

Greenhouse Gas Emissions



Environmental Analytics Integrated Capital Management City of Spokane – Public Works 2025 April 10

Greenhouse Gas (GHG) Emissions

2020-2022 Update

- Team Overview
- GHG Introduction
- Climate Planning Alignment
- Methodology Overview
- Community Inventory Results
- Local Government Operations Results
- Emissions Forecast
- Emission Reduction Targets
- Next Steps



Team Overview

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ICM - Environmental Analytics

Environmental Analytics is a sub-group within Public Works' Integrated Capital Management department







Cascadia Consulting Group

- Small, women owned consulting firm working to foster sustainability in communities, businesses, and organizations
- 30 years of experience nationally, with deep expertise in PNW & CA

3 lines of business:

- Planning & Facilitation
- Communications & Engagement
- Research & Analysis



Climate Planning/Analysis Clients

Cities:

- All King County Cities
- Tacoma
- Bainbridge Island
- Everett
- Edmonds
- Port Angeles
- Vancouver, WA
- San Francisco, CA
- Pleasanton, CA
- Albany, CA
- Dublin, CA
- Foster City, CA
- Livermore, CA
- Ashland, OR
- Flagstaff, AZ
- Sedona, AZ
- Columbia, MO
- Telluride, CO

Other Entities:

- DNR & DFW
- Sound Transit
- Port of Seattle
- OR DEQ

- Counties:Spokane
- King
- Pierce
- Snohomish
- Kitsap
- Thurston
- Whatcom
- San Mateo (CA)
- Sonoma (CA)
- Los Alamos (NM)
- Teton (WY)

Tribes:

- Coeur d'Alene
- Port Gamble
 S'Klallam
- Lummi
- Puyallup
- University of Washington
- Lawrence Berkeley
 National Laboratory





Greenhouse Gas Introduction

Purpose and Value

Greenhouse Gas Inventory Definition

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- Greenhouse gas emissions are a type of climate pollution that represent the release of heat-trapping gases such as carbon dioxide and methane - into the atmosphere that contribute to the greenhouse effect
- "Greenhouse gas (GHG) inventories calculate, quantify, and assess community associated emissions and their sources" – ICLEI





Greenhouse Gas Inventory Purpose



- Greenhouse gas reporting focuses on tracking activity leading to emissions
- Most emissions come from fossil fuels
- Emissions reduction efforts provide local benefits





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Critical Component for Informed Action





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Climate Planning

Providing technical and project support to the Planning Department

Comprehensive Plan 101



RCW 36.70A

Washington State has a planning framework called the **Growth Management Act** (GMA)

- Comprehensive Plan identifies the community's growth and development over a long period
- The plan is a set of visions, goals, policies, and strategies for how the city should grow physically, socially, and economically.
- Update every 10 years City of Spokane is due in June 2026



 \star Starred counties are partially planning under the Growth Management Act



Climate Element Overview (HB 1181)





Adds **Climate & Resiliency Goal** to the Growth Management Act in 2023

- Reduce emissions and vehicle miles traveled
- Foster community preparedness and resiliency, response and recovery efforts to climate impacts
- Prioritize environmental justice to avoid worsening disparities
- Engage overburdened communities who face the greatest risk to climate impacts



HB 1181 GHG Requirements



Local Action on Specific Sectors at Minimum

- Transportation
- Buildings and Energy
- Zoning and Development

Defining greenhouse gas emissions reduction (mitigation)

Actions taken to reduce or eliminate the emissions of greenhouse gases (present and future) in order to reduce the rate and extent of climate change damage. **Three GHG Policy Requirements**

- Requirement 1: Result in reductions in overall greenhouse gas emissions generated by transportation and land use within the jurisdiction but without increasing emissions elsewhere in Washington;
- Requirement 2: Result in reductions in per capita vehicle miles traveled within the jurisdiction but without increasing greenhouse gas emissions elsewhere in Washington; and,
- Requirement 3: Prioritize reductions that benefit overburdened communities in order to maximize the co-benefits of reduced air pollution and environmental justice.



HB 1181 GHG Requirements



- Community Engagement Input for GHG Mitigation Policy Changes
 - Convene workshops with vulnerable communities to get input on development and implementation of mitigation measures
 - Provide technical graphics to communicate emissions data in compelling ways that are meaningful and actionable

Reduction Targets

 Must set Net Zero goals by 2050 with interim targets to align with state



- Implementation Tracking
 - 5-year Progress Update for Policy Implementation



Climate Reporting Elements







ADAPTATION

A variety of actions that are meant to reduce or compensate for or adapt to the adverse impacts that arise from changes in the Earth's climate

MITIGATION

Actions or changes in societal behavior taken to reduce or eliminate greenhouse gas (GHG) emissions and/or to remove GHGs from the atmosphere to prevent significant adverse climate effects

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Climate Planning - Phase 1 Tasks

Steps and Pathways to Integrate Climate Policies into the Comprehensive Plan





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Comprehensive Plan Process

Comp Plan + Climate Integration



Integrative Approach

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Climate affects all aspects of planning and needs an integrative approach.



Engagement Phases







Climate Planning Phases – GHG Element









GHG Methodology Overview

WASHING

Turning raw data into actionable insights

What is a greenhouse gas inventory?



- Set of methods for quantifying/estimating GHG emissions produced by a community or other entity
- Takes various types of activity data, like electricity or natural gas use, and applies emissions factors to estimate total emissions



Key Metric Requirements



CO₂e Emissions

Vehicle Miles Traveled (VMT)



Data Source: U.S. Environmental Protection Agency (EPA), Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2022, April 2024. Note: Data are CO_2e based on 100-year global warming potential.

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Inventory Scopes and Sectors







Multilayered Reporting Protocols

- Global Protocol for Community-scale GHG Emissions
 (GPC): Developed by the World Resources Institute,
 C40 Cities Climate Leadership Group, and ICLEI (Local
 Governments for Sustainability), the GPC provides
 standards for disclosure and reporting requirements
 for community-scale inventories that align with global
 standards (IPCC Guidelines for National Greenhouse
 Gas Inventories).
- U.S. Community Protocol (USCP) for Accounting and Reporting of Greenhouse Gas Emissions: Developed by ICLEI (Local Governments for Sustainability) and a Steering Committee of U.S. local government members and technical subject matter experts. The USCP provides detailed guidance on how to perform communitywide GHG inventory calculations for U.S. cities.
- Local Government Operations Protocol (LGOP): Developed by the <u>California Air Resources Board</u> (CARB), <u>California Climate Action Registry (CCAR)</u>, ICLEI (Local Governments for Sustainability), and <u>The</u> <u>Climate Registry</u>, the LGOP provides detailed guidance on best practices for completing a government operations GHG emissions inventory for U.S. jurisdictions.







Data Management and Partnerships







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Different Approaches

 Constant evaluation of analysis approach can achieve maximal benefits with reduced costs

Inventory Analysis Approaches	Benefits	Risks
In-house Staff	 Full control over data and methodology and customized reporting Potential for greater understanding of operations Enhanced internal capability building 	 Time-consuming and labor- intensive Requires dedicated staff and training May lack specialized expertise and global trend knowledge
Consultants	•Access to specialized expertise and experience •Saves time for internal staff to focus on other work •Potential for high-quality and comprehensive reports	• Can be expensive •Less control over the process •Possible communication challenges
ICLEI Membership & ClearPath Tool	 Software and support tailored for local governments and communities Standardized methodology that complies with global protocols Integrates various data sources and modeling abilities 	 •Requires initial setup and ongoing training •Limited customization options •Subscription costs
 Goal Maximize the benefits while mitigating the risks Outcome Continually reviewed blended approach 		



Data Quality Tracking

- Standard operating procedures
- Data and assumptions tracked on quality
- Various quality assurance steps
- Recommendations for future improvements analysis
- GHG Tracker Workbook

Activity Data Quality

Medium = Modeled



Emissions Factor Data Quality

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Data Reporting Value



BENEFITS OF CLEAR AND CONSISTENT GHG EMISSIONS AND VEHICLE MILES TRAVELED REPORTING



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Audience Focused Deliverables





Reporting Update Intervals







Inventory Baseline Year

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- The City of Spokane has set a baseline year of 2016 for tracking future emissions
- Older data is not high quality enough to ensure comparability



* relative to a 2016 baseline



GHG Inventory Process Summary



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Greenhouse Gas Emissions

Inventories for Community and Local Government Operations

Drivers of Variability



• The City of Spokane's population **increased 7%** between 2016 and 2022

City of Spokane Population





Drivers of Variability

- In 2022, the City of Spokane experienced a 16% increase in heating degree days
- Additionally, the City of Spokane experienced a 50% increase in cooling degree days

Annual Total Degree Day History (Base 65°F)







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Community GHG Emissions

- The City of Spokane's community produced 2,283,457 metric tons of carbon dioxide equivalent (MTCO₂e) in 2022.
- The total per-capita emissions for the City of Spokane in 2022 were 9.89 MTCO₂e.
- Primary Sectors
 - Energy
 - Transportation
 - Other
 - Refrigerants
 - Solid Waste
 - Wastewater





Community Results for 2022

- Total emissions increased 5% from 2016 to 2022
- On a per capita basis, emissions decreased 2%
- The increase in emissions is primarily due to an increase in population

Annual City of Spokane Community Emissions by Source





Community Energy Emissions

- Energy emissions increased 8% from 2016 to 2022.
- Emissions from electricity decreased
 6% over this time while emissions from natural gas increased 30%.

Annual City of Spokane Community Energy Emissions by Fuel Source









Electricity Renewable Fuel Mix

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- In 2022, utility fuel mix disclosures for Avista showed 51% renewable energy sources
- For regulatory compliance, by 2030 electricity will be net neutral on emissions and by 2045 will be carbon free



AVISTA FUEL MIX DISCLOSURE FOR 2022

City of Spokane



Data Source: Washington State Department of Commerce, Washington Electric Utility 2023 Fuel Mix Disclosure Report, For calendar year 2022, published June 3, 2024

Energy Access and Poverty Assessment

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Secure Energy

 Indicator
 2022 Value

 Average yearly energy consumption per capita
 8,981 kWh/capita

Sustainable Energy

Indicator	2022 Value
Energy consumption from renewable energy courses	3,196,629 MW
Energy consumption from renewable energy sources	(51% of total)

Affordable Energy

Indicator	2022 Value
Percentage of households or population spending up to X% of income on energy service	13% of total population are energy burdened low-income households ("Energy burdened" is defined as households spending more than 6% o their household income on energy bills





Community Transportation Emissions

1,200,000



Annual City of Spokane Community Transportation Emissions

- Transportation emissions decreased
 5% from 2016 to 2022
- New SRTC travel
 demand model



Community Vehicle Miles Traveled

- On-Road Vehicle Miles Traveled (VMT)
 decreased 1% from 2016 to 2022
- On a per capita basis,
 VMT decreased 7%
- SRTC working to develop regional VMT goals

Annual City of Spokane Community Vehicle Miles Traveled (VMT)





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Community Refrigerants Emissions

- Refrigerant emissions are calculated using national estimates reported by the U.S.
 Environmental Protection Agency (EPA), scaled down to Spokane using population.
- Estimated refrigerant leakage produced 126,649 MTCO₂e in 2022 (6% of total emissions)
- WA has new legislation aimed at reducing these emissions

Annual City of Spokane Community Refrigerant Emissions





Community Solid Waste Emissions

- Solid waste emissions have decreased 2% since 2016
- Most changes come from a 16% decrease in emissions from landfills over that same time period
- Primarily impacted by the volume of community solid waste processed

Annual City of Spokane Community Solid Waste Emissions by Source





Community Wastewater Emissions

- Emissions have decreased 24% since 2016
- Primarily due to cleaner effluent from treatment plant upgrades







Actions and Resources



Inventory covers actions already being taken in each sector you! Resources for how individuals can take action to reduce their emissions provided Ways to get involved in climate planning



Government Operation Emissions City of Spokane

Community Greenhouse Gas Emissions (MT CO2e)



Government Solid Waste Emissions

- Solid waste emissions have decreased 2% since 2016
- Most changes come from 16% decrease in emissions from landfills over that same time period
- Primarily impacted by the volume of community solid waste processed







Government Operation Emissions

- Government operation emissions without including solid waste have decreased 1% since 2016
- Primarily driven by increased adoption of LED lighting in facilities and for street and traffic lights.
- Additionally, 10% of 2022's electricity in "other" buildings was provided through Avista's Solar Select® program (100% renewable electricity) at City Hall

Annual City of Spokane Government Operations Emissions without Solid Waste Operations





Operational Efforts



Solid Waste

- Waste-to-Energy electricity generation
- Electric vehicles
- Renewable fuels
- Recycling contamination Al/camera demonstration
- Paint recycling
- Textile recycling
- Emissions lifecycle assessment
- Carbon capture feasibility analysis
- Landfill solar development

• Fleets

- EV infrastructure and charging stations
- RNG-powered solid waste collection vehicles
- Renewable diesel usage
- Reduce idling of vehicles
- Operational changes for less trips and reduced miles driven for leaf collection, snow plowing, and debris disposal
- Electronic routing for sweeping & snow plowing
- Use of satellite material locations for winter materials to reduce miles driven

Traffic and Streetlights

- Installation of LED lights
- Upgrading streetlights and traffic signals to LEDs

Wastewater

- Biogas reuse
- Biogas flare reductions
- Electric vehicles
- Conserving water by recycling treated wastewater to clean membranes

• Water

- Upriver Hydroelectric Generation
- Electric Vehicles
- Mechanical upgrades
- Lighting upgrades to LED
- Efficient window upgrades
- Pumping strategies
- Well pump upgrades
- Water Wise conservation programs
- SpokaneScape upgrades
- Other
 - Building HVAC upgrades
 - Avista Solar Select Program for City Hall
 - Commute Trip Reduction program
 - Telework policy
 - Use of Microsoft Teams and other remote meeting solutions
 - Business travel policy





Emissions Forecast

Projections through 2050

Wedge Analysis









Similar Across All of Washington





Passenger vehicles - Electrified Light duty vehicles - Electrified Heavy dity vehicles - Electrified Transit - Electrified Waste reduction Weste reduction Remaining Enrisidens to Meet T Target (MTCO2e)

NET CARBON NEUTRALITY BY 205

level. Credit: City of Burie

50% REDUCTION BY 20

DSD

Emission Reductions Needed



 To achieve the City's greenhouse gas reduction targets, excess emissions not already covered by current Federal and State policies will need to be addressed at the Federal, State, and/or Local level



Emission Reductions Needed





Projected Emissions by Sub-Source





Key Takeaways



 The most effective policies will focus on reducing emissions in the largest sectors

Top 3 projected emissions in 2050 by source (86%)



Focusing on decarbonizing and reducing **natural gas & transportation fuel use,** and **vehicle miles traveled**, is critical to achieving GHG reduction goals





Emissions Reduction Targets





Current Emissions Reduction Goals





* relative to a 2016 baseline



Comparison of Different Target Methods



The City's current targets meets WA requirements, but there are additional ways to set emissions reduction targets

Emissions Reduction Target Comparisons

- Historic Emissions (2016 baseline)
- Projected Emissions Reduction From Current Policies (-35%, -45%, -47%)
- Current City & State Targets (-45%,-70%, -95% and Net Zero)
- Nationally Determined Contribution Targets (-54%, -64%, -74%, -95% and Net Zero)
- Science-based Targets (-64%, -72%, -80%, -95% and Net Zero)



Discussion





Are there specific ways to present the data that would be useful to you or the public for the next phase of considering policies for the Comprehensive Plan?



What emissions reduction targets would be most useful for our community?



What GHG policy approaches would be most effective for our community?





Next Steps

Climate Planning - Phase 1 Tasks

Steps and Pathways to Integrate Climate Policies into the Comprehensive Plan





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Climate Informed Planning Process







Benefits of Data-informed Policymaking





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Earth Day Climate Planning Workshop

City of Spokane



Help Support A More Resilient Spokane

Learn about ongoing climate planning efforts and provide input on future actions

Food from Feast World Kitchen Will be Provided

Raffle Prizes

Family Friendly

Near STA Route 21

Learn more at PlanSpokane.org

Community Workshop

April 22

West Central Community Center The Newton Room 6 - 7:30 p.m.





Join The Conversation!





my.spokanecity.org/climateplanning



<u>climateplanning@spokanecity.org</u>



PlanSpokane Monthly Newsletter



Engage.Spokane.gov









Appendix

Definitions



- **Climate Resilience:** The ongoing process of anticipating, preparing for, and adapting to changes in climate and minimizing negative impacts to our natural systems, infrastructure, and communities.
- Adaptation: The process of adjusting to new (climate) conditions in order to reduce risks to valued assets.
- Mitigation: Processes that can reduce the amount and speed of future changes to climate by reducing emissions of heat-trapping gases or removing them from the atmosphere.

Definitions based on the US Climate Toolkit and RCW 70A.65.010



Definitions



- Environmental Justice: The fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to development, implementation, and enforcement of environmental laws, regulations, and policies. Environmental justice includes addressing disproportionate environmental and health impacts in all laws, rules, and policies with environmental impacts by prioritizing vulnerable populations and overburdened communities and the equitable distribution of resources and benefits.
- Overburdened Community: A geographic area where vulnerable populations face combined, multiple environmental harms and health impacts, and includes, but is not limited to, highly impacted communities as defined in RCW <u>19.405.020</u>.

Definitions based on <u>RCW 36.70A.030</u>

