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2021 Green Team Sustainability Report

October 3, 2022

To: Tumwater City Council
From: City of Tumwater Green Team
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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 utilized. A Greenhouse Gas Emission baseline year of 2015 was established by resolution by the City Council and is 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 2021 data to each metric's established baseline year, goal, and past data wherever data was available.

Climate

Greenhouse Gas Emissions

This year's reporting on greenhouse gas emissions refers to our emissions in two ways: *total annual emissions* and *net emissions*. Emissions had previously only referred to total annual emissions in past Green Team Sustainability Reports, which is the sum of estimated emissions caused by City Operations. Net emissions refer to the total annual emissions minus carbon credits or renewable energy certificates.

City Operations of the City of Tumwater produced an estimated total annual emissions of 3,938 metric tons of CO_{2e} in 2021. Total emissions in 2021 are about 3% higher than the 2015 baseline. Emissions from the City's water and sewer infrastructure and vehicle fleet increased by 19.4% and 12% respectively between 2015 and 2021. However, Tumwater's population grew by about 36% between 2015 and 2021. Emissions associated with lighting, heating, and cooling the City's buildings and facilities fell by almost 17% between 2015 and 2021.

The City of Tumwater participates in Puget Sound Energy's Green Direct program and received certificates for 5,580,000 kWh generated at the Skookumchuck Wind Facility during the 2021 calendar year. Because of this, the net emissions of City Operations of the City of Tumwater in 2021 are estimated to be 1,100 metric tons of CO_{2e}.

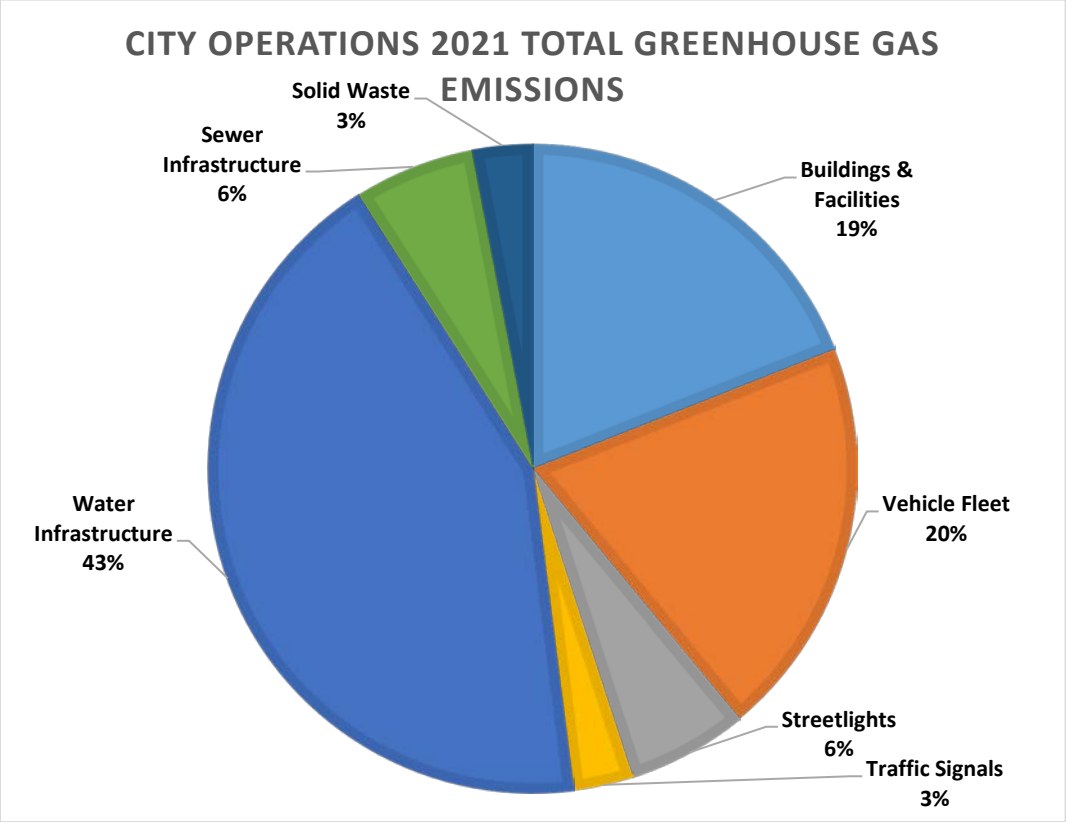


Figure 1. Sources of City GHG Emissions in 2021

City Fleet

The vast majority of City vehicles use gasoline or diesel fuel. In 2021, vehicles used 64,208 gallons of gasoline and 20,437 gallons of diesel. Figures 2 and 3 show the percentage of fuel consumed by each department. In 2021 the City was able to secure and consume 175 gallons of renewable diesel. Between the 2019 baseline and 2021, there was a 6% decrease in fuel consumption (gasoline and diesel combined).

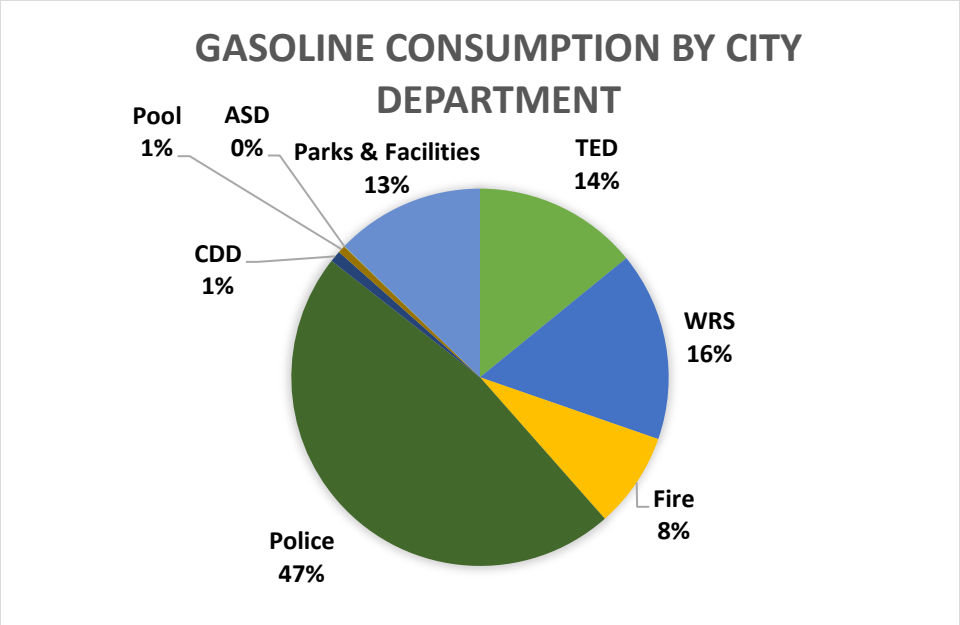


Figure 2. Gasoline Consumption by City Departments in 2021

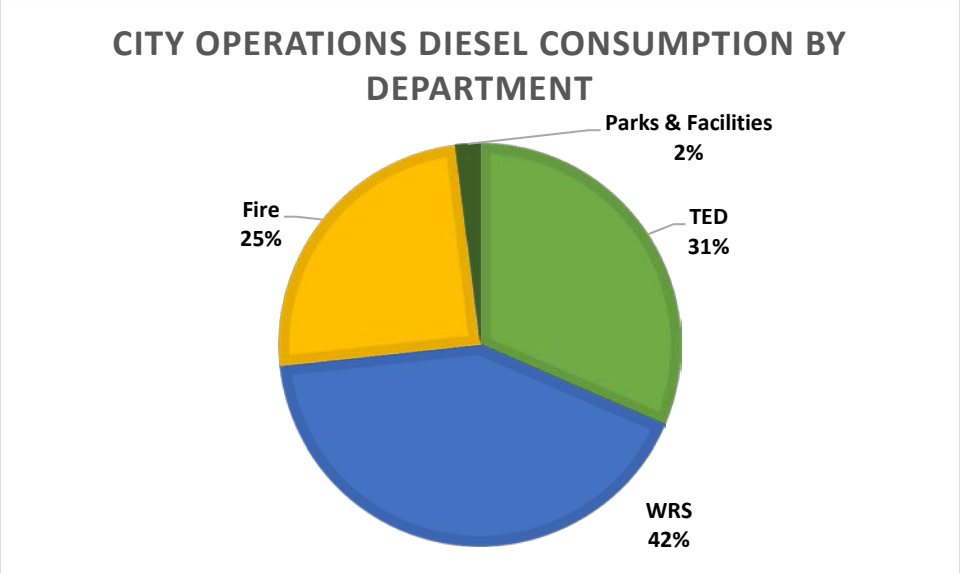


Figure 3. Diesel Consumption by City Departments in 2021

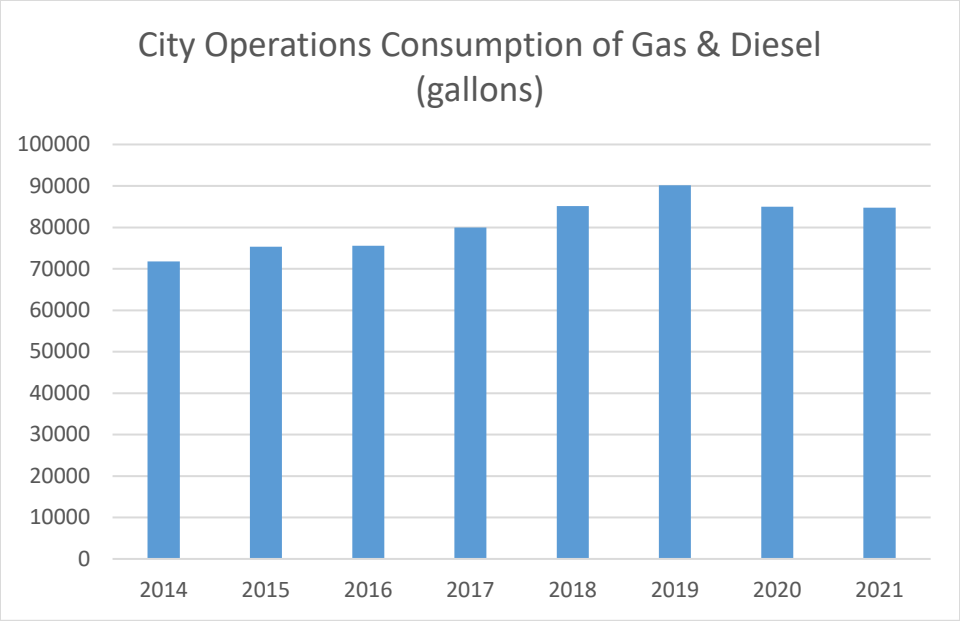


Figure 4. City Operations Consumption of Gas & Diesel since 2014

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 2021 the City currently has one (1) battery-electric vehicle, thirteen (13) hybrids (both plug-in and non-plug-in hybrids), 121 gasoline-powered vehicles, and 32 diesel-powered vehicles on-site. In 2021 three new vehicles were ordered for our Police fleet, two of which are gasoline-powered and one is hybrid.

In 2021 the City had two (2) Level 2 Electric Vehicle Charge ports to support our Electric and Plug-In Hybrid vehicles. Figure 4 shows the Energy Consumption of those chargers throughout 2021. All energy used to charge the City's Electric and Plug-In Hybrids is enrolled in PSE's Green Direct Program. The utilization of 320.31 kWh to charge our electrified fleet vehicles avoided the combustion of 64.06 gallons of fuel and an estimated 0.569 metric tons of carbon dioxide equivalent emissions. According to the EPA, this is the equivalent of 9.4 tree seedlings grown for 10 years.

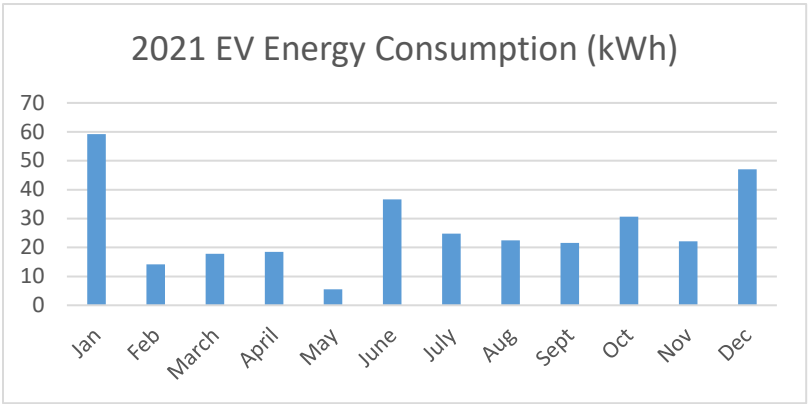


Figure 5. Electric Vehicle Energy Consumption for 2021.

Vehicle Type	2019 Baseline	2021
% 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 2021

City staff has also made progress in phasing out two-stroke motors used in our equipment and plans to continue electrifying small machinery and tools wherever possible.

There is no current established goal for decreased fuel (diesel nor gasoline) consumption. Additionally, there is no current established goal for increased percentage of electric vehicles in our City fleet.

Buildings

Natural Gas

Natural gas is a fossil fuel that emits greenhouse gasses including methane during its combustion and production. In 2021, the City consumed 30,636 therms of natural gas. The majority of the natural gas was used in City Hall, Fire Stations, and the Operations building (Figure 6). Between the 2019 baseline year and 2021 there was a 4% decrease (Figure 7). In general natural gas use peaks during the colder winters months to help heat buildings and facilities.

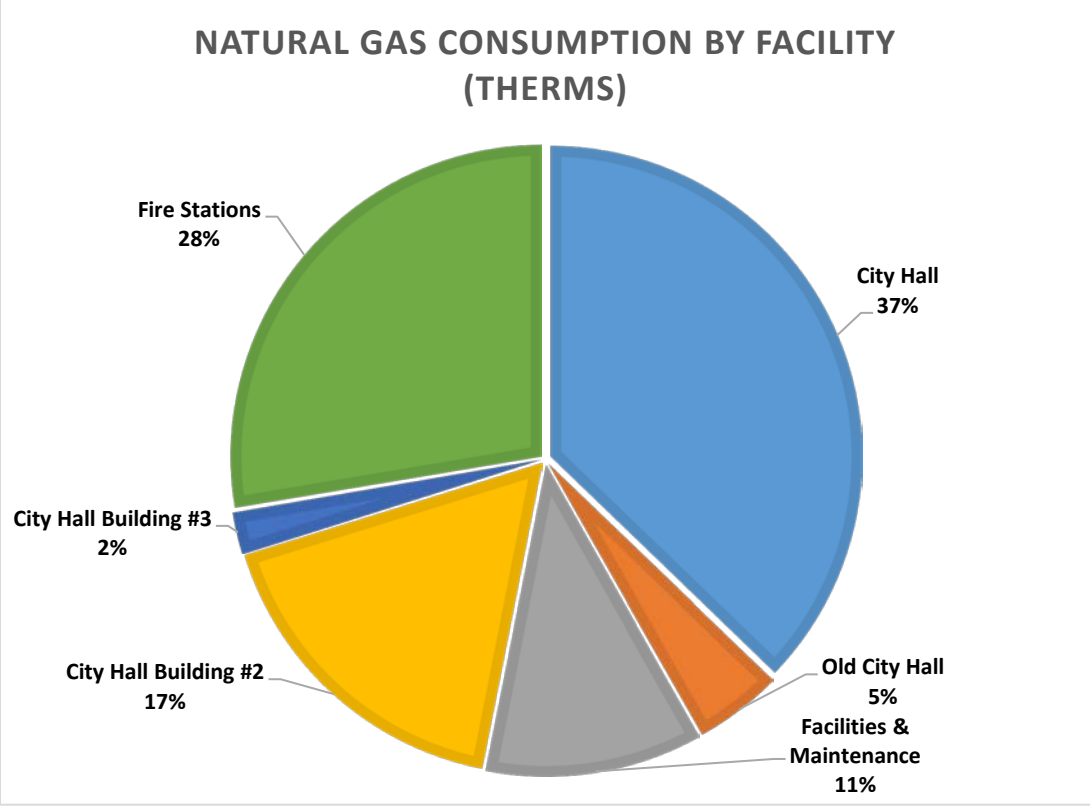


Figure 6. Natural Gas Consumption by Facility in 2021

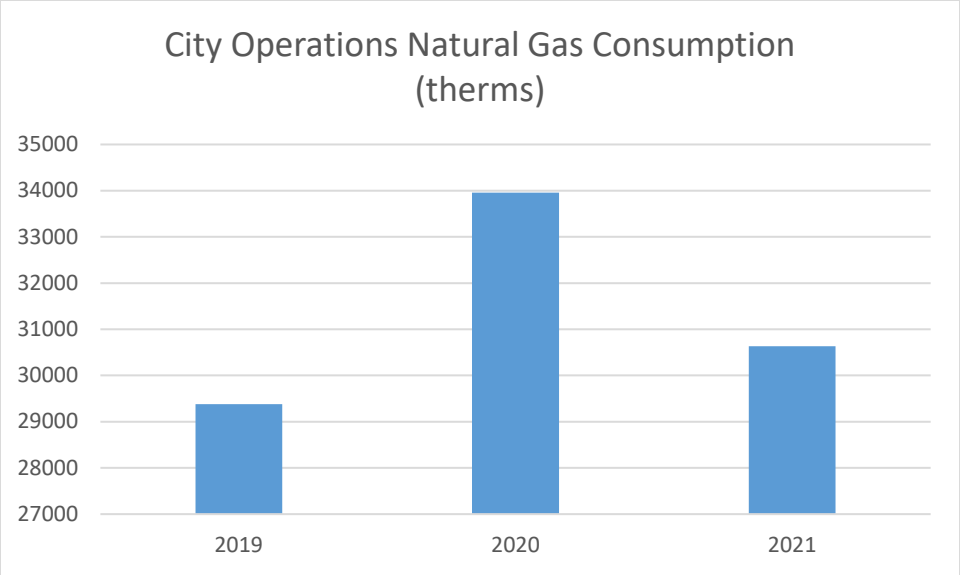


Figure 7. City Operations Natural Gas Consumption (therms)

There is no established goal to reduce City Operations natural gas consumption at this time.

Electricity

City buildings/facilities used 5,229,715 kWh of electricity in 2021, which equates to a 1.4% decrease from the 2019 baseline. Approximately 68% was used for water & wastewater infrastructure, 20% for buildings and facilities, and 12% for streetlights and signals.

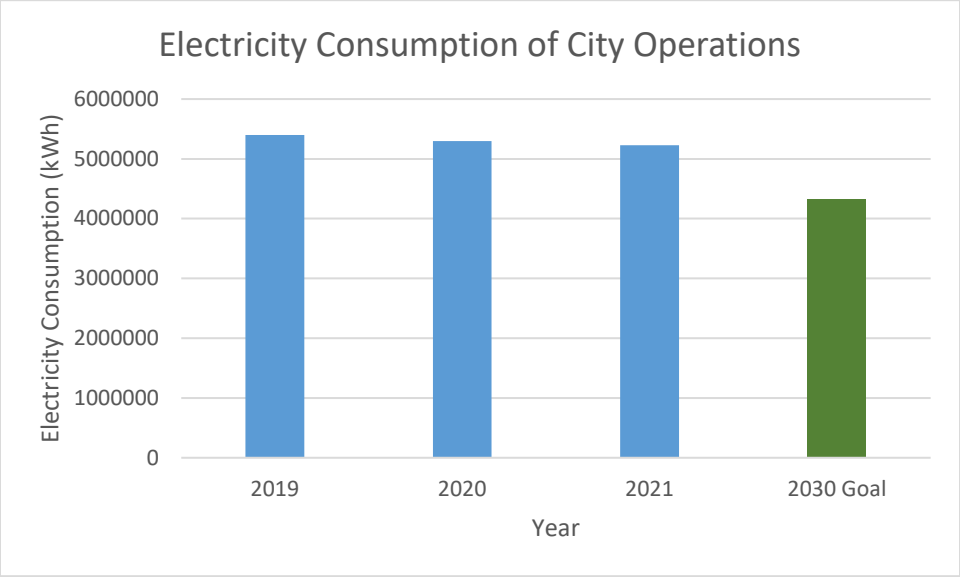


Figure 8. Electricity Consumption of City Operations and Goal

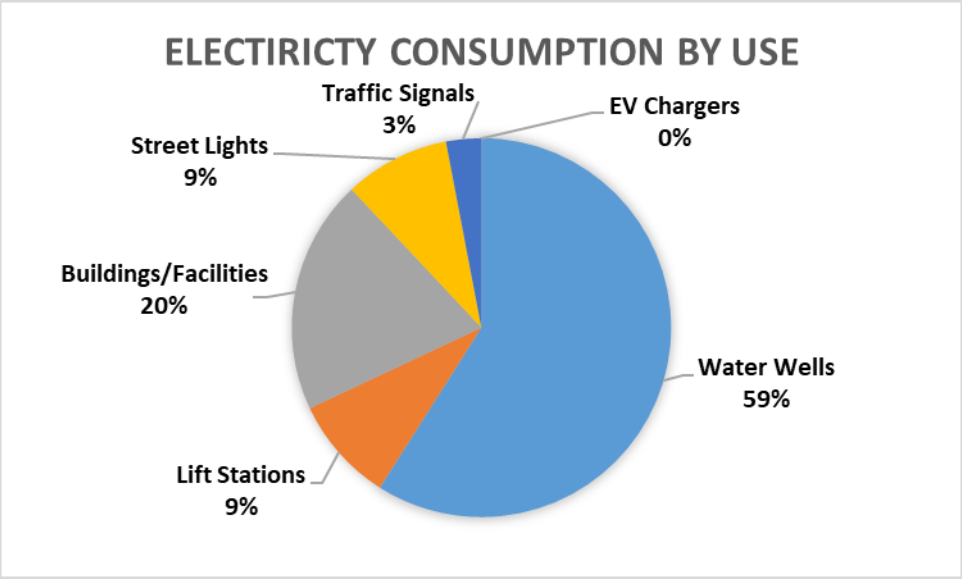


Figure 9. City Operations Electricity Consumption by Use

Renewable Energy

PSE Power Purchase

Starting in November of 2020, the City began receiving electricity from the Skookumchuck Wind Project via Puget Sound Energy's (PSE) Green Power Program. The Skookumchuck Wind Project, is an approximately 19,500 acre project located along the border of Thurston and Lewis counties. In 2021 City Operations received Renewable Energy Certificates for 5,598 MWh of electricity from this source in 2021, covering more than 100% of our City Operations electricity consumption.

Figure 10. Skookumchuck Wind Project.

Photo Credit: Southern Company.

On-Site Renewable Energy

In 2021, the solar panels at City Hall produced 22,340 kWh of energy. This accounts for 5.5% of City Hall's 2021 electricity consumption.

Employee Commute

The City partners with Thurston Regional Planning Council to run the Commute Trip Reduction Program, aimed at incentivizing employees to reduce the number of trips made to and from work each week in single-occupancy vehicles. In 2021 3% of total employees took advantage of this program and commuted to work without the use of a single-occupancy vehicle. This is a decrease from baseline and past years.

Data was not available as to the number of City employees who teleworked at least one day per week in 2021 as this has become a common practice among most City employees.

Indoor & Outdoor Water

In 2021, the City used 22.8 million gallons of water for both indoor/outdoor water use, a 14% increase from the baseline year. Out of the 22.8 million gallons used by the City in 2021, 1% was used inside City facilities, while the vast majority was used as irrigation in parks, medians, and right of ways.

In 2021, the City used 22.6 million gallons of potable water to irrigate parks, right of ways/medians, and building landscaping. Of the total amount of water used, 40% went to irrigating landscaping along City owned right-of-ways and medians, while 37% was used by parks and 22% for building landscaping, as seen in Figure 11.

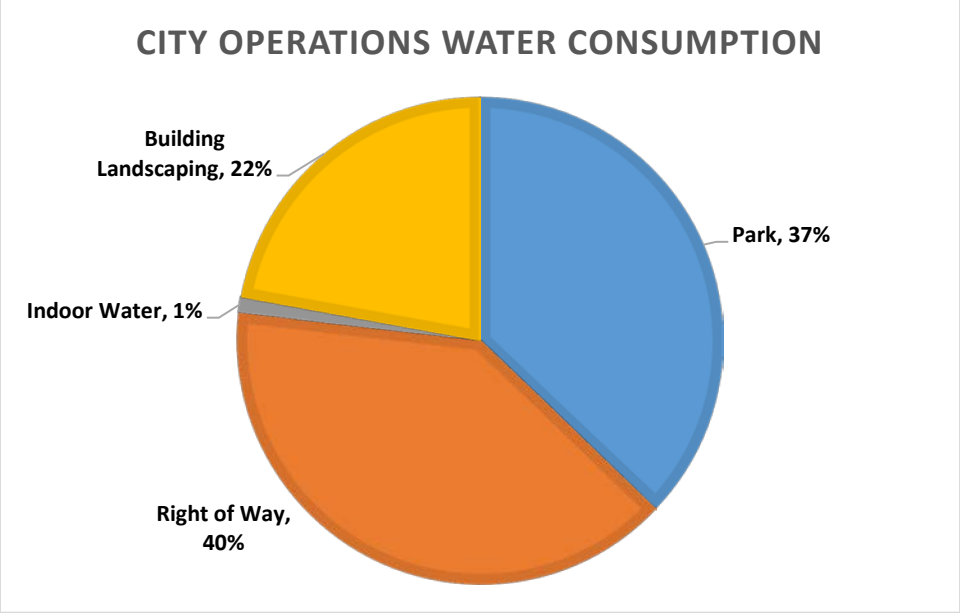


Figure 11. City Operations Water Consumption

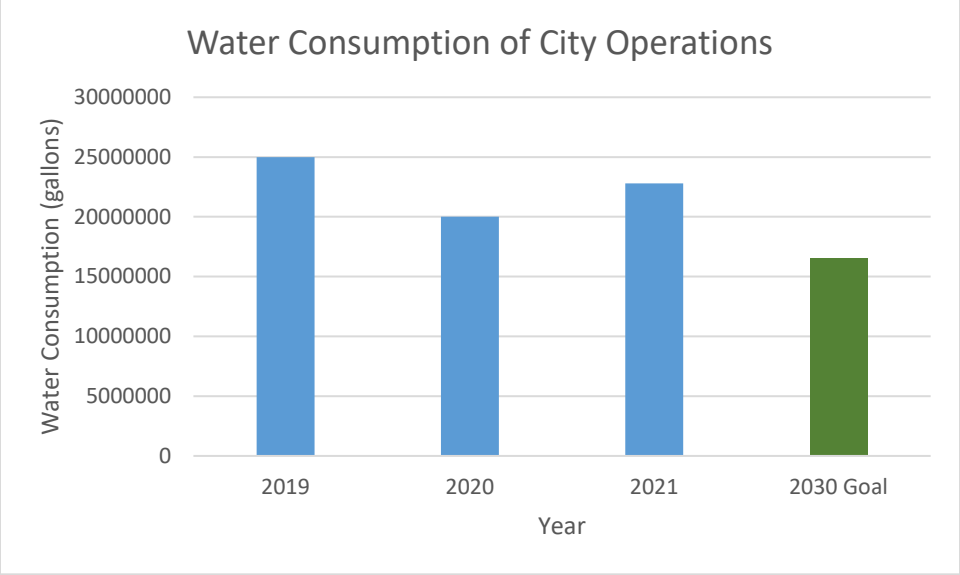


Figure 12. City Operations Water Consumption & Goal

Reclaimed Water

In 2021, the City used 42,356,000 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. This is a 12.3 million gallon (41%) increase from 2020 reclaimed water consumption.

Solid Waste

In 2021 City Operations produced an estimated 438,792 pounds of solid waste (Figure 13). We are currently recycling 19% of our solid waste by weight (Figure 14), which is approximately double the rate of recycling for our community as whole as reported by LeMay Pacific.

LeMay Pacific has provided this estimate amount of waste by type for the calendar year based on our container sizes and frequency as pickup for 2021. For the time being this estimation serves as a baseline for City Operations solid waste from which we can measure progress towards our goal to reduce solid waste produced by City activities 10% by 2030. An official waste audit should be conducted at City facilities to provide a more accurate baseline.

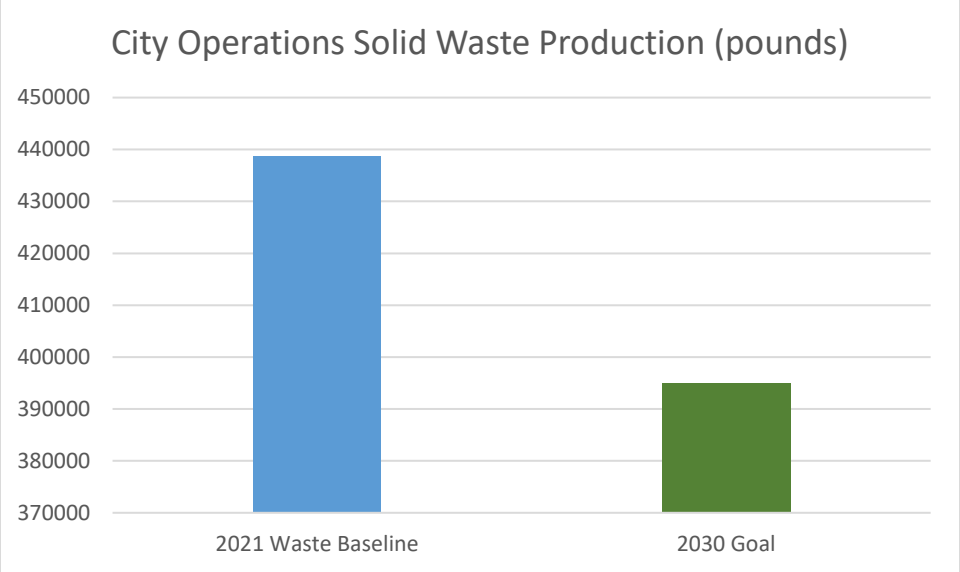


Figure 13. City Operations Solid Waste Production 2021 versus Goal

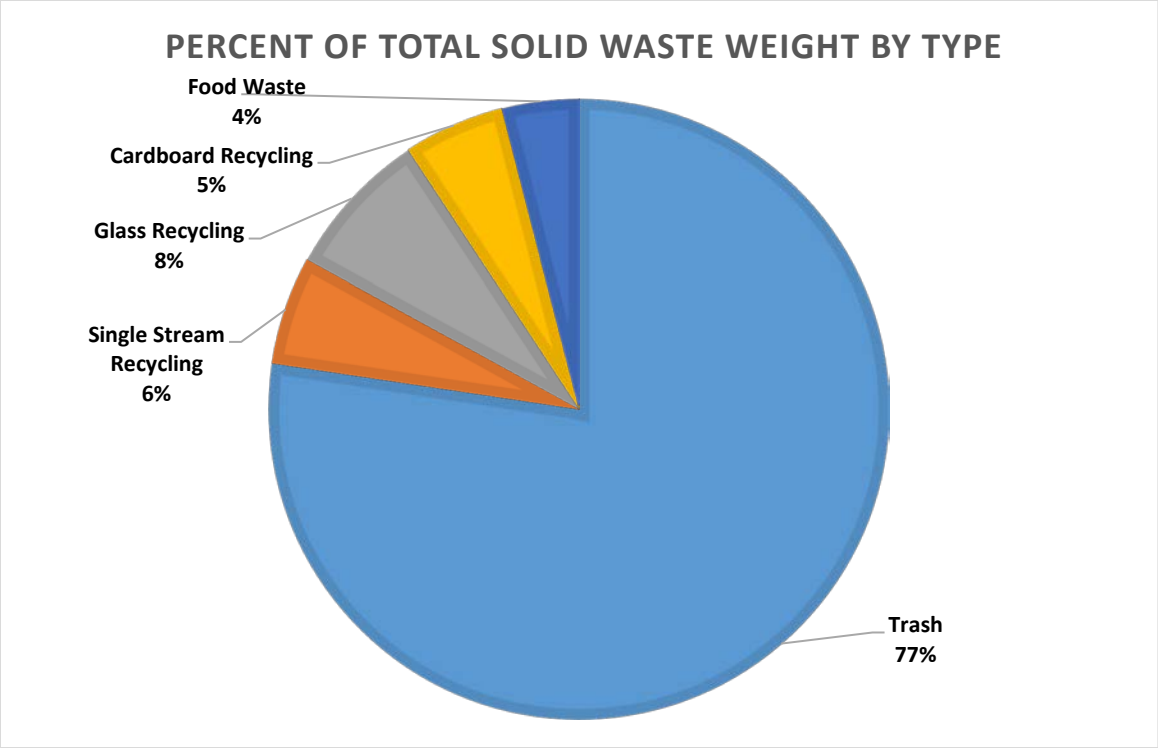
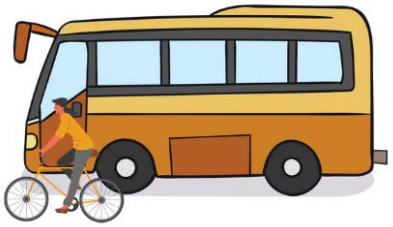


Figure 14. Solid Waste by Type Produced by City Operations in 2022

Sustainability 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. 2015-2021: 3% increase in total annual emissions from baseline.
    b. 2015-2021: 70.9% 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 provided by Skookumchuck Wind Farm through PSE Power Purchase Agreement.
    b. 2019-2021: 1.4% decrease in electricity usage.



3. Increase employee alternative transportation participation during their commutes to work by 30% by 2030.
    a. 2019-2021: 3% of employees participated in CTR in 2021, a 3% decrease from the baseline.

4. Reduce water use 3% per year from City activities from 2019 levels.
    a. 2019-2021: 14% increase in potable water use.
    b. 41% increase in the use of reclaimed water.

5. Reduce solid waste (garbage) produced by City activities by 10% by 2030.
    a. Baseline established as 438,792 pounds of solid waste.

Roadmap to Success

This report shows that we are not on track for some of our goals. The following are projects proposed by the Green Team which may help us meet those established goals:

Emissions Reduction

- Continued implementation of the Thurston Climate Mitigation Plan
- Purchase electric Public Works Trucks
- Anti-Idle Policy (underway in 2022)
- Switch to electric small equipment
- Planting more trees
- Renewable diesel

- Staff attending the same offsite meeting should carpool with coworkers
- Install air pressure monitoring valves on all city vehicles
- All actions listed below

Electricity Consumption

- Reduce hours or days of Operation at City Hall
- Utility Energy Audit (underway in 2022)
- Automatic thermostats that turn off when facility or operations doors are open
- Use water pipes to generate electricity
- Install VFD pumps at wells
- Replace all City lights with LED
- Turn off lights in Parks facilities that are closed to the public
- Install more solar panels at well houses, city buildings, parking lots, etc.
- Replacement hot water tank at Historical Park
- Replace electric furnace at the library with a more efficient heat pump

Commute Trip Reduction

- Reward staff who participate in CTR program

Potable Water Consumption

- Create landscaping plans for City Right of Way and medians
- Retrofit and upgrade City irrigation systems
- Increase recycled water usage
- Perform a Water Audit

Solid Waste Reduction

- Install compost receptacles in City Buildings
- Install recycling and compost cans at City parks
- Complete a City-wide dumpster and recycling audit
- Implement a City-wide Green Purchasing Policy favoring local goods and services
- All City events should use compostable products
- Automatically set all printers to print on both sides of the paper
- Host zero-waste events
- Compost paper towels
- Switch to paperless payroll
- Use recycled paper
- Have volunteers attending large events to assist in ensuring proper recycling disposal
- Take time to remove Departments from mailing lists
- Increase use to electric options for paperwork
- Purchase rechargeable batteries

Sustainability as an iterative process

The Green Team will continue to assess proposed and future projects/programs considering their feasibility and prioritization to achieve the established goals.

There are a number of sustainability metrics the City does not have established goals for and a handful of metrics reported here which in retrospect are not good measures of success. Suggested next steps include:

- Assess and report on water & sewer infrastructure electricity use *per capita*, rather than as a part of total electricity consumption reduction. Water & sewer demand will increase as the City grows and a per capita measurement is a better measure of success;
- Set goals for natural gas, gas, and diesel reductions;
- Set percent diversion goals for solid waste; and
- Include some community-wide (as opposed to only City Operations) goals and metrics to this annual report. The Green Team will retain focus on internal operations, but this report can function to provide a greater update on sustainability to our community.