

TACOMA COMMUNITY CLIMATE ACTION PLAN



APPENDIX 8

APPENDIX 8, MUNICIPAL CARBON NEUTRALITY STRATEGY

WHY DOES 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 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 thru 2020 include 1) an overarching, clear plan goal 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 prioritize 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 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 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 / exemptions only when insufficient reliable, resilience, technical, or cost infeasibility
- Inventory the City-owned facilities which within the City Limit that use fossil fuels, evaluating for feasibility of retrofitting these buildings to low-emission sources by 2030. Evaluations to make use of existing reports, and recommendations prepared regarding feasibility and life-cycle costs,
- Prioritize fleet new 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 6 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.

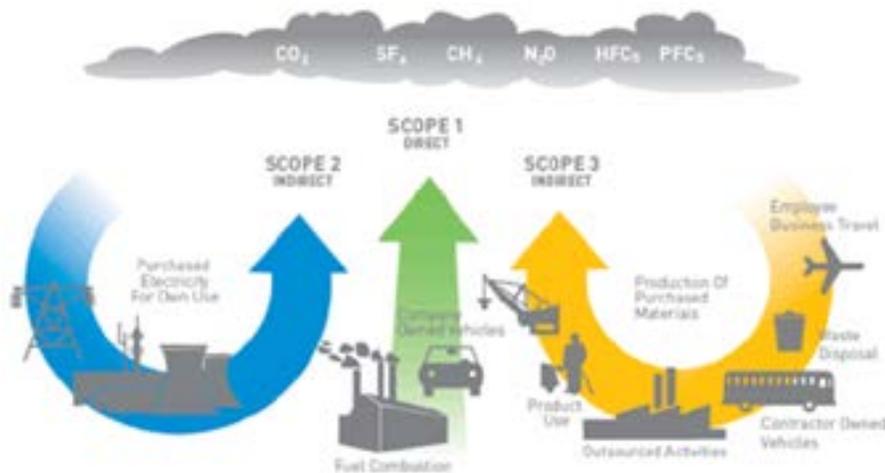


Figure 1. A graphic representation of the carbon footprint from the Life Cycle Initiative.

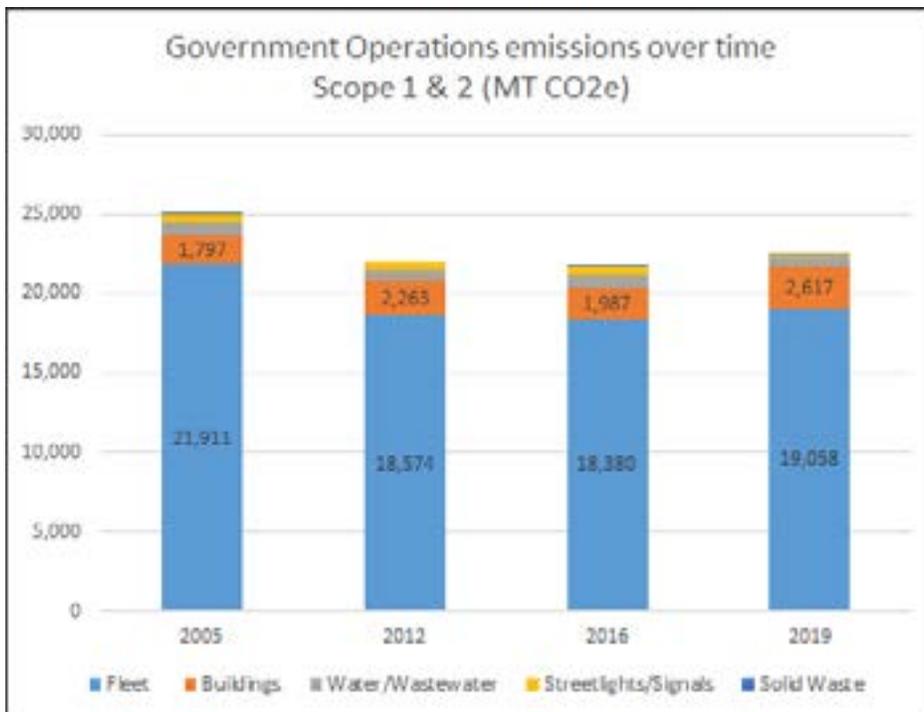


Figure 2. Government operation emissions over time.

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.

While total emission reductions have been minimal, many successes have been accomplished:

- New positions per CAP 2.0 established and hired – Resource Conservation Manager (GG), Facilities Conservation Manager (TPU), and Green Building and Resilience Specialist (City)
- Strategic Energy Management program 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, 3 of the City’s facilities 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. 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. Transition 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 1/3rd of Solid Waste' collection fleet updated from diesel to CNG trucks. Recent expansion of CNG fuel station capacity can support 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.

- Performance metrics of progress are shown in Figures 1 through 7 below

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 taskforce 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 Appendix 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 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
- Utilities carbon neutral by 2030

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

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 already operation 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: 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:

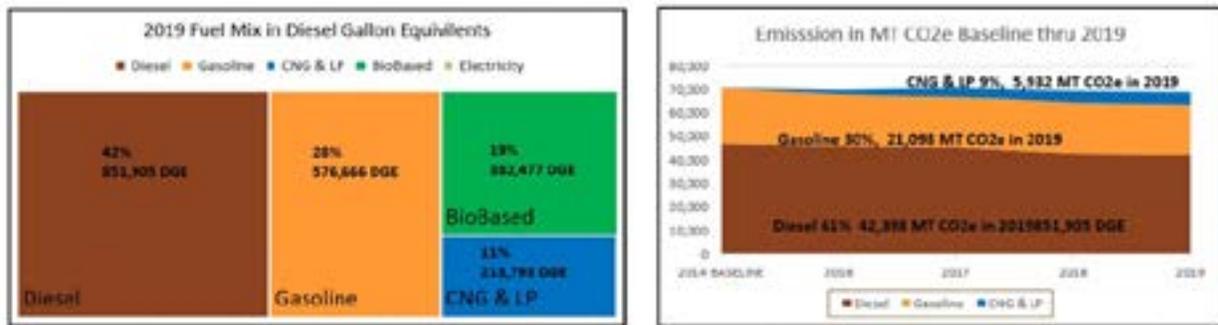


Figure 3. 2019 fuel mix vs emissions through 2019.

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

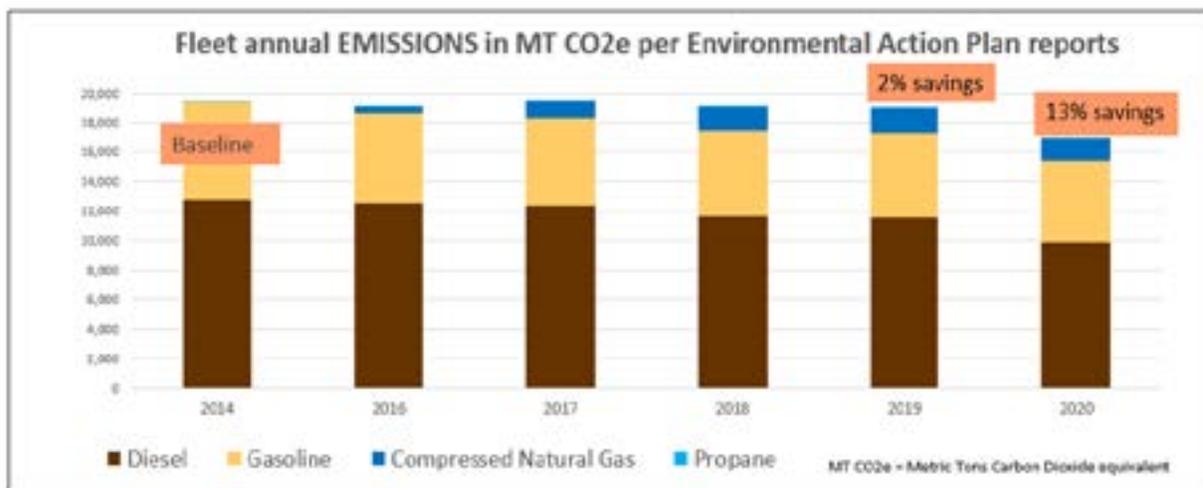


Figure 4. Fleet annual emissions in MTCO2e.

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

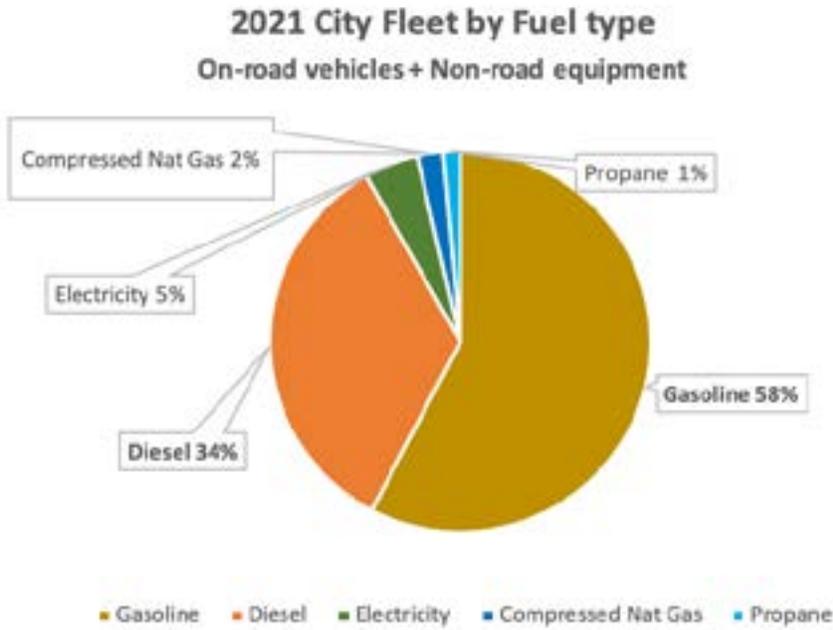


Figure 5. 2021 Tacoma city fleet by fuel type.

Gasoline burning vehicles are almost 60% of vehicles, but only 30% of emissions

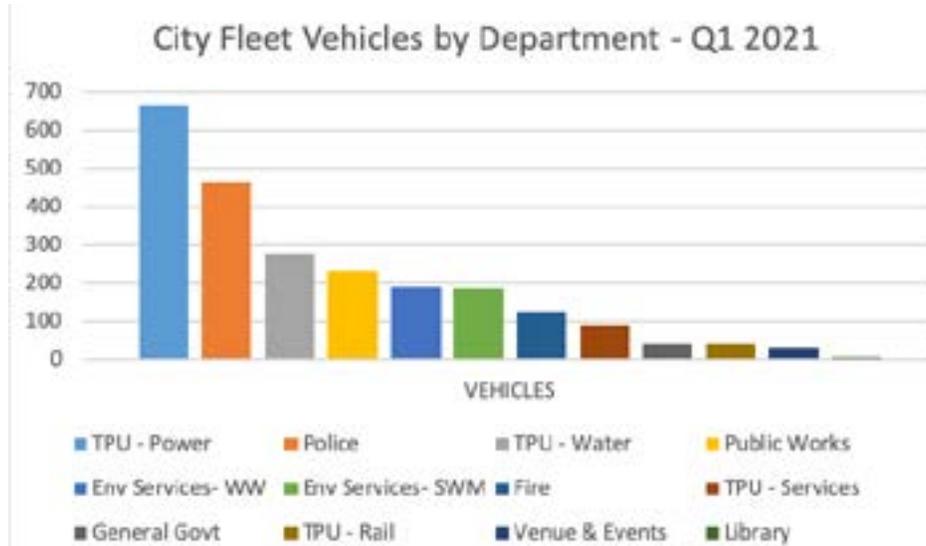


Figure 6. City fleet vehicles by department.

City Fleet Vehicles by Duty as of Q1 2021

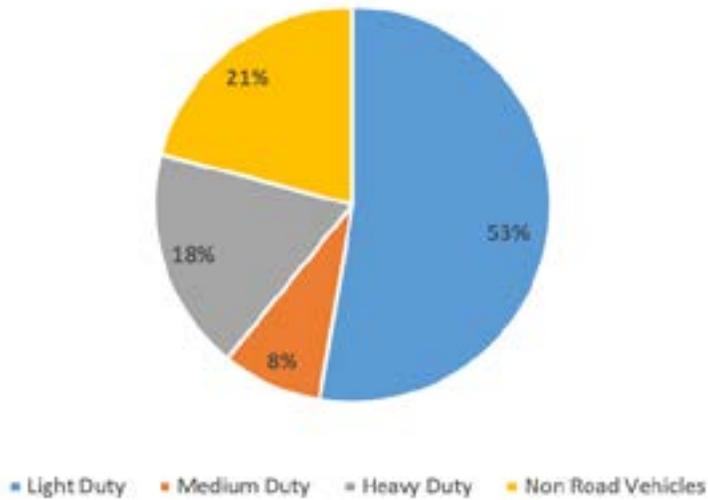


Figure 7. Fleet vehicles by duty.

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

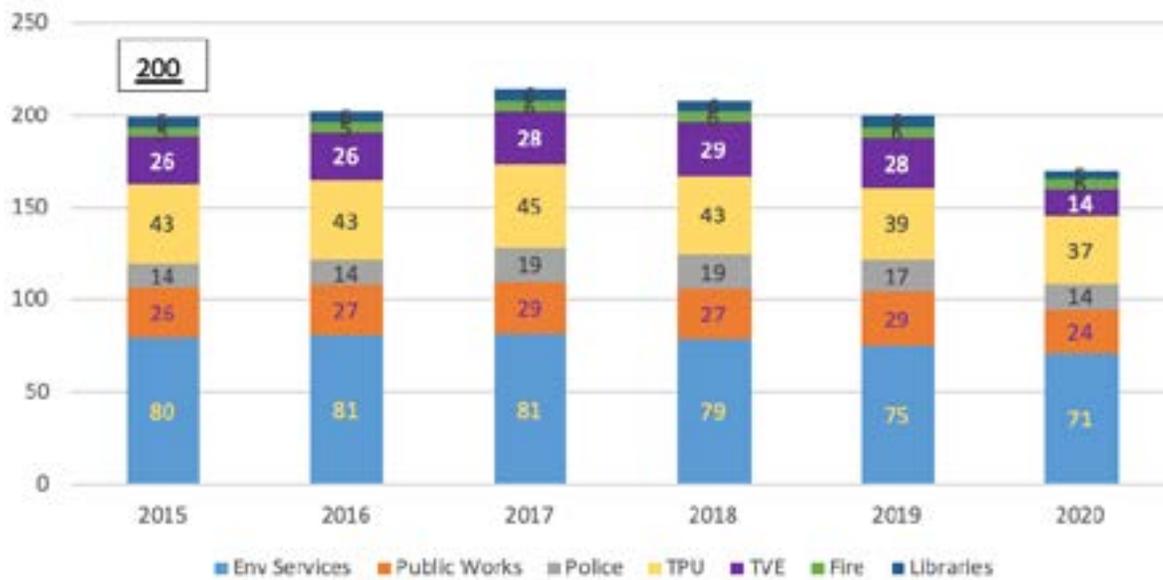


Figure 8. City facilities energy use by year.

Environmental Services, with two waste water treatment plants, are consistently the highest in annual energy use.



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

Energy reductions in 2020 primarily due to lower occupancy. 2019 is better baseline for comparing 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 2. 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 mgmt
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 bldgs. 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 & 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	Ease of data mgmt, Organization wide data analytics synergy	
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 and delivery.	Policy developed and implemented	OEPS	Purchasing	Sustainable Purchasing Policy	0	On-going			Supports local businesses

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 3	Large venue waste reduction - what action in 3 years	XX% reduction (volume off-site to disposal, % recycled)	TVE	SW/ OEPS	Sun Materials & Mgt Plan. SPP	To Be Determined	On-going	Green Sports trade assoc.	Aramark contracting, durables GTCC	Reduced food waste?
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 REAPs	Staff engagement

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 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, climate mitigation and adaptation) review	Team created and active; Meet at least 6x/yr				0	On-going	Scheduling of meetings		Staff coordination & better projects
Education & Engagement 1	Annual Directors Presentation/ Training	Annual presentation/ training occurs	OEPS		1 meeting/yr	0	On-going			

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 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
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?	