractor, specific staff leads assigned	Better real-time bldg mgmt, more automation

CATEGORY	ACTION	2024 OUTPUT	LEAD DEPT	SUPPORTING DEPTS	TIES TO OTHER PLANS, POLICIES	CITY INVESTMENT COST	ONE-TIME OR ON-GOING	OTHER RESOURCES NEEDED	KEY CONSIDERATIONS	ADDITIONAL BENEFITS & IMPACTS
Buildings & Infrastructure 4	Complete assessment on largest NG facilities for conversion or replacement opportunities.	Each facilities department prioritizes one facility for conversion/replacement with associated budget funds.	All Facility Mgmt departments	OEPS	Decarbonization Res 40776	\$50 - \$100K+ for consultant contract(s)	One-time	Vetted electrical equipment which can meet facilities needs	HVAC distribution may need resizing for lower output temp	Improved indoor air quality, eliminate burner maintenance & wear
Buildings & Infrastructure 5	Dedicate funding for efficiency, resiliency, and decarbonization in existing and replacement facilities, including staffing where necessary to carry out actions.	New staff hired and dedicated funding established in each fund. \$500,000 for general fund facilities.	OMB, Finance	Facility Mgmt, OEPS	Decarbonization Res 40776. Green Building Res 38249	\$5M to 15M (Capital Expense)	On-Time (projects)	Choosing based on Life Cycle Cost Analysis	Data Management system required to track and report	Improved building conditions for occupants, City funding for grant match important
Investments 1	Internal carbon pricing – shadow or real.	Price and process developed by Steering Committee.	OEPS	OMB, Finance	Sustainability in Decision Making Res 38247	To Be Determined	On-going with yearly updating	USDN, GRIT, other software	Shadow - decision analysis only. Real - department contribution/project	Connects carbon reduction more directly to procurement process

CATEGORY	ACTION	2024 OUTPUT	LEAD DEPT	SUPPORTING DEPTS	TIES TO OTHER PLANS, POLICIES	CITY INVESTMENT COST	ONE-TIME OR ON-GOING	OTHER RESOURCES NEEDED	KEY CONSIDERATIONS	ADDITIONAL BENEFITS & IMPACTS
Purchasing 1	Develop and incorporate contractor fuel emissions reduction standards into bids and contracts to ensure construction contractors doing work on the city's behalf are using fuel efficient and low polluting vehicles and equipment when feasible and practicable.	PW and ES contracts incorporate standards into bids and contracts.	OEPS/ PW/ ES	Purchasing	EAP	0	On-going		Need to consider equity in development	Clean air
Purchasing 2	Develop a City Sustainable and Healthy Meeting policy that prioritizes low greenhouse gas generating foods, delivery, and meeting access.	Policy developed and implemented.	OEPS	Purchasing	Sustainable Purchasing Policy	0	On-going			Supports local businesses
Purchasing 3	Develop and implement large venue waste reduction program and actions.	(TBD)% reduction (volume off-site to disposal, % recycled).	TVE	SW/ OEPS	Sun Materials & Mgt Plan. SPP	To Be Determined	On-going		Concession contracting, on-site durables, trade association best practices	Reduced food waste

CATEGORY	ACTION	2024 OUTPUT	LEAD DEPT	SUPPORTING DEPTS	TIES TO OTHER PLANS, POLICIES	CITY INVESTMENT COST	ONE-TIME OR ON-GOING	OTHER RESOURCES NEEDED	KEY CONSIDERATIONS	ADDITIONAL BENEFITS & IMPACTS
Organizational Capacity 1	Dept Resource Conservation & Climate Plans.	Department Plans developed with annual reporting.	OEPS	HR-CI	REAPs	0	On-going	Training and support	Coordination with Racial Equity Action Plans	Staff engagement
Organizational Capacity 2	Capital Projects inter-departmental team convenes to ensure all capital projects, including upgrades and maintenance, include sustainability (urban forestry, art, historic preservation, ADA, stormwater, active transportation, climate mitigation, and adaptation) review.	Team created and active; Meet at least 6x/yr.	City Managers Office			0	On-going	Scheduling of meetings		Staff coordination & better projects

CATEGORY	ACTION	2024 OUTPUT	LEAD DEPT	SUPPORTING DEPTS	TIES TO OTHER PLANS, POLICIES	CITY INVESTMENT COST	ONE-TIME OR ON-GOING	OTHER RESOURCES NEEDED	KEY CONSIDERATIONS	ADDITIONAL BENEFITS & IMPACTS
Education & Engagement 1	Annual Directors Presentation/Training.	Annual presentation/training occurs.	OEPS			0	On-going			
Education & Engagement 2	Cross Dept "tours" to showcase sustainability projects and engage staff from throughout the City.	1st cohort initiated in 2022.	OEPS-Envirochallengers		20 employees in annual program, starting in 2022	Minimal	On-going	Staff time		Staff engagement/relationships

CATEGORY	ACTION	2024 OUTPUT	LEAD DEPT	SUPPORTING DEPTS	TIES TO OTHER PLANS, POLICIES	CITY INVESTMENT COST	ONE-TIME OR ON-GOING	OTHER RESOURCES NEEDED	KEY CONSIDERATIONS	ADDITIONAL BENEFITS & IMPACTS
Education & Engagement 3	New employee orientation.	New employees trained in 2022.	OEPS	HR	All new employees trained in 2022	Minimal	On-going		In person, or recorded	Staff engagement

POLICIES & RESOLUTIONS ASSOCIATED WITH MUNICIPAL OPERATIONS GREENHOUSE EMISSION REDUCTIONS

1. [City Council Decarbonization Resolution 40776](#) (April 2021): reducing the City's municipal carbon footprint by restricting the use of natural gas and new fossil fuel for existing **facilities and fleet** future capital investments, encouraging other local jurisdictions to do the same, and assessing impacts for imposing the same restrictions on new commercial and residential construction., effective January 1, 2022
2. [City Council Climate Emergency Resolution 40509](#) (December 2019): declares the threats of climate change require immediate action to minimize harm to current and future generations, and therefore constitutes a public emergency. Include City conducting an organization-wide assessment of current Greenhouse Gas emission and set 10-year reduction targets towards making City operations carbon-neutral by 2050; to be done in coordination with update of City's Climate Action Plan.
3. WA State law [RCW 43.16.648](#) and [Chapter 194-29 WAC](#) require clean vehicle and fuel purchases and describes "Practicable Use of Electricity and Biofuels to Fuel Local Government Vehicles, Vessels, and Construction Equipment."
4. WA State [Clean Fuel Standard](#) for transportation fuels ([E3SHB 1091](#), May 2021): Ecology responsible for implementation toward curbing carbon pollution from transportation. Requires fuel suppliers to gradually reduce carbon intensity of fuels to 20% percent below 2017 levels by 2038. Several market-based pathways for fuel suppliers to achieve these reductions, include: improving efficiency of fuel production processes, produce / blend low-carbon biofuel, and, purchasing credits generated by low-carbon fuel providers such as electric vehicle charging providers
5. WA State [Climate Commitment Act](#) ([SB 5126](#), May 2021): Known as Cap and Invest, the act aims to deliver certainty of emission reductions at the scale and pace required to address climate change while co-benefits foster a more prosperous, equitable, and resilient Washington. Includes market-based approach allowing businesses to find the most efficient path to lower carbon emissions
6. WA State [Clean Buildings Performance Standard](#) (E3SHB 1257, 2019): Commerce responsible for deploying standard towards lowering costs and pollution from fossil fuel consumption in the state's existing buildings, especially large commercial buildings (50,000 Sq Ft Gross Floor Area and above). Includes early adopter incentives, and non-compliance penalties reporting schedule.
7. [City Council Municipal Green Building Resolution 38249](#) (2011): all new or renovated City facilities to strive for LEED Gold certification. All new construction and major renovation will exceed current WA State Energy Code by at least 5%. All existing LEED-certified municipal buildings strive towards LEED Existing Building Operation and Maintenance Silver certification

8. [City Council Life-Cycle Assessments Resolution 38188](#) (2011): expresses support of life-cycle assessments and life-cycle thinking in its relevant legislation and management decisions.
9. [City Council Sustainable Purchasing Policy Resolution 38248](#) (2011): strive to do business with contractors and endorse who value our commitment to sustainability.



Tacoma Climate Adaptation Strategy

October 2021



Letter from City Council

Our fellow Tacomans,

Climate change is no longer a threat in the distant future – it's here now. And the impacts of climate change have been even more pronounced this past year in the Pacific Northwest. Our region has experienced unprecedented heat waves, wildfire smoke and heavy rain events. We will all need to adjust to our changing climate and prepare for more frequent and intense climate change impacts.

With over 30 miles of shoreline, soaring bluffs and a significant estuary at the mouth of a mighty glacier-fed river that joins Commencement Bay, Tacoma is the pearl of the Puget Sound. An uncomfortable truth is that many of our unique and treasured natural assets are threatened by climate change. Climate change threats extend to the built environment and people as well. The purpose of this Climate Adaptation Strategy is to help prepare the City of Tacoma to be more resilient in the face of these threats by enhancing our capacity to prevent, respond and adapt. The adaptation actions included in the plan focus on protecting its infrastructure, economy, and community in the face of increasing climate threats.

We also recognize that social equity is essential to effective and long-lasting resilience to climate change. Every step of the adaptation planning process ensures that city and community investments prioritize equity and frontline communities.

We can't succeed in doing this work alone; it will require community investment. This plan is a call to action for our government, businesses and residents. We invite you to join us in this important work.

In service,

[Signatures]

Land Acknowledgement

ʔukʷədiid čəʔ ʔuhigʷəd txʷəl tiit ʔa čəʔ ʔal tə swatxʷixʷtxʷəd ʔə tiit puyaləpabš. ʔa ti dxʷʔa ti swatxʷixʷtxʷəd ʔə tiit puyaləpabš ʔəstəʔəʔlil tulʼal tudiʔ tuhaʔkʷ. didiʔʔ ʔa həlgʷəʔ ʔal ti sləxil. dxʷəstəʔlils həlgʷəʔ gʷəl ʔʼuyayus həlgʷəʔ gʷəl ʔʼuʔaʔxʷad həlgʷəʔ tiit bədədəʔs gʷəl tiʔdxʷ həlgʷəʔ tiit ʔiišəds həlgʷəʔ gʷəl ʔʼuʔalalus həlgʷəʔ gʷəl ʔʼutxʷəlšucidəb. ʔʷəla...b ʔə tiit tuyəlʼyəlabs.



We gratefully honor and acknowledge that we rest on the traditional lands of the Puyallup People. The Puyallup people have lived on this land since the beginning of time. They are still here today. They live, work, raise their children, take care of their community, practice their traditional ways and speak the Twulshootseed language – just as their ancestors did.

We recognize that this land acknowledgement is one small step toward true allyship and we commit to uplifting the voices, experiences, and histories of the Indigenous people of this land and beyond.

Source: Puyallup Tribe of Indians, [Land Acknowledgement](#).

See the Puyallup Tribe’s land acknowledgement spoken by Tribal members in their native Twulshootseed language: <https://youtu.be/KGnac8x-SIM>.

Acknowledgments

Councils/Commissions

Sustainable Tacoma Commission (STC)
Infrastructure, Planning, and Sustainability (IPS) Committee

Steering Committee

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Jim Parvey, Environmental Policy & Sustainability

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Executive Summary

Human-driven climate change continues to impact the Puget Sound region in multiple ways—the region has experienced unprecedented heat waves, warmer temperatures year-round, reduced snowpack, sea level rise, heavy rain events, wildfire smoke, and flooding. Even with ambitious climate mitigation actions that reduce the City’s greenhouse gas emissions, some climate impacts are already irreversible, and Tacoma will continue to experience them for years to come.

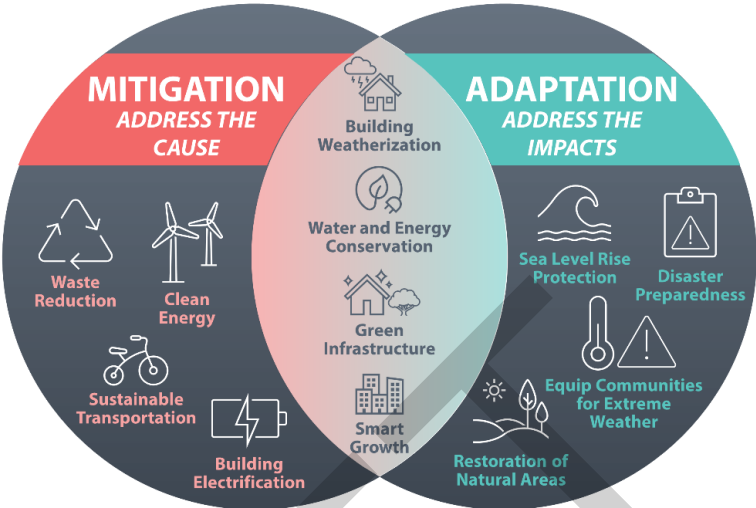
The City of Tacoma is continuing to invest in a climate-resilient and climate-smart future by building on our long history of climate action. These efforts include the first Tacoma Community Climate Action Plan in 2008, the 2016 Tacoma Environmental Action Plan, and the 2025 Tacoma Strategic Plan. To affirm this priority, the City simultaneously developed two updated plans: 1) this Tacoma Adaptation Strategy (“Strategy”), which aims to help the City cope and adapt to future climate impacts, and 2) the Tacoma Community Climate Action Plan, which aims to identify pathways to reduce the City’s greenhouse gas emissions.

Equity & Climate Resilience

Social equity is essential to effective and long-lasting resilience to climate change. The Tacoma Adaptation Strategy centered social equity along each step of the planning process.

- ▶ Equity was a key criterion to evaluate and prioritize actions.
- ▶ Adaptation strategies were cross-walked with other key city plans such as the Affordable Housing Action Strategy to ensure equitable impacts.
- ▶ Key strategies addressed community priorities of elevating youth leadership for environmental justice and creating central hubs to provide cooling and air quality relief.
- ▶ Each action has equity-specific considerations to ensure that investments prioritize equity and frontline communities.
- ▶ Implementation of key actions will be in conjunction with the [Tacoma Equity Index](#) to ensure that implementation and progress metrics are aligned with current City equity resources.

Climate Mitigation and Adaptation: What's the Difference?



The Tacoma Adaptation Strategy, summarized in the table below, provides a blueprint and foundation for the City of Tacoma to adapt to future climate risks and achieve its vision of a sustainable and resilient Tacoma. The Strategy's actions will reduce exposure to climate hazards, ensure that capital investments can withstand future climate change, protect our native habitats, build economic resilience and prosperity, support a diverse community with services and amenities, and enhance the health and well-being of current and future generations.

Sector	Strategies	Actions
Infrastructure	<ul style="list-style-type: none"> ▶ Improve building resilience ▶ Improve transportation resilience ▶ Improve water & energy infrastructure resilience ▶ Improve cross-sectoral infrastructure resilience 	<ul style="list-style-type: none"> ▶ Site-by-site flooding evaluation and planning ▶ Capital project standards and tools ▶ Development code improvements ▶ Capital project planning and prioritization, and implementation
Natural Systems	<ul style="list-style-type: none"> ▶ Improve ecosystem resilience ▶ Ensure a health and sufficient water supply 	<ul style="list-style-type: none"> ▶ Natural systems condition assessment and monitoring program ▶ Nearshore transitional zones ▶ Habitat restoration project guidance and resilience
Economy	<ul style="list-style-type: none"> ▶ Build resilient and adaptable industries. ▶ Build a resilient and effective workforce. 	<ul style="list-style-type: none"> ▶ Business engagement and continuity planning ▶ Just & green jobs transition plan
Public Health	<ul style="list-style-type: none"> ▶ Minimize climate-related health impacts ▶ Increase social cohesion ▶ Prepare for weather emergencies 	<ul style="list-style-type: none"> ▶ Cooling and air quality resilience hubs ▶ Co-create climate communications ▶ Filter fan distribution
Governance	<ul style="list-style-type: none"> ▶ Equip residents and businesses with resources to successfully adapt ▶ Increase City accountability ▶ Build regional, comprehensive resilience 	<ul style="list-style-type: none"> ▶ Climate equity initiatives ▶ Regional coordination ▶ Economic return-on-investment tools

To achieve the goals and vision of a more sustainable and resilient Tacoma for all residents, the City will need to collaborate with its implementation partners and strategically implement these adaptation actions. Key implementation considerations include:

- ▶ **Phasing:** The Strategy will be implemented in three phases spanning seven years (2021-2028).
- ▶ **Key Performance Indicators (KPIs):** The City will monitor, evaluate, and adjust action implementation and impact using quantitative KPIs.
- ▶ **Social Equity:** It will be important to optimize equitable outcomes and bridge historical health and economic disparities throughout action implementation, including inclusion of equity considerations and best practices.
- ▶ **Coordination:** Coordination with other City department and external partner activities and plans will leverage and streamline limited City resources.
- ▶ **Funding:** Options for funding action implementation include City resources and a variety of competitive federal, state, and private grants.

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Introduction

The City of Tacoma is in the Puget Sound region of Washington State—approximately 30 miles southwest of Seattle and 31 miles northeast of the state capital, Olympia—is an economically and culturally important part of Washington State. Located at the edge of Commencement Bay, Tacoma boasts beautiful scenery and shorelines, but is increasingly vulnerable to climate impacts such as extreme heat, sea level rise, landslides, and flooding.

Tacoma has a variety of thriving industries—including maritime, technology, art, healthcare, and aerospace industries. The City of Tacoma currently has over 110,000 jobs and has adopted targets for 97,000 new jobs by 2040. While Tacoma supports many thriving industries that will be impacted by climate change, the low-lying areas in particular—such as the Tacoma Tideflats and Ruston Way—that support the region’s maritime and industrial activities will be heavily affected by sea level rise, warming temperatures, and storm events. Heat waves, such as the heat dome event of June 2021, closed many restaurants and outdoor businesses due to public health and safety concerns.

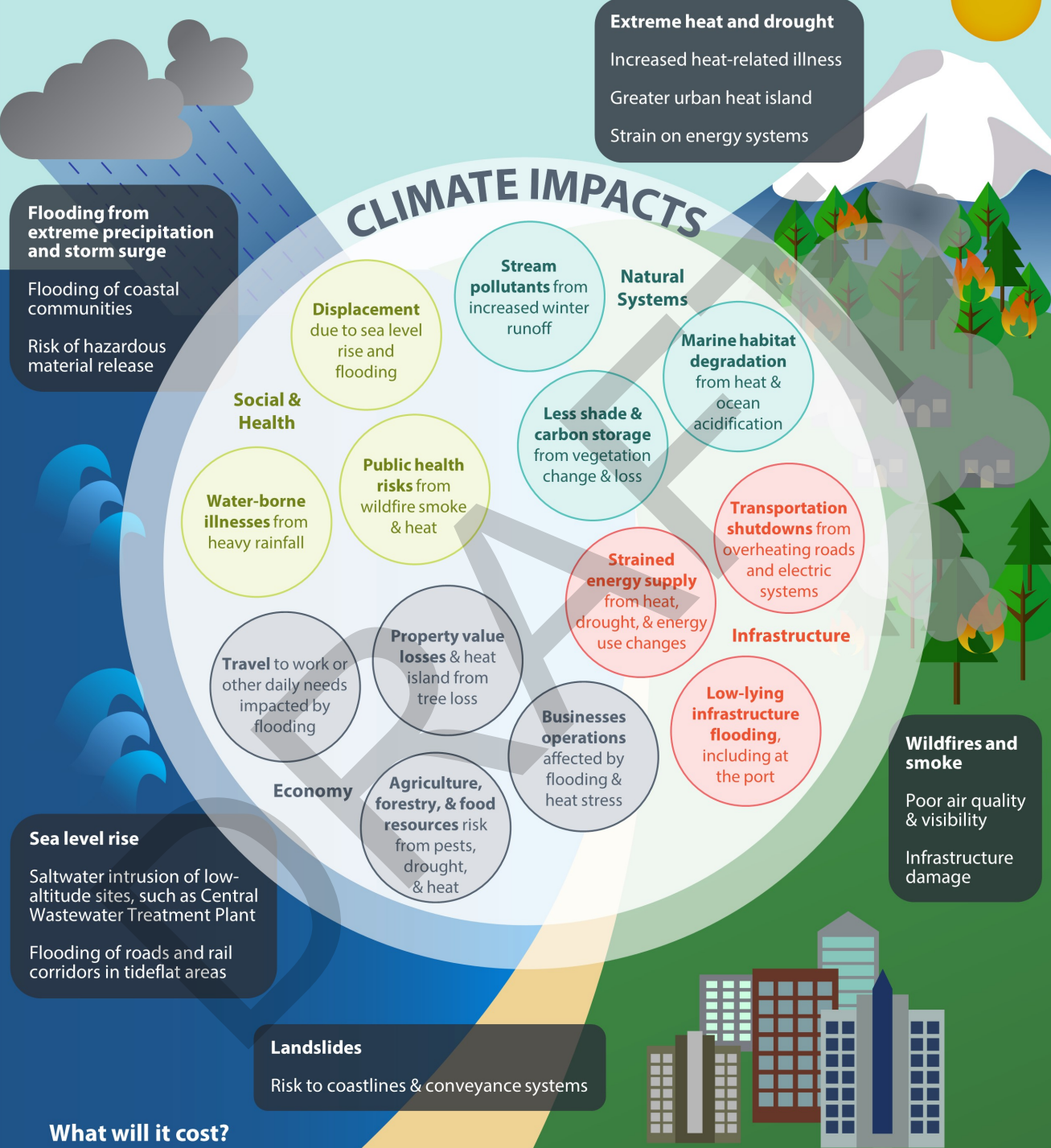
In addition to its many thriving economies, Tacoma offers a variety of amenities to its residents and visitors, including beautiful natural areas, a diverse and lively culture, and distinct and unique neighborhoods. Local parks and open spaces provide important recreational opportunities for Tacoma residents. Much of the Tideflats subarea is within the Puyallup Tribe survey boundaries and is an important location for cultural traditions and the practice of tribal treaty rights. The City is currently working to expand and enhance access to arts, culture, heritage, and science experiences by reducing barriers to access and expanding opportunities for underserved youth. These opportunities and assets—especially those in flood- and landslide-prone areas—will need to prepare for more frequent and damaging floods and landslides over the course of this century.

The heart of Tacoma is its people. The health and safety of Tacomans are increasingly threatened by severe extreme heat and wildfire smoke events—with record-breaking heat waves bringing 100°F+ temperatures to our region in 2021. These conditions are particularly dangerous for Tacomans with pre-existing health conditions, the very young and elderly, pregnant women, outdoor workers, and low-income and non-English speaking households with more limited access to resources and information.

The City of Tacoma has been working to prepare the community for the impacts of climate change. This **Tacoma Climate Adaptation Strategy** builds on a foundation of previous City efforts—such as the 2016 Climate Resiliency Study and the Environmental Action Plan—to prepare for climate change and provides a strategic roadmap for building communitywide resilience to climate change and other threats. The City is also working to lower climate-changing greenhouse gas (GHG) emissions, such as through the new Climate Action Plan and Resolution No. 40776, which restricts the use of fossil fuels in the City’s municipal operations.

TACOMA'S FUTURE CLIMATE

CLIMATE IMPACTS



What will it cost?

Climate impacts are already affecting the lives of Tacoma's residents and will worsen if we do not act. The cost of climate impacts—or the loss of human life, reduction in quality of life, disruption of critical services, and loss of economic assets from natural hazards and extreme events under future climate change conditions—is \$3.05 billion by 2050. While we cannot completely avoid these costs, implementing the actions in the Climate Adaptation Strategy could lessen these costs by \$152 million.

Strategy for a Resilient Future

The City of Tacoma's climate adaptation and resiliency goals were iteratively developed by the Tacoma Adaptation Steering Committee. The vision for the Tacoma Adaptation Strategy is:

Tacoma is a resilient, safe, and healthy community that is a leader in preparing for current and future climate change by distributing resources and services equitably, protecting city infrastructure, using best available science to inform decision-making, and holding ourselves accountable.

The planning team followed the guiding principles below to develop ambitious and equitable adaptation solutions. Many of these guiding principles also guided development of the 2021 Tacoma Community Climate Action Plan.

Guiding principle	The Tacoma Adaptation Strategy will...
<p>Lead with racial justice and equity.</p>	<ul style="list-style-type: none"> ▶ Prioritize strategies that benefit frontline communities—especially our Black, Indigenous, and communities of color and low-incomes communities—to ensure they have the access and resources to cope, adapt, and persist to future climate change. ▶ Empower frontline communities in decision-making and implementation to create an equitable future for all.
<p>Build transformational solutions for enduring community recovery.</p>	<ul style="list-style-type: none"> ▶ Be a leading example for other cities on how to adapt to future climate change in an ambitious and inclusive way. ▶ Pave the way for a prosperous and diverse community for all Tacomans for today and future generations.
<p>Be transparent and accountable.</p>	<ul style="list-style-type: none"> ▶ Build in accountability and transparency by integrating climate adaptation goals across congruent plans throughout all City departments. ▶ Utilize common language so that everyone understands what is being done and why. ▶ Track key metrics to ensure effective implementation and achievement of goals.
<p>Make decisions based on science and data, including community expertise and input.</p>	<ul style="list-style-type: none"> ▶ Ground decisions in best available science to inform policies and choices that will affect future generations. ▶ Respect and learn from the past. ▶ Listen to the community to stay connected, relevant, and responsive to their priorities.
<p>Prioritize health and other co-benefits.</p>	<ul style="list-style-type: none"> ▶ Ensure that all actions prioritize multiple co-benefits and support the health, well-being, economy, social fabric, housing equity, and cultural diversity of Tacoma.

Focus Areas & Goals

This Climate Adaptation Strategy focuses on six focus areas for achieving a resilient future:

Focus Area	Goal
Infrastructure	Promote resilient facilities and infrastructure that can withstand current and future climate impacts and provide multiple benefits.



Natural Systems	Protect and restore natural systems and landscapes to be resilient to climate impacts and provide ecosystem services.
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Economy	Promote a resilient economy that is both adaptable to future climate shocks and responsive to new economic opportunities.
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Public Health & Safety	Maintain and expand community-wide safety nets and services to ensure a healthy and safe community in the face of climate change.
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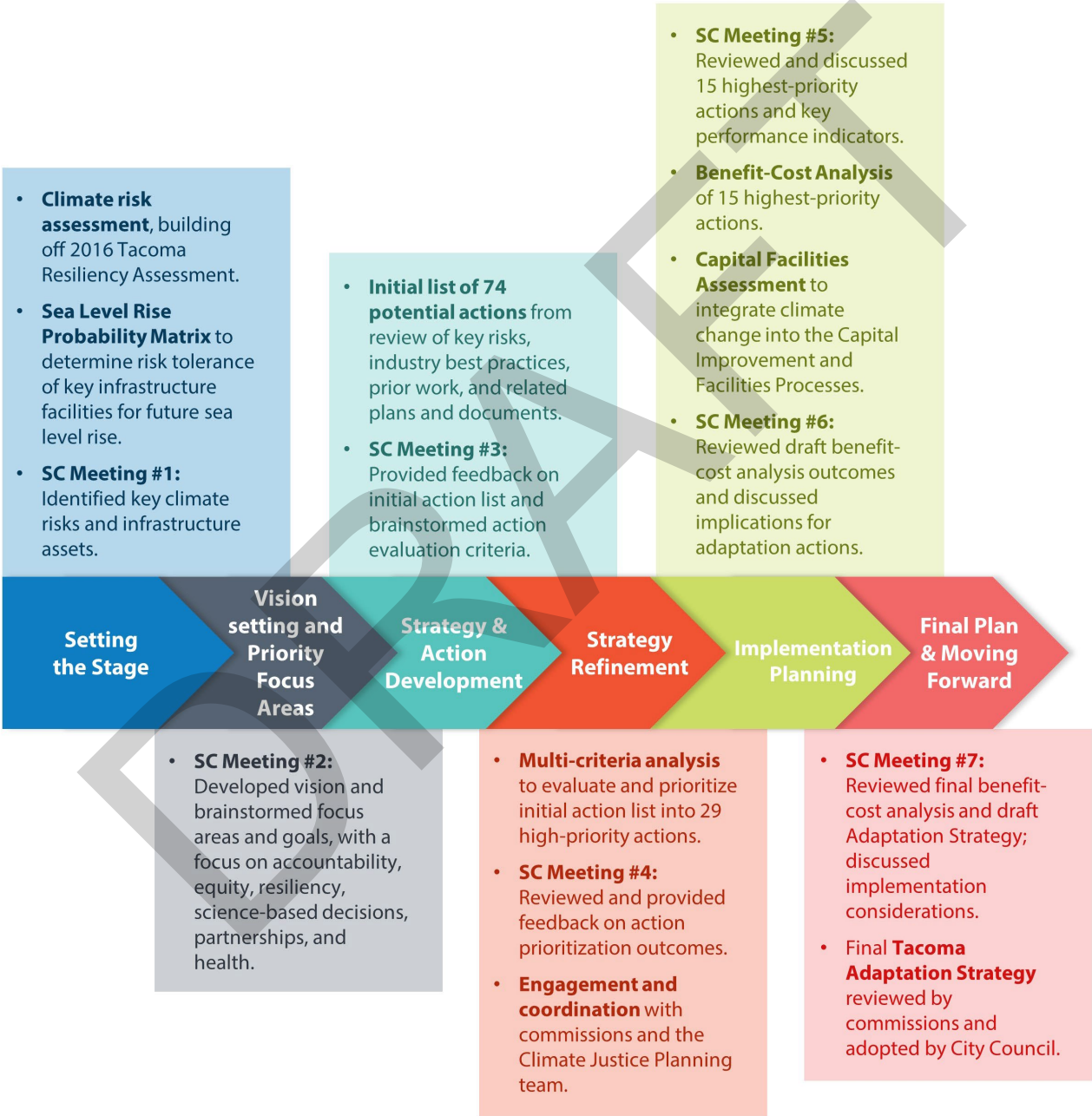


Governance	Institutionalize and prioritize climate change resilience across City processes and investments.
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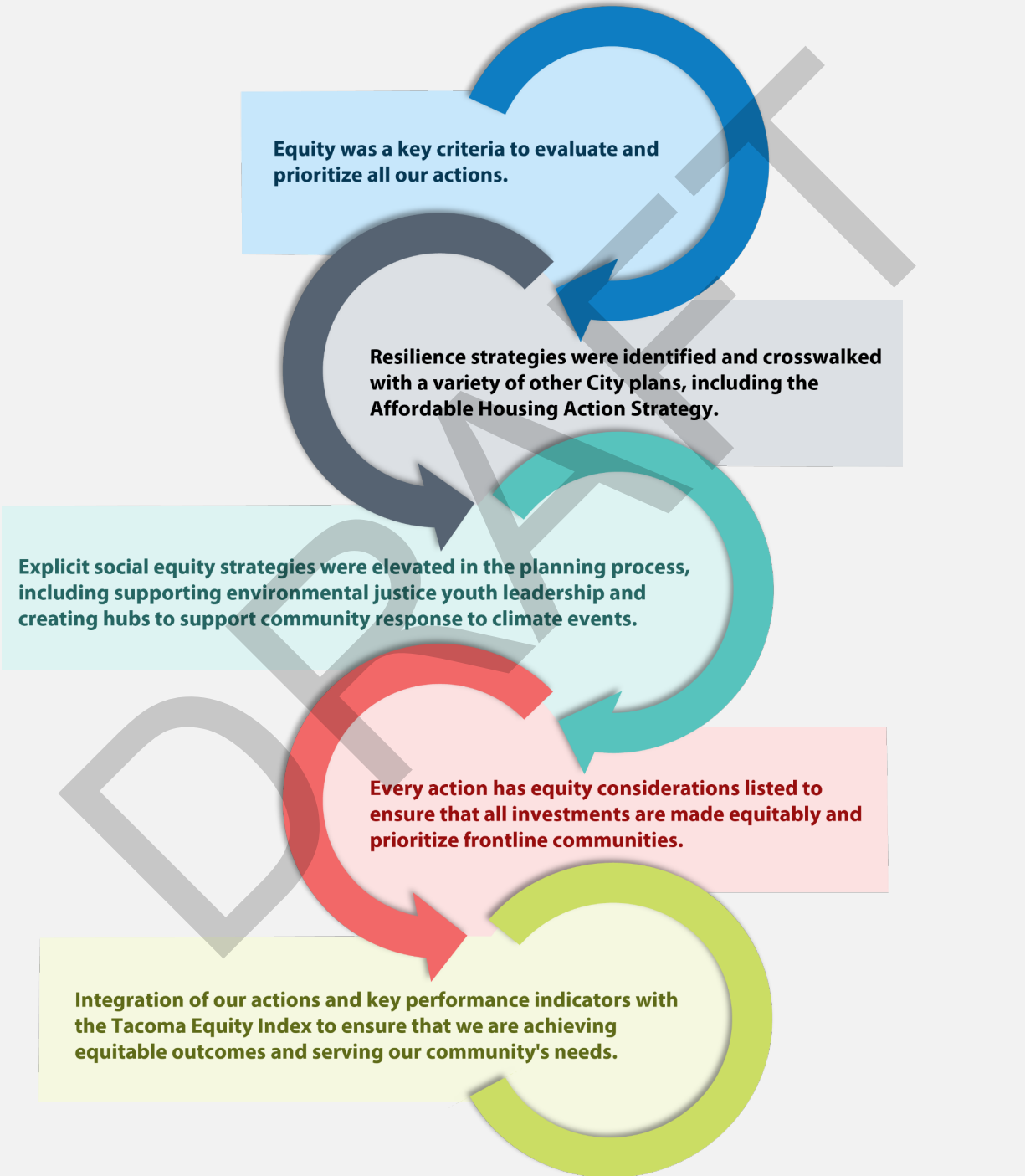
Our Process

The City of Tacoma and Tacoma Adaptation Steering Committee iteratively developed the focus area goals, associated strategies, and specific actions in this Strategy. The committee met seven times over the course of the planning process (October 2020 through August 2021). Key planning milestones for the Tacoma Adaptation Strategy and key feedback from the Steering Committee (SC) are summarized below.



Centering Social Equity

Social equity is critical and central to the success of the Tacoma Adaptation Strategy. Climate change will disproportionately impact some groups—including communities of color, low-income communities, elderly people, non-English speaking households, and immigrant communities. Social equity has also been central to Tacoma’s community vision for a sustainable, livable, economically vibrant, and socially responsible community for all its residents. This vision is supported by Resolution 40622 passed in 2020, which affirms the City of Tacoma’s commitment to anti-racist systems transformation.



Building on a Foundation

The **Tacoma Adaptation Strategy**—which focuses on opportunities to increase resilience of Tacoma’s residents, communities, businesses, and infrastructure to cope and adapt to future climate change—was developed concurrently in 2020-2021 with the **Tacoma Community Climate Action Plan**—which focuses on the biggest opportunities for Tacoma to reduce its greenhouse gas emissions. The Tacoma Adaptation Strategy builds on previous studies, reports, and plans commissioned by the City to prepare for future climate change impacts.



Collaboration & Coordination









Climate adaptation and resiliency building will require collaboration and coordination across City departments, agencies, and partners. This collaboration can create synergies to maximize benefits and leverage funding and resources. For more details on how collaboration and coordination will inform the implementation of this plan, please see the [Coordination](#) section on page 48.



Taking Action

This section details the strategies and actions for achieving a resilient future.

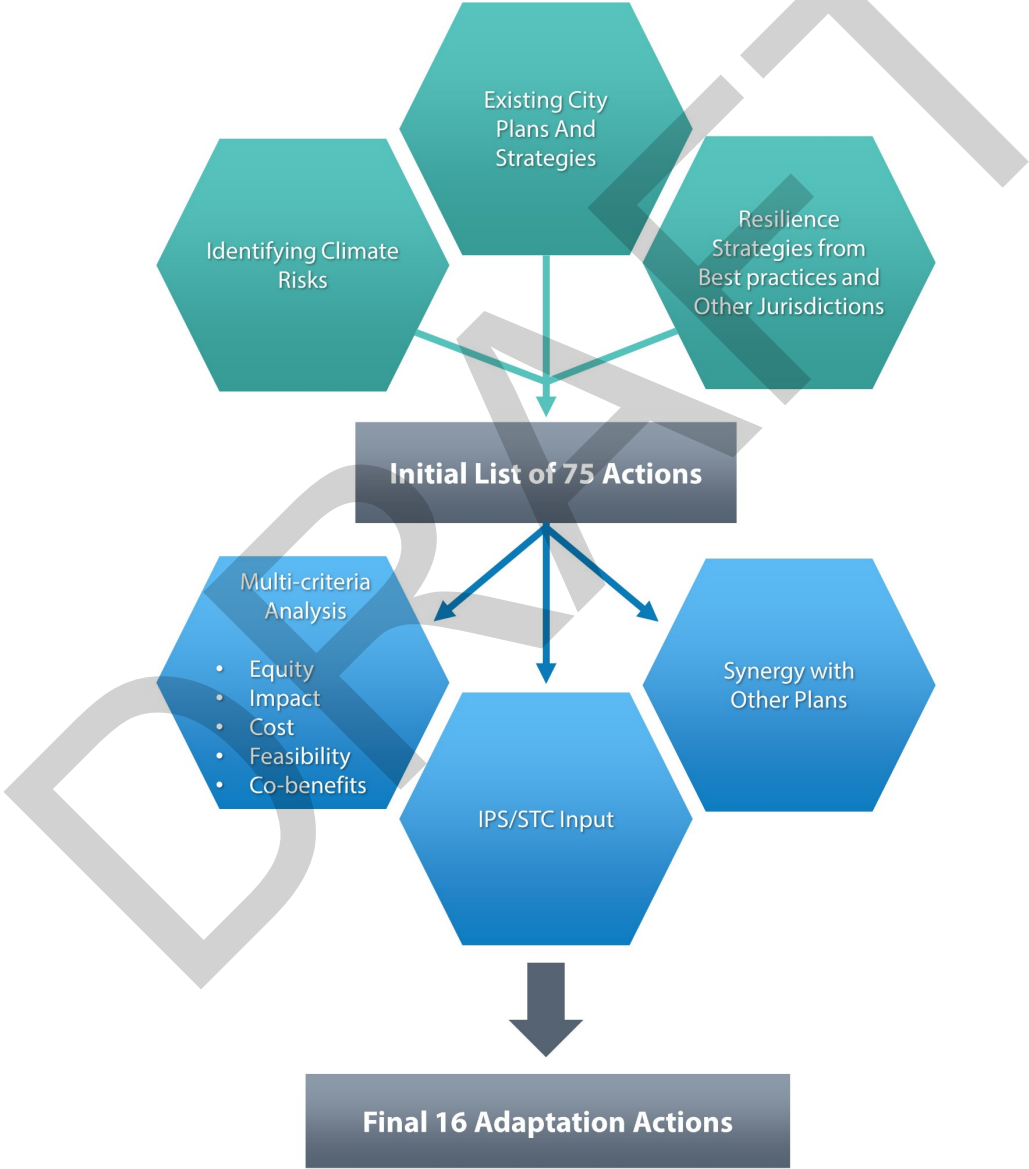
How to read actions in this section:

Action name			
Brief action description			
Why it's important	Why the action matters for the Tacoma community and climate resilience		
KPI	Key performance indicator to assess action progress		
Connection to other plans	Other City and organizational plans that include related actions or would require coordination	Hazards addressed	Climate hazards addressed:  Coastal Flooding  River Flooding  Snowpack & precipitation  Extreme heat  Wildfire smoke
		Co-benefits	Additional action benefits
		Project benefits*	Estimated avoided costs associated with action implementation*
Potential City Policies & Procedures Changes*	Potential climate adaptation changes for current city policies and procedures (Appendix E)		
Equity considerations	Considerations for ensuring equitable outcomes	Project costs*	Estimated City cost to implement action
		Cost of inaction*	Total estimated costs (damages) that community would have incurred from climate hazards and extreme events without action through 2080
		Lead implementor	Lead implementing entity
Other considerations	Other important implementation considerations	Partners	Needed partnerships to fully execute action
		Timeframe	Initiation timeframe:  = 2021-2024  = 2025-2027  = 2028 and beyond

*See Appendix C: Benefit-Cost Analysis for more details on the assumptions and parameters of the analysis and Appendix E: Potential Climate Adaptations for City Policies & Procedures for more details on applicable City programs & policies.

Action Development

Strategies and actions were iteratively developed by the City and consultant team in collaboration with the Tacoma Adaptation Steering Committee. An initial set of 75 actions were identified by reviewing existing City plans, best practices from comparable jurisdictions, and strategies that address key climate risks. Following this initial identification, a multi-criteria analysis, input from the City’s Infrastructure, Planning, and Sustainability (IPS) Commission and Sustainable Tacoma Commission (STC), and synergy across other City plans and priorities, the Steering Committee narrowed down the list of 75 actions to a set of 16 actions for inclusion in this Strategy.



Infrastructure

What is included?

Infrastructure encompasses the essential physical and organizational structures and facilities that is needed for the functional operation of the City government and its residents. City infrastructure includes roads, buildings, seawalls, piers, stormwater systems, wastewater facilities, and electric power facilities. Critical infrastructure will be impacted by a range of climate hazards, including sea level rise, flooding, extreme heat, and landslides. Investing in infrastructure resilience strategies can create local jobs, support economic resilience, protect valuable assets, and improve safety during emergencies.

***Goal:** Promote resilient facilities and infrastructure that can withstand current and future climate impacts and provide multiple benefits.*

How We'll Get There

Infrastructure resilience requires first identifying critical roads, infrastructure, and vulnerable populations that are at risk due to climate impacts. Once identified, updated standards and codes for current and future infrastructure can ensure assets are built to withstand and minimize climate impacts. This groundwork can inform the prioritization of specific capital improvement projects that build resilience in our built environment.




Sector Strategies:

- ▶ **Improve building resilience** by ensuring that private and publicly owned buildings are resilient to climate change.
- ▶ **Improve transportation resilience** by ensuring that transportation routes can withstand climate impacts.
- ▶ **Improve water & energy infrastructure resilience** by ensuring that water and energy supply and conveyance systems can withstand climate impacts.
- ▶ **Ensure that cross-sectoral infrastructure projects** can withstand climate impacts.

Connected Plans



- ▶ **Tacoma Community Climate Action Plan** includes actions for resilience retrofits, increasing staff capacity to meet new codes and retrofit opportunities, and keeping housing affordable and in good repair.
- ▶ **Affordable Housing Action Strategy** includes actions to access and renovate or resell derelict properties, using code compliance to support livability improvements, and using proactive rental inspection program to adhere to and support health standards.
- ▶ **Transportation Master Plan** includes actions to accommodate pedestrians and monitor sidewalk infrastructure, building incentives for developments that provide weather protection, and cross-jurisdictional collaboration to provide safe and accessible intersections to transit.
- ▶ **Planning & Development Services' 2025 Strategic Plan** includes actions to protect and preserve Tacoma's place-defining characteristics, including historic and cultural resources, scenic views, and natural settings.



Actions

Site-by-site flooding evaluation & planning														
Conduct a review of current science focusing on flooding impacts to critical roads, infrastructure, and steep slopes due to increasing intense rainfall events, sea level rise, flooding, and landslides. Integrate findings into City development codes, emergency management, and capital planning.														
Why it's important	An evaluation of subarea and basin flooding will help Tacoma better identify climate impacts on critical infrastructure. This action lays the groundwork for identifying vulnerable sites and preparing those sites for increasing sea levels, flooding, and landslides. Inaction would result in interrupted critical services and significant economic costs, especially during emergencies.													
KPI	Evaluation and assessment completion													
Connection to other plans	Tacoma Climate Change Resilience Study; Tacoma Community Climate Action Plan; One Tacoma Comprehensive Plan: Environment and Watershed Health Chapter													
	<table border="1"> <tr> <td>Hazards addressed</td> <td></td> </tr> <tr> <td>Co-benefits</td> <td>Public health, natural system health</td> </tr> <tr> <td>Project benefits</td> <td>\$4.3 million</td> </tr> <tr> <td>Project costs</td> <td>\$1.1 million</td> </tr> <tr> <td>Cost of inaction</td> <td>\$14.9 million</td> </tr> <tr> <td>Lead implementor</td> <td>City of Tacoma (Public Works Department and Planning & Development Services)</td> </tr> <tr> <td>Partners</td> <td>Pierce County, Port of Tacoma & NW Seaport Alliance, Metro Parks Tacoma, City of Tacoma (Emergency Management, Environmental Services), Tacoma Public Utilities, WSDOT, Sound Transit, Washington Sea Grant, University of Washington</td> </tr> </table>	Hazards addressed		Co-benefits	Public health, natural system health	Project benefits	\$4.3 million	Project costs	\$1.1 million	Cost of inaction	\$14.9 million	Lead implementor	City of Tacoma (Public Works Department and Planning & Development Services)	Partners
Hazards addressed														
Co-benefits	Public health, natural system health													
Project benefits	\$4.3 million													
Project costs	\$1.1 million													
Cost of inaction	\$14.9 million													
Lead implementor	City of Tacoma (Public Works Department and Planning & Development Services)													
Partners	Pierce County, Port of Tacoma & NW Seaport Alliance, Metro Parks Tacoma, City of Tacoma (Emergency Management, Environmental Services), Tacoma Public Utilities, WSDOT, Sound Transit, Washington Sea Grant, University of Washington													
Potential policy & procedure modifications	<ul style="list-style-type: none"> Prioritize the evaluation of contaminated areas to ensure they can withstand sea level rise. 													
Equity considerations	Ensure study assesses infrastructure that services key demographic groups.													
Other considerations	Will require regulatory action and City Council approval. Ensure diversity of multi-modal transportation options (e.g., rail, bicycles, and walking).													
Timeframe														

Capital project standards & tools

Develop tools and standards of practice to ensure that capital projects being planned now account for future climate conditions, such as a greenhouse gas emissions and climate impacts, for incorporation into budget, capital, and work plans at the departmental level.

Why it's important	This action will ensure that new development being planned now will accommodate future climate change. This will reduce the risk of hospitalizations and deaths from heat waves and wildfire events, support energy efficiency goals, and extend infrastructure lifespan. This action will also ensure that railways and roads can withstand heavier flooding and landslides—reducing potential disruption of transportation services.		
KPI	% of new capital projects that account for future conditions	Hazards addressed	
Connection to other plans	Tacoma Climate Change Resilience Study; Tacoma Community Climate Action Plan; City asset management program	Co-benefits	Public health, natural system health
		Project benefits	\$4.2 million
Equity considerations	Ensure that investments in capital projects are equitably distributed and provide benefits to the most vulnerable populations.	Project costs	\$1.3 million
		Cost of inaction	\$14.9 million
Potential policy & procedure modifications	<ul style="list-style-type: none"> Provide language to support adaptation recommendations in in the Right-of-Way Design Manual including: use of reclaimed water, permeable pavement for shared paths, alternative pavement options for roads. 		
Other considerations	Certain building types should be prioritized for investments if they provide services to particularly vulnerable populations (e.g., retirement homes, senior community centers).	Lead implementor	City of Tacoma (Public Works Department and Office of Budget & Management)
Timeframe		Partners	City of Tacoma (Environmental Services and Planning & Development Services), Tacoma Public Utilities, Pierce County

Code improvements			
<p>Identify opportunities to increase resilience and support health through development, energy, and land use code improvements. This could include: a) aligning with the Regional Code Council for both existing and new construction, b) including actions to ensure private buildings meet healthy building standards, c) informing updates or implementation of the development code to limit construction and development in hazard-prone areas, and d) providing informational resources for residents and businesses to understand options for retrofitting buildings to be more resilient to climate change.</p>			
Why it's important	<p>Development code improvements—such as meeting healthy building standards to mitigated high heat and wildfire smoke impacts—can reduce deaths and hospitalizations as heat wave and wildfire smoke events become increasingly common during the summertime. Additionally, development and land use code improvements that limit development or require preparation for landslides and flooding will reduce property damage as well as protect resident safety in particularly vulnerable and hazardous areas.</p>		
KPI	# of codes evaluated & improved	Hazards addressed	
Connection to other plans	<p>Tacoma Climate Change Resilience Study; Tacoma Community Climate Action Plan; Green Economy action 5; Affordable Housing Action Strategy; Tacoma Title 13 (Land Use Regulatory Code); Tacoma Building Codes</p>	Co-benefits	Community resilience, public health
			\$149.9 million
Potential policy & procedure modifications	<ul style="list-style-type: none"> • Require large new buildings to incorporate solar or living roofs. • Require development to implement measures to reduce heat island effects. • Develop Flood Damage Protection Ordinance. • Promote public benefits and climate adaptation thru bonus building capacity. • Consider adding the National Housing Standard to referenced technical codes. 	Project benefits	
		Equity considerations	<p>Development codes can increase the cost of buildings and make housing less affordable for low-income populations. Consider financially supporting historically underinvested areas.</p>
Other considerations	<p>Some buildings will be affected by certain hazards more than others, so there will be a need to prioritize certain standards for some buildings and not others.</p>	Cost of inaction	\$1.3 billion
		Lead implementor	City of Tacoma (Planning & Development Services Department)
Timeframe		Partners	City of Tacoma (Office of Environmental Policy & Sustainability), Tacoma Public Utilities

Capital project planning, prioritization, & implementation

Use the outcomes of the site-by-site flooding evaluation and planning and natural systems condition assessment and monitoring actions to define capital projects that are necessary to build resilience, prioritize those projects, and implement them and integrate into Capital Facilities Planning process. Include upgrading priority wastewater system areas for inflow and infiltration (I&I) reduction while considering areas with potential for saltwater intrusion and inflow into the system.

Why it's important	This action represents the implementation of upgrades following the site-by-site flooding evaluation and planning and natural systems condition assessment actions. This action will reduce property damage and disruption of critical services due to increased exposure to coastal and riverine flooding especially during storm events. Furthermore, the identification of priority areas to reduce I&I in the wastewater system will be important in protecting high water quality for recreational harvesters, fishers, and residents. Heavier precipitation due to climate change may damage wastewater collection systems and result in discharge of untreated wastewater into local water bodies.		
KPI	# of completed capital projects identified in assessment	Hazards addressed	
Connection to other plans	Capital plans for utilities; Tacoma Community Climate Action Plan; Tacoma Capital Facilities Program Plan; Wastewater Comprehensive Plan; One Tacoma Comprehensive Plan; 6-Year Capital Facilities Program	Co-benefits	Community resilience
		Project benefits	\$1.2 million
Potential policy & procedure modifications	<ul style="list-style-type: none"> • Prepare for changing base flood elevations. • Develop a plan for stormwater outfalls and culvert inundation. • Increase setback distances on coastal bluffs over time. • Consider bigger buffers around shorelines to combat accelerated coastal erosion. • Incorporate climate change into Critical Area Ordinance. 	Project costs	\$0.8 million
Equity considerations	Ensure investments prioritize vulnerable populations and key demographic groups.	Cost of inaction	\$8.5 million
		Lead implementor	City of Tacoma (Planning & Development Services, Public Works Department, Office of Management and Budget)
Other considerations	Will require regulatory action through planning commission and City Council if exceed Comprehensive Plan requirements. This action can build upon City asset management program.	Partners	Port of Tacoma, City of Tacoma (Environmental Services), Tacoma Public Utilities
Timeframe			

Natural Systems

What is included?

Natural systems such as open spaces, parks, shorelines, and natural habitat provide many resilience and adaptation benefits—including protecting residents and infrastructure from climate risks and hazards, filtering and maintaining clean air and water, and reducing the urban heat island effect. These natural systems and the benefits they provide are at risk from a changing climate, and their degradation would exacerbate citywide damages from sea level rise, flooding, landslides, and tsunamis. Investing in natural system improvements will create local jobs, protect valuable assets, improve public health, and improve safety during emergencies.

Goal: *Protect and restore natural systems and landscapes to be resilient to climate impacts and provide ecosystem services.*

How We'll Get There

Building natural system resilience will begin by assessing the condition of Tacoma's natural habitats and monitoring changes over time. In parallel, developing project guidance for habitat restoration can ensure that restored habitats are maintained and remain functional despite future climate impacts. With the assessment and guidance complete, establishing transitional zones nearshore will be critical to protect restored habitats and infrastructure from sea level rise, coastal storms, and tsunamis. Additional resources to support maintenance of existing open spaces and habitat restoration efforts will bolster natural barriers to flooding.

Sector Strategies:

- ▶ **Improve the resilience of inland, coastal, and marine ecosystems** to damaging climate impacts.
- ▶ **Ensure a healthy and sufficient water supply** for all needed uses, including for residents, businesses, and ecosystems.


Connected Plans

- ▶ **Open Space Management Plan** includes information around cost modelling and financial resources for open space maintenance and restoration. The plan also includes a monitoring and adaptive management program that leverages volunteers and prioritizes resources.
- ▶ **City of Tacoma Watershed Management Plan** (forthcoming in 2023/2024) includes effective stormwater actions and projects and an adaptable framework to account for development, climate change impacts, and new pollution hotspots. The Plan also sets standards for tracking and reporting progress towards goals.
- ▶ **Tideflats Subarea Plan** provides information to support local and regional Capital Facilities Programs and potential amendments to the City zoning districts, Shoreline Master Program, and City's Land Use Regulatory Code.
- ▶ **Tacoma Public Utilities' 2020 Integrated Resource Plan** includes proposed actions to meet energy needs such as through demand response, conservation portfolio, or Tacoma Power Hydro. There are also considerations of climate impacts on energy demand.

- ▶ **Transportation Master Plan** includes actions to ensure subarea plans for mixed-use zones to ensure transit and bicycle access.
- ▶ **Shoreline Restoration Plan** includes a prioritization plan, detailed timeline for shoreline restoration efforts, and an implementation plan which includes funding for conservation easements.



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Actions

Natural systems condition assessment & monitoring program			
<p>Assess conditions of seawalls, piers, revetments, shoreline infrastructure, open spaces, parks, and habitat to identify length of service, repair, and maintenance. Work with partners to develop a Sea Level Rise Master Plan and monitoring program to track sea level and shoreline changes at key locations (e.g., Tideflats, Ruston Way, Titlow, Foss) to determine needed adaptation actions.</p>			
Why it's important	<p>This action provides a critical first step in assessing and monitoring the conditions of seawalls, piers, revetments, shoreline infrastructure, open spaces, parks, and habitat. This step will be important in understanding the trajectory of sea level rise and allowing the City to adequately prepare for it—protecting property and critical services in the process.</p>		
KPI	% completion of assessment and plan	Hazards addressed	
Connection to other plans	<p>Strategic 20-Year Passive Open Space Plan; Envision Our Waterfront (Ruston Way Action Plan); Tacoma Community Climate Action Plan; SLR Master Plan (forthcoming); One Tacoma: Watershed Health; Shoreline Master Program; Shoreline Restoration Plan</p>	Co-benefits	Natural system health, community resilience
		Project benefits	\$7.5 million
Equity considerations	<p>Certain underinvested areas may be more vulnerable to sea level rise than others. Property that is worth more may be prioritized for funding, but this may not result in equitable outcomes.</p>	Project costs	\$2.5 million
		Cost of inaction	\$12.8 million
Other considerations	<p>Watershed Planning is creating a tool—similar to the Forest Landscape Assessment Tool—to evaluate conditions of current watershed habitats. There should be concerted efforts to engage shoreline landowners who can implement strategies (e.g., using soft armoring).</p>	Lead implementor	City of Tacoma (Environmental Services, Planning & Development Services)
Timeframe		Partners	Watershed Planning, Metro Parks Tacoma, Washington Sea Grant, University of Washington, Tacoma Public Utilities, City of Tacoma (Public Works Department)



Habitat restoration project guidance & resilience

Develop a Habitat Strategy that fosters a climate change-ready urban landscape by: a) updating critical areas, b) inventorying and mapping high priority habitats for protection and restoration, c) providing code recommendations, d) identifying goals for enhancements and new protections through purchase or easements, e) identifying funding for open space acquisition, and f) synthesizing and employing guidance—such as using native and climate-adapted vegetation and analyzing higher peak flows for restored wetlands and stream systems—for enhancing resilience of habitat restoration projects.

Why it's important	Habitat restoration can reduce the likelihood of landslide and flooding, as well as provide refuge during heat island events. Trees, plants, rain gardens, and low-impact development can also filter water and slow down stormwater that damages wastewater collection systems and pollute waterways. Healthy and restored habitats benefit the health and safety of wildlife and humans alike and can protect fish habitat and local economies that depend on them.		
KPI	Acres of habitat restored and maintained	Hazards addressed	
Connection to other plans	Tacoma Climate Change Resilience Study; Tacoma Community Climate Action Plan; Watershed Management Plan; Shoreline Master Program; Shoreline Restoration Plan; Tacoma Title 13 (Land Use Regulatory Code); Basin and site-specific plans	Co-benefits	Natural system health, community resilience
		Project benefits	\$10.4 million
Potential policy & procedure modifications	<ul style="list-style-type: none"> • Develop an addendum to address climate change in the open space planning process to include nature-based climate solutions. • Revise tree list and other planting requirements to create more resilient urban habitat and urban forest canopy. Consider expanding definition of climate adapted species in the City's Urban Forest Manual. 	Project costs	\$25.4 million
Equity considerations	Impact of restoration on salmonid and shellfish habitat that are critical to Tribal fisheries and cultural practices. Equitable access to green space can offer health benefits. Encourage long-term funding considerations, such as increasing to 2% of stormwater fees budgeted to Open Spaces program.	Cost of inaction	\$225.2 million
		Other considerations	Accessibility to recreational opportunities in habitat restoration areas.
Timeframe		Lead implementor	City of Tacoma (Environmental Services and Planning & Development Services)
		Partners	Pierce County Sustainability, City of Tacoma (Office of Environmental Policy & Sustainability, Office of Equity & Human Rights, Emergency Management)

Nearshore transitional zones

Establish transitional zones around the nearshore where armoring or other infrastructure currently restricts the ability of marine ecosystems to adjust to sea level rise. Identify places where infrastructure can be set back as part of capital improvement project implementation.

Why it's important	Establishing transitional zones will reduce damages to assets at risk from sea level rise, flooding, and landslides. Nearshore armoring can prevent flooding in the near-term, but it will result in erosion and severe slope stabilization issues that threaten nearshore properties.		
KPI	Acres of transitional zone established and maintained	Hazards addressed	
Connection to other plans	Tacoma Climate Change Resilience Study; Tacoma Community Climate Action Plan; Shoreline Master Program; Shoreline Restoration Plan	Co-benefits	Natural system health, community resilience
			\$7.7 million
Potential policy & procedure modifications	<ul style="list-style-type: none"> • Prepare for changing base flood elevations. • Increase setback distances on coastal bluffs over time. • Consider bigger buffers around shorelines to combat accelerated coastal erosion. 	Project benefits	
Equity considerations	Impact of infrastructure on salmonid and shellfish habitat that are critical to Tribal fisheries and cultural practices.	Project costs	\$41.5 million
		Cost of inaction	\$12.8 million
Other considerations	Creating new nearshore habitat is more difficult to permit than alternatives due to coastal hydrology and sediment transport processes. Will need to work with private landowners and businesses along shorelines to implement effectively.	Lead implementor	City of Tacoma (Environmental Services)
Timeframe		Partners	Washington Sea Grant, University of Washington, Metro Parks Tacoma

Economy

What is included?

Tacoma's economy includes the production, distribution, trade, and consumption of goods and services within the city. Economies are often characterized by economic security, types of jobs available, and the sectors of goods and services. From corporations to small business owners, creating flexibility and realizing opportunities for economic prosperity withing Tacoma are crucial to building a resilient economy.

Goal: *Promote a resilient economy that is both adaptable to future climate shocks and responsive to new economic opportunities.*

How We'll Get There

By taking steps to improve strength of the local economy, Tacoma can have a smooth and equitable transition away from unsustainable business practices while building resilience and continuity in the face of climate change. Strategies to secure and employ local business resources, build continuity plans, and train workers will pay dividends for both local businesses and the broader Tacoma community for years to come.



Sector Strategies:

- ▶ **Advance economic security** by investing in adaptable and resilient industries, especially for local and small businesses.
- ▶ **Build a resilient and effective workforce** by expanding development and training pathways for workers in resilient industries with livable wages.

Connected Plans

- ▶ **Tacoma Community Climate Action Plan** includes actions to support sustainable business development, green job training, and sustainable industry collaboration.
- ▶ **Community & Economic Development Strategic Plan 2020-2025** includes actions to identify infrastructure issues that inhibit business growth, expanding the business, retention, and recruitment efforts to include smaller businesses, and supporting areas that might undergo gentrification.

Actions

Business engagement & continuity planning			
<p>Convene the business community in a conversation on business climate impacts and resilient industries. Provide technical assistance to local businesses for creating business continuity plans to better prepare employers and employees to act when a climate disruption occurs. Address both programming needs (e.g., business operations) and infrastructure needs (e.g., rail or roads that are disrupted).</p>			
Why it's important	<p>Investing in industries and businesses that are aligned with Tacoma's vision of being resilient and sustainable will foster a local economy is responsive and resilient to future economic innovations and opportunities. Engaging with local businesses will provide businesses with access to the resources they need to adapt to climate change in a timely manner, reduce long-term costs, and capitalize on future opportunities.</p>		
KPI	# of Business Retention & Expansion (BRE) meetings that "climate change" is mentioned; # of climate-related referrals	Hazards addressed	
Connection to other plans	Tacoma Community Climate Action Plan; Community & Economic Development Strategic Plan	Co-benefits	Community resilience, growth of local economy
		Project benefits	Not estimated
Equity considerations	Ensure that small businesses and minority-owned businesses are not excluded from conversations.	Project costs	Not estimated
		Cost of inaction	Not estimated
Other considerations	Certain businesses are more heavily impacted by certain hazards than others. If businesses request climate-related information from CED, they will need to work with other departments to provide tools and resources.	Lead implementor	City of Tacoma (Community and Economic Development Department)
		Partners	Tacoma-Pierce County Chamber and Lakewood Chamber of Commerce
Timeframe			

Just & green jobs transition plan

Identify industries at-risk from closure due to the low-carbon transition and make a transition plan for industry workers well in advance of industry closure. Transition plans should promote labor standards, shared benefits, reducing job commute times and trips, and long-term support, with a focus on green industries such as electric bus infrastructure. Within the plan, partner with frontline communities, labor organizations, educational institutions, and youth programs to develop a green jobs strategy that evaluates and establishes pathways to bring frontline communities—particularly Black, Indigenous, and Communities of Color (BIPOC communities)—into living-wage green jobs.

Why it's important	This action would involve funding a workforce development program that would help train local and BIPOC staff to meet the labor demands for the transition to a clean energy economy via training opportunities and a development program. Without a workforce development program, carbon-intensive industry workers will be left behind and the growing need for green labor may be left unmet.		
KPI	Completion of just & green jobs transition plan; # of businesses with transition plans	Hazards addressed	
Connection to other plans	Tacoma Climate Change Resilience Study; Tacoma Community Climate Action Plan; One Tacoma: Economic Development; Tideflats Subarea Plan	Co-benefits	Growth of local economy,
		Project benefits	Not estimated
		Project costs	\$4.3 million
Equity considerations	<ul style="list-style-type: none"> Consider demographic disparities that may exist between organizational leadership and workers in green industries. Consider career pathways that do not require a college degree and expand green career employment opportunities. 	Cost of inaction	Not estimated
		Other considerations	Provide continuing education opportunities and connect with south Tacoma green manufacturing efforts. Consider connection to the blue economy. Coordinate with the upcoming Green Economy Study, funded by the American Rescue Act.
Timeframe		Lead implementor	City of Tacoma (Community and Economic Development Department)
		Partners	City of Tacoma (Office of Environmental Policy & Sustainability, Planning & Development Services), WA State Centers of Excellence & Department of Commerce; Tacoma-based technical colleges and workforce central.

Public Health & Safety

What is included?

While climate change will affect the health and safety of all Tacomans, these impacts will disproportionately affect some groups more than others. Increased exposure to wildfire smoke and extreme heat in the summer will exacerbate pre-existing health conditions for frontline communities and increase hospitalizations and death. Higher temperatures will also increase the risk of vector-borne diseases, length of the pollen season, and incidence of harmful algal blooms. Flooding, landslides, and sea-level rise also threaten the safety and wellbeing of residents and businesses.

***Goal:** Maintain and expand communitywide safety nets and services to ensure a healthy and safe community in the face of climate change.*

How We'll Get There

The most significant and immediate public health and safety threat due to climate change are extreme heat and wildfire smoke events. Providing air filter fans and creating effective communications—especially for low-income residents—will ensure residents have access to resources to reduce exposure to extreme events, such as heat waves and wildfire smoke events. Building cooling and air quality centers to support residents—especially low-income residents and unhoused people—will ensure there are equitable benefits that reduce historical health disparities.

Sector Strategies:

- ▶ **Minimize climate impacts to community health**, including from decreased air quality and water- and vector-borne illnesses.
- ▶ **Increase social cohesion and connectivity** in Tacoma to ensure community support systems.
- ▶ **Ensure sufficient capacity to respond to weather-related emergencies** and maintain public safety.

Connected Plans



- ▶ **Tacoma Community Climate Action Plan** includes actions to leverage public land resources for resilience hubs and open space.
- ▶ **Affordable Housing Action Strategy** includes actions to access and renovate/resell derelict properties using code compliance to support livability improvements and using proactive rental inspection program to support health standards.
- ▶ **2020 Comprehensive Emergency Management Plan** includes procedures and mechanisms for responding and obtaining support and funding to address emergency events.

Actions

Cooling & air quality resilience hubs															
Coordinate with partner agencies to expand public access to cooling, warming, and clean air shelters and resilience hubs within every neighborhood.															
Why it's important	Cooling and air quality relief resilience hubs provide refuge to vulnerable residents who do not have access to air conditioning or filtered air during extreme heat and wildfire events, respectively. These hubs could reduce injury and mortality rates during extreme weather events, such as the heat wave of 2021 that brought regional hospitals to their capacity. These centers can also provide other critical amenities during extreme events, such as electrical power, food, and personnel support (e.g., welfare checks).														
KPI	% of <u>neighborhood council districts</u> with cooling & air quality resilience hubs														
Connection to other plans	Tacoma Community Climate Action Plan; Tacoma Equity Index; Neighborhood Council Program														
Equity considerations	Ensure that frontline communities—especially in <u>communities of focus</u> such as Eastside and South Tacoma—can easily access cooling centers through alternative modes of transportation.														
Other considerations	Consider whether certain types of public & private buildings (e.g., libraries, business centers) can be considered cooling and air quality relief centers for the public.														
Timeframe															
	<table border="1"> <tr> <td>Hazards addressed</td> <td></td> </tr> <tr> <td>Co-benefits</td> <td>Equity and inclusion, public health</td> </tr> <tr> <td>Project benefits</td> <td>\$22.5 million</td> </tr> <tr> <td>Project costs</td> <td>\$3.0 million</td> </tr> <tr> <td>Cost of inaction</td> <td>\$1.3 billion</td> </tr> <tr> <td>Lead implementor</td> <td>City of Tacoma (Emergency Management Department and Neighborhood and Community Services),</td> </tr> <tr> <td>Partners</td> <td>Tacoma-Pierce County Health Department, Metro Parks Tacoma</td> </tr> </table>	Hazards addressed		Co-benefits	Equity and inclusion, public health	Project benefits	\$22.5 million	Project costs	\$3.0 million	Cost of inaction	\$1.3 billion	Lead implementor	City of Tacoma (Emergency Management Department and Neighborhood and Community Services),	Partners	Tacoma-Pierce County Health Department, Metro Parks Tacoma
Hazards addressed															
Co-benefits	Equity and inclusion, public health														
Project benefits	\$22.5 million														
Project costs	\$3.0 million														
Cost of inaction	\$1.3 billion														
Lead implementor	City of Tacoma (Emergency Management Department and Neighborhood and Community Services),														
Partners	Tacoma-Pierce County Health Department, Metro Parks Tacoma														

Co-create climate communications

Co-create communications with the City, County, and frontline communities that focus on climate impacts and health, access to emergency resources and warnings, and training and materials to prepare for emergency events and health impacts. Design and disseminate communications in a manner that reduces access and participation barriers.

Why it's important	Creating and disseminating climate-focused communications will be vital to ensuring that frontline communities have access to emergency resources during emergency events and are not left behind in the process. Climate change will amplify existing inequities and health disparities, and informative and accessible communications can equip frontline communities with resources to reduce those inequities.		
KPI	# of materials co-created and translated into non-English languages	Hazards addressed	
Connection to other plans	Tacoma Environmental Action Plan: Action C1; Tacoma Community Climate Action Plan	Co-benefits	Equity and inclusion, public health, community resilience
		Project benefits	\$2.4 million
		Project costs	\$1.9 million
Equity considerations	Ensure that translated materials are available for those who cannot read or speak English well. Ensure that vulnerable populations with less digital access can still be reached.	Cost of inaction	\$14.9 million
		Lead implementor	City of Tacoma (Emergency Management Department and Media and Communications Office)
Other considerations	In-person meetings during a pandemic will require additional precautions to reach populations with less digital access.	Partners	Tacoma-Pierce County Health Department, City of Tacoma (Office of Environmental Policy & Sustainability)
Timeframe			

Filter fan distribution

Work with the Tacoma-Pierce Health Department to provide filter fans for at-risk community members to assist in mitigating wildfire smoke in their homes and businesses.

Why it's important	Filter fans reduce indoor air pollution from wildfire smoke that can exacerbate respiratory and cardiovascular issues, particularly for people with asthma, cardiovascular disease, diabetes, Alzheimer's disease, dementia, and obesity. This action would reduce the risk of death or illness from air quality issues during wildfire events.		
KPIs	# of filter fans distributed to households; # of residents reached	Hazards addressed	
Connection to other plans	Tacoma Climate Change Resilience Study; Tacoma Community Climate Action Plan	Co-benefits	Public health, equity, and inclusion
		Project benefits	\$25.5 million
Equity considerations	Ensure that frontline communities—especially in <u>communities of focus</u> such as Eastside and South Tacoma—are prioritized for distribution.	Project costs	\$2.3 million
		Cost of inaction	\$91.3 million
Other considerations	City already contracts with TPCHD to do this work. Digital or in-person trainings can support DIY home-filter fans. Tips on staying cool and information on cooling centers can be distributed in tandem with this action. Collecting KPIs at point-of-distribution can reflect true impact of action.	Lead implementor	Tacoma-Pierce County Health Department
Timeframe		Partners	City of Tacoma (Office of Environmental Policy & Sustainability and Neighborhood and Community Services)

Governance

What is included?

Governance includes City processes and investments that drive emergency response measures and infrastructure. Good governance is essential to responding in an equitable manner to all forms of climate hazards. Coordination and communication across City departments and with regional partners will encourage equitable investments, timely emergency response during extreme events, and effective implementation of adaptation actions.

Goal: Institutionalize and prioritize climate change resilience across City processes and investments.

How We'll Get There

Governance improvements require community and partner engagement and coordination to equip individuals, institutions, and agencies for climate emergencies. Support to decisionmakers such as through the development and use of financial tools can facilitate better understanding and prioritization of climate resilience actions across City government departments, levels, and activities.

Sector Strategies:



- ▶ **Engage and equip residents and businesses** with resources to successfully adapt to climate change.
- ▶ **Build in accountability mechanisms** for City departments to implement climate resilience actions, including funding and resource dedication.
- ▶ **Coordinate regionally and across sectors** to foster broad resilience to multiple climate impacts.

Connected Plans

- ▶ **Tacoma Community Climate Action Plan** includes actions, in coordination with the Tacoma Adaptation Strategy, that find critical roads and infrastructure and integrate into City emergency management and capital planning.
- ▶ **Environmental Services Strategic Plan 2018-2025** includes actions to identify priority locations for green projects that will prepare Tacoma to respond to climate impacts, identify how customers of different demographics obtain information on government services, and conduct outreach out to receive feedback on customer needs and barriers.
- ▶ **One Tacoma Plan** includes an action in the Environment and Watershed Health section that directs the City to utilize climate science and climate risks into our planning, codes, and investments.

Actions

Climate equity initiatives			
Incorporate climate resilience and equity considerations in emergency planning and hazard mitigation updates to reduce climate vulnerability—especially for disproportionately impacted groups—with established checkpoints for justifying decisions with a climate and equity lens.			
Why it's important	Centering equity in climate-related initiatives will ensure that everyone has access to critical emergency services—especially overburdened and frontline communities. Without climate resilience and equity considerations, emergency planning and hazard mitigation activities will be ill-equipped to address the growing disparities between populations.		
KPIs	Presence of climate change and social equity section(s) in hazard mitigation plan	Hazards addressed	
Connection to other plans	Tacoma Environmental Action Plan; Tacoma Climate Change Resilience Study; Tacoma Community Climate Action Plan; One Tacoma Plan: Environment and Watershed		
Equity considerations	Consider an array of different feedback opportunities (e.g., surveys, workshops, pop-up events, public meetings) and consider varying accessibility considerations—such as childcare needs, time-of-day, and translation or interpretation requests.	Co-benefits	Equity and inclusion, community resilience
		Project benefits	Not estimated
		Project costs	\$1 million
Other considerations	Equity considerations can be difficult to measure through quantitative metrics like KPIs.	Cost of inaction	Not estimated
		Lead implementor	City of Tacoma (Emergency Management)
Timeframe		Partners	City of Tacoma (Office of Environmental Policy & Sustainability), Pierce County

Regional coordination			
Continue to support regional climate adaptation stakeholders by collaborating with agencies, institutions, property owners to tackle cross-jurisdictional information needs and adaptation opportunities. Continue to engage in and support regional efforts within the Puyallup River watershed basin to improve river management in the context of floods, sediment, agriculture, and infrastructure protection needs.			
Why it's important	Regional coordination with agencies and institutions will result in more efficient, holistic, and effective climate adaptation.		
KPIs	# of cross-agency collaboration meetings	Hazards Addressed	
Connection to other plans	Tacoma Climate Change Resilience Study; Tacoma Community Climate Action Plan	Co-benefits	Community resilience, natural systems health
		Project benefits	\$0.75 million
		Project costs	\$3.6 million
Equity considerations	Action accountability may become more difficult when multiple agencies are involved. Ensure that the public has opportunity to participate in the decision-making process.	Cost of inaction	\$2.0 million
		Lead implementor	City of Tacoma (co-led by Office of Environmental Policy & Sustainability and Planning & Development Services)
Other considerations	Structure coordination to acknowledge and accommodate varying risks and adaptation interests across organizations and property owners.	Partners	Port of Tacoma, Puyallup Tribe, Tacoma Public Utilities, Tacoma-Pierce County Health Department, Metro Parks Tacoma, Pierce County, Sound Transit, UW Climate Impacts Group, Puget Sound Climate Preparedness Collaborative, WA Sea Grant, WA Dept. of Ecology, WSDOT, FEMA, BNSF Railway
Timeframe			



Economic ROI tools

Create and utilize financial tools that capture the full lifecycle costs of City decisions, including the costs of climate maladaptation (adaptation strategies that increase climate risk or vulnerability) or inaction. Utilize this tool in complement with the [Tacoma Equity Index](#).

Why it's important	Economic return-on-investment tools can help justify and support climate adaptation investments. Without such a tool, the long-term benefits of climate adaptation efforts are not as transparent as the near-term costs. In complement with the Tacoma Equity Index, financial tools can clarify economic and equity co-benefits of the City's investments and , as a result, prevent health disparities from worsening.		
KPIs	# of projects that utilize ROI tool	Hazards addressed	
Connection to other plans	Tacoma Climate Change Resilience Study; Tacoma Community Climate Action Plan	Co-benefits	Growth of local economy, equity, and inclusion
		Project benefits	Not estimated
		Project costs	\$0.05 million
Equity considerations	Areas that have been traditionally underinvested may have lower property values, which may result in prioritization of investments in wealthier areas.	Cost of inaction	Not estimated
		Lead implementor	City of Tacoma (Community & Economic Development, Office of Equity & Human Rights, Emergency Management)
Other considerations	Ensure transparency in assumptions and methods of the analysis.	Partners	City of Tacoma (Office of Environmental Policy & Sustainability, Management & Budget Office)
Timeframe			

Community check-ins

Provide ample and periodic opportunities—such as through surveys or public meetings—to engage the community around climate resilience issues and incorporate feedback into ongoing initiatives and programs.

Why it's important	Community check-ins provide a space for community members to express areas of support, concerns, and feedback to improve programs. Gathering community feedback can help secure community buy-in for climate action, inspire personal action, and improve resilience outcomes for all.		
KPIs	# of engagement activities; demographic of community members reached	Hazards addressed	
Connection to other plans	Tacoma Climate Change Resilience Study; Tacoma Community Climate Action Plan	Co-benefits	Community resilience, equity and inclusion, public health
		Project benefits	Not estimated*
		Project costs	\$0.8 million
Equity considerations	Ensure a diversity of engagement opportunities, including digital opportunities, in-person opportunities, and translated services.	Cost of inaction	Not estimated*
		Lead implementor	City of Tacoma (Office of Environmental Policy & Sustainability)
Other considerations	Consider pandemic precaution protocols in engagement. Ensure that engagement tools (survey, public meeting, tabling) are right-sized to the objective.	Partners	Community Based Organizations
Timeframe			

Implementation

Building resiliency to climate change impacts will require dedication, time, and resources from City government, the broader Tacoma community, and external partners. We must be thoughtful in how we sequence, fund, and implement actions to leverage windows of opportunity, minimize harms from climate impacts, and support those most in need. This implementation section presents a detailed plan for meeting desired outcomes of the Tacoma Adaptation Strategy, including information on implementation accountability and enforcement mechanisms, phasing, key performance indicators, social equity, coordination, and funding.

To effectively implement the Tacoma Climate Adaptation Strategy and the Tacoma Climate Action Plan, **the City will need to hire a Climate Action/Adaptation Manager** to coordinate the implementation and monitoring of the City’s climate efforts.







Phasing

Actions in this Strategy will be implemented in the following phases:

- ▶ **Phase I (2021-2024):** Near-term implementation focuses on establishing a foundation for meeting both mid- and long-term goals.
- ▶ **Phase II (2025-2027):** Mid-term solutions that address complex issues that require more time and coordination to get underway, such as incentive development and transitional plans.
- ▶ **Phase III (2028 & beyond):** Long-term strategies that are more comprehensive solutions that require long-term investment, careful planning, and broad coordination.

Action	Phase I	Phase II	Phase III
Site-by-site flooding evaluation & planning	→		
Capital project standards & tools	→		
Code improvements		→	
Capital project, planning, & implementation			→
Natural systems condition assessment & monitoring program	→		
Habitat restoration project guidance & resilience	→		
Nearshore transitional zones			→
Business engagement & continuity planning	→		
Just & green jobs transition plan	→		
Cooling & air quality resilience hubs	→		
Co-create climate communications	→		
Filter fan distribution	→		
Climate equity initiatives		→	
Regional coordination	→		
Economic ROI tools		→	
Community check-ins	→		

Accountability and Enforcement

<p>Progress Reporting <i>Plan progress reports will be developed and reviewed annually and will include status updates on all actions and associated key performance indicators.</i></p>	<p>Implementation Team <i>Plan implementation will be led by the City of Tacoma. A cross-departmental team of City staff will meet on a recurring basis to monitor and plan for implementation.</i></p>	<p>Partnerships <i>The City will actively maintain partnerships with businesses, community leaders, and organizations throughout the implementation process through existing communication channels, key staff liaisons, and ongoing convening of the plan steering committee.</i></p>
		
<p>Public Participation <i>The City will continue to engage the public through social media, news articles, monthly newsletters, and community meetings.</i></p>	<p>Lead by Example <i>The Tacoma City Council will have the responsibility of oversight for the plan. The Council will receive annual updates on Strategy progress and make policy decisions, budgetary appropriations, and workplan approvals that will facilitate implementation.</i></p>	<p>Plan Updates <i>The plan will be evaluated on an annual basis and updated as needed—at a minimum, within five years—to reflect lessons learned and changes in community priorities, technologies, and scientific understanding.</i></p>
		

Key Performance Indicators

Outputs: Action-Specific

Output-based KPIs, listed below, measure the progress of each specific adaptation action.

Action	KPI	Monitoring Lead	2030 Target	
Infrastructure	Site-by-site flooding evaluation & planning	Evaluation and assessment completion	City of Tacoma (Public Works and Planning & Development Services)	Completed initial evaluation; 2 additional evaluation iterations across Phases II and III
	Capital project standards & tools	% of new capital projects that account for future conditions	City of Tacoma (Public Works, Office of Management & Budget, Environmental Services, and Tacoma Public Utilities)	100% of new capital projects after 2024
	Code improvements	# of development and commercial energy codes evaluated & improved	City of Tacoma (Planning & Development Services)	5 plans/codes improved
	Adaptation capital project prioritization, & implementation	# of completed adaptation capital projects identified in assessment	City of Tacoma (Planning & Development Services and Public Works)	# (total determined from natural systems condition assessment and site-by-site evaluation actions)
Natural Systems	Natural systems condition assessment & monitoring program	Assessment completion	City of Tacoma (Environmental Services/Open Space and Planning & Development Services)	Completed initial assessment; 2 additional assessment iterations across Phases II and III
	Habitat restoration project guidance & resilience	Acres of habitat managed and protected	City of Tacoma (Environmental Services/Open Space and Planning & Development Services)	94.5 acres managed; 530 acres protected
	Nearshore transitional zones	Acres of transitional zone established and protected	City of Tacoma (Environmental Services/Open Space, Metro Parks Tacoma, Port of Tacoma)	300 acres protected
Economy	Business engagement & continuity planning	# of BRE meetings that "climate change" is mentioned; # of climate-related referrals	City of Tacoma (Community & Economic Development)	50 mentions of "climate change" in BRE meetings; 20 climate-related referrals
	Just & green jobs transition plan	Completion of just & green jobs transition plan or green economy strategy	City of Tacoma (Community & Economic Development)	Completed Green Economy Strategy and Implementation Plan by City
Public Health & Safety	Cooling & air quality resilience hubs	% of <u>neighborhood council districts</u> with cooling & air quality resilience hubs	City of Tacoma (Emergency Management and Neighborhood & Community Services)	100% neighborhoods with cooling & air quality resilience hub access during unhealthy events
	Co-create climate communications	# of materials co-created and translated to non-English languages	City of Tacoma (Emergency Management and Media & Communications Office)	5 different communication materials created with active frontline engagement
	Filter fan distribution	# of filter fans distributed to households; # of residents reached	Tacoma-Pierce County Health Department	2,500 distributed by 2024 while reaching 12,000 residents from frontline communities

Action	KPI	Monitoring Lead	2030 Target	
Governance	Climate equity initiatives	Presence of climate change and social equity section(s) in hazard mitigation plan	City of Tacoma (Emergency Management)	20 mentions of “climate change” and/or “social equity”
	Regional coordination	# of cross-agency collaboration meetings	City of Tacoma (Office of Environmental Policy & Sustainability and Planning & Development Services)	Convene County-wide adaptation group quarterly
	Economic ROI tools	# of projects that utilize ROI tool	City of Tacoma (Community & Economic Development, Office of Equity & Human Rights, and Emergency Management)	Every project after 2027
	Community check-ins	# of engagement activities; demographic of community members reached	City of Tacoma (Office of Environmental Policy & Sustainability)	2 engagement activities per year; demographics reflective of the City of Tacoma

DRAFT

Outcomes: Cross-Cutting

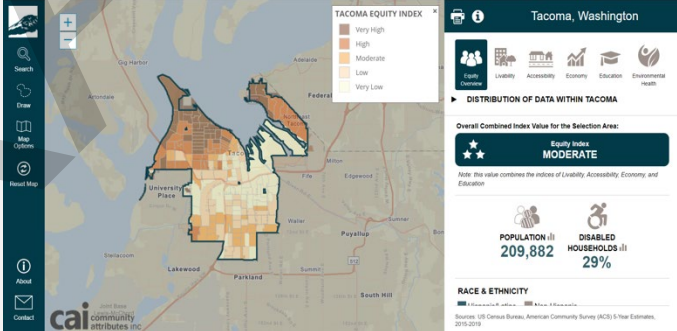
Outcomes-based KPIs, listed below, measure the long-term impact of the Tacoma Adaptation Strategy. These KPIs aren't associated with specific actions, such as the output KPIs, but are associated with the **overall resilience and adaptive capacity benefits we aim to achieve through the implementation of the adaptation actions**. Additionally, we include equity indicators for each outcome KPI to ensure that benefits are equitably distributed across Tacoma's communities. These KPIs may not require annual tracking. Some of these KPIs are not currently being tracked and will require additional levels of effort to monitor. For KPIs that are not currently tracked, a "—" is in the "Current Value" column.

Focus Area	KPI	Current Value	Target Trend	Equity Indicator	Monitoring Considerations
Infrastructure	# and % of buildings at risk of flooding	109 buildings; 0.17%	↓	Geographic distribution of disruptions of at-risk buildings	In Pierce County's 2017 FEMA Risk Report . Monitor next time associated report or Hazard Mitigation Plan is completed.
	# and % of buildings at risk of landslides	185 buildings; 0.29%	↓	Geographic distribution of disruptions of at-risk buildings	
Natural Systems	% tree canopy cover (<u>Equity Index</u> Indicator)	20%	↑	Geographic distribution of tree canopy cover	Dependent on LIDAR monitoring, which is infrequent due to costs.
	B-IBI index of the Puyallup River Watershed	1 site w/ good water quality; 11 sites w/ moderate water quality; 1 site w/ poor water quality	↑	—	Monitored by Pierce County's Public Works program here .
	% reduction in armoring in nearshore transitional zones	Narrows – 76% armoring; Point Defiance – 18% armoring; Ruston Way – 97% armoring; Waterways – 71% armoring; Marine View Drive – 12% armoring	↓	—	Based off 2007 Tacoma Shoreline Inventory and Characterization . Monitor next time there is a shoreline inventory.
	Access to Parks & Open Space	22% High Access ; 47% Moderate Access	↑	Geographic distribution of parks and open space	Tacoma Equity Index indicator. Monitored each time Equity Index tool is updated.
Economy	# of green jobs, as measured by tax credit	25 green jobs	↑ 250 green jobs	Demographic disparity of green job employees	Measured by green jobs tax credit.
	Student mobility of green job strategy programs (<u>Equity Index</u> Indicator)	10%	↑	Demographic disparity of student mobility	Tacoma Equity Index indicator. Monitored each time Equity Index tool is updated.
	# of business disruption events (e.g., restaurant closures from extreme heat)	—	↓	% minority-owned businesses impacted by business disruption events	Not currently tracked. Will be led by Community & Economic Development.

Focus Area	KPI	Current Value	Target Trend	Equity Indicator	Monitoring Considerations
	# of businesses that adopted climate-resilience measures in business planning	0	↑	% minority-owned businesses that adopt climate-resilience measures	Not currently tracked. Will be led by Community & Economic Development.
Public Health & Safety	# hospital visits from people with cardiovascular disease during wildfire events	—	↓	Demographic disparity of hospital visits	Not currently tracked. Will be led by Tacoma-Pierce County Health Department.
	ER visits or 911 phone calls related to physical injury or mental health during extreme events (heat waves, flooding)	—	ê	Demographic disparity of hospital visits	Not currently tracked. Will be led by Tacoma-Pierce County Health Department and City of Tacoma.
	<u>Tacoma Equity Index Score</u> (minimum)	District-dependent	↑	Increasing equity scores for Central, Southeast, and South Tacoma	<u>Tacoma Equity Index</u> indicator. Monitored each time Equity Index tool is updated.

Tacoma Equity Index

Multiple actions in this Strategy aim to decrease historical economic inequities and bridge health disparities. There are multiple outcome KPIs—such as tree canopy coverage and student mobility into green jobs—that are directly related to the [Equity Index](#). Tying this Strategy into existing equity work that the City is leading will ensure that benefits are equitably distributed and climate impacts are minimized for frontline communities.



Social Equity

Implementation will need to be carefully monitored and assessed to optimize equitable outcomes and ensure that frontline communities are prioritized through the city's resilience-building efforts. Among the actions in this strategy, key equity implementation considerations include the following:

- ▶ Ensure that studies and assessments examine impacts and implications **specific to key demographic groups**.
- ▶ Ensure that City investments—including capital and restoration projects—are **equitably distributed and provide benefits to the most vulnerable populations**. Consider that access to services varies by population and services must be accessible by alternative transportation modes. Recognize that areas with higher hazard damage costs are often in wealthier areas and should not be the sole basis for locating and prioritizing investment.
- ▶ Consider and proactively address unintended consequences of new or updated policies—such as development, building, and zoning codes—on **affordability** for lower-income households and **gentrification/displacement risks**.
- ▶ Ensure that **small businesses, minority-owned businesses, and BIPOC community members are included** in conversations, communications, and planning efforts. Consider language barriers and recognize that the demographic composition of organizational leadership is often different from that of its workers.
- ▶ Provide all communications and programmatic information in a **variety of formats**, including both digital and non-digital forms.
- ▶ Ensure that the **public has opportunity to participate** in decision-making processes and make an explicit effort to bring underrepresented voices to the table. This may mean compensating BIPOC experts. Recognize that communities have existing priorities and expertise, respect these “ways of knowing,” and share power with community members.
- ▶ Maintain **transparency and accountability** throughout plan implementation and decision-making processes by making information accessible, relevant, and culturally appropriate.

To monitor, evaluate, and ensure equitable outcomes, it will be important to conduct **disaggregated analysis** of key performance indicators. This means, for example, not just considering the number of people who receive a service—but the *demographic makeup* and *geographic distribution* of those people. To the extent possible, this information should be gathered during action implementation and a plan for doing so should be developed prior to action execution. For example, when distributing filter fans, the City should administer a demographic questionnaire for each household that receives a fan.

Coordination

The Tacoma Adaptation Steering Committee will continue to meet on a quarterly basis to coordinate implementation. Additionally, key City committees—such as the Sustainable Tacoma Commission and Infrastructure, Planning & Sustainability Committee—will be key leaders in directing the regional coordination and implementation of climate adaptation actions.

The table below documents key synergies between the Tacoma Adaptation Strategy and other City plans, as well as key coordination opportunities between the City and external partners.

City Department and Relevant Plans and Programs	Focus Area				
	Infrastructure	Natural Systems	Economy	Public Health & Safety	Governance
Environmental Services	X	X	X	X	X
<u>Environmental Services Strategic Plan 2018-2025</u>	X	X		X	X
<u>2016 Environmental Action Plan</u>	X	X	X	X	X
<u>2016 Climate Risk Assessment</u>	X	X	X	X	X
<u>Open Space Management Plans</u>		X			
<u>Tacoma's Healthy Neighborhoods Watershed Management Plan</u> (forthcoming in 2023/2024)		X		X	
Community & Economic Development	X		X	X	X
<u>Community & Economic Development Strategic Plan 2020-2025</u>	X		X	X	X
<u>Affordable Housing Action Strategy</u>			X	X	
Public Works	X			X	X
<u>Transportation Master Plan</u>	X			X	X
<u>Six-Year Comprehensive Transportation Improvement Program 2021-2026</u>	X			X	
Emergency Management				X	X
<u>2020 Comprehensive Emergency Management Plan</u>				X	X
Planning & Development Services	X	X	X	X	X
<u>Planning & Development Services' 2025 Strategic Plan</u>	X	X	X	X	X
Tacoma Public Utilities	X	X			X
<u>2020 Integrated Resource Plan</u>	X	X			

	Focus Area				
	Infrastructure	Natural Systems	Economy	Public Health & Safety	Governance
Key External Partners					
Puyallup Tribe		X			X
Port of Tacoma	X	X	X		X
Metro Parks Tacoma		X		X	X
Pierce County	X	X	X	X	X
Tacoma-Pierce County Health Department				X	X
Northwest Seaport Alliance	X		X		X
University of Washington, Tacoma	X	X		X	X
Washington Sea Grant	X	X			X
Pierce Conservation District		X			X

Funding

The City will utilize existing City resources and external grants and funding sources to the extent possible in implementing the Tacoma Adaptation Strategy. These investments will not only avoid future climate-related costs to the community, but will also bring other valuable environmental, social, and economic benefits such as job security, improved public health, and more beautiful and livable neighborhoods. Potential funding sources include:

- City general fund
- Bonds
- Taxes, fees, and utility revenues
- Federal and state grants
- Private grants/investment and public-private partnerships
- Revolving loan funds
- Local carbon funds

Funding Opportunities for Climate Adaptation

There are increasing federal, state, and private funding opportunities for local climate resilience programs and projects. Current resources to consider include:

- ▶ **FEMA Hazard Mitigation Assistance Grants:** Funding for eligible mitigation measures that reduce disaster losses.
- ▶ **FEMA Flood Mitigation Assistance (FMA) Program:** Funds for planning and projects to reduce or eliminate risk of flood damage to buildings insured under the National Flood Insurance Program.
- ▶ **FEMA Building Resilient Infrastructure Communities (BRIC):** Support for states, local communities, and tribes undertaking hazard mitigation projects.
- ▶ **EPA Environmental Justice Small Grants Program:** Helps communities with localized strategies address climate change risks (CBOs and Tribal governments are eligible).
- ▶ **EPA Smart Growth Grants:** Occasionally offered to support activities that protect human health and the environment.
- ▶ **Kresge Environment Program:** Helps communities build resilience through place-based innovation and bringing to scale promising climate-resilience approaches.
- ▶ **WA Department of Ecology Shoreline Master Program (SMP) Competitive Grant Pilot Program:** Provides funding for local jurisdictions with a SMP to implement local shoreline planning priorities, permit monitoring and adaptive management, and sea level rise planning.
- ▶ **WA Department of Commerce Growth Management Grants:** Provides funding for cities and local jurisdictions to 1) adopt and implement new housing action plans, 2) facilitate transit-oriented development, and 3) develop utility improvements for affordable housing projects and low-income households.
- ▶ **U.S. Climate Resilience Toolkit:** Clearinghouse of current climate resilience funding opportunities.

Appendix A: Climate Risk Assessment

This memorandum documents the suite of **identified top priority climate-related risks** that the City is expected to face in the future. These risks are organized into the following categories and will be used **for identifying adaptation goals and actions** in the Tacoma Adaptation Strategy:

- ▶ Flooding
- ▶ Sea level rise & storm surge
- ▶ Extreme precipitation
- ▶ Wildfire smoke
- ▶ Landslides
- ▶ Warmer temperatures, extreme heat, & drought

What's at Risk	Evidence/ Rationale
Flooding	
Critical infrastructure	<ul style="list-style-type: none"> ▶ Puyallup River is at high risk of flooding that could affect many types of infrastructure, including the Central Wastewater Treatment Plant and Interstate 5, as water flows towards Commencement Bay. These road obstructions could limit emergency vehicle access. ▶ Puyallup River has low capacity for adaptation due to levee placement and past river management (increased sedimentation due to ending dredging). ▶ White River at Buckley & Puyallup watershed. ▶ Flooding could risk release of hazardous materials located in vulnerable areas.
Coastline communities	<ul style="list-style-type: none"> ▶ Communities along city coastline (West End/Salmon Beach, North End, South Tacoma, Tacoma Tideflats) will experience higher flood risk due to precipitation changes and sea level rise. ▶ Communities that travel to flooded areas for work or other daily needs will also be impacted by localized and coastal flooding.

What's at Risk	Evidence/ Rationale
Sea level rise & storm surge	
Critical infrastructure	<ul style="list-style-type: none"> ▶ Central Wastewater Treatment Plant at high risk due to saltwater intrusion and inflow causing corrosion or system upsets. ▶ Large portions of the wastewater system in the tide flats area are below the existing Base Flood Elevation and several feet below projected future extreme high tide. ▶ Tidally-influenced stormwater conveyance and outfalls are at high risk from backwatering of outfalls. ▶ Roads (tide flat areas, Puyallup River historic channel migration zone, Ruston Way, Marine View Drive) are at high risk, are not currently well protected by dikes or levees, and will be further degraded in their capacity over time due to sedimentation in the Puyallup River. ▶ At least two public health facilities are at risk of flooding from sea level rise. Hospital systems and the NW Detention Center in the tide flats may also be at risk. ▶ Bridge abutments could be at increased risk of scour. ▶ Freight mobility in the tidelands will be at higher risk with more frequent storm and flood events.
Marine ecosystems	<ul style="list-style-type: none"> ▶ Marine ecosystems (including aquatic life such as salmon, fish, and shellfish) are at high risk due to increased frequency and duration of inundation in currently supratidal and upland areas, reduction in light penetration in subtidal areas, and changes to sediment dynamics. ▶ Ocean acidity is expected to increase in Puget Sound, leading to impacts such as increased corrosion and inhibited shellfish development.
Public access to coastal areas	<ul style="list-style-type: none"> ▶ Public access to coastal areas—including public amenities and businesses—are at risk from sea level rise and storm-related inundation and damages. This lack of access could have implications for the ability of vulnerable populations to find cool outdoor spaces during heat waves.
Port functions	<ul style="list-style-type: none"> ▶ Port jobs and infrastructure could be at risk from flooding and other changes.

What's at Risk	Evidence/ Rationale
Extreme precipitation	
Stormwater and wastewater systems	<ul style="list-style-type: none"> ▶ Areas of the stormwater system with known capacity issues and culverts and small bridges are at risk from more intense rain events. Stormwater systems are at most risk in tide flats, Foss Waterway, Leach Creek, and Flett Creek watersheds. Future conveyance systems will also need to be designed to account for changing precipitation patterns. ▶ Tidally-influenced conveyance and outfalls may experience increased flow rates which put densely developed places at higher risk, especially where backflow prevention devices are not present.
Freshwater ecosystem health	<ul style="list-style-type: none"> ▶ Freshwater tributary systems will experience increased peak flows due to more precipitation falling as rain, particularly streams with erodible glacial sediment and no bypass pipe. ▶ Winter runoff will transport pollutants from urbanized areas into streams.
Public health	<ul style="list-style-type: none"> ▶ Heavy precipitation events could contribute to transmission of water-borne illnesses—especially among unhoused populations.
Wildfire smoke	
Public health	<ul style="list-style-type: none"> ▶ Wildfire smoke can be especially dangerous for sensitive groups—including infants, children, people over 65, and those that are pregnant, have heart or lung diseases, and other preexisting conditions.
Landslides	
Roads/ infrastructure	<ul style="list-style-type: none"> ▶ Conveyance system has high exposure to landslides; a system failure would cause significant environmental, property, and health/safety impacts. ▶ North End Treatment Plant is exposed to increased potential for high flows in Mason Gulch. ▶ Ruston Way and Marine View Drive have increased risks.
Coastline communities	<ul style="list-style-type: none"> ▶ Communities along coastlines (West End/Salmon Beach, North End, port area of New Tacoma) face higher landslide risk.
Warmer temperatures, extreme heat, & drought	
Existing urban vegetation	<ul style="list-style-type: none"> ▶ Existing vegetation, including tree health may be affected by pest, water, and heat stress resulting in loss of habitat, shade, water retention/interception, and filtering (water and air) of pollutants.

What's at Risk	Evidence/ Rationale
	<ul style="list-style-type: none"> ▶ Tree loss may negatively impact property values and increase the impact of heat island effects.
Public health	<ul style="list-style-type: none"> ▶ Extreme heat will disproportionately threaten populations in urban heat islands with low canopy cover (e.g., New Tacoma and central part of the city). ▶ Heat and air quality related illnesses may impact those over age 65, children, poor and socially isolated individuals, people without shelter, people with mental illnesses, outdoor laborers, and those with cardiac, respiratory, or other underlying health problems. ▶ Warmer climates could also increase the risk of mosquito-borne diseases such as West Nile virus.
Agriculture/forestry	<ul style="list-style-type: none"> ▶ The agricultural and forestry industry may be affected by pest, water, and heat stress concerns due to rising temperatures. This in turn could threaten local food resources.
Industries	<ul style="list-style-type: none"> ▶ Industries relying on cooling water may be impacted by additional water and heat stress.
Freshwater ecosystem health	<ul style="list-style-type: none"> ▶ Freshwater tributary systems will experience higher stream temperatures. ▶ Freshwater wetland systems (especially those dependent on surface water) may experience changes in water availability. ▶ Wapato Lake water quality is at high risk from increased temperatures. ▶ Tacoma lakes could experience higher incidences of toxic algae from warming temperatures.
Municipal water supply	<ul style="list-style-type: none"> ▶ Freshwater supply may decrease as winter snowpack decreases.
Energy supply	<ul style="list-style-type: none"> ▶ Changes in temperature, hydrological conditions, customer energy use, and the number of customers served could strain hydropower energy supply sources and systems.

Appendix B: Sea Level Rise Matrix

DRAFT



memorandum

date May 5, 2021 – revised June 2, 2021

to Beth Jarot, City of Tacoma

cc Andrea Martin, Cascadia Consulting Group

from Lindsey Sheehan, P.E., ESA

subject City of Tacoma Sea-Level Rise Matrix

As part of the City of Tacoma’s Comprehensive Climate Adaptation Strategy, ESA has developed a sea-level rise matrix to prioritize assets for implementing adaptation strategies. This memorandum documents the development of the sea-level rise matrix, which is based on the most recent downscaled sea-level rise projections from the Washington Coastal Resilience Project (WRCP). ESA worked with the project Steering Committee to identify which assets to consider in the matrix and to gather data on the assets’ life cycles. The following sections provide additional detail on this process.

1. Sea-Level Rise Projections

1.1 State Projections

In 2018 as part of the WRCP ¹, an updated assessment of projected sea-level rise for Washington State was prepared, which included projections for sea-level rise at various locations along the open coast and the Puget Sound shoreline. The University of Washington’s Climate Impact Group developed a [website](#) that includes interactive sea-level rise data visualizations to illustrate the data from the updated assessment. The report presents different sea-level rise values based on two global greenhouse gas emissions scenarios:

High Emissions Scenario (Representative Concentration Pathway (RCP) 8.5) – This scenario assumes a future where there are no significant local or global efforts to limit or reduce emissions. This scenario assumes “high

¹ Miller, I.M., Morgan, H., Mauger, G., Newton, T., Weldon, R., Schmidt, D., Welch, M., Grossman, E., 2018. Projected Sea Level Rise for Washington State – A 2018 Assessment. A collaboration of Washington Sea Grant, University of Washington Climate Impacts Group, University of Oregon, University of Washington, and US Geological Survey. Prepared for the Washington Coastal Resilience Project. updated 07/2019 <https://cig.uw.edu/resources/special-reports/sea-level-rise-in-washington-state-a-2018-assessment/> [last accessed December 28, 2020]

population and relatively slow income growth with modest rates of technological change and energy intensity improvements, leading in the long-term to high energy demand and greenhouse gas emissions”.²

Low Emissions Scenario (RCP 4.5) – This scenario assumes more aggressive emissions reduction actions corresponding to the aspirational goals of the 2015 Paris Agreement, which calls for limiting mean global warming to less than 2 degrees Celsius and achieving net-zero greenhouse gas emissions in the second half of the century. This scenario is considered challenging to achieve and would include updated climate policies, concerted action by all countries, and a shift to a lower emissions service and information economy.

The 2018 assessment provides a range of probabilistic projections of sea-level rise, which was an update specifically designed to help inform decision-makers. A second WRCP report³ discusses how coastal managers can properly apply the projections. The report provides guidance on the different probabilistic projections as follows:

High Probability Projections (>83%) – These projections are for risk-tolerant situations where infrastructure can accommodate sea-level rise impacts or where projects have significant flexibility or adaptability. This range of probabilities would be appropriate for a beach path, where the consequences of flooding would be minimal.

Mid-Range Probability Projections (83% - 17%) – This is the most likely to occur range, with the 50% probability projection representing the most likely future amount of sea-level rise based on all model projections. This scenario should be used for assets or projects that are not particularly risk-averse or risk-tolerant.

Low-Range Probability Projections (<17%) – These projections are for assets or projects that are more risk-averse and where sea-level rise will have substantial consequences. This scenario is a more conservative approach and should be used for critical infrastructure, such as sewage treatment plants or emergency response infrastructure, or others that would be seriously compromised by flooding.

Extreme Low Probability Projections (0.1%) – This projection is designed as the physical upper limit for sea-level rise. The scenario should be used only as the worst-case scenario for extremely conservative decisions. This amount of sea-level rise is unlikely to be revised upward with future scientific updates.

Table 1 shows the 2018 assessment projections for the State of Washington with the probabilities identified in the columns. While the assessment provides projections through 2150, it is important to note that sea-level rise is expected to continue for centuries, because the earth’s climate, cryosphere⁴, and ocean systems will require time to respond to the emissions that have already been released to the atmosphere. Although sea-level rise is typically presented as a range in the amount of sea-level rise that will occur by a certain date (e.g., 1-2 feet of sea-level rise by 2050), it can also be presented as a range of time during which a certain amount of sea-level rise is projected to occur (e.g., 1.5 feet of sea-level rise between 2040 and 2070). Even if emissions are reduced to levels consistent with the low-emissions-based projections, sea levels will continue to rise to higher levels, just at a later date.

² Riahi, K., Rao, S., Krey, V. et al., 2011. RCP 8.5—A scenario of comparatively high greenhouse gas emissions. *Climatic Change* 109, 33. <https://doi.org/10.1007/s10584-011-0149-y> <https://link.springer.com/article/10.1007/s10584-011-0149-y#citeas> [last accessed February 19, 2021]

³ Raymond et al, 2020. How to Choose: A Primer for Selecting Sea Level Rise Projections for Washington State,

⁴ The cryosphere is the portions of the Earth’s surface where water is in solid form, like glaciers and ice caps.

TABLE 1
ABSOLUTE SEA-LEVEL RISE PROJECTIONS FOR WASHINGTON STATE (MILLER ET AL. 2018)

PROJECTED ABSOLUTE SEA LEVEL CHANGE (feet, averaged over each 19-year time period)						
Time Period	Greenhouse Gas Scenario	Central Estimate (50%)	Likely ⁵ Range (83-17%)	Higher magnitude, but lower likelihood possibilities		
				10% probability of exceedance	1% probability of exceedance	0.1% probability of exceedance
2050 (2040-2059)	Low	0.6	0.4 - 0.8	0.9	1.2	1.8
	High	0.7	0.5 - 0.9	1.0	1.3	2.0
2100 (2090-2109)	Low	1.6	1.0 - 2.2	2.5	4.1	7.2
	High	2.0	1.4 - 2.8	3.1	4.8	8.3
2150 (2140-2159)	Low	2.5	1.5 - 3.8	4.4	8.5	16.2
	High	3.4	2.3 - 4.9	5.6	10.0	18.3

The 2018 assessment also provided local estimates of relative sea-level rise (RSLR), which combine estimates of absolute sea-level rise and vertical land movement. Where the land is uplifting, the RSLR is less than in areas where the land is subsiding. The assessment provides estimates of RSLR for 171 locations along Washington’s coastline.

1.2 Tacoma Projections

The 2018 assessment provides future flood hazards from RSLR for the Puget Sound shoreline areas of Tacoma, divided into 2 segments (Figure 1). Table 2 presents a summary of the RSLR projections for the two segments of Tacoma under both emissions scenarios and four probabilities. At most, the RSLR projections for the two segments of the Tacoma shoreline vary by 0.3 feet for the extreme probability projection for 2100. The extreme probability projection under the RCP 8.5 scenario predict an upper limit of 8.6 – 8.8 feet of RSLR. This is higher than absolute sea-level rise shown in Table 1 due to the addition of vertical land movement.

For the purposes of this project, the higher projections for the eastern segment of the city were used as a conservatively high estimate of RSLR for the full Puget Sound shoreline within Tacoma.



Figure 1. The two Tacoma shoreline segments defined in the WCRP modeling.

TABLE 2
RELATIVE SEA-LEVEL RISE PROJECTIONS FOR THE CITY OF TACOMA

Year	Area	Amount of SLR (ft)							
		RCP 4.5				RCP 8.5			
		Low (83%)	Medium (50%)	High (17%)	Extreme (0.1%)	Low (83%)	Medium (50%)	High (17%)	Extreme (0.1%)
2030	East	0.3	0.5	0.6	0.9	0.3	0.5	0.6	0.9
	West	0.2	0.4	0.5	0.8	0.3	0.4	0.5	0.8
2060	East	0.8	1.1	1.4	3	0.9	1.2	1.5	3.2
	West	0.6	0.9	1.2	2.8	0.7	1	1.3	3
2100	East	1.5	2.1	2.7	7.9	1.9	2.5	3.3	8.8
	West	1.2	1.8	2.5	7.6	1.6	2.3	3	8.6

2. Future Water Levels

2.1 Tidal Datums

The National Oceanic and Atmospheric Administration (NOAA) maintains a tide gage in the Tacoma Tideflats area (Station ID: 9446484). Table 3 provides the tidal datums based on the Tacoma gage. Assuming a RSLR increase of 8.8 feet, based on the extreme probability projection under the RCP 8.5 scenario, future mean higher high water (i.e., the average daily highest high tide; MHHW) would be 18.2 feet NAVD88⁵ in 2100 (Table 3).

TABLE 3
CURRENT AND FUTURE TIDAL DATUMS

Datum		Current Elevation (ft NAVD88)	2100 Elevation (ft NAVD88)
Mean higher high water	MHHW	9.39	18.19
Mean high water	MHW	8.51	17.31
Mean tide level	MTL	4.48	13.28
Mean sea level	MSL	4.45	13.25
Mean low water	MLW	0.45	9.25
Mean lower low water	MLLW	-2.39	6.41

⁵ North American Vertical Datum of 1988

2.2 Extreme Water Levels

The Federal Emergency Management Agency (FEMA) provides projections of extreme coastal water levels as part of their National Flood Insurance Program (NFIP). However, FEMA does not presently address climate change related flood hazards as part of the NFIP. Table 4 provides an estimate of future extreme total water elevations⁶, assuming the same RSLR increase of 8.8 feet as discussed in the previous section. While adding RSLR to the FEMA projections does not consider complex hydrodynamics including changes to waves and currents based on higher water levels inundating different land covers, it offers a good first order approximation of the elevations that may be inundated with sea-level rise.

TABLE 4
CURRENT AND FUTURE TOTAL WATER LEVELS FOR TACOMA

Return Period	Current Elevation (ft NAVD)	2100 Elevation (ft NAVD)
10-year event (10% annual chance)	14.7	23.5
50-year event (2% annual chance)	15.2	24.0
100-year event (1% annual chance)	15.3	24.1
500-year event (0.2% annual chance)	15.5	24.3

2.3 Sea-Level Rise Mapping

NOAA developed a [Sea-Level Rise Viewer](#) to view sea-level rise and potential coastal flooding impact areas and relative depth. The Viewer provides a good first-order approximation of flooding extent with different amounts of sea-level rise. The Viewer does not account for erosion and should only be used as a screening-level tool for management decisions. More refined coastal hazard modeling could be done to better evaluate the City's vulnerabilities.

3. Sea-Level Rise Matrix

In coordination with the project Steering Committee and the City's Infrastructure Committee, ESA identified key City assets that would be tidally inundated with 8.8 feet of RSLR as a conservative estimate of the assets that could experience flooding by 2100. Assets were categorized based on the categories used in the City of Tacoma's Capital Facilities Plan 2021-2026. Based on the condition/age, cost/value/importance, and function of the asset, recommendations from the WRCP, and City staff input, a probability projection or risk tolerance was assigned to the asset. Risks were generally assigned as follows:

- Parks and open space, trails and bike paths, and natural areas were assigned a 50% or mid-range probability of sea-level rise exceeding the planned amount.

⁶ The total water level represents the still water level (the result of astronomical and meteorological effects) plus the effect of waves.

- Buildings, key roads and railroad tracks, pump stations, and power substations were assigned a 17% or low-range probability of sea-level rise exceeding the planned amount.
- Public safety or public health facilities and the Central Wastewater Treatment Plant were assigned a 1% or very-low-range probability of sea-level rise exceeding the planned amount.

Next, using the corresponding sea-level rise scenario for each risk projection and elevations for each individual asset, hazard exposure was determined for each asset. The elevations are approximate based on LiDAR data in the vicinity of the asset and do not include seawalls or other structures that may protect against flooding unless otherwise noted. Therefore, the hazard exposure analysis may have resulted in conservatively high estimates of flooding in certain cases. Table 5 provides the asset matrix with the resulting exposures to flood hazards.

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Asset	Current Elevation (ft NAVD)	Condition/Age	Cost/Value/Importance	Function	Risk	Exposure	Adaptation Note
Community Development							
Sea Scouts/Tacoma Steam Plant Building	14.5 - 15.5	Built prior to 1950			17%	10-yr coastal storm flooding today, with flooding becoming more frequent through 2100	May need to be reconstructed with longer guide piles and support piles to allow infrastructure to float higher with higher water levels.
Berg Scaffolding Building	11.5 - 12.5				17%	10-yr coastal storm flooding today, tidal inundation by 2100	
16th Street Pier	n/a				n/a	Already exposed based on purpose of structure	
Kayak Float at Waterway Park	n/a				n/a	Already exposed based on purpose of structure	
North Moorage	n/a				n/a	Already exposed based on purpose of structure	
Pier A	n/a				n/a	Already exposed based on purpose of structure	
Dock St. Marina	n/a				n/a	Already exposed based on purpose of structure	
Delin Docks	n/a				n/a	Already exposed based on purpose of structure	
Cultural Facilities - none within SLR hazard zone during study timeline							
General Governmental Municipal Facilities							
Museum of Glass Garage	19				17%	Not expected to flood during 100-yr coastal storm through 2100	
Center for Urban Waters	13 - 14				17%	10-yr coastal storm flooding today, with flooding becoming more frequent through 2100	
Libraries - none within SLR hazard zone during study timeline							
Parks and Open Spaces							
Days Island	5 - 30				50%	Some areas likely flood during high tides now, and exposure will increase with sea-level rise	
Julia's Gulch	7 - 9				50%	Some areas likely flood during high tides now, and exposure will increase with sea-level rise	
Marine View Drive	~15				50%	Low points expected to flood during 100-yr coastal storm today, with frequency increasing to flooding during 10-yr coastal storm by 2030	
Marine View Drive East	~15				50%	Low points expected to flood during 100-yr coastal storm today, with frequency increasing to flooding during 10-yr coastal storm by 2030	
Swan Creek	13.5 - 15				50%	10-yr coastal storm flooding today, with flooding becoming more frequent through 2100	
Titlow Park	6 - 20				50%	Some areas likely flood during high tides now, and exposure will increase with sea-level rise	

Asset	Current Elevation (ft NAVD)	Condition/Age	Cost/Value/Importance	Function	Risk	Exposure	Adaptation Note
Parks and Open Spaces Continued							
Bayside Park	14 - 15				50%	Low points expected to flood during 10-yr coastal storm today, with flooding becoming more frequent through 2100	
Chinese Reconciliation Park	14 - 20				50%	Low points expected to flood during 10-yr coastal storm today, with flooding becoming more frequent through 2100	
Hamilton Park	~14				50%	Low points expected to flood during 10-yr coastal storm today, with flooding becoming more frequent through 2100	
Jack Hyde Park	>8				50%	Some areas likely flood during high tides now, and exposure will increase with sea-level rise	
Marine Park & Les Davis Pier	13 - 17				50%	Low points expected to flood during 10-yr coastal storm today, with flooding becoming more frequent through 2100	
Ruston Way Tidelands	>9				50%	Some areas likely flood during high tides now, and exposure will increase with sea-level rise	
Public Safety							
Marine Security Joint Operations Center	14.5 - 15				1%	10-yr coastal storm flooding today, tidal inundation by 2100	
Fire Station No. 6	15.5 - 16.5				1%	10-yr coastal storm flooding by 2030-2040, with flooding becoming more frequent through 2100	
Fire Station No. 5/renamed No. 6	14.5 - 15.5		\$7.005 million in funding in 2021-2026 CFP		1%	10-yr coastal storm flooding today, tidal inundation by 2100	
Fire Training Center	15.5 - 16.5				1%	10-yr coastal storm flooding by 2030-2040, with flooding becoming more frequent through 2100	
Transportation							
Environmental Services (Tagro) - Cavanaugh	12.5 - 13.5				17%	10-yr coastal storm flooding today, tidal inundation by 2100	
Ruston Way Trail and Bike Lane	14 - 16				50%	10-yr coastal storm flooding by 2100	
Owen Beach Trail	12 - 13				50%	10-yr coastal storm flooding today, tidal inundation around 2100	
Ruston Way	14 - 16	Built in early 1900s and renovated in mid-1980s. Poor condition			17%	10-yr coastal storm flooding today, with flooding becoming more frequent through 2100	
Marine View Drive	15 - 20				17%	100-yr coastal storm today, with frequency increasing to flooding during 10-yr coastal storm by 2030	Not city-owned
Tideflats Roads	13 - 20				17%	10-yr coastal storm flooding today, with flooding becoming more frequent through 2100	

Asset	Current Elevation (ft NAVD)	Condition/Age	Cost/Value/Importance	Function	Risk	Exposure	Adaptation Note
Transportation Continued							
Dock Street	13 - 16				17%	10-yr coastal storm flooding today, with flooding becoming more frequent through 2100	
N Schuster Pkwy (Ruston-0 Block)	13.5 - 15				17%	10-yr coastal storm flooding today, with flooding becoming more frequent through 2100	
E Dock St (E D St-SEN)	13 - 13.5				17%	10-yr coastal storm flooding today, with flooding becoming more frequent through 2100	
E D St (Dock-15th)	11.5 - 14				17%	10-yr coastal storm flooding today, tidal inundation around 2100	
Urban Waters (E D St, E F St, etc)	13 - 14				17%	10-yr coastal storm flooding today, with flooding becoming more frequent through 2100	
E 11th St (Dock-Portland)	13 - 14				17%	10-yr coastal storm flooding today, with flooding becoming more frequent through 2100	
St Paul Ave (11-Portland)	11 - 14				17%	10-yr coastal storm flooding today, tidal inundation around 2100	
E 15th St (D-St Paul) and Adjacent Streets	12 - 14				17%	10-yr coastal storm flooding today, tidal inundation around 2100	
Puyallup Ave (Milwaukee-F) and Adjacent Streets	14 - 16				17%	10-yr coastal storm flooding today, with flooding becoming more frequent through 2100	
Portland Ave (27-SEN)	12.5 - 14				17%	10-yr coastal storm flooding today, tidal inundation around 2100	
Port Streets - A (Puyallup River-Blair Waterway, SR 509-Commencement Bay)	11 - 15				17%	10-yr coastal storm flooding today, tidal inundation around 2100	
Port Streets - B (Blair Waterway-Hylebos Waterway, SR 509-Commencement Bay)	11.5 - 14				17%	10-yr coastal storm flooding today, tidal inundation around 2100	
Site 10 Seawall & Esplanade Repair and Replacement	17.6		\$1.715 million in funding in 2021-2026 CFP		17%	100-yr coastal storm flooding by 2080 and 10-yr coastal storm flooding by 2100	
Site 12 Seawall	17.6		\$1.7 million in funding in 2021-2026 CFP		17%	100-yr coastal storm flooding by 2080 and 10-yr coastal storm flooding by 2100	
Solid Waste - none within SLR hazard zone during study timeline							

Asset	Current Elevation (ft NAVD)	Condition/Age	Cost/Value/Importance	Function	Risk	Exposure	Adaptation Note
Storm Water							
Cleveland Way Pump Station	14 - 16	Installed 2016. Age of individual assets within facility varies.			17%	10-yr coastal storm flooding today, with flooding becoming more frequent through 2100	
Central WWTP Floodwall Bypass Pump Station	Flood wall protects for 500-year storm plus 1 foot.				1%	500-yr riverine storm flooding by 2040	
Wastewater							
Central Wastewater Treatment Plant	Flood wall protects for 500-year storm plus 1 foot.	Constructed in 1952			1%	500-yr riverine storm flooding by 2040	
North End Wastewater Treatment Plant						Beyond study timeline	https://www.cityoftacoma.org/go/vernment/city_departments/environmentalservices/wastewater/wastewater_system/netp
Western Slopes Wastewater Treatment Plant						Beyond study timeline	
Eductor Facility	15 - 18	Constructed in 2013. Good condition.		Area to decant water from solids collected during conveyance system cleaning.	17%	100-year coastal storm flooding today, 10-year coastal storm flooding by 2030	
Septage Facility	14.5 - 17	Constructed in 2013. Good condition.		Septage dumping station for customers	17%	10-yr coastal storm flooding today, with flooding becoming more frequent through 2100	
Wastewater Pump Stations							
2201 - Titlow	14	Constructed in 1973			17%	10-yr coastal storm flooding today, with flooding becoming more frequent through 2100	
1304 - Salmon Beach Lower	7.5 - 9.5	Constructed in 1991			17%	Already exposed to tidal inundation	
3104 - 15th & Dock	17.5 - 18.5				17%	100-yr coastal storm flooding by 2080 and 10-yr coastal storm flooding by 2100	
3101 - Dock Street	20 - 21				17%	Not expected to flood during 100-yr coastal storm through 2100	
3105 - Picks Cove	12.5 - 13	Constructed in 1980			17%	10-yr coastal storm flooding today, tidal inundation around 2100	
3103 - 11th St. Bridge	14.5 - 15	Constructed in 1981			17%	10-yr coastal storm flooding today, with flooding becoming more frequent through 2100	
4101 - Lincoln Ave.	14.5 - 15.5	Constructed in 1986			17%	10-yr coastal storm flooding today, with flooding becoming more frequent through 2100	

Asset	Current Elevation (ft NAVD)	Condition/Age	Cost/Value/Importance	Function	Risk	Exposure	Adaptation Note
Wastewater Continued							
4109 - Milwaukee Way	13.5 - 14	Constructed in 1983			17%	10-yr coastal storm flooding today, with flooding becoming more frequent through 2100	
4116 - Marshall & Port of Tacoma	15 - 16	Constructed in 1989			17%	10-yr coastal storm flooding today, with flooding becoming more frequent through 2100	
4104 - Lincoln & Port of Tacoma	13.5 - 14	Constructed in 2008			17%	10-yr coastal storm flooding today, with flooding becoming more frequent through 2100	
4105 - Ross & Port of Tacoma	14.5 - 15.5	Constructed in 2008			17%	10-yr coastal storm flooding today, with flooding becoming more frequent through 2100	
4102 - Lincoln & Alexander	14 - 15	Constructed in 1990/2012			17%	10-yr coastal storm flooding today, with flooding becoming more frequent through 2100	
4106 - Lincoln & Taylor Way	15 - 15.5	Constructed in 2007			17%	100-year coastal storm flooding today, 10-year coastal storm flooding by 2030	
4107 - Taylor Way	13 - 13.5	Constructed in 1979/2013			17%	10-yr coastal storm flooding today, with flooding becoming more frequent through 2100	
4103 - Marine View Drive	14.5 - 15	Constructed in 1990/2012			17%	10-yr coastal storm flooding today, with flooding becoming more frequent through 2100	
4108 - Marine View Drive	16.5 - 17	Constructed in 1989			17%	100-yr coastal storm flooding by 2050 and 10-yr coastal storm flooding by 2070	
Tacoma Power							
Alexander Distribution Substation	14.5 - 15.5	Constructed in 1977 with some rebuild in 1998	Critical to local customers; \$6-10M to replace	Distribution Substation, which transforms power from high voltage to medium voltage.	17%	10-yr coastal storm flooding today, with flooding becoming more frequent through 2100	
Blair Distribution Substation	16 - 18	Constructed in 2004	Critical to local customers; \$6-10M to replace	Distribution Substation, which transforms power from high voltage to medium voltage.	17%	100-yr coastal storm flooding by 2040, with frequency increasing to flooding during 10-yr coastal storm by 2060	
East F Distribution Substation	15.5 - 16.5	Constructed in 1970 with full rebuild in 2016	Critical to local customers; \$6-10M to replace	Distribution Substation, which transforms power from high voltage to medium voltage.	17%	100-yr coastal storm flooding today, with frequency increasing to flooding during 10-yr coastal storm by 2040	
Lincoln Distribution Substation	14 - 15.5	Constructed in 1999	Critical to local customers; \$6-10M to replace	Distribution Substation, which transforms power from high voltage to medium voltage.	17%	10-yr coastal storm flooding today, with flooding becoming more frequent through 2100	

Asset	Current Elevation (ft NAVD)	Condition/Age	Cost/Value/Importance	Function	Risk	Exposure	Adaptation Note
Tacoma Power Continued							
Northeast Distribution Substation	12.9 - 15	Constructed in 1972	Critical to power system; \$20-30M to replace	Transmission and Switching Substation.	1%	10-yr coastal storm flooding today, high tide inundation by 2080	
Milwaukee Distribution Substation	12.8 - 13.5	Constructed in 2010	Critical to local customers; \$6-10M to replace	Distribution Substation, which transforms power from high voltage to medium voltage.	17%	10-yr coastal storm flooding today, high tide inundation by 2100	
Taylor Distribution Substation	14.4 - 17	Constructed in 2018	Critical to large customer; \$6-10M to replace	Distribution Substation, which transforms power from high voltage to medium voltage.	17%	10-yr coastal storm flooding today, with flooding becoming more frequent through 2100	
Municipal Railway							
Tacoma Rail, Tidelands Headquarters	16.5 - 18.5				17%	100-yr coastal storm flooding by 2050, with frequency increasing to flooding during 10-yr coastal storm by 2070	
Tidelands Track	>13				17%	10-yr coastal storm flooding today, spring high tide inundation by 2100	
Water							
Highland Pump Station	16 - 18				17%	100-yr coastal storm flooding by 2040, with frequency increasing to flooding during 10-yr coastal storm by 2060	
Natural Areas							
Gog-le-hi-te Wetlands	High ground is 18 - 20 ft				50%	Already exposed based on type of habitat	Some habitat transgression area
Puget Gulch	Some areas down to 15 ft				50%	Already exposed based on type of habitat	Room for habitat to transgress upstream
Swan Creek	Some existing low areas				50%	Already exposed based on type of habitat	Room for habitat to transgress upstream
Public Health							
Franciscan Occupational Health - Port Clinic	14 - 14.5				1%	10-yr coastal storm flooding today, tidal inundation by 2100	

4. Results

The exposure column of Table 5 is color coded to represent the more exposed assets in darker blues and the lesser exposed assets in lighter blues. The hazard analysis identified two types of assets for the City to prioritize:

- High consequence assets – assets where failure could result in considerable public health, public safety, or environmental impacts.
- High exposure assets – assets that are most at risk for impacts with RSLR.

4.1 High Consequence Assets

The high consequence assets are assets the City will want to prioritize for adapting to sea-level rise to avoid failure of the asset. These assets include (in order of exposure):

- Within the 10-year coastal storm flood elevation today, with risk of tidal flooding by 2100:
 - Marine Joint Operations Center
 - Fire Station Number 5
 - Franciscan Occupational Health (Port Clinic)
- Within the 10-year coastal storm flood elevation by 2030-2040, with flooding becoming more frequent through 2100:
 - Fire Station Number 6
 - Fire Training Center
- Central Wastewater Treatment Plant and Floodwall Bypass Pump Station: The Plant and Pump Station are protected from the 500-year riverine storm event with a floodwall with 1 foot of freeboard. Sea-level rise will eliminate this freeboard by 2040.

4.2 High Exposure Assets

The high exposure assets should also be prioritized for adapting to sea-level rise as they will be the first assets impacted. These assets include (in order of exposure):

- Salmon Beach Lower Pump Station
- St. Paul Avenue (11th St. to Portland St.)
- Port Streets – A (Puyallup River to Blair Waterway to SR 509 to Commencement Bay)
- Berg Scaffolding Building
- E. D Street (Dock St. to 15th St.)
- Port Streets – B (Blair Waterway to Hylebos Waterway to SR 509 to Commencement Bay)

- E. 15th Street (D St. to St. Paul Ave.) and adjacent streets
- Picks Cove Pump Station
- Environmental Services (Tagro) – Cavanaugh
- Portland Avenue

4.3 Conclusions

When planning for adaptation to sea-level rise, the City could consider a two-phased approach. Initially, the City will be able to develop asset-specific adaptation strategies to address the most at-risk assets. However, at a certain point (when water levels regularly reach around 11 – 12 feet NAVD likely around 2050 – 2080), much of the key infrastructure in the Tideflats, including the roads, will be at risk for flooding. At this stage, the City will need to collaborate with the City of Fife, the Puyallup Tribe of Indians, Port of Tacoma, BNSF Railway, and Pierce County to develop a broader adaptation strategy to address flooding across the Tideflats area.

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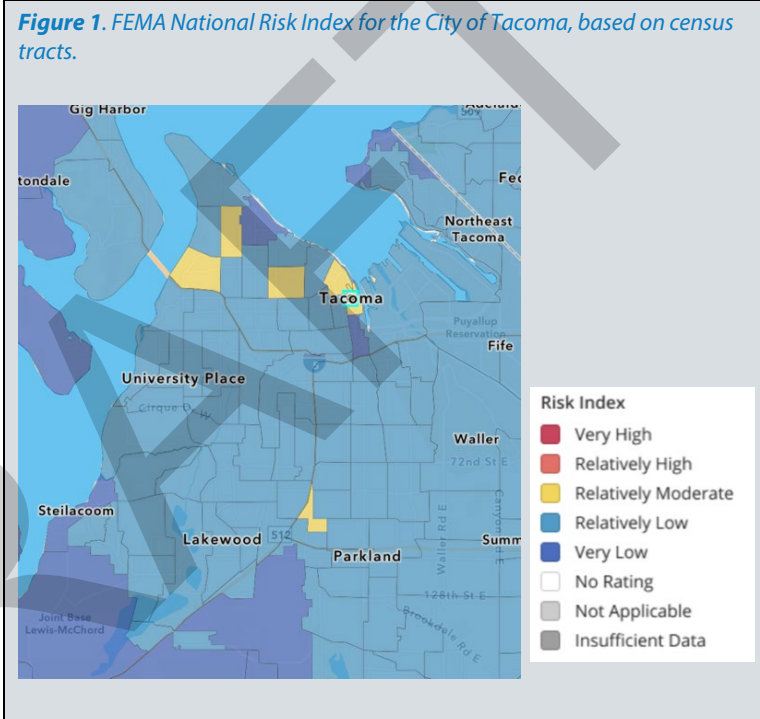
Appendix C: Benefit-Cost Analysis

The benefit cost-assessment (BCA) provides an overview of the economic implications of climate hazards and impacts in Tacoma and how the Tacoma Adaptation Strategy can reduce Tacoma’s exposure and costs associated with climate impacts. Knowing the benefits and costs of each action will help guide which actions to prioritize. Benefits include impacts to human life, infrastructure, and property. Costs include staffing, materials, capital infrastructure, plan development, and technology.

Methodology

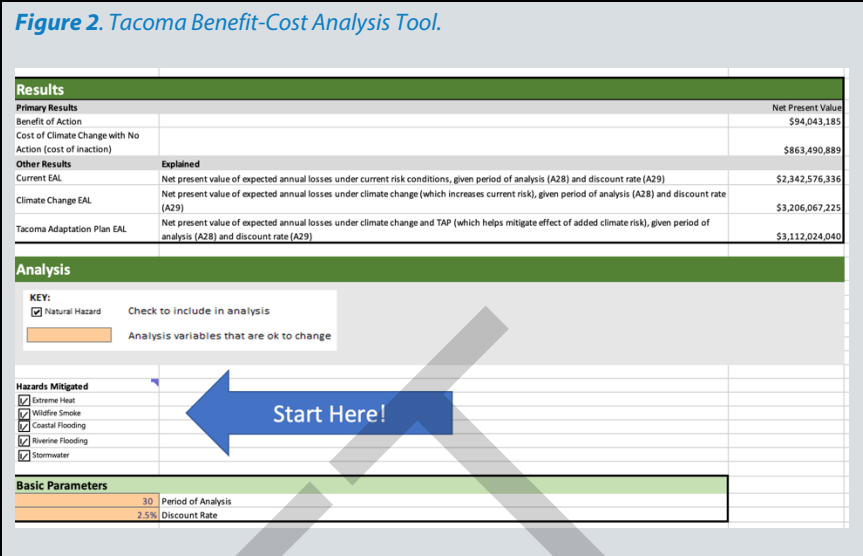
The benefits of the actions were estimated by using the FEMA National Risk Index which characterizes 18 natural hazard risks¹, plus social vulnerability, and community resilience. The main climate change hazards that Tacoma faces include extreme heat, coastal flooding, river flooding, landslide, and wildfire smoke.

- ▶ Extreme heat increases mortalities associated with extreme heat events (above 82 degrees F).
- ▶ Coastal flooding includes tidal flooding which is compounded by sea level rise, coastal storms, and damages buildings and other structures.
- ▶ River flooding is the predicted within the floodplain. This impacts structures, population, and agriculture.
- ▶ Landslides impact homes and buildings in certain areas and infrastructure like roads, rail, and stormwater.
- ▶ Wildfire smoke increases mortalities due to respiratory and cardiovascular issues.



¹ Risk is identified as the likelihood of exposure multiplied by the economic consequence of that exposure.

The BCA estimates the net present value (NPV) of expected losses on an annualized basis and extended out for a hundred years, discounted at a rate of 2.5%. In the table below, the “Status quo” column shows expected annual losses that the City can experience from current hazards. The “Status quo over 100 years” shows the long-term costs that the City can experience from current hazards absent future climate change. The “Future climate change” column shows how hazards will worsen under future climate change and its economic impact on the City for the next 100 years. Finally, the “Tacoma Adaptation Strategy” column shows the NPV of avoided damages from this Strategy. Individual cost of CAS inaction—or the embedded costs of not successfully implementing the actions in the CAS—calculations are directly associated with each action and can be referenced in the action-specific tables.



Hazard	Status quo: NPV of annual expected losses from hazards	Status quo over 100 years: NPV of expected losses from hazards over 100 years	Future climate change: NPV of expected losses from hazards, considering how climate change will exacerbate current hazards	Tacoma Adaptation Strategy: NPV of damage avoided from hazard exposure reduction over 100 years
Coastal Flood	\$59,200,000	\$2.2 billion	\$3.1 billion	\$116 million
Extreme Heat	\$9,247,920	\$347 million	\$729 million	\$34 million
Landslide	\$684,780	\$26 million	\$39 million	\$3.9 million
River Flood	\$60,247	\$2.3 million	\$4.3 million	\$430,000
Wildfire Smoke	\$40,000,000	\$1.5 billion	\$1.7 billion	\$10 million

Action Assumptions

The table below provides high-level details in the benefit and cost assumptions of each of the actions in the Tacoma Climate Adaptation Strategy.

Action	Hazards addressed	Benefit assumptions	Cost assumptions
Site-by-site flooding evaluation & planning		The evaluation will identify at-risk buildings and people and allow Tacoma to prepare accordingly.	Cost of the vulnerability assessment.
Capital project standards & tools		New development will be able to accommodate high heat and wildfire smoke – reduction in human health impacts.	Cost of tools and standards development. Ongoing program administration costs.
Development code improvements		Future buildings will incorporate climate-conscious planning, population will be less susceptible to these impacts.	Cost to conduct study and develop HVAC and building material code improvements.
Capital project planning, prioritization, & implementation		Reduced impact of at-risk buildings and population. *Does not include stormwater flooding*	Cost of upgrading stormwater system and program administration. Ongoing O&M costs.
Natural systems condition assessment & monitoring program		Reduction in damages to assets at risk from SLR, flooding, and landslide.	Cost to conduct initial assessment; ongoing program administration.
Nearshore transitional zones		Reduction in damages to assets at risk from SLR, flooding, and landslide.	Cost to conduct initial assessment, cost of nearshore restoration, cost of ongoing monitoring program.
Habitat restoration project guidance & resilience		Reduction in likelihood of slide and flooding (frequency), as well as provide refuge during heat island events (exposure).	Annual per acre cost for restoration, program administration.
Business engagement & continuity planning		Not estimated.	Not estimated.

Action	Hazards addressed	Benefit assumptions	Cost assumptions
Just & green jobs transition plan		Benefits not quantified due to wide variability in action parameters and associated impacts.	Cost of staff time to develop workforce grant application. \$100k annually for workforce development grant program funded by the city.
Cooling & air quality resilience hubs		At-risk population will have places to seek refuge during extreme heat events.	Establishing 3 resilience hubs in the most critical locations. Ongoing O&M costs.
Co-create climate communications		TAP will prepare the city to deal with climate change driven hazards, reducing the risk to Tacoma's population.	\$50k in startup costs and ongoing cost of staff time.
Develop a coordinated strategy for addressing extreme heat and smoke risks		Avoided costs associated with people who suffer from health impacts (mortality) associated with wildfire smoke and heat hazards.	\$60 per filter box fans for 12,450 box fans. Cost to administer program.
Climate equity initiatives		Benefits not quantified due to wide variability in action parameters and associated impacts.	Cost of climate equity fellow, cost of racial equity trainings and materials.
Regional coordination		Reduction in the frequency and extent of flooding.	\$1.5 million in initial restoration planning, modeling, capital investments for 2 major watershed basins; \$60,000 in ongoing restoration maintenance costs.
Economic ROI tools		Benefits not quantified due to wide variability in action parameters and associated impacts.	Cost to create economic tools, based on similar tools developed in Redmond, WA.
Community check-ins		Benefits not quantified due to wide variability in action parameters and associated impacts.	Ongoing 0.15 FTE cost with \$25,000 in initial cost and \$5,000 in ongoing costs for materials with translation services.

Considerations

The estimated benefits of actions are conservative because of the limitations of the FEMA National Risk Index model and limited information regarding the impacts of supportive actions. The model does not consider the economic losses such as reduced tourism or work productivity. It also does not consider increased morbidity and the costs associated with increased hospitalizations. During the recent 2021 summer heat wave, regional hospitals were at capacity, and they activated their emergency response. Furthermore, the FEMA National Risk Index model does not measure the indirect benefits of “soft” or supportive actions like co-creating climate communications or a just and green jobs transition plan. These benefits are more difficult to measure and are not estimated in this cost-benefit analysis.

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Appendix D: Capital Facilities Assessment

Date: August 23, 2021

To: City of Tacoma Climate Adaptation Strategy Steering Committee
Beth Jarot, City of Tacoma

Copy to: Andrea Martin, Cascadia Consulting Group
Mike Chang, Cascadia Consulting Group

From: Matt Fontaine, Herrera Environmental Consultants
Julianne Chechanover, Herrera Environmental Consultants

Subject: Task 2.6 – Capital Facilities Adaptation Assessment

Introduction

The City of Tacoma (City) is in the process of understanding how City departments and Metro Parks Tacoma are integrating climate change and social equity into their capital planning processes. Currently, these departments both independently and collaboratively incorporate various levels of climate adaptation measures and social equity considerations into their planning processes. To gain a better understanding of these processes, this technical memorandum serves to:

- ▶ Document how climate change and social equity is being incorporated into City capital planning processes
- ▶ Provide recommendations to further incorporate climate change and social equity into City capital planning processes

It should be noted that the recommendations provided in this memorandum are not a comprehensive or exhaustive list but create an opportunity for the departments to learn from each other and create a foundation to continue incorporating climate change and social equity into their capital planning processes.

Methods of Analysis

Five city departments and Metro Parks Tacoma were interviewed about their current capital planning processes and how climate change and social equity are currently being incorporated into those processes. These departments were selected for the following reasons:

- ▶ They are the primary departments within and affiliated with the City of Tacoma that are managing infrastructure projects.
- ▶ They are able to incorporate climate change and social equity into their infrastructure projects.
- ▶ They are active members of the City's Climate Adaptation Strategy Steering Committee.

The City’s Office of Management and Budget was also interviewed about how climate change and social equity is being incorporated in the Capital Facilities Plan (CFP). These departments and their points of contact are summarized in Figure 1 and Table 1, respectively.

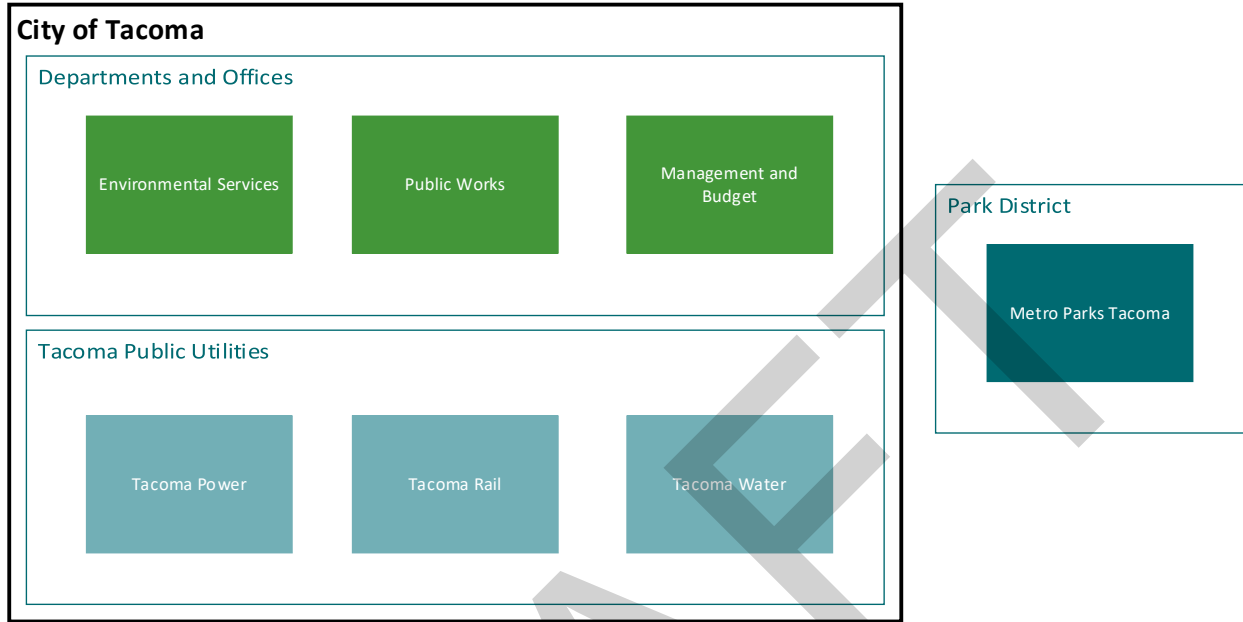


Figure 1. Departments interviewed during this study.

Table 1. Points of Contact.				
Name	Title	Department	Email	Phone
Karen Bartlett	Principal Engineer	Environmental Services	kbartlet@cityoftacoma.org	(253) 502-2257
Chris Larson	Engineering Division Manager	Public Works	clarson@cityoftacoma.org	(253) 591-5538
Nick Anderson	Management Analyst	Management and Budget	nanderson@cityoftacoma.org	(253) 591-5847
Bonnie Meyer	Facilities Conservation and Planning Administrator	Tacoma Power	bmeyer@cityoftacoma.org	(253) 753-3027
Terry Coggins	Facility Manager		tcoggins@cityoftacoma.org	(253) 502-8310
Alan Matheson	Assistant Superintendent	Tacoma Rail	amatheson@cityoftacoma.org	(253) 502-8934
Tosha Siebert	Assistant Division Manager for System and Asset Planning	Tacoma Water	tsiebert@cityoftacoma.org	(253) 878-2323
Jessica Knickerbocker	Project Delivery Manager		jknicker@cityoftacoma.org	(253) 502-2119
Marty Stump	Deputy Director	Metro Parks Tacoma	marty@tacomaparks.com	(253) 305-1078

Results

Generalized Capital Planning Process

For consistency across all departments (excluding Management and Budget), a generalized version of capital planning process was illustrated based on questionnaire responses and displayed in Figure 2.

Most departments have identified ways that they already incorporate climate change and social equity in their capital planning processes. These adaptation measures and recommended adaptation measures are described in more detail in the following section.

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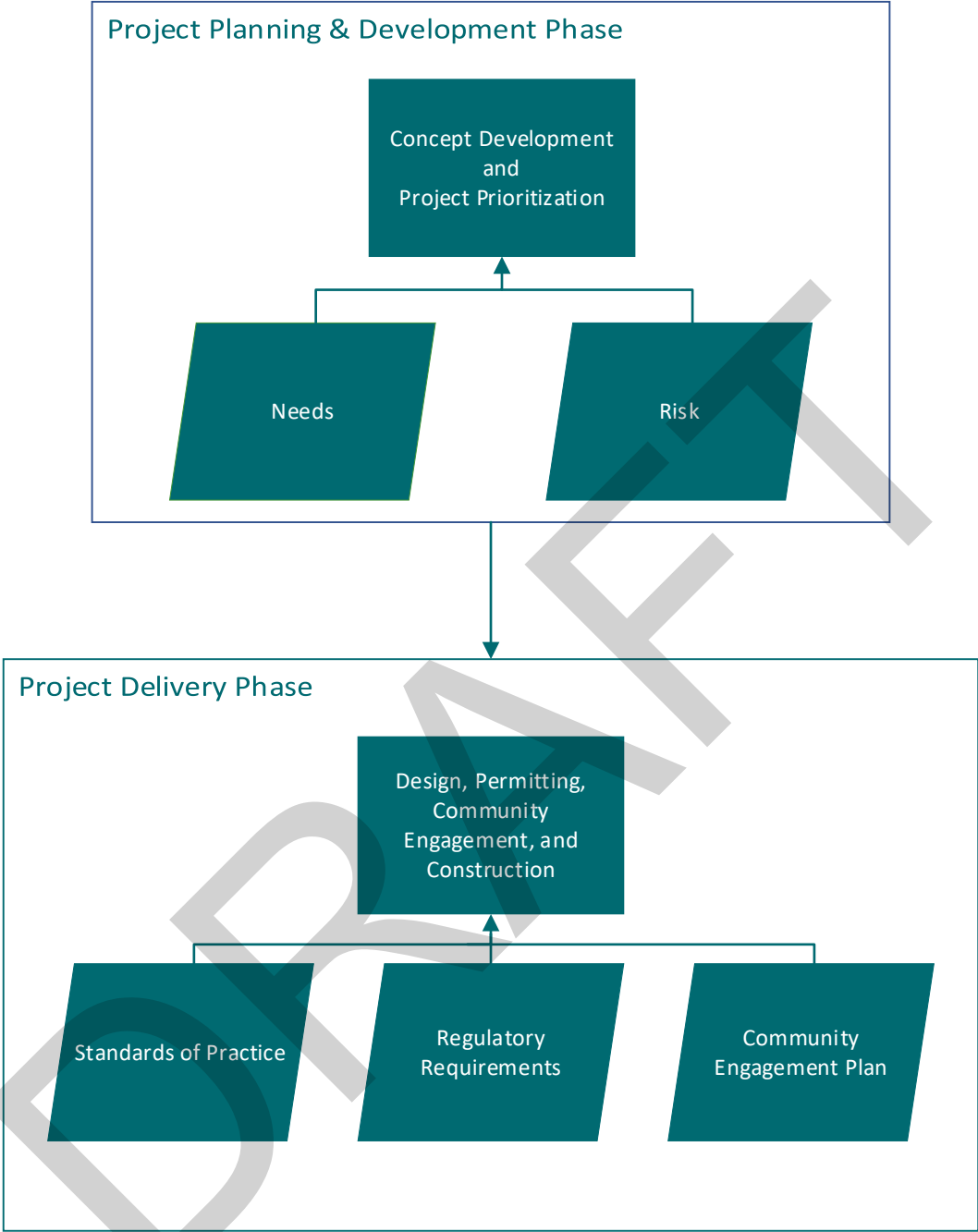


Figure 2. Generalized capital planning process.

Climate Adaptation Measures

Each department has taken their own approach to implementing climate change adaption and social equity measures into their capital planning process. The existing and recommended adaptation measures are grouped by the interviewed departments shown in Figure 1. Each adaptation measure is organized into either the Project Planning & Development Phase or Project Delivery Phase of the flowchart shown in Figure 2. Information about how all departments can further incorporate climate

change and social equity in their capital planning process can be found in the Overall Recommendations section of this memorandum.

Departments and Offices

Environmental Services

Existing Climate Adaptation and Social Equity Measures

Environmental Services incorporates social equity into the Project Planning & Development Phase of their capital planning process. For example, Environmental Services uses the City's Equity Index when working with Public Works on planning stormwater or wastewater pipe installation projects that correspond with streets projects. Environmental Services also incorporates social equity and climate change into the Project Delivery Phase of their capital planning process. Social equity is incorporated in the design and community engagement processes through developing green stormwater infrastructure (GSI) in areas with a low equity index score and incorporating citizen feedback about localized flooding issues. Climate change is incorporated by upsizing stormwater pipes during design to account for increased flow rates. Environmental Services is also currently in the process of investigating incorporation of a climate change-based design storm into their Standards of Practice (Stormwater Management Manual [SWMM]).

Recommended Climate Adaptation and Social Equity Measures

Environmental Services oversees solid waste, surface water, and wastewater management within the City. Each division should consider incorporating climate change into the Project Planning & Development Phase and Project Delivery Phase of their capital planning process.

Recommendations for each of the divisions are outlined below:

- ▶ **Solid Waste Management Division:** In the Solid Waste Management Plan, discuss contaminated site management at the Tacoma Recovery and Transfer Station due to flooding from extreme precipitation events. Consider collaborating with Emergency Management on Disaster Debris Management Plan to ensure compliance with regulations and minimize the impact to the environment and human health.
- ▶ **Surface Water Management Division:** Finalize the implementation of a climate change-based design storm in the SWMM and work with Metro Parks Tacoma and Public Works on implementing GSI projects. GSI has many co-benefits related to climate change and social equity including, but not limited to, the following:
 - Reducing impacts of higher temperatures (climate change)
 - Beautifying neighborhoods (social equity)
 - Reducing respiratory and heat-related illnesses (social equity)
 - Improving air quality (social equity and climate change)
 - Reducing flooding (climate change)

Incorporating climate change-based standards into SWMM requirements that apply to the public may be a controversial action due to uncertainty with climate projections and costs to developers for larger stormwater facilities. An interim step could be to develop a standard of practice that is followed on City projects, particularly conveyance projects, until SWMM requirements can be defined and adopted.

- ▶ **Wastewater Management Division:** Consider investigating additional odor control at the North End Wastewater Treatment Plant, Central Wastewater Treatment Plant, and wastewater pump stations. This is due to increased hydrogen sulfide production caused by increased temperatures. Work with Surface Water Management on implementation of a climate change-based design storm to prepare for increased inflow and infiltration (I&I) in wastewater collection systems. This would include incorporating sea level rise (SLR) and saltwater intrusion into the design process and integrating findings from the Shoreline SLR Assessment when planning for new capital projects.

Public Works

Existing Climate Adaptation and Social Equity Measures

Public Works incorporates social equity into the Project Planning & Development Phase of their capital planning process. As described above, Public Works uses the City's Equity Index when prioritizing Tacoma Street Initiative with Environmental Services and considers equity on their other transportation infrastructure projects as well. Public Works has also **started to investigate how climate change will change water levels, storm drainage, and vegetation requirements, which may potentially impact the planning and design of their capital projects.**

Recommended Climate Adaptation and Social Equity Measures

Public Works should continue to investigate climate change and incorporate it into their capital planning process. It is recommended that Public Works investigates the impacts of flooding on physical road damage, road closures, and network disruptions (e.g., electrical networks for streetlights and traffic lights). This can be included as a Risk in the Project Planning & Development Phase of the capital planning process. Public Works should work alongside Tacoma Rail and the Port of Tacoma on intermodal projects to ensure networks are in place during extreme climate events.

Management and Budget

Existing Climate Adaptation and Social Equity Measures

Management and Budget oversees the execution of the CFP. Each project within the CFP is required to answer 14 questions to group the projects into tiers. This ensures that the projects align with Tacoma 2025 goals as well as other planning document goals (e.g., Puget Sound Regional Council Plans, Transportation Master Plans, etc.). Out of the 14 questions, four questions relate to climate change and social equity. These questions are summarized below:

1. Does the project improve the equitable access to public facilities and services? (social equity)
2. Does the project align with Tacoma 2025 or other City priorities? (climate change and social equity)
3. Does the project reduce greenhouse gas emissions or support the adaptation of climate change? (climate change)
4. Does the project meet growth patterns and projected needs and/or serve new development and redevelopment? (Is the project in a mixed-use center?) (climate change and social equity)

In addition to the CFP, Management and Budget staff have been collaborating with other City departments on organizing an internal team to evaluate capital project prioritization called the Capital Planning Committee. This team has been investigating how to include climate change and equity into capital projects with a focus on city-owned building projects.

Recommended Climate Adaptation and Social Equity Measures

Capital Facilities Plan

Management and Budget should consider rephrasing and elaborating on the CFP questions above to include more climate change adaptation and social equity measures. It is recommended that the questions are rephrased to say how the projects plan on incorporating climate change adaptation and social equity measures as opposed to asking if they do so. This would suggest that climate change adaptations and social equity considerations are required instead of recommended.

It is also recommended that Question #3 is split into two questions. This is due to the fact that reducing greenhouse gas emissions is a mitigative measure while the rest of the question focuses on adaptive measures. This would allow for both climate change mitigation and adaptation to be required as opposed to one or the other. In regard to social equity, Management and Budget should consider asking how the project plans on including the City's Social Equity Index. This can be done by rephrasing Question #1 as the following: "How does the project incorporate the City's Social Equity Index (e.g., improve the equitable access to public facilities and services)?"

Capital Planning Committee

Management and Budget staff should continue to convene the Capital Planning Committee on a regular basis. The committee should consider expanding their focus to include other capital projects as it becomes more established and collaborate with members of the Climate Adaptation Strategy Steering Committee when discussing climate change adaptation and social equity measures.

Tacoma Public Utilities

Tacoma Power

Existing Climate Adaptation and Social Equity Measures

Tacoma Power does extensive planning related to climate change. In 2020, Tacoma Power developed an Integrated Resource Plan. This plan included refining their climate change modeling efforts with more recent climate change projections (e.g., temperatures and inflows) to understand the impact on future loads and generations. This could be considered a Risk in the Project Planning & Development Phase. Tacoma Power is also planning for change in how they maintain their lands, forests, and facilities due to climate change as well.

When building or remodeling facilities, Tacoma Power uses the Leadership for Equity Assessment & Development (LEAD) tool. They use this social equity tool to ensure they are identifying best public transportation available, following Americans with Disabilities Act rules, and providing excellent customer service to all people.

Recommended Climate Adaptation and Social Equity Measures

Tacoma Power should continue to work on their climate adaptation planning and incorporating social equity into their projects. It is recommended that Tacoma Power continues to plan for flooding events, especially for climate susceptible infrastructure (e.g., utility pole structures in the floodplain) to ensure adequate service to their customers. Tacoma Power should also consider using the City's Equity Index to be consistent with other departments when considering equity in their capital planning process.

Tacoma Rail

Existing Climate Adaptation and Social Equity Measures

Tacoma Rail currently does not incorporate social equity or climate change adaptations in their capital planning processes. Climate change, specifically sea level rise, is being considered for future rail infrastructure projects.

Recommended Climate Adaptation and Social Equity Measures

Tacoma Rail should continue to work with the Port of Tacoma on intermodal projects and start to coordinate with Public Works to minimize the loss of freight during extreme climate events. Tacoma Rail should also consider investigating the interaction between extreme climate events and railway management. This could include incorporating a warning and monitoring system to ensure the safety of Tacoma Rail's assets. Tacoma Rail should also plan for maintaining bank stability near their rail lines that may be impacted by more severe flooding events. This can be incorporated as a Risk in Project Planning & Development phase.

Tacoma Water

Existing Climate Adaptation and Social Equity Measures

In 2015, Tacoma Water conducted a vulnerability assessment that considered natural threats to their system. Similar to Tacoma Power, Tacoma Water also developed an Integrated Resource Plan in 2018 that documented supply resource needs due to the impacts of climate change. This included investigating the impact of drought conditions on Tacoma Water's well assets. In addition to incorporating climate change into their planning efforts, Tacoma Water also uses the Equity Index during Concept Development and Project Prioritization in the Project Planning & Development phase.

Recommended Climate Adaptation and Social Equity Measures

Tacoma Water should investigate the influence of climate change on source water quality (e.g., temperature), which can potentially impact treatment and performance at the Green River Water Filtration Facility and storage at the McMillin Reservoir. This can be incorporated as a Risk in the Project Planning & Development phase of capital planning process. Tacoma Water should also consider the impacts of saltwater intrusion on their well assets as a Risk in Project Planning & Development phase as well.

Park District

Metro Parks Tacoma

Existing Climate Adaptation and Social Equity Measures

Metro Parks Tacoma incorporates social equity into the Project Planning & Development Phase of their capital planning process. This includes using the City's Equity Index during Concept Development and Project Prioritization. Metro Parks Tacoma also incorporates climate change into the Project Delivery Phase of their capital planning process as a design driver. For example, sea level rise projections are a design criterion in the renovation and redevelopment project at Owen Beach.

Recommended Climate Adaptation and Social Equity Measures

Metro Parks Tacoma should collaborate with Environmental Services on incorporating GSI into parks projects (see co-benefits of GSI in the Environmental Services section above). This could be incorporated as a Need for all parks projects in the Project Planning & Development Phase. In addition, Metro Parks Tacoma should consider developing waterfront and shoreline parks to reduce the impacts of flooding on inland areas. Similar to the Owen Beach project described above, sea level rise projections should be incorporated in all future waterfront and shoreline park projects to ensure the parks' facilities can adapt to extreme climate events.

Summary

Five city departments and Metro Parks Tacoma, interviewed during this study, are currently incorporating climate change and social equity into their capital planning processes. Management and Budget is also considering climate change and social equity in the CFP and the Capital Planning Committee.

Of all departments interviewed, Environmental Services, Tacoma Power, Tacoma Water, and Metro Parks Tacoma currently incorporate climate change into their Project Planning & Development Phase. Climate change is also being incorporated into the Project Delivery Phase by Environmental Services and Metro Parks Tacoma. It should be noted that Public Works and Tacoma Rail have started investigating the incorporation of climate change into their capital planning processes.

Environmental Services, Metro Parks Tacoma, Public Works, and Tacoma Water use the City's Equity Index in their Project Planning & Development Phase. All departments (excluding Management and Budget) incorporate social equity into the procurement process to incentivize minority and women-owned business enterprise (MWBE) contractor participation in their projects during the Project Planning & Development Phase and Project Delivery Phase.

Overall Recommendations

Each department has started and has the potential to include more climate change and social equity considerations in their capital planning processes. Many recommendations can be applied across multiple or all departments. Overall recommendations for climate change and social equity are discussed in more detail below. The relationship between these recommendations and the City's Crosswalk between Climate Adaptation Planning Actions and Adaptation High Priority Actions are summarized in the last section of this report.

Climate Change

Similar to Tacoma Water, City departments and Metro Parks Tacoma should assess the vulnerability of their current assets to climate change to gain a better understanding of the risks at a project scale. The Shoreline Condition Assessment & Monitoring Program will develop information that can be used by all departments during their assessment. The results from these vulnerability assessments can be incorporated as a Risk in the Project Planning & Development Phase.

City departments and Metro Parks Tacoma can also incorporate climate change in their Standards of Practice similar to what is being considered by Environmental Services. This includes incorporating climate change language into design standards, manuals, and checklists. Two examples of cities incorporating climate change language into Standards of Practice include the City of San Francisco,

California and New York, New York. The City of San Francisco has developed Guidance for Incorporating Sea Level Rise in Capital Planning (2020a) and is requiring all projects within their “Sea-Level Rise Vulnerability Zone” (or 1-in-100-year storm plus 66 inches of sea level rise) to follow their Sea Level Rise Checklist (2020b). New York City Mayor’s Office of Resiliency has developed Climate Resiliency Guidelines (2020) to incorporate climate change, such as storm surge and sea level rise, during design and construction.

Since there is uncertainty about long-term effects of climate change, it is important to note that capital improvements should be planned and designed to withstand the range of potential climate conditions anticipated over their useful life.

Social Equity

In regard to social equity, City departments and Metro Parks Tacoma should consider expanding inclusion requirements in their procurement processes in the Project Planning & Development Phase or Project Delivery Phase. This can include incorporating social equity requirements during the Request for Proposals or bid stage of the project. City departments and Metro Parks Tacoma should continue to use the Equity Index to ensure that projects are prioritized for areas with a low Equity Index score and incorporate Tacoma-Pierce County Health Department’s Health-in-all-policies Tools during the Project Planning & Development Phase. As part of the Community Engagement Plan, the departments should reach out to a diverse group of stakeholders and incorporate their feedback as a Need in the Project Planning & Development Phase. Projects should also continue to be prioritized in vulnerable neighborhoods that are more susceptible to receiving the negative impacts of climate change based on the City’s Equity Index.

Climate Change and Social Equity

In the Project Planning & Development Phase, both climate change and social equity should be added as scoring criteria for capital projects. This can be incorporated as a general criterion or requiring that the project meets specific desired outcomes (e.g., reducing the risk of losses from flooding, in an area of Low or Very Low opportunity on the City’s Equity Index, etc.). An example of this type of CIP scoring criteria is currently being done by the City of Oakland, California (2018) and is summarized below:

- ▶ Collaboration: Combine city projects to save time and money (8 points)
- ▶ Economy: Benefit small Oakland businesses and create local job opportunities (13 points)
- ▶ Environment: Improve the environment and address **climate change** (11 points)
- ▶ **Equity**: Investment in underserved communities (16 points)
- ▶ Existing Conditions: Renovate or replace broken or outdated City property (13 points)
- ▶ Health/Safety: Improve safety and encourage healthy living (16 points)
- ▶ Improvement: Build new and upgrade a city-owned property (8 points)
- ▶ Project Readiness: Ready-to-go projects without delay (5 points)
- ▶ Required Work: Areas where the city may be held financially and legally responsible (10 points)

Climate Adaptation Planning Actions and Adaptation High Priority Actions Crosswalk

Recommended adaptation measures summarized in this technical memorandum align with the following high priority climate adaptation actions:

- ▶ Capital project standards & tools
- ▶ Capital project planning, prioritization, and implementation
- ▶ Neighborhood-specific investments
- ▶ Shoreline condition assessment & monitoring program

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Appendix E: Potential Climate Adaptations for City Policies & Procedures

Name	Title, Plans, and Chapters	Potential Climate Adaptations	Examples
Tacoma Municipal Code (TMC)	<p>Title 2 – Building and Development Code</p> <p>Title 13 – Land Use Regulatory Code</p>	<p>Require large new buildings to incorporate solar or living roofs.</p> <p>Require development to implement measures to reduce heat island effects, such as incorporating roof reflectivity requirement on new and replaced residential roofs.</p> <p>Develop a Flood Damage Protection Ordinance or Sea Level Rise Flood Damage Ordinance.</p> <p>Promote public benefits and climate adaptation through bonus building capacity.</p> <p>Consider adding the National Healthy Housing Standard to referenced technical codes.</p>	<p>City of San Francisco’s Planning Code, Section 149, Better Roofs; Living Roof Alternative.</p> <p>City of Los Angeles’ Cool Roofs Ordinance.</p> <p>Island County Code, Title XIV – Buildings and Construction, Chapter 14.02A – Flood Damage Prevention Ordinance.</p> <p>City of Olympia’s Sea Level Rise Response Plan.</p> <p>City of Miami’s 21 Zoning Code (Miami 21), Section 3.14, Public Benefits Program (Florida).</p> <p>City of Auburn’s Construction Administrative Code, Section 15.07.010, General.</p>

<p>Title 12 – Utilities</p>	<p>Provide language to support recommendations in in the Right-of-Way Design Manual including the following: reclaimed water, permeable pavement use for shared paths, and alternative pavement options for roads.</p>	<p>City of Olympia’s Municipal Code, Chapter 13.24, Reclaimed Water. City of Issaquah’s Municipal Code, Chapter 18.07, Required Development and Design Standards, 18.07.050 Impervious Surface. City of Battle Ground’s Municipal Code, Chapter 12.116, Transportation Standards, 12.116.080 Transportation Facilities – Traffic Calming Measures.</p>
<p>Title 19 – Shoreline Master Program</p>	<p>Prepare for changing base flood elevations. Develop a plan for stormwater outfalls and culverts being inundated (may require tide gates and/or pinch valves to accommodate an increase in flooding). Increase setback distances on coastal bluffs over time. Prioritize the evaluation of contaminated areas to ensure they can withstand sea level rise. Consider bigger buffers around shorelines to combat accelerated coastal erosion. Incorporate climate change into Critical Area Ordinance.</p>	<p>City of Port Orchard’s Shoreline Master Program. City of Langley’s Shoreline Master Program, Policy 6 (2013). City of Burien’s Shoreline Master Program, Policy 4 (2019). City of Ocean Shores’ Shoreline Master Program, Policy B (2018). City of Port Angeles’ Shoreline Master Program, Critical Areas (Geological Hazardous Areas), Regulation 2 (2014). City of Bainbridge Island’s Ordinance No. 2020-17, Critical Area Ordinance. San Juan County’s Shoreline Master Program, General Environmental Protection (2021).</p>

Open Space Program	Strategic 20-Year Passive Open Space Plan	Develop an addendum to address climate change in the open space planning process to include nature-based climate solutions.	City of Burlington's Climate Change Addendum to Open Space Plan (Vermont).
Right-of-Way Design Manual (Design Manual)	Chapter 1 – Introduction and General Requirements	No recommendation	Not applicable
	Chapter 2 – Right-of-Way/Site Permitting and Local Improvement Districts	No recommendation	Not applicable
	Chapter 3 – Site Development Permit and Right-of-Way Construction Plan Format	No recommendation	Not applicable
	Chapter 4 – Street Design	Identify other pavement options such as resin-based pavements, colored asphalt, and colored concrete for use in the public right-of-way.	U.S. Environmental Protection Agency's Reducing Urban Heat Islands: Compendium of Strategies, Cool Pavement.
	Chapter 5 – Illumination	No recommendation	Not applicable
	Chapter 6 – Traffic Signalization	No recommendation	Not applicable
	Chapter 7 – Channelization and Signing	No recommendation	Not applicable

Chapter 8 – Pedestrian Facilities	No recommendation	Not applicable
Chapter 9 – Tree and Vegetation Management	<p>Revise tree list and other planting requirements to create more resilient urban habitat and expand urban forest canopy. For example, consider whether approved plant species are climate adapted, per the definition in the City's Urban Forest Manual, and whether it's appropriate to remove species that are short lived and/or prone to pest issues (e.g., Himalayan Birch <i>Betula jacquemontii</i>, Rosaceae family).</p> <p>Consider whether the City's Urban Forest Manual should expand the definition of climate adapted species, such as defining other approved species besides street trees.</p>	<p>City of Shoreline's Climate Impacts & Resiliency Study.</p> <p>City of Seattle's 2020 Urban Forest Management Plan.</p>
Chapter 10 – Shared-Use Paths	Include permeable pavement as a paved surface option or recommendation.	Snohomish County's Engineering, Design, and Development Standards, Chapter 4, Road Elements and Features, 4-07 Shared Paths.
Chapter 11 – Stormwater and Wastewater Sewer Design	Incorporate climate change projections (e.g., increased precipitation intensity) into design storm events.	<p>City of Olympia's Sea Level Rise Response Plan.</p> <p>City of Boston's Climate Resilient Design Standards & Guidelines for Protection of Public Rights-of-way.</p>
Chapter 12 – Water Plans	Consider adding reclaimed water into the design manual.	City of Olympia's Engineering, Design, and Development Standards, Chapter 10, Reclaimed Water.
Chapter 13 – Construction Related Permits and Easements	No recommendation	Not applicable

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