MEMO

Date: August 9, 2023
To: Tumwater City Council
From: City of Tumwater Green Team

2022 Green Team Sustainability Report

Purpose

This report evaluates the City's current practices related to climate, water, energy, transportation, and solid waste. This is the third consecutive Green Team Sustainability Report for the City of Tumwater. For all but two metrics (waste and greenhouse gas emissions) a baseline year of 2019 is used. A greenhouse gas (GHG) baseline year of 2015 was established by Resolution by the City Council and reported as such. A solid waste baseline had not been available in prior years and thus 2021 is established as the baseline year. This report compares 2022 data to each metric's established baseline year, goal, and past data wherever data was available.

Climate

Greenhouse Gas Emissions of City operations

City operations produced an estimated total annual emissions of 3,736 metric tons of CO_{2e} in 2022. Total emissions in 2022 are 3% below the 2015 baseline. Emissions from the City's water and sewer infrastructure increased by about 11%, the City vehicle fleet emissions increased by 8%, and emissions associated with lighting, heating, and cooling City buildings and facilities fell by 20% between 2015 and 2022. However, Tumwater's population grew by about 33% between 2015 and 2022. When expressed in terms of MTCO2e/City resident, the 2022 City operations carbon footprint was about 26% lower than the 2015 per resident carbon footprint.

The City of Tumwater takes part in Puget Sound Energy's Green Direct program and received certificates for 5,600,000 kWh generated at the Skookumchuck Wind Farm and Lund Hill Solar Farm during the 2022 calendar year. Because of this, the net emissions of City operations in 2022 are estimated to be 1,092 metric tons of $CO_{2e.}$

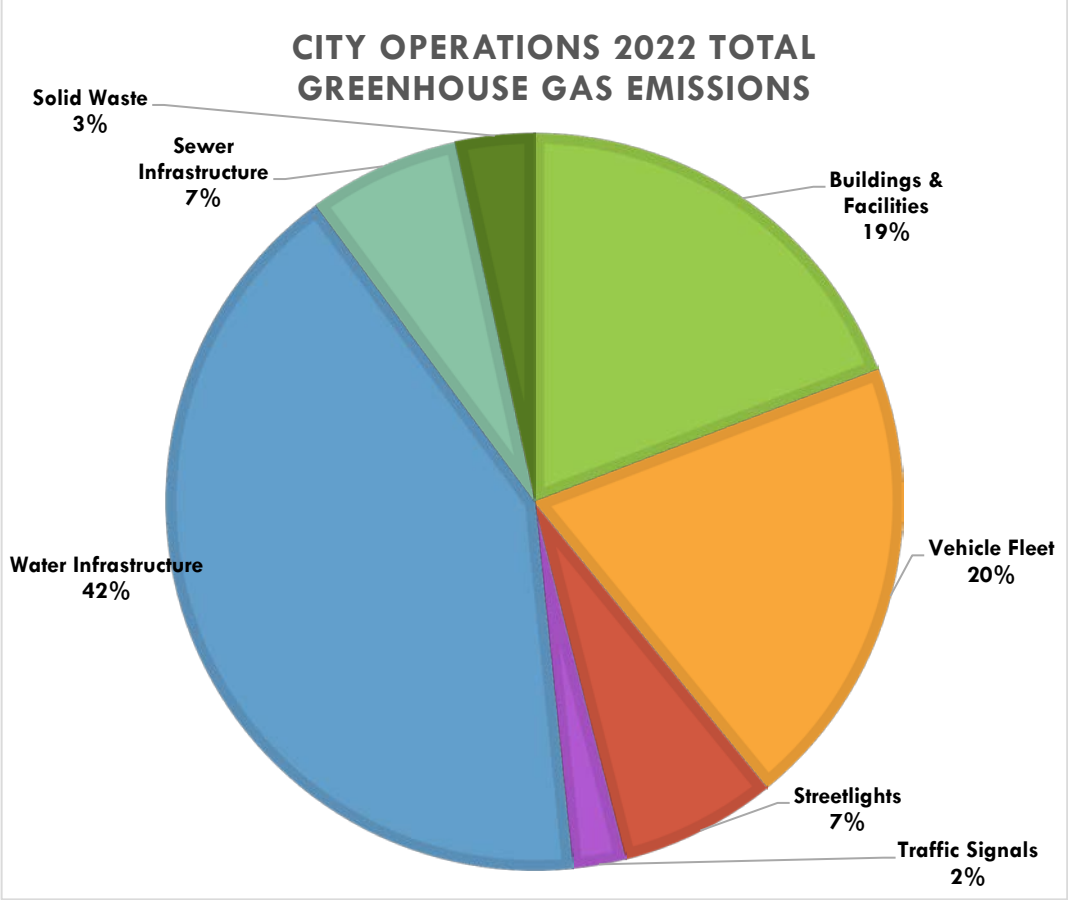


Figure 1. Sources of City GHG Emissions in 2022

Thurston Climate Mitigation Plan implementation

In 2021 the City Council accepted the Thurston Climate Mitigation Plan (TCMP). The TCMP includes seventy-two actions the City and regional partners can take to achieve the regionally accepted greenhouse gas reduction targets of 45% reduction by 2030 and 85% reduction by 2050 (compared to 2015 baseline).

The Thurston Regional Planning Council produced the 2022 Annual Report on Regional Implementation which details which actions the City of Tumwater has taken to date. A selection of those implementation actions by the City of Tumwater taken in 2022 include:

- Hired a Sustainability Coordinator;
- Started the process of SolSmart designation;
- Installed ten solar panels at two water infrastructure sites;
- Replaced 900+ light fixtures at the Tumwater Timberland Library with LEDs;

- Signed an agreement with the Department of Enterprise Services to begin an Energy & Water Audit at City facilities;
- Kicked off the public process to revise urban forest-related codes; and
- Began the process of doing a Fleet Electrification Assessment.

City Fleet

Most City vehicles use gasoline or diesel fuel. In 2022, vehicles used 64,097 gallons of gasoline and 17,911 gallons of diesel. Figures 2 and 3 show the percentage of fuel consumed by each department. Between the 2019 baseline and 2022, there was a 9% decrease in fuel consumption (gasoline and diesel combined).

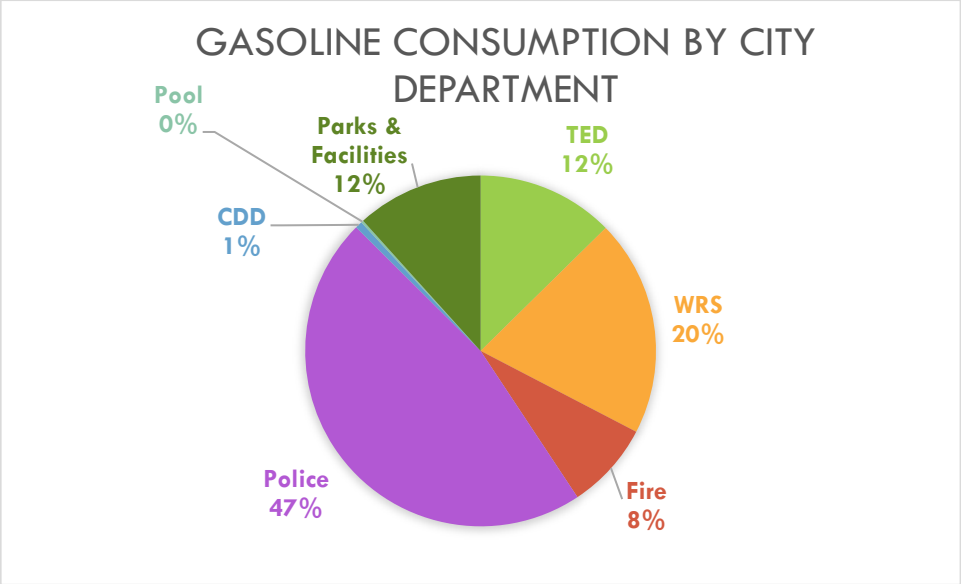


Figure 2. Gasoline Consumption by City Departments in 2022

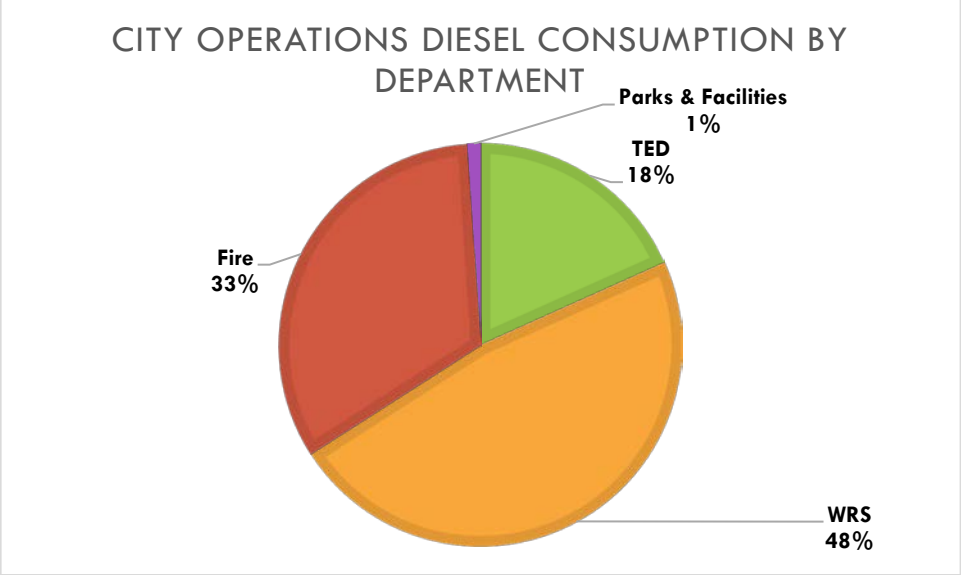


Figure 3. Diesel Consumption by City departments in 2022

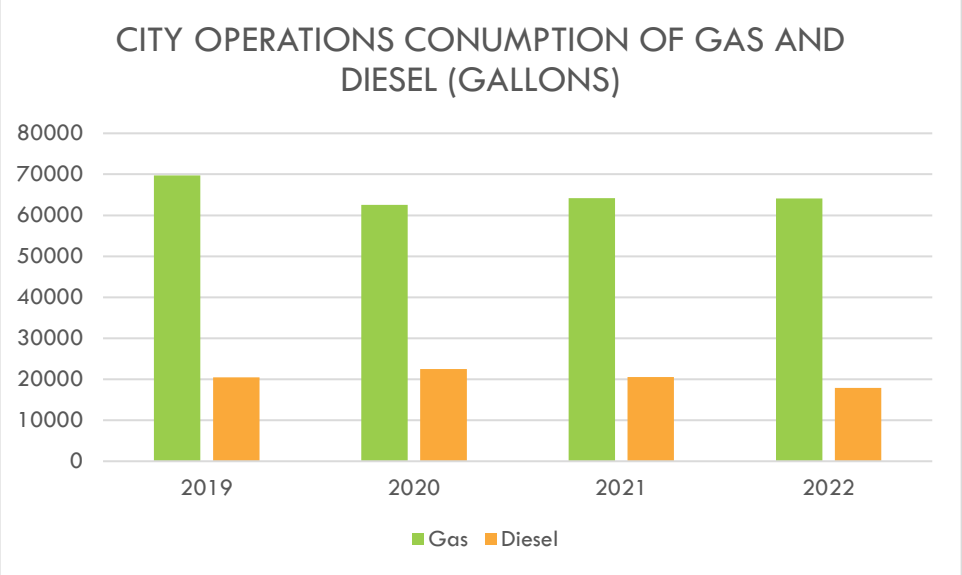


Figure 4. City operations consumption of Gas & Diesel since 2019

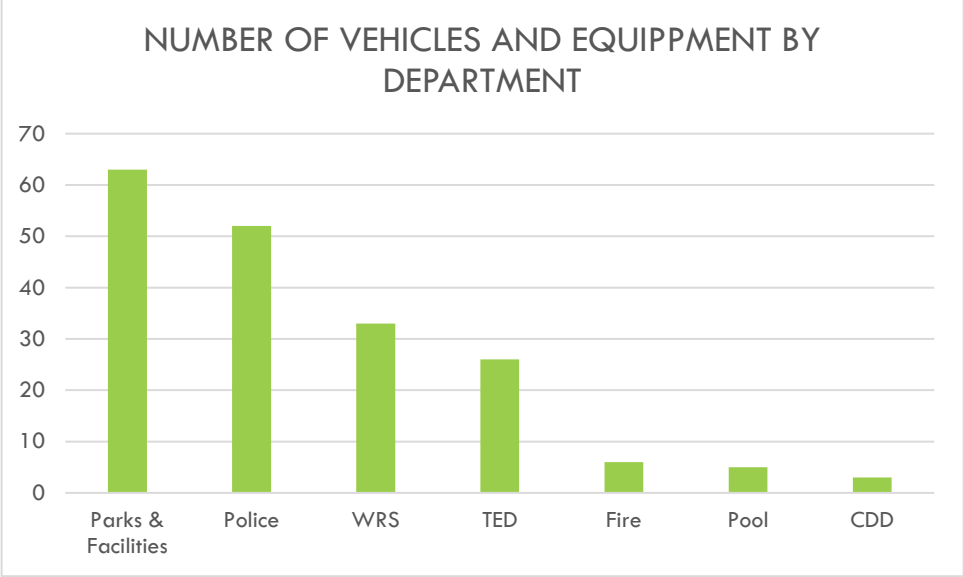


Figure 5. Number of vehicles and equipment by Department

The City has taken steps to increase the number of electric vehicles in the fleet and functions under an "EV or Hybrid First" purchase method for replacement and new vehicles. As of 2022 the City currently has one (1) battery-electric vehicle, fourteen (14) hybrids (both plug-in and non-plug-in hybrids), 121 gasoline-powered vehicles, and thirty-two diesel-powered vehicles in use. In 2022 the City ordered 10 Ford F-150 Lightning Electric Trucks; however, they have not been delivered yet due to manufacturer delays.

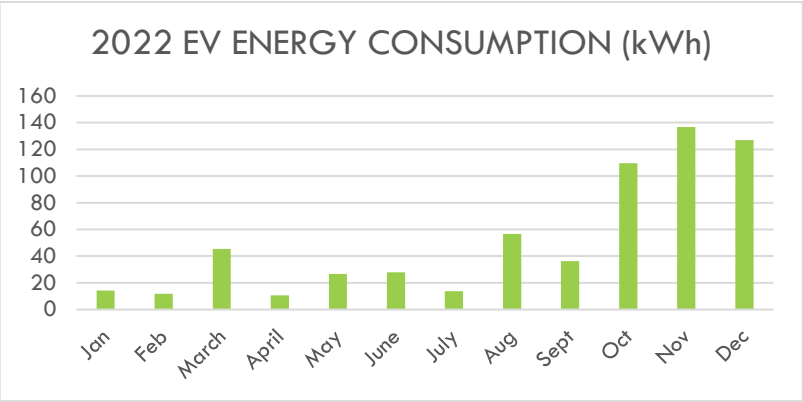


Figure 6. Electric Vehicle Energy Consumption for 2022.

In 2022 the City had a total of eight (8) Level 2 Electric Vehicle Charge ports to support the fleet Electric and Plug-In Hybrid vehicles. Figure 6 shows the Energy Consumption of those chargers throughout 2022. All energy used to charge the City Electric and Plug-In Hybrids is enrolled in PSE's Green Direct Program.

In 2022 City utilization of electricity at the chargers nearly doubled compared to 2021. The utilization of 616.61 kWh to charge the electrified fleet vehicles avoided the combustion of 130.45 gallons of fuel and an estimated 1.2 metric tons of carbon dioxide equivalent emissions.

Vehicle Type	2019 Baseline	2022
% of gas-fueled vehicles	85%	72%
% of diesel-fueled vehicles	9%	19%
% of hybrid vehicles	5%	8%
% of electric vehicles	1%	1%

Table 1. Percentage of Vehicle Types 2019 baseline compared to 2022

City staff have also made progress in reducing fuel consumption by passing an Anti-Idle Policy for fleet vehicles and continuing the process to phase out two-stroke motors used in City equipment.

Buildings

Natural Gas

Natural gas is a fossil fuel that emits greenhouse gases including methane during its combustion and production. In 2022, the City consumed 33,202 therms of natural gas. Most of the natural gas was used in City Hall, Fire Stations, and the Operations building (Figure 7). Between the 2019 baseline year and 2022 there was a ~7% increase in emissions because of natural gas consumption. 2022 was a colder year than 2015 with 19% more heating degree days[1]. In general, natural gas use peaks during the colder winters months to help heat buildings and facilities.

[1] Heating Degree Day (HDD) is a measurement designed to quantify the demand for energy to heat a building. This measure reflects the assumption that when the outside temperature is 65 degrees Fahrenheit, mechanical heating is not necessary for personal comfort.

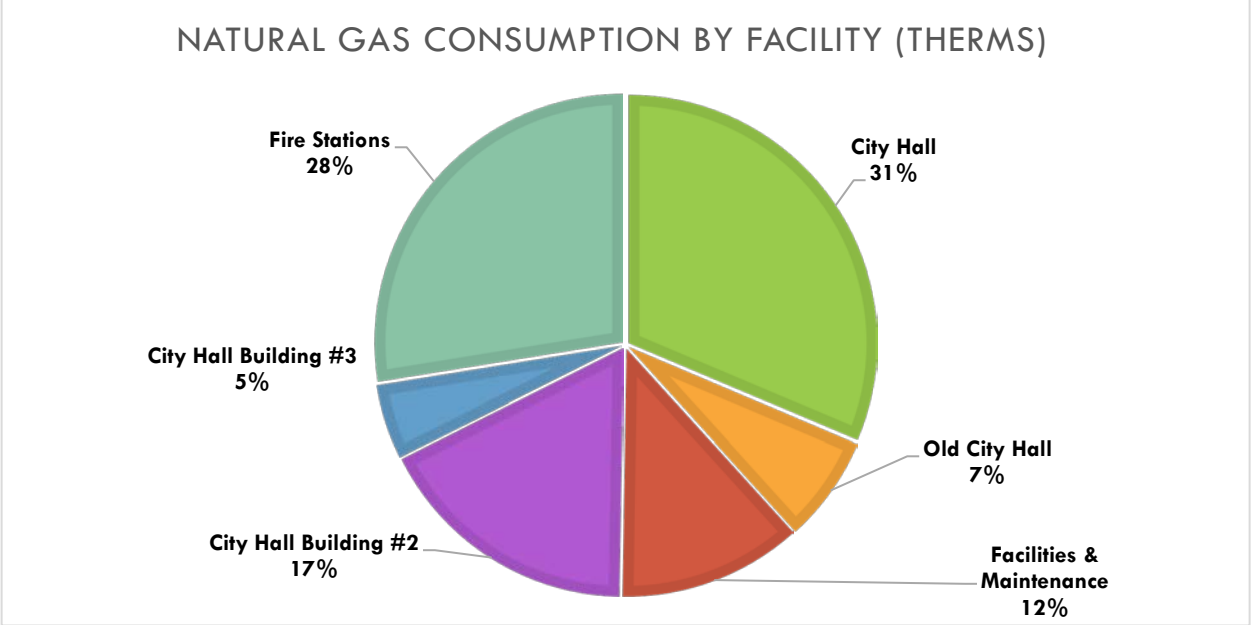


Figure 7. Natural Gas Consumption by Facility in 2022

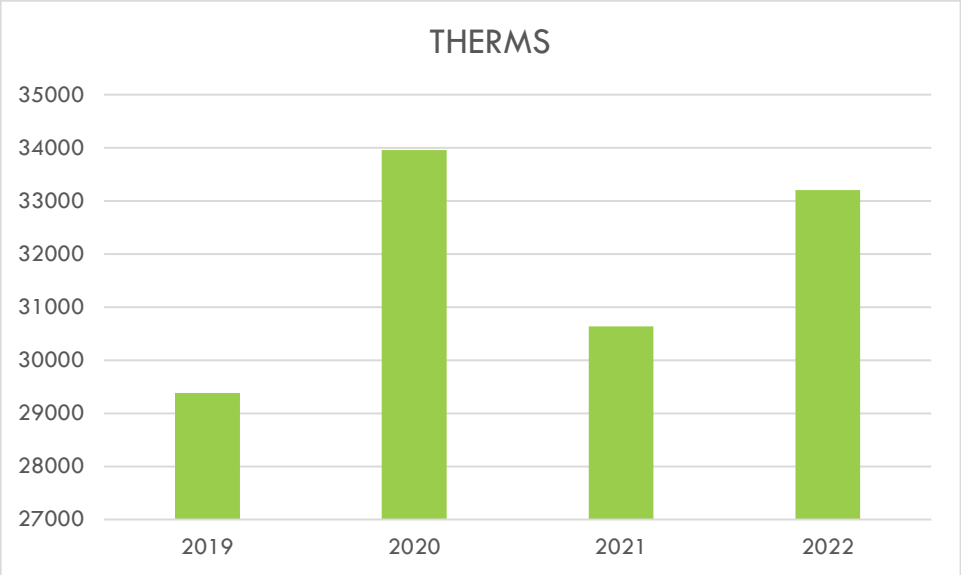


Figure 8. City operations Natural Gas Consumption (therms)

Tumwater City Council has adopted a Strategic Priority for new City buildings to be electric, but there is no established time-based target to reduce City operations natural gas consumption in existing buildings currently.

Electricity

City buildings/facilities used 5,687,286 kWh of electricity in 2022, which equates to a 5.3% increase from the 2019 baseline. Approximately 64% was used for water & wastewater infrastructure, 25% for buildings and facilities, and 11% for streetlights and signals.

Figure 9. Electricity Consumption of City operations and Goal

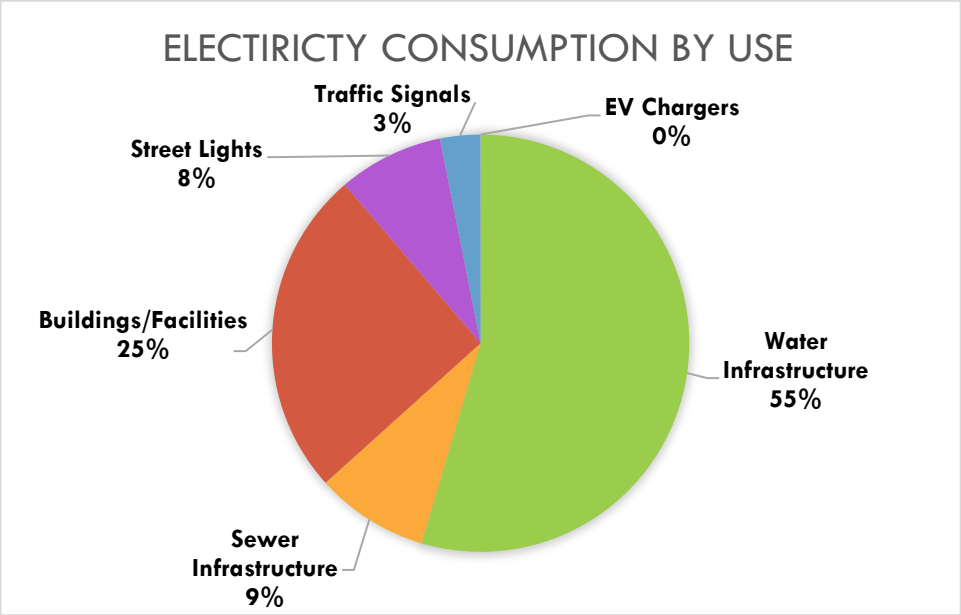


Figure 10. City operations Electricity Consumption by Use

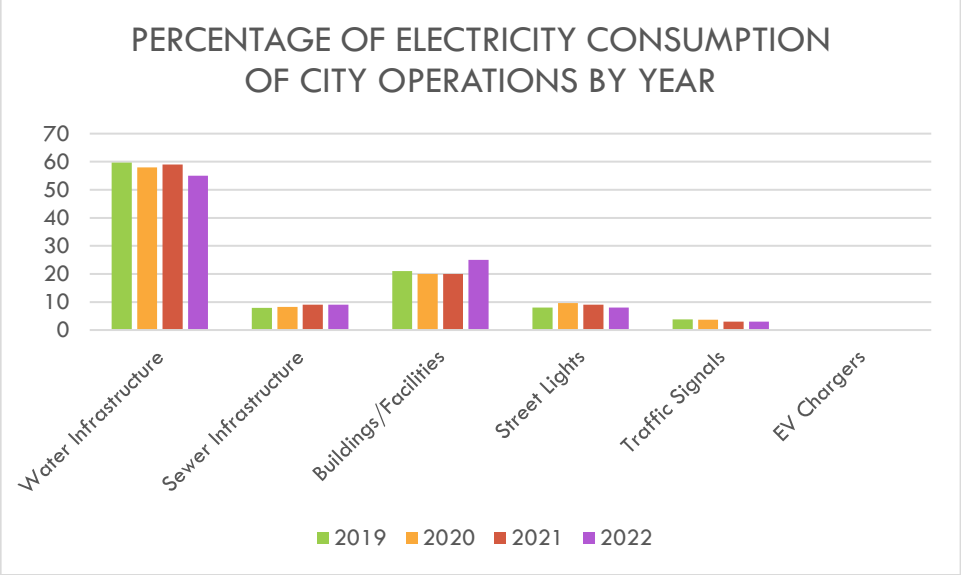


Figure 11. Percentage of electricity consumption of City operations by year

Renewable Energy

In 2022, the solar panels at City Hall produced 21,690 kWh of energy. This accounts for 0.38% of City Hall's 2022 electricity consumption.

In November 2020, the City began receiving electricity from the Skookumchuck Wind Project via Puget Sound Energy's (PSE) Green Power Program. In 2022, the Lund Hill Solar Project was added to PSE's Green Power Program. In 2022 City operations received Renewable Energy Certificates for 5,600 MWh of electricity from Skookumchuck and Lund Hill in 2022, covering 100% of City operations electricity consumption.

Figure 12. Lund Hill Solar Project.
Photo Credit: Iberdrola.

Employee Commute

The City partners with Thurston Regional Planning Council to run the Commute Trip Reduction (CTR) Program, aimed at incentivizing employees to reduce the number of trips made to and from work each week in single-occupancy vehicles. The CTR program was paused during the COVID-19 pandemic. In 2022 the City Green Team refreshed the City CTR policy and re-launched the CTR program to staff. The major changes include:

- Removing telework as an incentivized action as it has become a widespread practice.
- Adding walking, biking, and taking the bus as incentivized CTR methods.
- Created an incentive for employees to purchase/lease new/used electric and plug-in hybrid vehicles.

Indoor and Outdoor Water Consumption

In 2022, the City used 21.8 million gallons of water for both indoor/outdoor water use, a 12% decrease from the baseline year. Out of the 21.8 million gallons used by the City in 2021, 11% was used inside City facilities, while the vast majority was used for irrigation in parks, medians, and right of ways.

In 2022, the City used 21.8 million gallons of potable water to irrigate parks, right of ways/medians, and building landscaping. Of the total amount of water used, 46% was used by Parks, while 29% was used to irrigate right of way, and 14% was used for Building landscaping as seen in Figure 13.

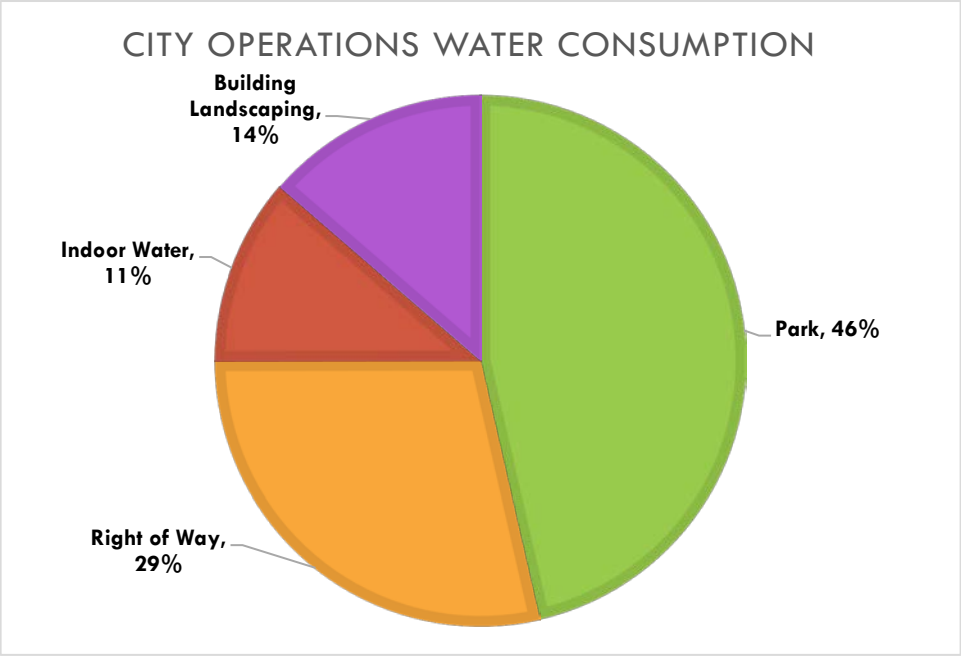


Figure 13. City operations Water Consumption

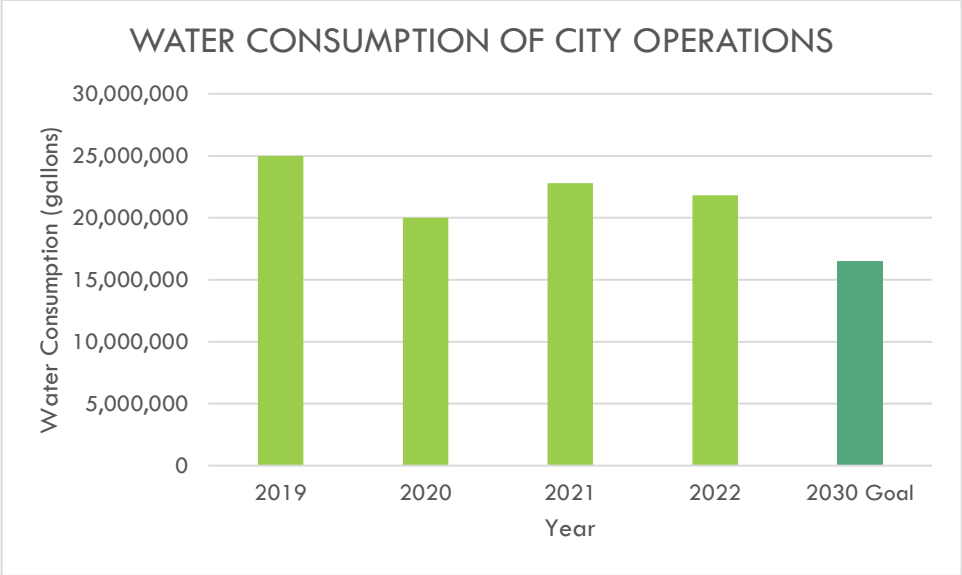


Figure 14. City operations Water Consumption & Goal

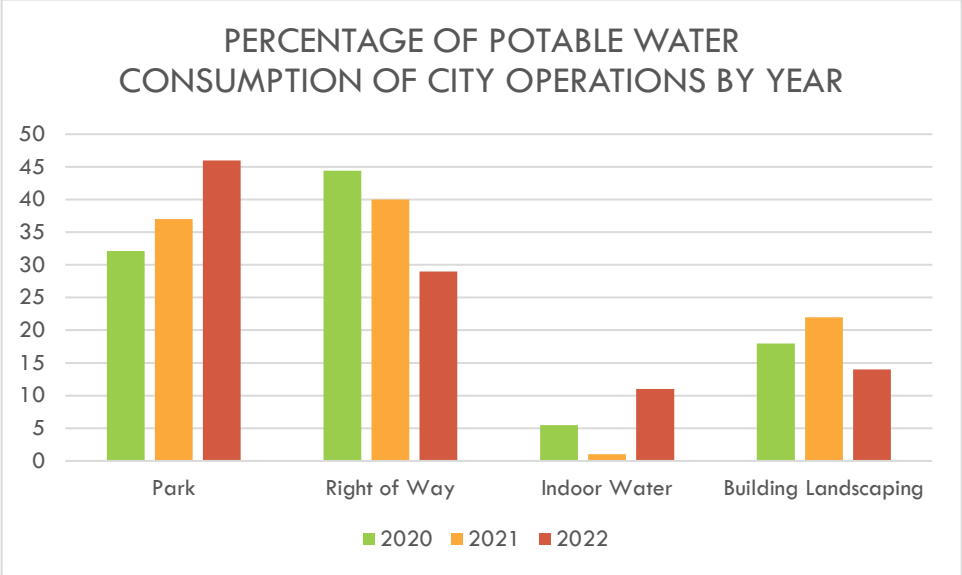


Figure 15. Percentage of potable water consumption of City operations by year

Reclaimed Water

In 2022, the City used 39,666,000 gallons of reclaimed water at the golf course. Use of reclaimed water is a best management practice for water use management at golf courses and is a great use of water that has been used once, cleaned to a high level, and can then be used again.

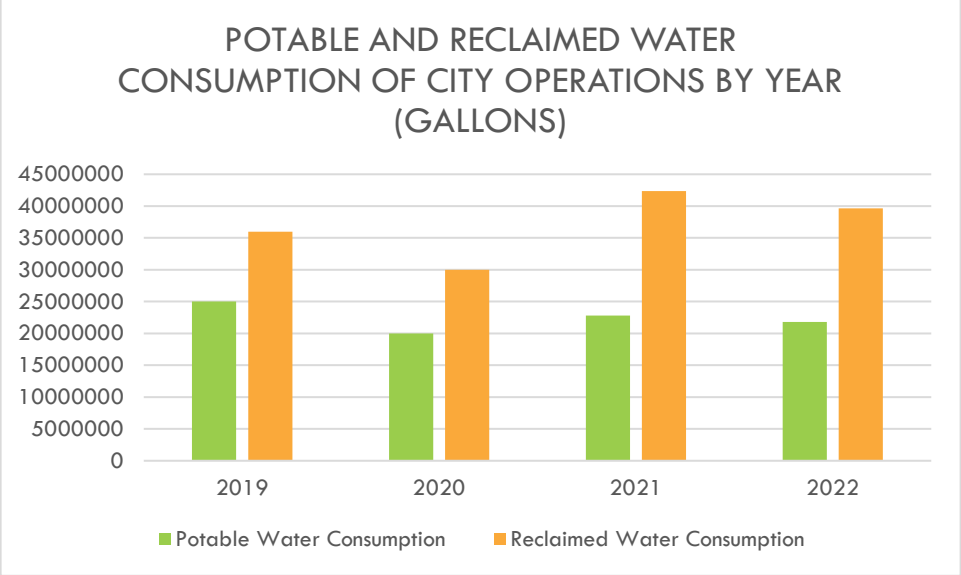


Figure 16. Potable and Reclaimed water consumption of City operations by year (gallons)

Solid Waste

In 2022 City operations produced an estimated 428,169 pounds of solid waste (Figure 17). This value does not include solid waste produced at Parks nor Street Sweeping waste. We are currently recycling or composting 33% of City operations solid waste by weight (Figure 18).

LeMay/Pacific Disposal has provided this estimated amount of waste by type for the calendar year based on container sizes and frequency as pickup for 2021 and 2022.

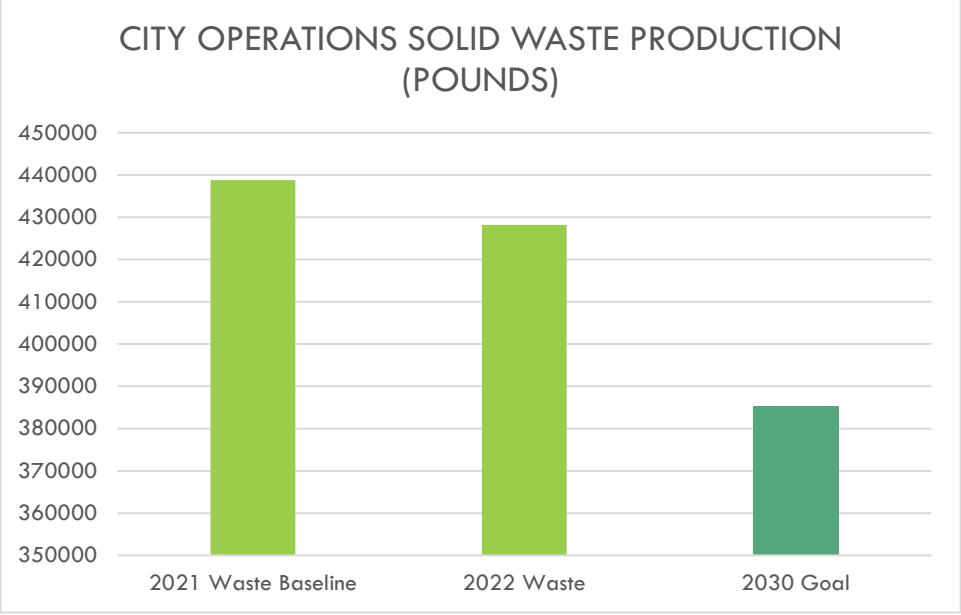


Figure 17. City operations Solid Waste Production

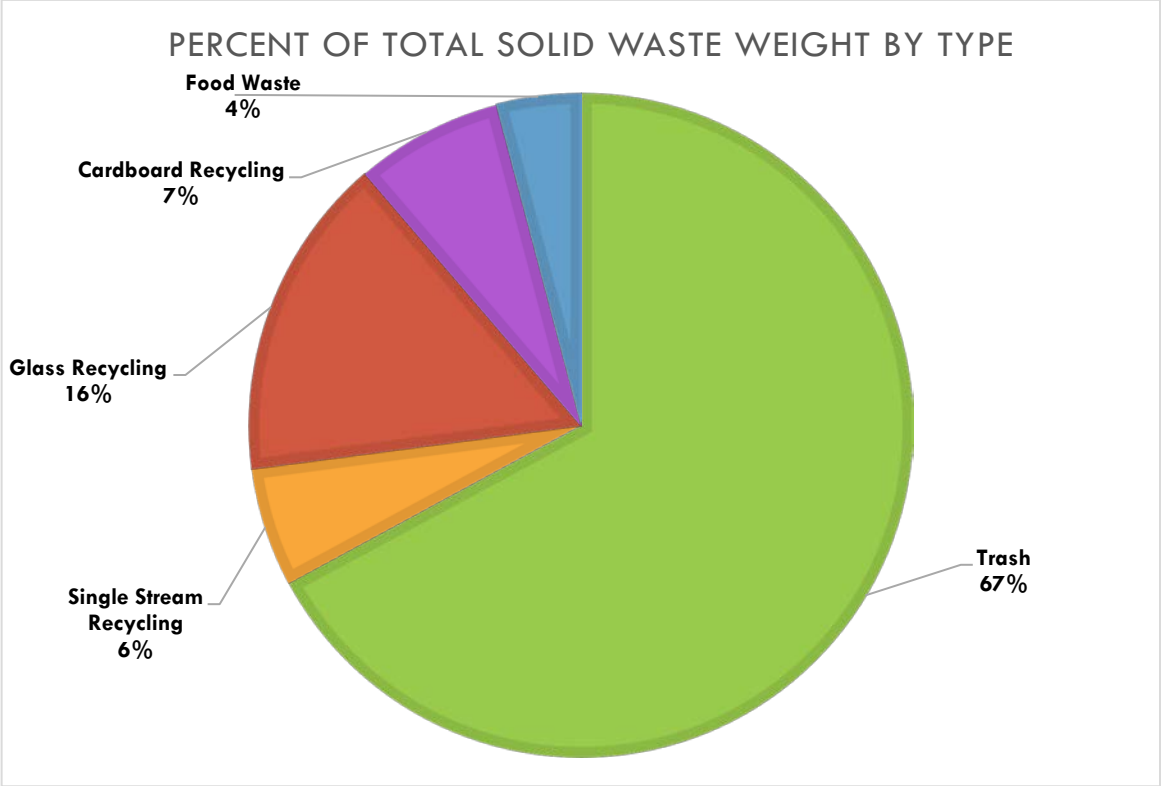


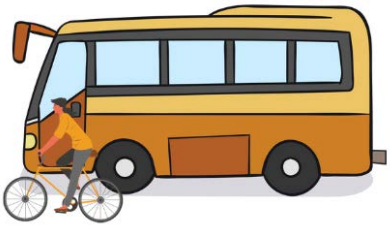
Figure 18. Solid Waste by Type Produced by City operations in 2022

Progress towards goals

1. Reduce greenhouse gas emissions produced by City activities 45% below 2015 levels by 2030: approximately 3% per year. In 2015 the City produced 3,793 metric tons of CO_2e.
    a. 2015-2022: 3% decrease in total annual emissions from baseline.
    b. 2015-2022: 71% decrease in net annual emissions from baseline.

2. Increase the percentage of renewable energy being used by City activities and reduce electricity usage 2% per year; or 20% by 2030 from 2019 levels.
    a. 100% of electricity consumption was offset with Renewable Energy Certificates provided by PSE Green Direct Program.
    b. 2019-2022: 5.3% increase in electricity usage.

3. Increase employee alternative transportation participation during their commutes to work by 30% by 2030.
    a. The Commute Trip Reduction Policy was revised and re-launched in 2022.



4. Reduce water use 3% per year from City activities from 2019 levels.
    a. 2019-2022: 12% decrease in potable water use.

5. Reduce solid waste (garbage) produced by City activities by 10% by 2030.
    a. 2021-2022: 2.4% decrease in solid waste produced by City Activities.
    b. In 2022, an estimated 33% of all solid waste by weight was diverted to recycling and composting.

Recommended Next Steps

The following recommendations are intended to help the City continue to make progress on its goals:

- Fund and carry out electrification and efficiency improvements as recommended by the Energy & Water Audit being conducted in 2023;
- Pass a Resolution establishing a commitment to electrifying existing City buildings either by a certain date or as natural gas-powered appliances and machinery reaches the end of their useful life;
- Conduct a formal waste audit of City operations; and
- Continue implementing the Thurston Climate Mitigation Plan both regionally and as an individual jurisdiction.

Acknowledgments

This report would not have been possible without the members of the City Green Team:

Dan Smith (Water Resources & Sustainability), Troy Niemeyer (Finance), Ann Cook (Executive), Alyssa Jones Wood (Water Resources & Sustainability), Brad Medrud (Community Development), Brianna Feller (Executive) Carrie Gillum (Water Resources & Sustainability), Todd Anderson (Parks and Recreation), Officer Rosco Rollman (Police), Wes Holmgren (Parks and Recreation), Marc Lavack (Transportation & Engineering), Matt Ames (IT), Erika Smith-Erickson (Community Development), Grant Gilmore (Water Resources & Sustainability), and Shane Brady (Fire).

Additionally, community member and Thurston Climate Action Team volunteer Dave Bradley conducted the City operations GHG inventory referenced in this report.