Washington State Transportation Carbon Reduction Strategy

November 15, 2023

WSDOT

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Prepared by

WSDOT

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Executive Summary

FHWA Carbon Reduction Program

Estimated Funding Amounts FY22-26

All CRP Funds: $6.4 Billion

WA State Funds: $110 Million

In 2021, the federal government established the Carbon Reduction Program (CRP)[1] as part of the Bipartisan Infrastructure Law (BIL). The Federal Highway Administration (FHWA) will allocate approximately $6.4 billion of CRP funds over five years to states to plan for and implement projects and programs to reduce carbon emissions from the transportation sector. The CRP funds may be used for a range of activities identified in the legislation including, but not limited to, public transit investment, transportation alternatives projects, congestion pricing, and port electrification.

Carbon reduction strategy

The CRP requires each state to develop a carbon reduction strategy (CRS) in consultation with the state's metropolitan planning organizations (MPOs) to identify projects and strategies that reduce carbon emissions from transportation. The CRS is to be tailored to the state's population density and context to ensure appropriate projects, strategies, and investments. States must submit their strategies to FHWA by November 15, 2023, and update them at least once every four years thereafter. States and MPOs are encouraged to obligate CRP funding for projects that support implementation of the CRS.[2]

Washington State Transportation Carbon Reduction Strategy

In response to this requirement, the Washington State Department of Transportation (WSDOT), in partnership with MPOs and regional transportation planning organizations (RTPOs), as well as state agencies, tribes, local agencies, industry, and community groups, developed this Washington State Transportation Carbon Reduction Strategy (TCRS).

This TCRS describes the policy framework Washington State is using to reduce transportation emissions and identifies the types of strategic actions Washington is investing in to work toward state statutory GHG emissions limits. Recent and planned projects are listed to demonstrate the types of work the state is undertaking.

The TCRS serves three main purposes:

1. This TCRS aids Washington in implementing the Federal CRP, which will provide about $110 million to Washington over the course of federal fiscal years 2022-2026. This TCRS helps WSDOT and MPOs across the state identify and select eligible transportation investments appropriate to Washington's population and context.

2. As an educational tool, the TCRS summarizes ongoing actions to reduce transportation carbon emissions in Washington. It helps inform transportation-related organizations and

[1] FHWA's Bipartisan Infrastructure Law factsheet on the Carbon Reduction Program. Available at https://www.fhwa.dot.gov/bipartisan-infrastructure-law/crp_fact_sheet.cfm.

[2] Information Memorandum: Carbon Reduction Program (CRP) Implementation Guidance based on 23 U.S.C. 175, from Gloria M. Shepherd, Associate Administrator Office of Planning, Environment, and Realty to Division Administrators Directors of Field Services, April 21, 2022. https://dot.ca.gov/-/media/dot-media/programs/local-assistance/documents/crp/2022/crp-guidance.pdf

decision-makers about the state's goals, policies, priorities, and strategies to decarbonize transportation.

3. The document also supports future planning efforts by establishing a baseline for decarbonization actions with partners, setting the stage for prioritizing the next steps, and establishing consistent messaging across the state. WSDOT will update the TCRS every four years in compliance with federal law.

Washington context

The State of Washington is committed to tackling human contributions to climate change and has set ambitious goals to reduce greenhouse gas (GHG) emissions. Washington's first statewide GHG limits were established in 2008. In 2020, the state updated these limits to reflect advancements in climate science:[3]

- By 2030 – 45 percent below 1990 levels
- By 2040 – 70 percent below 1990 levels
- By 2050 – 95 percent below 1990 levels and net zero emissions

Washington also has parallel statutory goals for reducing per capita VMT to reduce GHG emissions.[4]

The most recent statewide GHG emissions inventory reports 2019 emissions. In that year, Washington emitted 102.1 million metric tons (MMT) of carbon dioxide equivalent (CO_2e), a 9.3 percent increase above the 1990 baseline. In 2019, the transportation sector was the largest contributor, accounting for 39 percent of all GHG emissions.

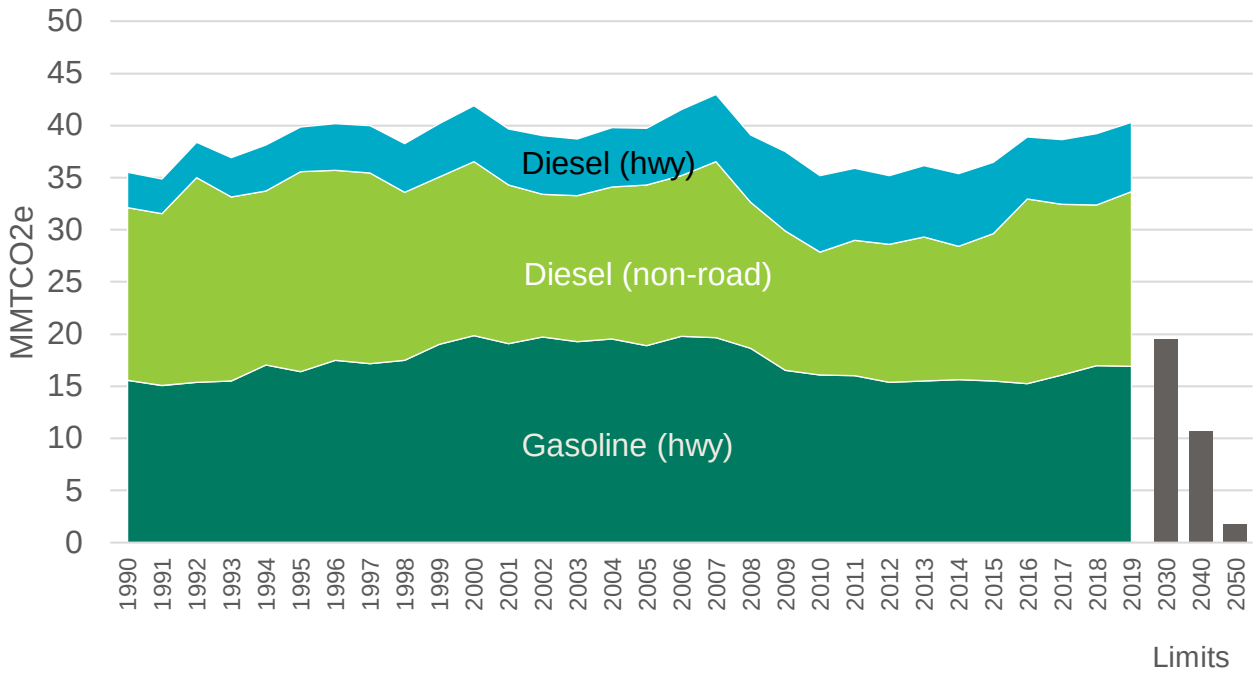
To achieve the state's emissions limits, Washington must move aggressively on multiple fronts, including the transportation sector.

For planning purposes, Washington is applying the state limits proportionally to the transportation sector, i.e., assuming the transportation sector needs to meet the same percentage reductions as established for the entire state. Because transportation emissions have increased since 1990, emissions must decline by 50 percent in the 7 years between now and 2030 and the entire transportation sector (trains, planes, autos, trucks, ferries, and other marine vessels) must decline to net zero in one generation. Figure ES-1 shows Washington's historic transportation GHG emissions (1990-2019) and the proportional emission reductions for this sector.

[3] Washington State Legislature, RCW 70A.45.020: Greenhouse gas emissions reductions—Reporting requirements. Available at: https://apps.leg.wa.gov/rcw/default.aspx?cite=70A.45.020

[4] Washington State Legislature, RCW 47.01.440: Adoption of statewide goals to reduce annual per capita vehicle miles traveled by 2050. Available at: https://apps.leg.wa.gov/rcw/default.aspx?cite=47.01.440

Figure ES-1. Washington's historical on-road transportation GHG emissions with proportional emission limits (MMT, CO_2e)



Note the change in horizontal scale after year 2019.

[Source: generated from data in Ecology's GHG Emissions Inventory[5] with proportional emission limits.].

State framework

The 2021 State Energy Strategy is Washington's blueprint for achieving comprehensive decarbonization across all economic sectors. The transportation chapter of the State Energy Strategy identifies two overarching strategies that work together to reduce transportation GHG emissions:

- Move people and goods more efficiently and equitably.
- Electrify vehicles and switch to low-carbon fuels.

The TCRS builds on this two-part strategy to describe how Washington is addressing GHG emissions from transportation.

Since the State Energy Strategy was published, two key programs have been enacted that provide overarching direction for the state to decarbonize equitably:

- The Healthy Environments for All[6] (HEAL) Act is Washington's cornerstone environmental justice legislation, creating a coordinated state approach toward identifying and addressing environmental and health disparities for overburdened communities and vulnerable populations. The two key objectives of the HEAL Act are to:

[5] Washington State Greenhouse Gas Emissions Inventory: 1990–2019. Stacey Waterman-Hoey, Washington State Department of Ecology, Olympia, Washington, December 2022, Publication 22-02-054. Available at: https://apps.ecology.wa.gov/publications/documents/2202054.pdf

[6] https://doh.wa.gov/community-and-environment/health-equity/environmental-justice

  - Promote the equitable distribution of environmental benefits while investing in communities that experience the greatest environmental and health burdens.
  - Reduce environmental and health disparities among overburdened communities and vulnerable populations in Washington and improve the health of all residents.

- The Climate Commitment Act (CCA)[7] creates a carbon cap and invest program, capping large emitters and directing the proceeds from auction allowances to investments that transition the state to a low-carbon economy. Most transportation fuels[8] are included in the program. Approximately $5.4 billion in auction receipts are directed towards transportation carbon reduction investments over 16 years through the Move Ahead Washington transportation funding package.[9]

While WSDOT has a key role in leading efforts to address emissions from users of the transportation network and the network itself, the complex nature of transportation and transportation emissions requires coordination across the state. The state legislature's role is critical – enabling action, providing direction, and allocating funding. WSDOT and other agencies work under the Governor's leadership. Two other state agencies – Ecology and Commerce – also play important roles as they lead the state's efforts to decarbonize fuels used in the transportation sector and oversee land use planning. Other partners make important local decisions (e.g., land use), build infrastructure, and provide transportation services.

Strategic actions

Guided by these overarching state policies from the State Energy Strategy, across the state numerous strategies are being implemented to reduce emissions. These strategies can be grouped into the two categories identified in the State Energy Strategy: **move people and goods more efficiently and equitably** and **reduce the carbon intensity of transportation**.

Strategies to move people and goods more efficiently and equitably:

- **Land use strategies** improve multimodal accessibility and safety, reduce the distance single occupancy vehicles must travel, and enhance freight efficiency.
- **Active transportation** strategies make walking, biking, and using transit, attractive, practical, and safe to use.
- **Transit and rideshare** incentives and strategies, including supportive infrastructure, such as bus lanes, bus shelters, and park and ride facilities, encourage more efficient trips.
- **The internet** and the corresponding availability of broadband services can reduce the need for some trips.
- **Efficient system operations and user fee strategies** reduce congestion and manage traffic flow in high-volume areas.

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[7] Washington State Department of Ecology, Climate Commitment Act. Available at https://ecology.wa.gov/Air-Climate/Climate-Commitment-Act

[8] Exceptions are identified in RCW 70A.65.080 (https://app.leg.wa.gov/RCW/default.aspx?cite=70A.65.080) and WAC173-446-050 (https://app.leg.wa.gov/WAC/default.aspx?cite=173-446-040)

[9] http://leap.leg.wa.gov/leap/Budget/Detail/2022/ctLEAPDocument2022-A-030922.pdf

- **Fleet operations management** by freight and other partners optimize travel efficiency.
- **Vehicle efficiency** improvements reduce the energy needed for and emissions from each mile traveled.

Strategies that reduce the carbon intensity of transportation:

- **Electric vehicle strategies**, such as charging infrastructure, public outreach, incentives, grants, and vouchers, reduce emissions per mile traveled.
- **Green hydrogen and low-carbon fuels**, such as biodiesel and renewable diesel, in construction equipment, long-haul freight, marine, rail, and aviation, provide lower carbon options while longer term options are developed.
- **Strategies to reduce the embodied emissions in transportation infrastructure**, such as using environmental product declarations (EPDs) to track lifecycle material impacts in construction projects, will lead to making more informed decisions about the emissions in transportation infrastructure.

Outreach and engagement

Just as this strategy builds on the State Energy Strategy, the outreach and engagement efforts for the TCRS build on engagement conducted during the development of the State Energy Strategy.

Recognizing the importance of collaborative decision-making and inclusive planning, WSDOT conducted extensive outreach activities to engage partner representatives from tribes, state agencies, MPOs and RTPOs, industry partners, community-based organizations, and highly impacted communities. This engagement is documented in Appendix B.

Throughout the development process, WSDOT used various outreach methods such as focused partner meetings, mailings and email, surveys, publicly posted materials, and webinars. These diverse approaches provided our partners with multiple opportunities to contribute their insights. WSDOT reached out to over 600 partner organizations and all 29 federally recognized tribes in Washington. Two webinars were conducted to share information about the TCRS development with partners and stakeholders, including tribes, environmental justice groups, unions, chambers of commerce, and economic development organizations.

A public comment period from July 17 through August 16, 2023, provided partners and the public an opportunity to review and comment on a draft version of the TCRS.

These efforts provided opportunities for partners to share their perspectives, data, ideas, and priorities related to carbon emissions reductions in transportation. The engagement activities fostered a collaborative environment and helped shape the TCRS and ensure its alignment with the state's goals and priorities.

Next steps

The TCRS is one step in an ongoing process. It brings together the extensive work underway in Washington to reduce transportation GHG emissions and shows the breadth of policies, plans, programs, and projects in place to move the state toward the GHG goals. As such, this strategy joins

the family of strategies and plans that WSDOT prepares. WSDOT will continue working with our partners to implement the strategies outlined here.

Federal law requires that states submit the next carbon reduction strategy to FHWA in 2027. WSDOT will begin the update process in 2026. The update will discuss the state's work on closing the gap between the outcomes of our existing programs and our emission limits.

WSDOT will work to expand community engagement efforts and develop additional tools to support the strategy update. The complex nature of transportation emissions requires collaborative work with partners; WSDOT will continue to engage with partners on how best to coordinate efforts.

Ongoing work needs to include:

- **Supporting strong collaboration** – Meeting state transportation GHG reduction targets requires partnerships to implement solutions across the state. Collaboration will be needed to incorporate the information from many partners in subsequent planning efforts, from local comprehensive plans, to MPO and RTPO regional efforts, to other WSDOT plans.
- **Expeditiously implementing existing policies and programs and track progress** – To be successful, the state needs to ensure that efforts are fully implemented, which will require funding, staffing, and effort over time. Regularly assessing the effects of investments on emission reductions, equity, and travel efficiency is necessary for evaluating policy and program effectiveness and progress toward these overarching goals.
- **Filling policy gaps** – Additional policies are needed to meet state reduction limits. Three key efforts will provide additional information on how the state can address specific areas of carbon reduction:
  - Vehicle Miles Traveled (VMT) Targets Final Report
  - Transportation Electrification Strategy (TES)
  - Green Electrolytic Hydrogen Study
- **Understanding the emission gaps** – The Transportation Carbon Reduction Technical Report[10] shows that current emission reduction policies are insufficient to meet state GHG limits. Closing these gaps will require additional analysis to provide a framework for making informed choices as the state continues to reduce emissions.
- **Tracking and adopting innovation** – New technologies and improvements continue to emerge that help make the changes needed to meet statewide GHG reduction limits. The state and partners should support promising new research and be ready to fund pilot and demonstration projects. This work is especially important for medium- and heavy-duty vehicles, rail, marine, and aviation.
- **Tracking emerging issues** – The transportation landscape in Washington State continues to evolve. Work to reduce transportation carbon emissions requires that emerging issues be identified and addressed in a timely manner so that challenges do not grow and opportunities can be expanded upon. Three issues warrant attention as the state works on transportation decarbonization: transportation network companies, online shopping and home delivery, and population growth.
- **Identifying funding gaps** – Many of the strategies identified throughout this report have historically had low funding. The Climate Commitment Act is providing a new revenue source

[10] Washington State Transportation Carbon Reduction Technical Report: Transportation Carbon Emissions Scenario Modeling, November, 2023.

and is being used to increase investments in transit, active transportation, electric vehicle charging infrastructure, and other programs that reduce GHG emissions. Even with this implementation, the state will need to assess and identify which strategies and programs require further investment to meet state transportation GHG emissions reduction, equity, and efficiency goals.

- **Updating the Transportation Carbon Reduction Strategy** – Federal law requires states to update their carbon reduction strategies every four years. The first update of this strategy is due in November 2027; work on the strategy update will begin in 2026. In the meantime, WSDOT will continue working with partners on engagement and implementation.

Additional work to support strategic emission reduction implementation

In addition to the above efforts that are underway to fill policy gaps, and parallel to the TES, the state would benefit from a **statewide multimodal transportation efficiency strategy** to accelerate transportation efficiency improvements**.** This work would identify preferred policies to reduce per capita vehicle miles traveled (VMT), meet greenhouse gas (GHG) limits, minimize the need for transportation energy infrastructure investments, and improve equitable access. This strategy would need to be developed in close collaboration with partners and would support future legislative policy development and investment decisions.

As noted above, the Transportation Carbon Reduction Technical Report[11] shows that current emission reduction policies are insufficient to meet state GHG limits. Closing these gaps will require additional analysis to provide a framework for making informed choices as the state continues to reduce emissions. Specific needs include:

- **Analysis of transportation efficiency improvements –** an analysis of transportation efficiency opportunities and measures is needed to support the development of a **statewide multimodal transportation efficiency strategy**. This analysis would identify how efficiency improvements contribute to emissions reductions and the support needed for their strategic implementation. This analysis must account for different types of communities (urban, suburban, small city, rural) and different types of travel (commutes, recreational, errands, etc.).
- **Opportunities analysis for high-capacity inter-city transit and passenger rail –** identify the types of service that best meet traveler needs across the state and where they can be most efficiently implemented throughout the state, expanding beyond the central Puget Sound area and I-5 corridor. This analysis would evaluate efficiency improvements between communities: identifying demand, identifying service levels to meet that demand, and establishing priorities for implementation.
- **Freight analysis (rail, marine, aviation, and on-road freight) –** work with industry partners to characterize emissions and identify opportunities and challenges to improving efficiency from freight to inform the development of effective and efficient policies and programs that address freight-related emissions, specifically:
    - **Baseline emissions profile –** develop a baseline emissions profile of freight and off-road modes to characterize the emissions from these sectors.

[11] Washington State Transportation Carbon Reduction Technical Report: Transportation Carbon Emissions Scenario Modeling, November, 2023.

    - **Opportunity analysis for freight efficiency improvements** – identify opportunities, challenges, and potential policy and programmatic supports to improve efficiency across all freight modes.

- **Evaluate the role of reducing VMT in lowering energy requirements and associated costs –** While it is generally understood that fewer miles traveled requires less energy, an analysis of the infrastructure and energy cost savings from improved transportation efficiency would support state vehicle electrification efforts and may help direct efforts for the most effective implementation.

Seattle freeway by Stephen Leonardi on Unsplash

Chapter 1. Introduction

1.1. FHWA Carbon Reduction Program

The 2021 Bipartisan Infrastructure Law (BIL) established the Carbon Reduction Program.

The Federal Highway Administration (FHWA) notes that, "The purpose of the Carbon Reduction Program (CRP) is to reduce transportation emissions through the development of state carbon reduction strategies and by funding projects designed to reduce transportation emissions," where, "transportation emissions means carbon dioxide emissions from on-road highway sources of those emissions within a State."[12] The CRP provides states with funds for projects designed to reduce carbon emissions from transportation sources.[13]

1.1.1. Carbon Reduction Program funding

The Federal CRP will provide an estimated $110 million to Washington State for the federal fiscal years 2022-2026.[14] These funds will be distributed among the state and metropolitan planning organization (MPO) partners according to the CRP formula set by law,[15] with 65 percent apportioned to MPOs based on population, and the remaining 35 percent available in any area of the state.[12] WSDOT Local Programs will provide allocations to the MPOs for regional CRP projects.

The BIL identifies numerous project types eligible for funding.[16] These include but are not limited to:

- Public transportation
- Transportation infrastructure for pedestrians, bicyclists, and other nonmotorized forms of transportation
- Replacing street lighting and traffic control devices with energy-efficient alternatives
- Projects to support the deployment of alternative fueled vehicles
- Projects to quantify embedded carbon emissions in the state's transportation facilities

1.1.2. Carbon Reduction Strategy requirement

Under the CRP, by November 15, 2023, states must develop a Carbon Reduction Strategy (CRS) document, in consultation with MPOs, to identify projects and strategies that reduce transportation carbon emissions.[17] FHWA guidance requires the CRS to:

A. Support efforts to reduce transportation emissions.

B. Identify projects and strategies to reduce transportation emissions, which could include

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[12] Information Memorandum: Carbon Reduction Program (CRP) Implementation Guidance based on 23 U.S.C. 175, from Gloria M. Shepherd, Associate Administrator Office of Planning, Environment, and Realty to Division Administrators Directors of Field Services, April 21, 2022. https://www.fhwa.dot.gov/environment/sustainability/energy/policy/crp_guidance.pdf.

[13] Consistent with this definition, the terms Greenhouse Gas (GHG) emissions, Carbon Dioxide emissions, and carbon emissions are used synonymously in this document.

[14] USDOT FHWA, 5-year Carbon Reduction Program by State, Available at https://www.fhwa.dot.gov/bipartisan-infrastructure-law/crp_5year_funding_by_state.cfm

[15] 23 U.S.C. 175(e)

[16] USDOT FHWA, Carbon Reduction Program. Available at https://www.fhwa.dot.gov/bipartisan-infrastructure-law/crp_fact_sheet.cfm

[17] U.S.C. 175(d) (info from guidance) under CRS.

projects and strategies for safe, reliable, and cost-effective options:

i. to reduce traffic congestion by facilitating the use of alternatives to single-occupant vehicle trips, including public transportation facilities, pedestrian facilities, bicycle facilities, and shared or pooled vehicle trips within the state or an area served by the applicable MPO, if any;

ii. to facilitate the use of vehicles or modes of travel that result in lower transportation emissions per person-mile traveled as compared to existing vehicles and modes; and

iii. to facilitate approaches to the construction of transportation assets that result in lower transportation emissions as compared to existing approaches.

C. Support the reduction of the state's transportation emissions.

D. Quantify (at the state's discretion) the total carbon emissions from the production, transport, and use of materials used in transportation construction within the state.

E. Align with the state's population density and context, including MPOs designated within the state.

1.1.3. Washington State approach

This Washington State Transportation Carbon Reduction Strategy (TCRS) was prepared to meet the CRP requirements and support Washington State's efforts to reduce transportation greenhouse gas (GHG) emissions. The strategy summarizes statewide carbon reduction efforts in transportation and related priorities in a single document. This information will guide investment decisions and future work by partners statewide to help meet Washington's aggressive targets. The document also provides a baseline from which to build additional efforts.

1.2. Content and development overview

This TCRS document is based on a combination of research, engagement, and analysis from December 2022 through November 2023:

Research: GHG emissions reduction policy research identified nearly 500 transportation GHG reduction strategies from more than 100 organizations in Washington State. These strategies form the basis of the TCRS strategies presented in Chapter 3. Appendix A provides additional details on the research methodology and a detailed list of the strategies identified.

Transportation partner engagement: A comprehensive engagement plan to solicit input from a diversity of partners facilitated productive discussion among stakeholders. Partners included state, federal, transit and local agencies, tribes, WSDOT staff, MPOs and regional transportation planning organizations (RTPOs), community organizations, freight stakeholders, aviation stakeholders, and interested individuals. The engagement included surveys, mailings and email, public meetings, interviews, webinars, and publicly posted materials. The information collected informed the identified strategies. Appendix B describes the engagement process and summarizes the information collected.

Developing Washington's Transportation Carbon Reduction Strategy: This strategy provides a comprehensive snapshot of transportation decarbonization efforts statewide, identifying the policy framework, strategic actions, and types of programs and projects

taking place. This information provides context and examples for planners using CRP funds.

1.3. How to use this document

This is Washington's first TCRS. It provides a consolidated overview of the state's vision for transportation decarbonization and serves the following purposes:

1.3.1. Carbon Reduction Program implementation

Washington intends for CRP funded investments to support reducing GHG emissions. The TCRS supports the state's work to implement the CRP by identifying strategies consistent with both federal and state priorities. It will help MPOs and the State select and prioritize eligible strategies by providing information on current efforts, gaps, and relevant examples.

1.3.2. Education

As the first document to compile all actions being undertaken to reduce transportation carbon emissions within Washington State, the TCRS serves as a principal reference for the state's goals, policy framework, priorities, strategic actions, programs, and projects for reducing transportation emissions. As such, it is intended to provide information on how the state is reducing transportation carbon emissions and to inform decision makers about the level of effort and resources needed to decarbonize transportation in Washington State consistent with State GHG reduction goals.

Chapter 3 and Appendix A of this document summarize the nearly 500 strategies identified from over 100 organizations, showing the breadth of strategies and investments underway statewide. Current CRP funded investments are identified at the end of Chapter 3 and projects currently programmed in the Statewide Transportation Improvement Program (STIP) that support transportation emission reductions are listed in Appendix D.

1.3.3. Future development

Federal law[18] requires states to update their Transportation Carbon Reduction Strategy on a four-year cycle. Washington's first TCRS document establishes a baseline for the state's actions on decarbonization and provides a foundation for prioritizing next steps. Future iterations of the TCRS will reflect work accomplished over this first planning period.

1.4. The changing climate

Since the Industrial Revolution, human activities have released large amounts of carbon dioxide and other greenhouse gases into the atmosphere, changing the earth's climate. These gasses are rapidly accumulating and have so far raised the global average temperatures by approximately 2 degrees Fahrenheit since 1880. This warming is altering natural cycles in Washington State and around the world.

In Washington and across the planet, oceans are warming and becoming more acidic, glaciers are receding, ice caps are melting, and the sea level is rising. Many places, including Washington, are experiencing changes in rainfall, resulting in more floods, droughts, or intense rain, as well as more frequent and severe heat waves.

[18] 23 U.S.C. 175(d)(3) and (4)

These changes present unprecedented challenges to our society and environment. Economic impacts of climate change include increasing risks to property and communities from flooding and wildfire, and potential losses of income in the forestry and agricultural sectors due to increasingly severe and frequent droughts. Everyone is directly or indirectly affected by these changes.

1.5. Washington State emissions context

1.5.1. Washington State emissions and limits

Washington State is a leader in curtailing GHG emissions and has established statutory[19] GHG emission limits based on scientific evidence that identifies the emission reductions needed to avoid the worst climate change impacts:

- By 2030 – 45 percent below 1990 levels
- By 2040 – 70 percent below 1990 levels
- By 2050 – 95 percent below 1990 levels and net zero emissions

Progress toward meeting these limits is reported every two years in the Washington State Greenhouse Gas Emissions Inventory. Washington uses this inventory to track progress toward meeting emissions limits and design policies that reduce GHG emissions. During development of this strategy, the most recent inventory available was from 2019.[20] The state's GHG emissions inventory begins with 1990; it does not predict future trends.

In 2019, total emissions from all sectors were 102.1 million metric tons (MMT) of carbon dioxide equivalent (CO_2e), 9.2 percent above the 1990 baseline level of 93.5 MMT CO_2e.

Figure 1 shows Washington's total GHG emissions by sector. The transportation sector is the largest single contributor, in 2019 emitting 40.3 MMT of CO_2e, or 39 percent of all emissions.

Figure 2 shows the statewide GHG emissions by sector since 1990 and statewide GHG emission limits.[21]

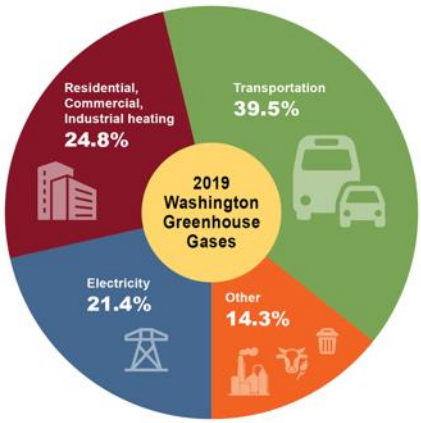


Figure 1. 2019 statewide GHG emissions in Washington by sector [Source: Ecology**20**]

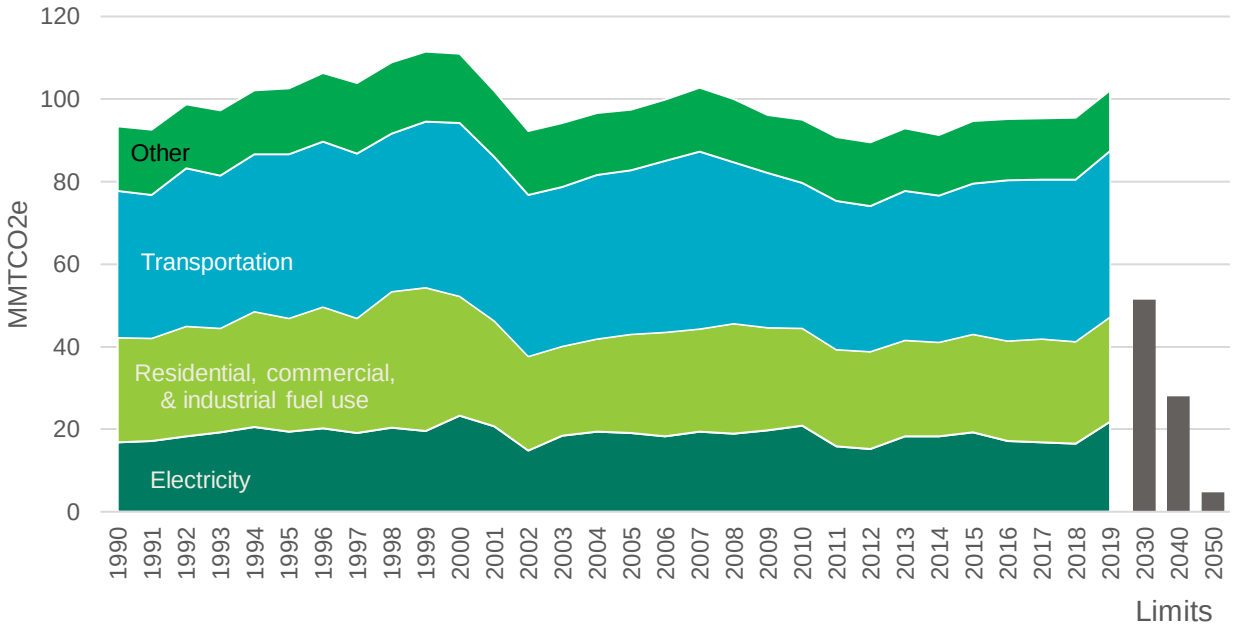
At the same time, the state is working to reduce total GHG emissions, state population is growing. This means that per capita emissions need to decrease more than the percentage reductions in statue. In other words, meeting expanding mobility needs must happen simultaneously with reducing emissions.

[19] RCW 70A.235.020

[20] Washington State Greenhouse Gas Emissions Inventory: 1990–2019. Stacey Waterman-Hoey, Washington State Department of Ecology, Olympia, Washington, December 2022, Publication 22-02-054. Available at: https://apps.ecology.wa.gov/publications/documents/2202054.pdf

[21] Washington State Legislature, Greenhouse gas emissions reductions—Reporting requirements. Available at https://apps.leg.wa.gov/rcw/default.aspx?cite=70A.45.020

Figure 2. Washington's total GHG emissions by sector, 1990-2019 (MMT, CO_2e). Future year emission limits (State total) are shown for reference



Note the scale change after year 2019.
[Source: Ecology[20] with emission limits superimposed.]

1.5.2. Washington transportation emissions

The transportation sector is the largest source of GHG emissions in Washington State, contributing approximately 39 percent of the state's carbon emissions.[22] Washington's abundant hydropower means that the state's electricity sector is smaller than the national average, leaving the transportation sector to make up a larger proportion of the state's emissions.

Although emissions have gone up and down since 1990, in 2019, the transportation sector's CO_2e emissions were 40.3 MMT, 14 percent above the 1990 level. Emissions have not decreased overtime as needed to begin meeting emission limits.

The Washington State Legislature has not set sector-specific limits. In planning efforts, the state is applying the economy-wide reduction percentages proportionally to the transportation sector. This approach results in sector CO_2e emission limits for transportation of 19.5 MMT by 2030, 10.7 MMT by 2040, and 1.8 MMT by 2050. **Table 1** shows the statewide historic emissions and future emission limits for the state, the transportation sector, and transportation's on- and off-road components.

[22] Washington State Department of Ecology Green House Gas Inventory (2018-2019). Available at https://apps.ecology.wa.gov/publications/documents/2202054.pdf.

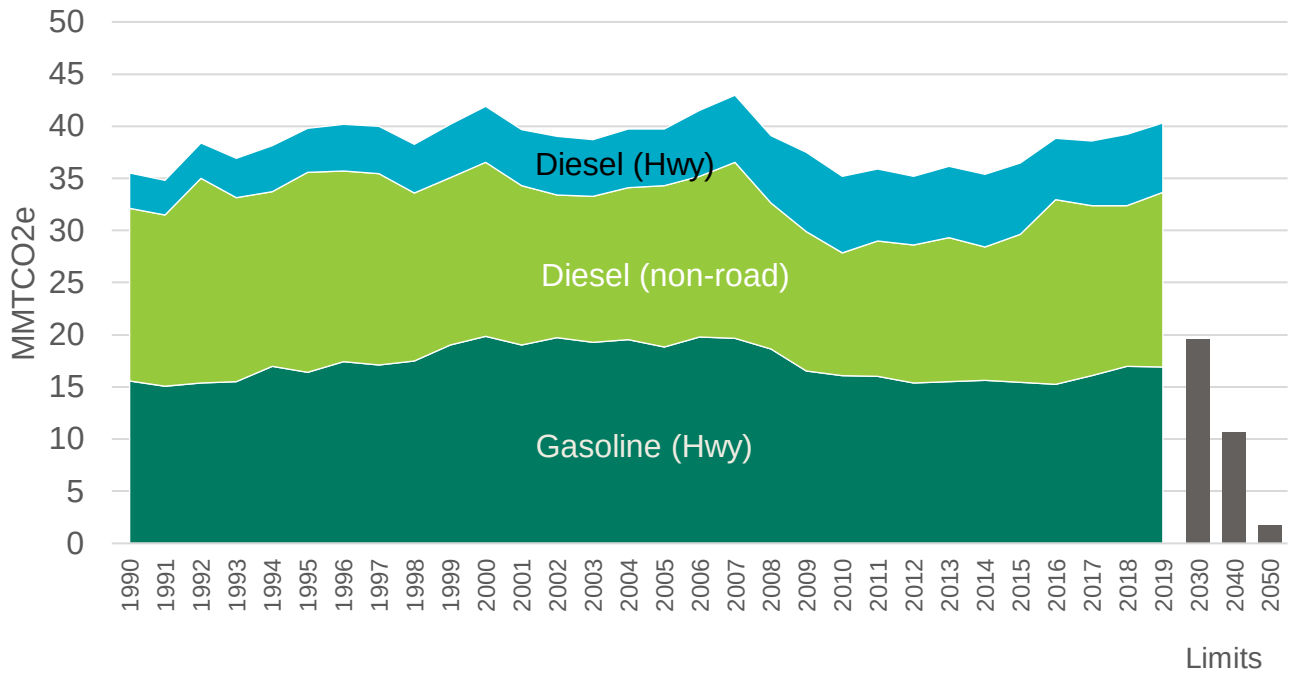
Table 1. Historic GHG emissions and future GHG emission limits

Category	Emissions (MMT CO_2e)			Emission limits (MMT CO_2e)		
	1990	2019	Change since 1990 (percent)	2030	2040	2050
Total state emissions	93.5	102.1	9.2%	51.4	28.1	4.7
Transportation sector	35.5	40.3	13.5%	19.5	10.7	1.8
On-road transportation	19.0	23.5	23.7%	10.5	5.7	1.0
Off-road transportation	16.6	16.7	0.1%	9.1	5.0	0.8

Note: numbers may not add due to rounding.
[Source: generated from data in Ecology's GHG Emissions Inventory[20]]

Figure 3 further breaks down transportation sector emissions by fuel type and use: highway gasoline, highway diesel, and non-road use. On-road diesel emissions come largely from medium- and heavy-duty trucks, whereas gasoline is primarily used by light-duty vehicles and some smaller trucks. Non-road emissions come from aviation, marine, rail, agricultural, and construction equipment. Most importantly, emissions have increased since 1990. To meet state limits, emissions need to decline significantly in the coming years.

Figure 3. Historic on-road transportation sector emissions by fuel type, 1990-2019



Note the change in horizontal scale after year 2019.
[Source: Ecology[20].]

1.6. Transportation equity

Washington's transportation system does not meet everyone's needs and some bear more of the negative effects than others. Transportation system burdens, such as air pollution, and benefits, such as easy access, have historically been unevenly distributed; overburdened communities and vulnerable populations have often been further marginalized by these transportation system effects.

The State Energy Strategy identified the need to reduce emissions in a manner that addresses historical inequities. The Healthy Environments for All (HEAL) act creates a coordinated approach toward identifying and addressing environmental and health disparities for overburdened communities and vulnerable populations.

Addressing historical inequities in the transportation system requires systemic modifications that both reduce emissions and ensure that everyone has the access they need while no one bears a disproportionate burden. Additionally, the transition of the transportation system to clean fuels must be done equitably. This means ensuring that overburdened communities and vulnerable populations directly receive the benefits of this transition through improved air quality and access to clean transportation options. This can be done through specifically designated programs, apportionment goals in benefit distributions, and other requirements; this work requires continued attention and tracking.

1.7. Washington State carbon reduction roles

In Washington State many entities play a role in reducing transportation carbon emissions, including tribes, state government, local governments, private entities, community organizations, and individuals.

1.7.1. Washington State government

The Washington State Legislature establishes overarching policy, sets requirements, and appropriates funding. State agencies implement these policies and programs using the funds provided by the Legislature. The Departments of Ecology, Commerce, and Transportation play key roles in executing the state's carbon reduction efforts.

As a regulatory agency, Ecology is implementing the Climate Commitment Acts cap and invest program and the Clean Fuels Standard. They establish the rules for these key programs as well as administer the programs' implementation and track statewide progress toward meeting emission limits through the state's biennial greenhouse gas inventory.

Commerce provides policy expertise and grant administration to move transportation carbon reduction efforts forward. Their policy experts support the generation of statewide policies such as the State Energy Strategy. They are also co-leading the development of the Transportation Electrification Strategy. The Legislature has provided significant funding for different types of carbon reduction and energy efficiency grants that Commerce administers, including transportation electrification.

WSDOT's greenhouse gas reduction focus is on transportation emissions. While WSDOT does not regulate emissions, the agency plays an important role in reducing transportation emissions. Agency activities important to greenhouse gas reductions include developing policy, designing and constructing infrastructure, maintaining and operating the state highway and ferry system, administering funding, preparing transportation plans, and collecting data.

The Washington State Legislature has established six policy goals for the state's transportation

system: preservation, safety, stewardship, mobility, economic vitality, and environment. WSDOT's climate work is an example of how the agency implements these goals across the state.

1.7.2. Tribes

Tribal governments are responsible for planning and implementing transportation investments, building and maintaining roads, establishing local zoning regulations, and operating transit services. Tribal governments also work with the state through consultation when transportation projects affect tribal communities, artifacts, or lands.

1.7.3. Regional and local governments and agencies

Regional and local governments and agencies include public entities like MPOs, RTPOs, cities, counties, and transit providers. MPOs and RTPOs work with members and stakeholders to identify transportation investment priorities, develop transportation plans, and secure funding for transportation infrastructure and services. Certain federal funds for transportation projects and programs are channeled through MPOs, that award them to local agencies, transit agencies, and other entities. Cities and counties also have planning functions, build and maintain roads, and establish local land use regulations. Transit services are provided by cities, counties, transit agencies, and community organizations.

1.7.4. Utilities

Utility providers, particularly electric utilities, play an important role in vehicle electrification and charging infrastructure. These entities must plan for providing the additional energy needed for vehicles and some are implementing programs such as curbside electric vehicle charging and supporting transit electrification. State decarbonization goals for the electric utility industry are established through the Clean Energy Transformation Act, and work in tandem with the TCRS as part of the comprehensive State Energy Strategy.

1.7.5. Community organizations

Community organizations include a variety of groups working to address transportation greenhouse gas emissions and improve the quality of life for the people in the area they serve. The work these organizations do varies, including advocacy, direct service, educating and empowering their community, and ensuring their membership's or community's needs are considered and met.

1.7.6. Private sector

The private sector includes companies that provide transportation services or use transportation facilities as part of their business, such as delivering goods. The private sector also provides passenger transportation services, including taxis, ridesharing, airlines, and passenger rail.

1.7.7. Individuals

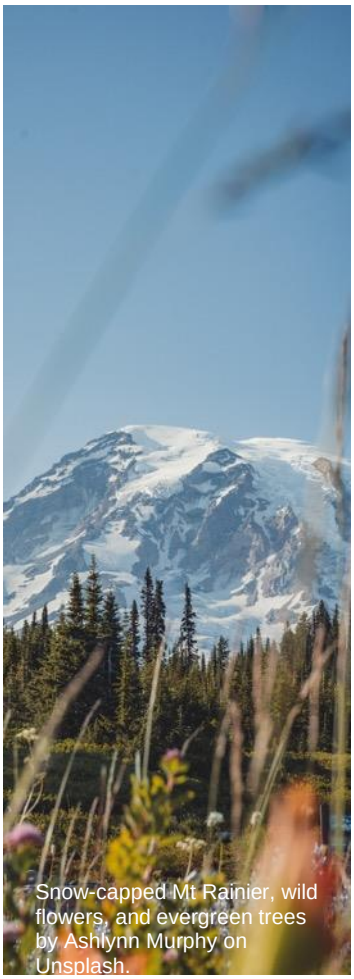
Every individual in Washington plays a role in reducing transportation carbon emissions. Individuals make decisions about where to live and when and how to move about. Not everyone has the same options to choose from, but most can choose between options with varying emissions effects. Over time, the options to meet individual and family travel needs will change as more electric vehicles, new bike infrastructure, and safer pedestrian spaces become available.

Chapter 2. Statewide Transportation Decarbonization Policy Framework

Washington State is taking a multifaceted approach to reducing transportation sector GHG emissions and addressing environmental justice and equity. Foremost in this effort is the State Energy Strategy.[23] Published in 2021, the State Energy Strategy serves as Washington's blueprint for actions and strategies to achieve deep decarbonization across the state's economy.

The State Energy Strategy recognizes that "no sector is as important as transportation to achieving decarbonization, nor as complex in its operation and governance." It provides a roadmap to reducing transportation GHG emissions to achieve aggressive carbon emissions reductions using, "multiple policies to achieve comprehensive benefits, including improved public health from reduced co-pollutants, increased physical activity, reductions in traffic-related injuries, greater economic opportunities (from lower costs and more mobility choices), and increased quality of life in both urban and rural areas."

Within this framework two recent acts provide cross-sector policy direction. The Healthy Environments for All (HEAL) Act provides overarching direction on environmental justice and the Climate Commitment Act (CCA) establishes an emissions cap and invest program and generates revenue for a variety of carbon reduction programs.



Snow-capped Mt Rainier, wild flowers, and evergreen trees by Ashlynn Murphy on Unsplash.

2.1. Statewide energy strategy

The 2021 State Energy Strategy provides a roadmap for meeting the state GHG reduction limits across all sectors: buildings, electricity, industry, and transportation. The State Energy Strategy makes priority recommendations that represent a significant and intentional transition for the state's economy, while recognizing that overburdened communities and vulnerable populations must gain the most from the transition and have the most at risk from worsening climate impacts.

Because the transportation sector produces almost 40 percent of GHG emissions in the state, decarbonizing the transportation sector is critical to achieving Washington's emissions limits.

In addition, transportation is a major contributor to local air pollution, especially for overburdened communities close to transportation facilities such as roadways, airports, marine ports, industrial activity, and railways. To operate more equitably, Washington's transportation system must reduce air pollution, improve public health, provide economic mobility, and improve quality of life statewide.

The State Energy Strategy transportation recommendations highlight specific activities to advance the state's energy goals and address historic inequities impacting overburdened communities and vulnerable populations throughout Washington. These actions are grouped into two categories:

[23] 2021 State Energy Strategy - Washington State Department of Commerce. Available at https://www.commerce.wa.gov/growing-the-economy/energy/2021-state-energy-strategy/

- **Move people and goods more efficiently and equitably.** Transportation efficiency can be improved in two ways:
    - Reduce the need for travel by shortening the travel distance (e.g., through improved urban design) or avoiding the need for trips altogether (e.g., via telemedicine).
    - Shift travel to more efficient modes to move more passengers or goods per trip, such as active transportation, public transit, or maritime freight transport.

  Although certain approaches may be more relevant in urban, suburban, or rural environments, comprehensive implementation will result in widespread equity and efficiency benefits.

- **Electrify vehicles and switch to low-carbon fuels**
    - Decarbonizing transportation requires that vehicles use zero-emission fuels. Making the transition to these vehicles demands accessible and affordable charging and refueling infrastructure, sufficient incentives to support rapid adoption, and education and outreach so that Washingtonians have the information to choose their mobility future.

Commerce prepares a biennial energy update to report on State Energy Strategy implementation. The 2023 Biennial Energy Report identified significant accomplishments including passing the HEAL Act and the CCA. These two acts provide overarching direction guiding Washington's implementation of transportation GHG reduction efforts. The report also identifies next steps by economic sector.

2.1.1. Healthy Environment for All Act

Passed in 2021, the Healthy Environment for All (HEAL) Act is Washington's cornerstone environmental justice legislation, creating a coordinated state approach toward identifying and addressing environmental and health disparities for overburdened communities and vulnerable populations.

The two key objectives of the HEAL Act are to:

- Promote the equitable distribution of environmental benefits while investing in communities that experience the greatest environmental and health burdens.
- Reduce environmental and health disparities among overburdened communities and vulnerable populations in Washington and improve the health of all residents.

The HEAL Act created the Environmental Justice (EJ) Council to provide recommendations to the Governor and the Legislature, track state progress, and provide guidance to state agencies. The EJ Council must track, measure, and report on EJ implementation. Likewise, identified agencies, including Commerce, Ecology, and WSDOT, are required to develop EJ implementation plans, metrics to track agency EJ goals, and equitable funding strategies to ensure that EJ is incorporated into agency decision making.

HEAL Act strategic actions most relevant to this TCRS include:

- Engagement – Each agency must create a community engagement plan that describes how it will engage with overburdened communities and vulnerable populations as it evaluates new and existing activities and programs. Each agency is also required to develop a framework to engage with and conduct formal consultation processes with tribal governments addressing tribal considerations regarding environmental and health disparities.

- Reporting and metrics – Each agency must report annually on the development and implementation of environmental justice in agency strategic plans, funding decisions, and other engagement activities related to EJ.
- Budgets and funding – Each agency must incorporate EJ principles into its decision processes for budget development, making expenditures, and granting or withholding environmental benefits. Agencies must equitably distribute funding and expenditures to overburdened communities and vulnerable populations while providing meaningful opportunities for inclusive public participation in agency expenditure decisions and set goals for directing funds to these communities.

2.1.2. Climate Commitment Act

Enacted in 2021, the Climate Commitment Act (CCA) directs Ecology to implement a cap-and-invest program for carbon emissions. The program sets a limit on carbon emissions from large emitters, including transportation fuel suppliers,[24] and auctions emissions allowances to capped entities. Over time the number of available carbon allowances decline, requiring capped entities to reduce their emissions.

In 2023, section 70A.65.030[25] of the CCA was amended, adding the requirement that agencies must conduct an EJ assessment consistent with the requirements of RCW 70A.02.060 of the HEAL Act when allocating funds or administering grants or programs funded by certain accounts.

The CCA directs the revenue raised through the auction to state programs that reduce emissions, improve equity, and increase climate resilience. At least 35 percent of funds must benefit overburdened communities, with a minimum of 10 percent allocated to tribal communities. Additionally, the EJ Council makes recommendations to the Legislature on how auction revenue should be used. Agencies using funding from CCA revenue must report their progress toward EJ goals.

The CCA revenue is a significant new source of funding for transportation projects and programs that reduce emissions. The use of these funds illustrates the state's multifaceted approach to address carbon reductions. An estimated $5.4 billion[26] is expected to be invested in transportation emission reduction efforts over a 16-year span (fiscal years 2023 to 2038). The first two quarterly auctions raised $856 million.[27]

2.2. Move people and goods more efficiently and equitably

The State Energy Strategy identifies two overarching approaches to reducing transportation GHG emissions – the first is to move people and goods more efficiently and equitably. Improving efficiency takes several forms, each supporting decarbonization in a slightly different, but important, way.

While eliminating the need for some trips directly cuts the energy used for transportation, improving trip efficiency reduces the amount of energy needed for a trip.

The State Energy Strategy identified that as the state seeks to decarbonize transportation, improving efficiency is fundamental to reducing the cost of the transition to alternative fuels.

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[24] Exceptions are identified in RCW 70A.65.080 (https://app.leg.wa.gov/RCW/default.aspx?cite=70A.65.080) and WAC173-446-050 (https://app.leg.wa.gov/WAC/default.aspx?cite=173-446-040)

[25] SB 5187

[26] Washington State Legislature, Move Ahead Washington Climate Commitment Act Spending. Available at http://leap.leg.wa.gov/leap/Budget/Detail/2022/ctLEAPDocument2022-A-030922.pdf

[27] Learn more from the Department of Ecology: https://ecology.wa.gov/Air-Climate/Climate-Commitment-Act/Cap-and-invest/Auctions-and-market .

The State Energy Strategy states that, "By reducing energy use through energy efficiency, the state will reduce the need for investment in infrastructure resulting in cost savings."[28] In other words, needing less energy to meet our transportation needs means less energy infrastructure to meet those needs.

Reducing the amount of travel also reduces transportation infrastructure needs, which, in turn, avoids the embodied emissions associated with construction. The state is also looking at ways to reduce embodied emissions associated with its construction activities through careful consideration of materials used, materials suppliers, and construction practices.

The State Energy Strategy identifies the categories below for efficiency actions; relevant state policies and programs are identified.

2.2.1. Set clear and ambitious targets

An important first step in improving transportation system efficiency is for the state to establish targets and milestones that provide clear direction and identify trends.

Per capita Vehicle Miles Traveled (VMT) Targets Proviso

Washington State established per capita VMT targets in 2008. In the 2021 Transportation Budget, the "VMT Targets Proviso" directed WSDOT to work with Commerce in developing per capita VMT targets for counties meeting specific population criteria in partnership with local jurisdictions, regional transportation planning organizations, and other stakeholders. An initial technical report, an interim report, and the final report document the findings from this work:

- Technical Report (2021) – provides background on the VMT proviso, identifies included counties, and describes the existing per capita VMT reduction benchmark.
- Interim Report (2022) – describes work to date, including foundational analysis and stakeholder engagement results.
- Final Report (2023) – defines a process for developing targets at a region scale (RTPO/MPO), the costs associated with carrying the work forward, and provides 24 potential changes to laws and rules for the legislature's consideration.

2.2.2. Improve land use transportation system planning and coordination, prioritizing VMT reduction

To improve Washington's transportation system's efficiency and equity, the state is taking steps to set statewide priorities for land use planning, infrastructure development, and service improvements. The state provides resources to enhance the capacity of local jurisdictions and community groups to pursue those priorities. Strategy, design, and deployment must reflect each community's needs. To achieve transportation efficiency targets, the state must set clear priorities for local jurisdictions to follow.

This direction reflects the fundamental shifts in land use planning that are needed to create communities that are truly walkable and bikeable by focusing growth in diverse, compact communities.

Effective inter-jurisdictional coordination is essential for successful VMT-reducing measures, including developing transit systems, walking and cycling infrastructure, and multimodal

[28] Washington State Department of Commerce, Washington 2021 State Energy Strategy. Available at https://www.commerce.wa.gov/wp-content/uploads/2021/01/WA_2021SES_Chapter-B-Decarbonization-Modeling.pdf, page 20

connections. Existing transportation systems planning tools, such as the Statewide Human Services Transportation Plan, the State Public Transportation Plan, and the State Active Transportation Plan, support this coordination and identify gaps in infrastructure and service throughout the state.

Amending the Growth Management Act

In place since 1990, the Washington State Growth Management Act (GMA) requires some cities and counties to develop comprehensive plans and development regulations for their communities. The GMA has undergone periodic updates with recent updates addressing climate change and emission reductions.

In 2021, the Legislature directed Commerce[29] to develop guidance for counties and cities to address climate change issues within their comprehensive plans. Over the course of this multiyear project, Commerce, in partnership with WSDOT and other state agencies, developed guidance that covers both GHG reduction and resilience in preparation for adverse effects from climate change. The GHG guidelines include a set of actions that counties and cities may take through updates to their comprehensive plans and development regulations that have a demonstrated ability to reduce per capita VMT and are achievable throughout the state, including in small cities and rural cities. This guidance is now available.

The 2023 Legislature amended GMA[30] by adding new climate change and resiliency planning requirements for some cities and counties. For the subset of local governments fully planning under the GMA, these changes include adding GHG emission reductions and per capita VMT reductions to the transportation goal, requiring the land use element to consider urban planning approaches that reduce per capita VMT, and changes to the transportation element planning requirements that encourage the development of efficient multimodal transportation systems that reduce GHG and per capita VMT. The legislation directs Commerce (in consultation with WSDOT) to publish guidelines that specify measures counties and cities may implement via comprehensive plan updates and development regulations. The measures included must have the demonstrated ability to increase housing capacity within urban growth areas or reduce GHG emissions and consider emissions reductions achieved through statewide programs. The guidelines must prioritize measures benefitting overburdened communities, including communities that have experienced disproportionate harm due to air pollution, drawing upon the most recent Department of Health disparities data. These guidelines must be consistent with applicable requirements of the HEAL Act. The work completed in early 2023 will be revised to meet the new 2023 legislative requirements.

In support of this work, each year WSDOT must provide per capita VMT for each city in the state and for the unincorporated areas of each county.

Increasing housing density

Washington State recognizes the importance of housing development patterns in addressing transportation GHG emissions. Increasing housing density typically reduces travel distance and makes alternatives to driving alone more viable. Several bills to address housing needs and increase housing density came out of the 2023 legislative session:

- **HB 1110 – Increasing middle housing in areas traditionally dedicated to single-family detached housing** – establishes minimum development densities in residential zones and creates requirements for certain cities to allow multiple dwelling units on residential lots. Commerce will provide technical assistance to cities implementing the requirements.

[29] (SB 5092) (Sect. 129(126))
[30] HB 1181

- **HB 1337 – Expanding housing options by easing barriers to the construction and use of accessory dwelling units** – modifies GMA for accessory dwelling units (ADU) within urban growth areas by requiring cities and counties planning under chapter 36 to adopt regulations providing for ADUs and places limits on these regulations.
- **SB 5058 – Exempting buildings with 12 or fewer units that are no more than two stories from the definition of multiunit residential building** – modifies the definition of a multiunit residential building. In effect, this changes state requirements for smaller residential buildings.
- **SB 5412 – Reducing local governments' land use permitting workloads** – requires cities and counties to exempt all residential housing projects within cities and middle housing project in county urban growth areas from the State Environmental Policy Act (SEPA) if the project is consistent with all development regulations.

Community-centered carbon reduction strategies

To ensure that overburdened communities have adequate resources to participate in and address GHG reductions in their communities, the 2023 Transportation Budget includes $3 million for WSDOT to develop and implement a community outreach, education, and technical assistance program. This program will support overburdened communities and their partners in developing community-centered carbon reduction strategies that make meaningful community impacts and help gain access to available funding to implement these strategies, where applicable. The legislation allows WSDOT to provide appropriate compensation to members of overburdened communities who provide solicited community participation and input needed by WSDOT to implement and administer the program.

2.2.3. Expand and align transportation funding with emissions and equity goals

Building a more efficient and equitable transportation system in Washington requires investments to develop and maintain new infrastructure while ensuring that existing infrastructure is safe and functional. Funding must be prioritized to align investments with per capita VMT reduction and equity targets.

Climate Commitment Act funding

The CCA, described above, is generating new revenue through allowance auctions. Per the CCA, a portion of this revenue is directed to transit and active transportation investments. Although many of the funded programs pre-date the CCA, the level of funding is increasing with CCA funds.

Passed in 2022, the Move Ahead Washington transportation funding package allocates $5.4 billion dollars from the CCA for transportation investments over 16 years.[31] The bill will provide significant investments for active and public transportation.

Over the term of Move Ahead Washington, active transportation investments total over $1.2 billion and include funding for Safe Routes to Schools, school-based bike programs, bike and pedestrian grants, bike and pedestrian projects, Complete Streets, and connecting communities grants. Over $164 million is provided in the 2023-2025 biennium.

Public transportation investments in Move Ahead Washington total just over $3.0 billion. These investments include transit support grants, transit projects, tribal transit mobility grants, transit coordination grants, special needs transit grants, bus and bus facility grants, green transit grants, and transportation demand management investments. In addition, funding is

[31] http://leap.leg.wa.gov/leap/Budget/Detail/2022/ctLEAPDocument2022-A-030922.pdf

provided to support the new 18 and under fare-free policy for the ferry system and rail. In the 2023-2025 biennium, CCA funding includes about $406 million for public transportation operating support and capital expenses, including electrifying transit vehicles, across the state.

2.2.4. Remove barriers to transit, walking, and cycling

Boosting transit ridership and the use of active transport options requires a comprehensive approach involving land use change, transit service expansion, high occupancy vehicle infrastructure,[32] and travel-demand management measures implemented at local and regional levels. To be effective and mutually supportive, transit systems, sidewalks, and bike infrastructure need to be complete networks.

New funding supports opening these modes to those who might otherwise not be able to access them through bike subsidies and free transit. The State Active Transportation Plan (2020) notes that the state's active transportation network is still incomplete and additional funding is needed to expand the network and fill gaps. The state's Transportation Demand Management Strategic Plan 2019-2023 explains how the state and partner organizations are expanding travel options across the state.

The CCA is providing needed funding to expand both transit and active transportation options. Additional funding is making public transit safer, faster, more reliable and convenient, and more accessible to increase ridership while reducing emissions. High occupancy vehicle lanes allow transit vehicles to operate efficiently in congested areas.

Rail

2019 Washington State Rail Plan provides a framework for future actions and meets federal and state requirements. This plan analyzes existing rail systems, identifies trends, suggests strategies, and sets forth an investment plan for infrastructure and equipment for both freight and passenger rail transportation.

Complete Streets

Complete Streets is a multifaceted roadway design approach for safe and accessible streets for all users, including public transportation and vulnerable roadway users, like pedestrians, cyclists, and persons with disabilities. The Move Ahead Washington transportation funding package includes a Complete Streets requirement.[33] In July 2022, WSDOT began incorporating Complete Streets principles into the design of projects costing more than $500,000 that are located within population centers, removing barriers to access for pedestrians, bicyclists, and transit users.

Travel Washington Intercity Bus

This intercity bus service connects rural communities to major transportation hubs and urban centers; fills gaps in the public transportation network; and makes travel more accessible, reliable, and convenient. Travel Washington typically provides more than 30,000 trips per year, serving some of the most rural parts of the state.

[32] WSDOT has established and has plans to expand a high-occupancy vehicle network: https://wsdot.wa.gov/travel/roads-bridges/hov-lanes/hov-system-map

[33] RCW 47.24.060

Youth ride free

The Move Ahead Washington transportation funding package created the Transit Support Grant program. To be eligible to receive these grant funds, transit agencies must have a documented fare-free policy for riders 18 years and under.[34] The Washington State Ferry system has also been funded for the fare-free policy for those 18 and under riding as a passenger in a vehicle or walking onto a ferry.[35]

E-bike subsidies

The 2023-2025 Transportation budget provides $5 million to establish an e-bike subsidy program for individuals 16 years or older. Individuals with household incomes at or below 80 percent of the county median income can receive a rebate up to $1,200 on the sale of an e-bike and qualifying equipment and services. For all others, the rebate is up to $300.

Bike and pedestrian facilities as public facilities

In the 2023 session, the legislature provided local governments with increased flexibility to use impact fees to fund alternative commuting modes and apply those fees for "bike and pedestrian facilities designed with multimodal commuting as an intended use."[36]

Intercity Rail

Amtrak Cascades provides regular service between Vancouver, BC and Eugene/Springfield, OR. BNSF Railway owns the tracks; Washington State owns the train cars; and Amtrak operates the trains. WSDOT has started the process to update the Amtrak Cascades Service Development Plan,[37] including developing service option rider forecasts. Work on the preliminary plan is anticipated by December 2023.

Amtrack also provides daily east-west service across the state on the train that travels between Seattle and Chicago.

Frequent Transit Service Study (2023)

In its 2022 session, the Legislature directed WSDOT to study and report on statewide transit service benchmarks. The report:

- Identifies gaps in accessible, frequent fixed-route transit.
- Presents funding scenarios that address identified gaps.
- Analyzes gaps for disparities in race, age, and disability.
- Recommends further studies to measure access to all forms of public transportation.
- Discusses the expansion of fixed-route transit and other forms of public transportation (e.g., demand response, micromobility, ridesharing).

Ultra high-speed rail

WSDOT is studying how ultra-high-speed rail might serve as a catalyst to transform the Pacific Northwest. During the 2023 legislative session, the Legislature allocated $4 million for continued analysis and the development of an expanded framework for ultra high-speed rail between Vancouver, British Columbia and Portland, Oregon. The Legislature also authorized $50 million to be used as matching funds to leverage federal funding opportunities. WSDOT is

[34] WSDOT news, https://wsdot.wa.gov/about/news/2022/youth-can-ride-transit-free-most-washington
[35] WSDOT news, https://wsdot.wa.gov/about/news/2022/state-ferries-says-welcome-aboard-free-youth
[36] SB 5452
[37] https://wsdot.wa.gov/construction-planning/statewide-plans/passenger-rail-plans/amtrak-cascades-service-development-plan

working with a policy committee to determine the next phase of work and how it will be undertaken. In keeping with legislative direction, that work will include:

- Developing an organizational framework
- Developing a public engagement approach
- Preparing and applying for potential future federal, state, and provincial funding opportunities
- Beginning work on scenario analysis
- Recommending the structure and membership of a formal coordinating entity

Park and ride lots

Over 350 park and ride lots across the state offer travelers designated places to park their cars to take transit or meet a carpool or vanpool.

2.2.5. Support measures to optimize freight VMT

Freight moves a wide variety of goods through international transport and long-haul trucking to individual home and business deliveries. It is a multimodal system that moves goods on public and private infrastructure, with the private sector making most operational decisions. Because freight and digital commerce are expected to grow as the state's population increases, WSDOT will need to continue collaborating with the freight industry to support efficient movement of goods. This work will necessarily include exploring available options to minimize the number of vehicle-miles needed for transport and delivery.

The 2022 Washington State Freight System Plan was developed collaboratively with public and private partners and will inform future freight transportation policies, programs, and investments.

The VMT Targets – Final Report recommends that heavy-duty vehicle VMT is monitored, estimated, and forecasted to better understand changes over time and inform state, MPO and RTPO, and local partners. This report also notes that, "heavy-duty vehicles deserve special acknowledgement that this travel is non-discretionary and closely associated with economic activities."[38]

Freight mobility prioritization

In HB 1084 – Concerning freight mobility prioritization, the Legislature recognized that the negative impacts of freight transportation do not fall equally on all residents of Washington; historically, the negative impacts have been concentrated or felt most acutely within overburdened communities. Freight mobility improvement efforts must prevent or minimize community impacts in areas of high freight travel and engage the community in early planning for proposed public and private infrastructure investments. The Legislature also recognized that because freight GHG emissions contribute to global climate change, mobility efforts must transition toward zero emissions technology and proposed public and private infrastructure investments must align with this transition.

To address these issues, this legislation directs the Freight Mobility Strategic Investment Board (FMSIB) to develop a six-year investment program of the highest priority freight mobility projects across the state and across modes. These projects must include planning for

[38] WSDOT Vehicle Miles Traveled (VMT) Targets - Final Report, June 2023, page 41. Available at https://wsdot.wa.gov/sites/default/files/2023-06/VMT-Targets-Final-Report-June2023.pdf

sufficient engagement with affected overburdened communities and evaluate alternatives to address effects on these communities.

Truck Parking

Per state and federal law, truck drivers must take prescribed safety rest breaks. Currently, in many parts of the state, finding places to park large vehicles during rest periods is difficult, which results in idling and additional miles driven. The state is working to expand truck parking options. The Legislature provided direction and funding for several efforts in the 2023 session:

- Reconfiguring existing locations to accommodate more vehicles and provide adjacent facilities, such as restrooms
- Coordinating with local governments to identify sites and develop recommendations
- Pursuing federal grant opportunities to develop and implement parking availability information systems
- Planning for additional solutions identified through the above efforts

2.2.6. Reducing embodied emissions from transportation infrastructure

Embodied emissions in infrastructure development are the emissions released during the construction of the infrastructure and manufacturing materials of the materials used. WSDOT recently contracted with the University of Washington's Carbon Leadership Forum to determine the composition of WSDOT's supply-chain construction-related GHG emissions. This analysis shows that the three largest contributors of GHG emissions from roadway construction materials are asphalt, concrete, and steel. WSDOT is working with the Carbon Leadership Forum, with funding from a FHWA Climate Challenge Grant, to build the capacity of WSDOT and industry partners to use environmental product declarations (EPDs) to track supply-chain construction-related GHG emissions during project development and construction.

Recycled concrete

RCW 70A.205.700 requires WSDOT and its implementation partners to collaboratively establish objectives and strategies for the reuse and recycling of construction aggregate and recycled concrete aggregate. This statute also requires the annual use of 25 percent recycled construction aggregates and concrete materials on WSDOT projects unless recycled products are not readily available or cost effective. Annually, WSDOT reports to the Legislature on the status of this requirement and the use of recycled concreate aggregate on WSDOT projects.

2.3. Electrify vehicles and switch to low-carbon fuels

Industry is making rapid advancements on battery electric vehicles (EV), fuel cell technology (fuel cell vehicles, or FCVs), and low-carbon liquid and gaseous fuels. In the EV market, upfront costs are declining as range increases and the market matures; electrification of medium- and heavy-duty vehicles is advancing but lagging behind passenger vehicles.

A better understanding of the energy needs and specifications across non-road transportation segments is critical to successfully expand decarbonization to off-road travel such as rail, marine, and aviation. Aviation electrification still faces challenges and complexities that need to be addressed. For example, for short-haul trips, electrification is a promising alternative while long-haul trips will likely be better suited for alternative liquid or gaseous fuels. Shore power for marine vessels is becoming increasingly common as is electrification for short

distance vessels, such as ferries. Marine, rail, and freight operators in Washington have strategies underway to support the adoption of zero emission technology innovation by 2050.

Clean Energy Transformation Act (CETA)

A supply of clean electricity is fundamental to reducing transportation emissions by ensuring the upstream emissions from electric vehicles are eliminated by 2050.

Enacted in 2019, the Clean Energy Transformation Act (CETA)[39] commits Washington to a zero-emission electricity supply by 2045. The law requires utilities to phase out coal-fired electricity from their state portfolios by 2025. By 2030, their portfolios must be GHG emissions neutral; they may use limited amounts of electricity generated from natural gas if it is offset by other actions. By 2045, utilities must supply Washington customers with electricity that is 100 percent renewable or non-emitting with no provision for offsets.

CETA also requires that equity considerations become an explicit part of utility planning; decision makers must assess potential impacts on vulnerable populations and overburdened communities.

2.3.1. Set clear and ambitious statewide targets

Phasing out gasoline- and diesel-powered vehicles by mid-century is key to achieving Washington's emissions limits. To meet state GHG reduction limits, the pace of alternative fuel vehicle adoption must accelerate. Targets for EVs, low-carbon fuels, and associated infrastructure send an important signal to regulatory agencies, the public, and the private sector, demanding focused planning and increased coordination. Targets must be realistic in considering market, technological, and legal constraints, with ongoing progress reports increasing accountability and shaping policy development.

Washington's Motor Vehicle Emission Standards

The Washington Motor Vehicle Emissions Standards – Zero-Emission Vehicles law directed Ecology to adopt California's Advanced Clean Cars (ACC II) and Advanced Clean Trucks (ACT) regulations. In Washington, these are known as the Zero Emission Vehicle Standard (ZEV standard) and the Advanced Clean Truck Programs (ACT).

The ZEV standard requires 100 percent of light-duty vehicles sales to be zero-emission vehicles by 2035. This requirement scales down emissions from light-duty passenger cars, pickup trucks, and SUVs starting from model year 2026 through 2035 by requiring an increasing number of zero-emission vehicles be sold over that period. In addition, the standard sets increasingly stringent standards for gasoline cars and heavier passenger trucks to continue to reduce criteria pollutant emissions.[40]

The Advanced Clean Truck regulation is a manufacturer ZEV sales requirement. From 2024 through 2035 model years, an increasing percentage of medium- and heavy- duty vehicles must be ZEVs. The percentage varies from 40 percent to 75 percent in 2035, depending on the vehicle type.[41]

[39] https://www.commerce.wa.gov/growing-the-economy/energy/ceta/

[40] California Air Resources Board, Advanced Clean Cars Program. Available at https://ww2.arb.ca.gov/our-work/programs/advanced-clean-cars-program/advanced-clean-cars-ii

[41] California Air Resources Board, Advanced Clean Trucks, Final Regulation Order. Available at https://ww2.arb.ca.gov/sites/default/files/2023-06/ACT-1963.pdf

Washington clean cars target

The Washington State 2022 supplemental operating budget[42] established an additional state target that all light-duty vehicles sold, purchased, or registered in Washington of model year 2030 or later be electric vehicles. Effectively, this goal moves up the date for this class of vehicles to be all ZEVs by five years from the broader CA standards described above. As of this report, this is a target, not a regulatory requirement.

Improve planning and oversight of EV charging and FCV fueling infrastructure

The State Energy Strategy recommended that Washington create a state-level entity to oversee charging and fueling infrastructure planning and development. This entity should clearly identify roles and responsibilities for stakeholders and jurisdictions involved in infrastructure planning and development, including public and private utilities, MPOs and RTPOs, local governments, tribes, public and private vehicle fleet owners, equity advisors, overburdened communities and vulnerable populations, and others. By providing needed accountability and communication, this entity would help ensure the equitable, efficient, coordinated, and timely implementation of capital projects needed to deploy EV charging and FCV fueling infrastructure to support the fleet transition required by the ZEV and Clean Truck standards.

In 2022, the Legislature created the Interagency EV Coordinating Council (EV Council) to coordinate the state transportation electrification efforts. The EV Council, which is co-led by Commerce and WSDOT, will ensure the state is leveraging state and federal resources to the best extent possible and ensure zero emissions incentives, infrastructure, and opportunities are available and accessible to all Washingtonians.

Statewide Transportation Electrification Strategy (TES)

The Washington State 2022 supplemental operating budget directs the EV Council to prepare a statewide Transportation Electrification Strategy to ensure market and infrastructure readiness for all new electric vehicle sales. The plan is due at the end of 2023, with specific targets including:

- 100 percent of new passenger vehicles sold in the state ZEVs by 2030 and 2035 (targets for state ZEV goal and state mandate)
- 30-50 percent of medium-duty and heavy-duty vehicles sold in the state must be ZEVs by 2030 depending on vehicle class

The TES will provide recommendations to ensure access to electric vehicle incentives and infrastructure to all state residents, with clear consideration given to ensuring access for overburdened communities and vulnerable populations, as outlined in the HEAL act.

Washington State Plan for Electric Vehicle Infrastructure Deployment

Washington expects to invest $71 million in National Electric Vehicle Infrastructure (NEVI) Formula Program funds and almost $18 million in non-federal matching funds over five years. In July 2022, WSDOT submitted the required Washington State Plan for Electric Vehicle Infrastructure Deployment to access these funds. The annual plan update was completed in July 2023. This plan serves as the blueprint for a statewide network of charging stations along state and federal-aid highways to support efforts to meet statewide electrification goals. The

[42] ESB 5974. https://lawfilesext.leg.wa.gov/biennium/2021-22/Pdf/Bills/Session%20Laws/Senate/5974-S.SL.pdf?q=20231010091559.

plan identifies benefits to overburdened communities and efforts to reduce the cost burden of electric vehicles for disadvantaged communities.

Washington identified initial investments in fast charging along the state's existing Alternative Fuel Corridors. Priority deployments include completing I-5 and I-90 to the federally defined build out standards. Secondary priorities for investments include completing the I-82/I-182 and US 395 corridors, followed by US 101 and US 195.

ZEV Mapping and Forecasting Tool

In 2021, the Legislature directed WSDOT to develop a Zero Emission Vehicle Mapping and Forecasting Tool "to enable coordinated, effective, efficient, and timely deployment of charging and refueling infrastructure necessary to support statewide and local transportation electrification efforts that result in emissions reductions" consistent with state goals. WSDOT contracted with the Washington State University's Energy Program and University of Washington's Sustainable Transportation Lab to assess options for such a tool. The Implementing a Mapping and Forecasting Tool for Zero-Emission Vehicle Infrastructure in Washington report identified tool requirements, considered existing tools and data, suggested a path forward. WSDOT is currently scoping the tool, scheduling the work, and accessing data sources. A publicly available release is expected late summer 2024.

2.3.2. Accelerate the market for BEVs and FCVs

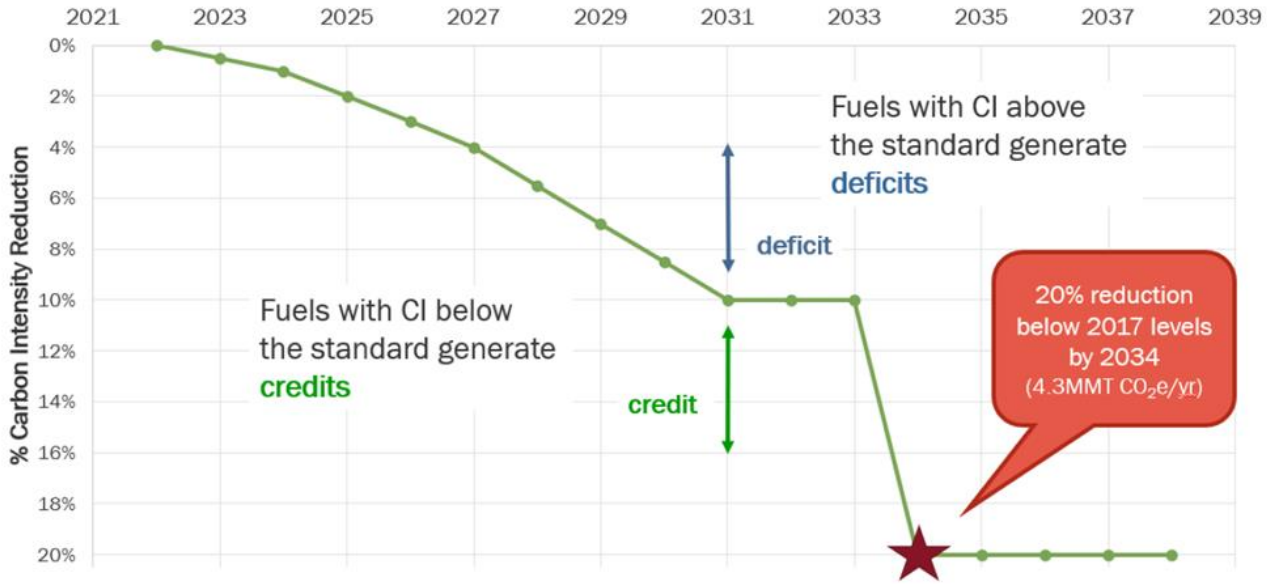
The pace of alternative fuel vehicle adoption, in the near term for passenger vehicles and over a longer timeframe for medium- and heavy-duty vehicles, will need to accelerate to meet GHG reduction limits. A range of parallel and complementary policies will push the market further and ensure equitable and affordable access.

Washington's Clean Fuel Standard

Passed in 2021, Washington's low carbon fuel standard, known as the Clean Fuel Standard[43] requires fuel suppliers to incrementally reduce the lifecycle carbon intensity of transportation fuels to 20 percent below 2017 levels by 2034. Refer to **Figure 4**.

[43] RCW 70A.535

Figure 4. Required carbon intensity reduction under the Clean Fuel Standard



[Source: Ecology[44]]

Fuel suppliers can achieve these reductions in several ways:

- Improving the efficiency of their fuel production processes
- Producing or blending low-carbon biofuels into the fuel they sell
- Purchasing credits generated by low-carbon fuel providers, including electric vehicle charging providers

Under the Clean Fuel Standard, the state assesses fuels to determine lifecycle carbon intensity. Fuels with a carbon intensity below the standard will generate credits, which can be kept or sold to producers of high-carbon fuels. Fuels with a carbon intensity above the standard will generate deficits. Fuel producers with deficits must buy enough credits to meet the carbon-intensity limit for that year. The allowable carbon intensity decreases over time, ensuring overall transportation fuel emissions decline.

While many efforts to reduce transportation emissions focus on tailpipe emissions, the Clean Fuels Standard evaluates the carbon intensity of fuels based on their lifecycle emissions, both the tailpipe emissions and the upstream emissions released during fuel production and transportation.

The enabling legislation directs three types of credit generators to reinvest credit revenue to further reduce transportation emissions:

- Electric utilities investing in electric vehicle charging infrastructure
- Investments funded from an Omnibus Transportation Appropriation Bill
- Backstop aggregators of electricity credits not otherwise claimed

[44] Washington Department of Ecology Clean Fuel Standard. See: https://ecology.wa.gov/Air-Climate/Reducing-Greenhouse-Gas-Emissions/Clean-Fuel-Standard

Under the Clean Fuels Standard, backstop aggregators are non-profit organizations promoting transportation electrification within the state and prioritizing projects that directly benefit disproportionately impacted communities.[45]

Tax incentives

Tax incentives to reduce the financial burden of purchasing alternative fuel vehicles and charging and refueling infrastructure are offered by both the federal and the state government. Washington state currently offers incentives on vehicles and on charging infrastructure for households. Additional incentives are available for commercial entities and installations.

Climate Commitment Act funding

The CCA, as noted above, is generating significant new revenue, with a portion directed to vehicle electrification and alternative fuel investments. Current biennium, fiscal years 2023-2025, funding allocations are noted in parentheses below.

Funding for light-duty EV charging includes the Zero-emissions Access Program (ZAP) ($2.8 million) that funds zero-emission carshare pilot programs in underserved and low- to moderate-income communities that do not have sufficient access to transit, and the Zero-emission Vehicle Infrastructure Partnership (ZEVIP) grant ($30 million) for installation of new electric vehicle charging equipment and hydrogen fueling infrastructure along priority corridors. Both are administered by WSDOT.

Funding is also provided to Commerce for community electric vehicle adoption support, including light-duty vehicle point-of-sale incentives ($50 million), community charging infrastructure development ($168 million). The WA EV charging[46] website provides a variety of resources and information to assist interested entities in applying for grant funds.

In addition, funding is also provided for the mapping and forecasting tool to provide future locations and information on available charging and refueling infrastructure ($17 million).

Additional funds support grants and demonstration projects for other vehicle types and modes, including commercial vehicle infrastructure ($120 million), hydrogen refueling infrastructure ($3 million), electrification of port cargo handling equipment ($2.5 million), and clean off-road equipment incentives ($5 million).

CCA funding is also supporting electrification of the Washington State Ferry system. The 2023-2025 budget includes funding toward terminal electrification, converting existing vessels to diesel electric hybrid, and a new diesel electric hybrid vessel.

2.3.3. Advance clean fuels

Washington is advancing electrification for many applications; however, electrification is not currently suitable for some transportation uses. The state has several efforts underway to advance other clean fuels options.

Clean Fuels Standard

As described above, under the Clean Fuel Standard the state assesses fuels to determine lifecycle carbon intensity to ensure compliance with declining carbon intensity requirements. To meet these requirements, in addition to investing in vehicle electrification, fuel suppliers

[45] WAC 173-424-220. https://app.leg.wa.gov/WAC/default.aspx?cite=173-424-220.
[46] https://waevcharging.org/

can produce or blend low-carbon biofuels into their fuels. The Clean Fuel Standard also has provisions to encourage in-state production of biofuels.

This option is expected to increase the availability of lower carbon fuels in the state at a price competitive with petroleum fuels.

Increasing the supply of biofuels available is expected to help reduce emissions from vehicles that are harder to electrify. Biofuels can serve as a bridge fuel until other technology options become more available.

Aviation Clean Fuels Research

Move Ahead Washington funds are supporting the development of an applied sustainable aviation evaluation center where Snohomish County and Washington State University will conduct research on technologies to minimize the impact of aviation on human health and the environment, including sustainable aviation fuel, hydrogen, and battery electric storage mechanisms.

Separate funding is provided for sustainable aviation grants for pilot projects demonstrating mobile battery charging technology, hydrogen electrolysers and storage, electric ground equipment, and hanger charging technology.

Alternative Jet Fuel

Legislation enacted in 2023 provides multiple financial and policy supports for the production and use of alternative jet fuels in Washington:

- Ecology must provide at least one carbon intensity pathway for alternative jet fuel in the Clean Fuels Program by December 31, 2023.
- Washington State University must convene a workgroup to further the development of alternative jet fuel as a productive industry in Washington. The workgroup must report to the Governor and Legislature on pertinent recommendations in December 2024, 2026, and 2028.
- Alternative jet fuels are added to the fuel types under the purview of Commerce's office of renewable fuels.
- To encourage the production and use of alternative jet fuels, the state has established fuel tax incentives for alternative jet fuels that take effect July 1, 2024.

Green Electrolytic Hydrogen and Renewable Fuels Study

Commerce is overseeing the Green Electrolytic Hydrogen and Renewable Fuels Study to develop a series of recommendations for state decision-makers to consider regarding the deployment of hydrogen and renewable fuels. Recommendations will include production factors, siting considerations, and permitting efforts, with the goal of advancing the State Energy Strategy, emission reductions, and economic and EJ responsibilities.

Key outcomes of the study will be projections of hydrogen and renewable fuel potential end uses and supplies, a resource input analysis assessment that describes the electricity and water required, a Washington hydrogen end use priorities tool, and recommendations for phasing hydrogen development. The final report is due December 1, 2023.

Pacific Northwest Hydrogen Hub

The Pacific Northwest Hydrogen Association is a public-private partnership that brings together key players in the emerging hydrogen industry, including utilities, environmental groups, tribes, labor unions, users, government, and industry to advance hydrogen in the region. The regional hydrogen hub proposal includes projects in the Pacific Northwest including Washington, Oregon, and Montana. The association has been selected for negotiation with US DOE to receive federal funding as a Regional Clean Hydrogen Hub. The Hub will leverage the abundant clean power and innovative technology companies in the Pacific Northwest to accelerate the transition to clean hydrogen production and focus on decarbonizing the region's hard-to-electrify heavy-duty transportation, long-duration energy storage, ports, agriculture, and industrial operations.

2.4. From policies to implementation

Washington State has numerous policies in place to reduce carbon emissions from transportation while improving the equity of the state's transportation system. Together the Climate Commitment Act and the Healthy Environments for All Act form the backbone of the state's efforts. The Clean Fuels Standard, along with zero emission vehicles sales requirements, supported by implementation funding from the CCA and guided by equity considerations through the HEAL act will transform the vehicle fleet over time. At the same time, changing land use, investing in infrastructure that improves the bikeability and walkability of neighborhoods, and providing ready transit services together will reduce the need for single occupancy vehicle travel.

However, implementation does not end with state actions. As noted in the introduction, everyone plays a role in transitioning Washington to a clean and equitable transportation system. All partners must work together in these efforts, including state agencies, the state legislature, tribes, MPOs and RTPOs, local jurisdictions and agencies, industry partners, community-based organizations, and highly impacted communities.

The next chapter describes the types of strategies and identifies projects being implemented across the state.

Washington State Ferry by Patrick Robinson on Unsplash

Chapter 3. Strategic Actions and Projects for Transportation Decarbonization

Chapter 2 described the policies Washington State has adopted to enable State Energy Strategy implementation. State agencies, tribes, MPOs and RTPOs, local governments, and industry and community partners are leveraging existing and new programs and state and federal funding to improve transportation system equity and efficiency while decarbonizing transportation fuels.

This chapter summarizes strategies being implemented through a variety of project types across the state to reduce transportation carbon emissions and make progress toward the state GHG emissions limits**.** Each strategy type includes highlights of implementation efforts as examples of the breadth of work being undertaken across the state. Finally, the chapter provides a framework for how the identified strategies relate to CRP project eligibility and identifies current projects receiving CRP funds. Appendices provide additional details:

- Appendix A includes a list of strategies being pursued statewide.
- Appendix C provides a list of funding opportunities available at the time this report is completed.
- Appendix D includes a list of investments in the current State Transportation Improvement Program (STIP) that support GHG reduction.

3.1. Strategy categories

Like the policies above, the strategies below are organized by the overarching State Energy Strategy categories of **move people and goods more efficiently and equitably** and **electrify vehicles and switching to low-carbon fuels.** Within these broad categories, strategies are further sub-grouped by similar types of actions. While not exhaustive, these categories illustrate the diverse actions needed to reduce transportation GHG emissions. Examples illustrate implementation in the state.

3.1.1. Move people and goods more efficiently and equitably

Moving people and goods more efficiently and equitably means maximizing the use of our transportation infrastructure and reducing emissions while improving access for those who have historically been underserved. The patterns of our built environment and operational improvements to the transportation system can reduce both the number and distance of trips by creating shorter or more efficient routes and facilitating non-single occupancy vehicle trips. Strategies in this category reduce the need for travel, shorten the travel distance, substitute more efficient modes, and improve system and vehicle efficiency.

Land Use strategies reduce the need for single occupancy vehicle travel. Planning for future growth must reflect fundamental shifts in land use that are needed to create communities that are truly walkable and bikeable by focusing growth in diverse, compact communities.

Compact development, such as comingling housing, commercial, employment, and other types of development, reduces travel distances. Policies such as parking management (e.g., eliminating parking requirements) and transit-oriented or mixed-use development encourage the use of transit or shorten the distance between home and destinations. Additionally, zoning and development standards can support active transportation, transit ridership, and urban design patterns that minimize the need to drive.

Affordable housing must be available within compact developments. Intermixing housing for all income levels creates mixed communities that provide access to jobs, services, and goods for all.

Co-benefits of land use strategies include reduced time for travel, reduced need to own a personal vehicle, and increased access for those who do not drive. Research identified approximately 33 strategies; examples are presented below.

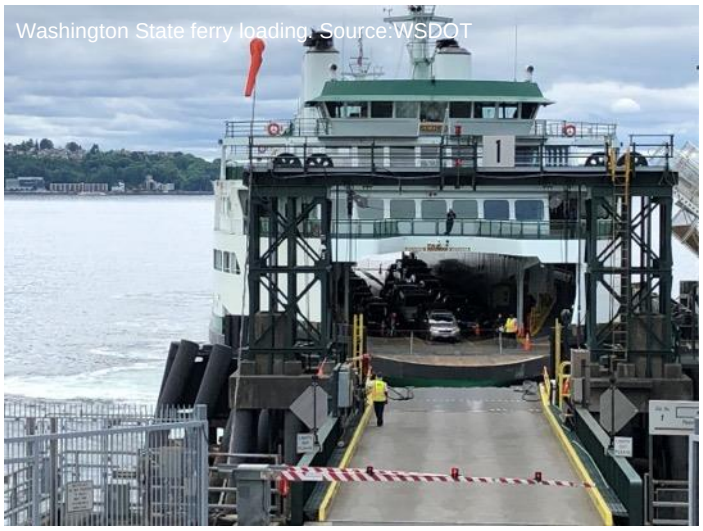
- The City of Tacoma's Climate Action Plan (2019) highlights updating zoning and development standards that support active transportation, transit ridership, and integrated public and private spaces that minimize parking needs. Making active transportation and transit more available and accessible and discouraging single occupancy vehicle use work together to shift transportation use away from vehicles.
- The Port of Everett's Climate Change Strategy (2020) supports continued mixed-use development at Waterfront Place Central. The development includes housing, restaurants, retail, commercial and office space, as well as outdoor amenities such as play areas, viewpoints, trails, and an outdoor performance venue. When fully realized, Waterfront Place is expected to support 2,075 family-wage jobs. The project's expected $550 million in public/private development investment will generate $8.6 million annually in state and local sales taxes. Recent Port investments include more than $50 million in completed projects at the development's Fisherman's Harbor district, one of five districts at the Port.
- The Thurston Climate Mitigation Plan (2020) calls for reevaluating long-term plans to prioritize walking and biking by setting goals and plans for mode shift, such as developing car-free corridors in commercial and mixed-use areas.

Active transportation replaces vehicle travel with walking, biking, e-biking, and e-scooters. In addition to accessing nearby destinations, active transportation can connect travelers with transit services. These trips are more feasible in areas where trips are shorter. Actions in this area include identifying and filling network gaps, expanding the network, increasing the safety and comfort for active transportation modes, as well as programs that make bikes and e-bikes available, either temporarily through bikeshare programs, or permanently through subsidies for underserved communities. Active transportation has a positive public health influence by increasing physical activity. Research identified approximately 39 strategies, including examples below.

- The Northeast Washington Regional Council's Regional Transportation Plan 2042 (2021) calls to convert former railroad rights-of-way to trails for public use. On trails separated from roads, cyclists typically feel more comfortable, thus more people are likely to choose biking as an alternative to driving.
- The Benton-Franklin Council of Governments' (BFCOG) Regional Active Transportation Plan (2020) proposes to develop criteria for pedestrian circulation serving public facilities, transit systems, and housing complexes including sidewalks as a first-last mile strategy. The plan calls for developers to be required to provide sidewalks where appropriate. BFCOG is also developing the area's first Regional Safe Routes to School plan.
- Jamestown S'Klallam Tribe's Carbon Neutral Plan (2022) raises the idea of subsidizing bicycle purchases for tribal members and employees.
- The Lummi Nation's 2016-2026 Climate Change Mitigation Plan (2016) introduces the concept of designating Priority Planning Areas, including those to promote walking and biking by identifying areas that have both a high vulnerability to climate change impacts and high risk for nonmotorized travelers or can benefit the most from a single action.
- The City of Tacoma's Climate Action Plan mentions the development and implementation of a funding program to prioritize and complete the city's sidewalks (including ADA improvements) and cycling network as well as Safe Routes to School improvements by 2050.

Two-way Protected Bike Lane, Granary Ave., Bellingham
Source: WSDOT

Transit, vanpool, and carpool[47] improve travel efficiency by increasing the number of occupants in a vehicle. Longer-range transit includes ferries and intercity travel (bus and rail). These modes work most efficiently in or between dense areas where there are more potential riders.


Washington State ferry loading. Source:WSDOT

Policy actions supporting public transportation include expanding both transit service and transit facilities. Expanding transit can take a variety of forms:

- New and expanded service – new routes, more frequent service
- Beyond commuter service – transit service outside traditional commuter hours
- Incentives that provide equitable access to public transportation services for all
- Supportive infrastructure – rail lines, bus shelters, high occupancy vehicle (HOV), lanes, and business access and transit (BAT) lanes support transit and transit users
- Community shuttles and specialized services where fixed route transit is not feasible provide access for those who do not drive

Ride share vehicles are often coordinated through employers, although do not need to be. In Washington state, ferries also provide public transportation, both where marine travel is the only way to get somewhere, as well places where water travel is more efficient than driving.

Co-benefits of increasing vehicle occupancy include greater affordability, potential for compact development, a more equitable transportation system, more accessible transportation for people of all abilities, congestion relief, and potential cost savings for travelers. The following are some specific examples.

[47] Appendix A contains 51 strategies in this category.

- The Island Regional Transportation Planning Organization's Regional Transportation Plan (2019) includes a strategy to establish a web-based One-Stop Traveler Information Portal to make it more convenient for people to use alternatives to driving alone to meet their mobility needs.
- King County's Strategic Climate Action Plan (2020) incorporates community-driven planning approaches that engage BIPOC communities in the transit design process as the agency seeks to improve transit options and infrastructure in underserved communities.
- The Peninsula Regional Transportation Planning Organization Regional Transportation Plan 2040 identifies engaging local communities and employers to increase the number of people who ride transit, carpool, vanpool, bicycle, walk, telework, and shift their work schedules to off-commute times as a way to reduce demand on state transportation facilities in their area. This work is an example of strategies that have been used in larger communities being applied in smaller and rural communities.
- The Move Ahead Washington transportation funding package provides funds for Transit Support Grants, which support 18-and-under fare-free programs; funds are distributed based on formula.
- Kitsap Transit offers passenger-only direct ferry service from Kingston, Southworth, and Bremerton to downtown Seattle.

Rail is typically more energy efficient per passenger or ton-mile of freight than road travel, thus switching from roads to rail can reduce emissions. In addition, moving some transportation from the roads to rail, reduces congestion on the road.

- The Washington Grain Train is jointly managed by WSDOT with the ports of Walla Walla and Moses Lake, and with Whitman County. The program has 125 grain cars that the 2,500 members of the cooperative use to move thousands of tons of grain to deep-water ports along the Columbia River and Puget Sound to ships bound for Pacific Rim markets. Operations began in 1994 to address shortages in available rail cars to transport Washington-grown grain.

The internet[48] and the corresponding availability of broadband services can eliminate some trips altogether. Teleworking and telemedicine provide connections without travel. Online education provides access to educational opportunities not otherwise available. Policy actions include expanding high speed broadband connections to all communities and households across the state and providing support for employers to establish teleworking programs for work that can be done remotely. Remote connectivity provides the co-benefits of saving travel time and having access to goods, services, education, and employment that may not be available locally. The following are some examples.

- Governor's Inslee's "Building a Modern Work Environment" Executive Order 16-07 directs state agencies to maintain policies for teleworking noting that, "it's what you do, not where you do it."
- The Washington State Broadband Office is developing a Five-Year Action Plan and a State Digital Equity Plan. These two plans will establish eligibility for federal funding to deliver significant investments for the expansion of broadband access and to help close the digital divide in the state.
- The King County Strategic Climate Action Plan describes efforts to investigate how strategies such as teleworking or other evolutions in the workplace could help to decrease overall VMT, using lessons learned from the COVID-19 pandemic.

Efficient system operations[49] increase the amount of travel supported by existing transportation infrastructure and can improve vehicle efficiency, as well. System operations strategies include intelligent transportation solutions (ITS), transportation demand management (TDM), variable speed limits, and first-last mile connectivity. Additional policy actions include developing corridor prioritization to invest in speed and reliability improvements that benefit public transit in areas with greatest needs, facilitating collaboration between transit and local jurisdictions to improve speed and reliability of bus service through dedicated bus lanes and right-of-way improvements, and implementing policies to prioritize routes that balance emission reductions with ridership and equity needs. For vehicles on the road, variable speed management can keep traffic moving at optimal speeds and incident response services help clear crashes or other disruptions as quickly as possible. High occupancy vehicle lanes (HOV) improve travel times for transit and high occupancy vehicles and encourage the use of these modes. Many of these strategies fall within umbrella transportation systems management and operations (TSMO). WSDOT provides TSMO resources[50] for agency staff and partners.

When the transportation system operates efficiently, freight also benefits by not being stuck in congestion. This allows truck to operate at more efficient speeds in addition to reducing their travel time. Maximizing the person throughput of existing infrastructure reduces the need for additional infrastructure, which is not only costly, but also causes additional emissions.

[48] Appendix A includes 9 strategies in this category.
[49] Appendix A includes roughly 89 system operation strategies identified during research.
[50] https://tsmowa.org

- WSDOT is using transit improvements and user fees to manage traffic and reduce congestion on the state highway system. These improvements include allowing buses to travel in the shoulder at peak times to bypass congestion and designing interchanges to include transit stops with quick access on and off a freeway. Express toll lanes allow individual drivers to access high-occupancy lanes by paying a toll.
- Seattle's Climate Action Plan describes building a Shared Mobility Hubs program to aggregate transportation connections, travel information, and other mobility amenities into a seam-less, understandable, and on-demand travel experience. For example, Shared Mobility Hubs can provide improved connections to public transit via electrically powered shared mobility services such as car share and ride-hail services.
- Vancouver Area Smart Trek, the VAST Program, is a coalition of state, regional, and local agencies that have been actively working together for over 10 years implementing ITS and operations solutions to address regional transportation needs. The operational projects include traveler information, transit signal priority, freeway and arterial management, and coordinated incident management.

User fees generate revenue, influence decisions about travel, and determine who bears the cost of transportation. Policies in this area include imposing fees on fuel use, vehicle registration fees, road usage charges, and parking fees. Co-benefits of user fees include financial incentives to use other modes. Following are two examples: Appendix A includes 11.

- In March of 2023, the City of Seattle increased on-street paid parking rates. The City seeks to price parking to maintain one or two open parking spaces on each block. They analyze parking conditions multiple times a year and adjust rates as needed.
- A road use charge (RUC) is a per mile charge drivers would pay instead of a gas tax. Since 2012 the Washington State Transportation Commission has been working to determine if a RUC is feasible. Their 2020 Road Use Charge Assessment Final Report documents their findings and recommendations that a RUC is feasible in the state.

Fleet operations management can eliminate some trips or shorten and ensure the most efficient travel options are used to meet travel needs. Freight and other partners do this as a matter of business to save employee time and reduce fuel and vehicle expenses. Opportunities include reducing business travel emissions by promoting virtual meetings, telework, and alternative modes. For organizations that operate a vehicle fleet, careful fleet management offers opportunities to reduce emissions through vehicle selection, maintenance, and operations. Truck parking facilities that ensure drivers can conveniently take mandatory breaks support efficient truck transport. Co-benefits can be time and cost savings. Two examples follow: Appendix A includes 14.

- A common theme found in the 2016 Puget Sound Maritime Emissions Inventory is increasing fuel efficiency through the use of idle reduction equipment by rail operators (e.g., Tacoma Rail) and ports (e.g., Port of Tacoma).
- BNSF Railway is replacing outdated locomotives with better technology, including newer fuel-efficient locomotives, and using rail lubricants to increase fuel efficiency.

Vehicle efficiency determines how far a vehicle can go on a given amount of energy. Improving vehicle efficiency directly reduces the amount of energy needed and associated emissions. Vehicle efficiency standards, often referred to as CAFE (corporate average fuel economy) standards, are established by the federal government (and California) to set minimum vehicle fuel efficiencies. However, everyone, from the individual vehicle owner to the largest corporation, can make the choice to drive the most efficient vehicle available that meets their needs and to operate the vehicle efficiently. Co-benefits of vehicle efficiency include cost savings through lower fuel use and a reduction in other pollutants. The box below provides two examples: Appendix A lists 26.

- King County's Strategic Climate Action Plan (2020) calls for fleet and workforce efficiencies such as right-sizing vehicles, pooling equipment, and expanding employee remote work options.
- The 2021 Washington State Truck Parking Workshop brought stakeholders together to both identify primary truck parking challenges and identify public and private sector practices for managing these challenges. The workshop built a collective set of potential truck parking strategies and funding options for Washington.

3.1.2. Reduce the carbon intensity of transportation fuels

Reducing the carbon intensity of transportation fuels is critical to meeting the state's GHG reduction limits. Options for reducing fuels' carbon content varies by use and vehicle type. Options will continue to evolve over time as technology and the market evolve. As described in Chapter 2, Washington's Clean Fuel Standard requires fuel suppliers meet declining limits on their fuels' carbon intensity. This program supports the transition to electric vehicles and is expected to increase the cost-effectiveness of alternative fuels, like renewable diesel. In addition to transitioning to electric vehicles and using low-carbon fuels, the state can reduce emissions by addressing the carbon intensity of our transportation infrastructure.

Electric vehicles rely on electricity instead of gasoline or diesel fuels. While they have no tailpipe emissions, generating the electricity they run on can release GHG emissions. Still, analysis shows that electric vehicles produce fewer GHGs per mile than gasoline or diesel vehicles.[51] In Washington State, the abundance of hydropower contributes to relatively low emissions from electricity generation. As the electric grid increasingly supplies more renewable power, the emissions associated with charging electric vehicles will further

[51] Environmental Protection Agency, Electric Vehicle Myths, https://www.epa.gov/greenvehicles/electric-vehicle-myths#Myth1

decrease. The Clean Energy Transformation Act (CETA) requires power suppliers in Washington provide 100 percent renewable energy by 2045.

To rapidly transition to electric vehicles, the state is advancing a combination of charging infrastructure, public outreach, incentives, grants, tax incentives, sales restrictions, and fuel regulations statewide. While some of these actions must be carried out at the state level, many are best implemented locally.

The Encouraging High-Consumption Fuels Users to Use Electric Vehicles report, prepared by the Washington State Joint Transportation Committee, confirms that encouraging high-consumption fuel users to adopt EVs faster than the general population would speed the displacement of GHG emissions. The report identifies policy options and barriers.

Revenue from the Climate Commitment Act's cap and invest program, as well as federal funds, are being invested in new electric vehicle charging infrastructure. Similarly, programs to make EVs accessible and affordable for all are also being funded.

The following are some examples promoting electric or other alternative fuel technologies.

- During the 2021-2023 biennium, the state's Zero-Emissions Access Program awarded $2.2 million dollars to nonprofits or local governments for carshare pilot programs in underserved and low- to moderate-income communities that have limited access to public transportation or are in areas where emissions exceed state or federal standards. For example, Lopez Island Community Land Trust has implemented a carshare program for its housing co-op community. The program has helped people who rarely have a chance to drive off the island venture out for family visits, healthcare needs, and leisure.
- The 2040 Regional Transportation Plan (2017) for the Okanogan Region calls for strategically developing a robust EV charging network along the region's scenic highways and other key corridors.
- The Thurston Climate Mitigation Plan (2020) recommends partnering with dealerships to provide purchase incentives for residents, including a group purchase program to provide deep discounts on alternative fuel or electric vehicles.
- The Ports of Tacoma and Seattle are installing shore power infrastructure at marine terminals to reduce emissions from ships while berthed at port. The Port of Everett is leveraging CMAQ funding to invest in electrical shore power infrastructure for vessels.
- South Whidbey School District received an EPA Clean School Bus grant for an electric school bus and charging station.

Green hydrogen and low-carbon fuels,[52] such as biodiesel and renewable diesel, produce fewer lifecycle GHG emissions than gasoline and diesel. The availability of liquid biofuels fuels is key where electric or hydrogen vehicles are not yet available – for construction equipment, long-haul freight, marine, rail, and aviation. The Clean Fuel Standard is expected to improve the cost effectiveness of these fuels and increase their availability in the state. The following are examples.

- The City of Tacoma's Climate Action Plan (2019) includes expanding bulk renewable fuel purchases for city fleet vehicles to fully meet projected needs.
- The Seattle-Tacoma International Airport is exploring opportunities to transition their bus fleet to operate with renewable natural gas (RNG) and advance the use of electric ground support equipment (eGSE).

Embodied emissions in infrastructure development are the emissions released during materials manufacturing and infrastructure construction. For example, consider the steel used in construction: the ore is mined, processed to form the steel, formed into products, transported to the construction site, and installed. Each step uses energy that produces emissions.

The data to track and evaluate emissions from this supply chain is becoming increasingly available through "environmental product declarations" (EPD), as are tools to consider the myriad combinations of design and material options. Embodied emissions reduction policies require suppliers to report and collect data and construction projects to use this information to help meet emission targets. The following is an example.

- WSDOT recently contracted the University of Washington's Carbon Leadership Forum to determine the composition of WSDOT's supply-chain construction-related GHG emissions. This analysis shows that the three largest contributors of GHG emissions from roadway construction materials are asphalt, concrete, and steel. WSDOT is now working the Carbon Leadership Forum, with funding from a FHWA Climate Challenge Grant, to the build capacity of WSDOT and industry partners to use EPDs to track supply-chain construction-related GHG emissions during project development and construction. Assessing the composition of and developing the capacity to track supply-chain construction-related GHG emissions are first steps in considering how to reduce these emissions.

3.2. Relationship between categories and the federal carbon reduction program

The Bipartisan Infrastructure Law (BIL) lists project types explicitly eligible for CRP funding.[53] These project types include, but are not limited to, public transportation; infrastructure for pedestrians, bicyclists, and other nonmotorized forms of transportation; replacing street lighting and traffic control devices with energy-efficient alternatives; and projects to support

[52] Appendix A lists over 45 strategies in this category.
[53] USDOT, FHWA, Carbon Reduction Program, https://www.fhwa.dot.gov/bipartisan-infrastructure-law/crp_fact_sheet.cfm

the deployment of alternative fueled vehicles. In their Implementation Guidance,[54] FHWA notes that other projects may be eligible if they can demonstrate reductions in transportation emissions; they provide the following examples: sustainable pavements and construction materials, climate uses of right of way (such as renewable energy installations), and projects supporting mode shift.

The FHWA Guidance states that CRP funded projects must be identified in a regional Transportation Improvement Program (TIP), included in the Statewide Transportation Improvement Program (STIP), and be consistent with the applicable Metropolitan Transportation Plan and the Long-Range Statewide Transportation Plan.

3.2.1. Recent investments

Across Washington State, the state, tribal governments, local jurisdictions, and numerous agencies are using a variety of funds to construct, maintain, and operate an increasingly efficient and equitable transportation system. Expenditures are going to building active transportation infrastructure and expanding transit, to electrifying buses and ferries, and to expanding electric vehicle charging across the state.

Appendix C provides a list of funding opportunities available at the time this report is completed.

2021-2023 Investments

Over the 2021-2023 biennium, WSDOT invested over $375 million in transit, active transportation, and electrification projects. Figure 5 breaks down this funding by investment type. Much of this funding was passed onto local partners through grant programs: transit, active transportation, EV charging, and sustainable aviation funds. This amount only includes projects expressly funded for these purposes; other projects may include active or transit elements but are not included in this total. Appendix D provides a comprehensive list of projects programmed in the 2023-2026 STIP that include active transportation, transit, and electrification elements.

Figure 5. 2021-2023 biennium carbon reduction investments

Investment Type	Amount
Active Transportation	90,500,000
EV Charging Infrastructure	13,009,000
Ferry Vessel Electrification	9,425,000
Passenger Rail Planning	500,000
Sustainable Aviation Grants	10,000
Transit Operations	241,290,000
Transit Electrification	20,849,000
Transportation Efficiency Planning (VMT Proviso)	500,000
Total	**376,083,000**

[54] USDOT FHWA Carbon Reduction Program (CRP) Implementation Guidance. Available at https://www.fhwa.dot.gov/environment/sustainability/energy/policy/crp_guidance.pdf

A few example projects funded in during the 2021-2023 biennium demonstrate the breadth of emissions reduction work Washington State is undertaking:

- **Transit expansion – South Whidbey Transit Center ($7.5 million)** – WSDOT received funding for the design, engineering, and construction of the South Whidbey Transit Center, located in Island County. The new transit hub will include six bus bays, allowing the transit agency to expand zero emission bus service and connect residents to ferry service, trails, and businesses in South Whidbey Island.
- **Passenger Vehicle Charging Infrastructure ($8.8 million)** – grants funded 11 new DCFC stations and upgraded 12 DCFC stations across the state:
    - Cascade Loop Corridor – Three new DCFC stations serving the Cascade Loop National Scenic Byway (Twisp, Pateros, Newhalem)
    - West Sound Ferry Cluster – Six new DCFC stations serving the western termini of 5 state ferry routes (Port Townsend, Poulsbo, Bainbridge, Gig Harbor, Kingston, Port Orchard)
    - West Coast Electric Highway – modernizing the 12 original DCFC stations along the West Coast Electric Highway (Bellingham, Burlington, Sultan, Skykomish, Snoqualmie, Leavenworth, Wenatchee, Cle Elum, Tumwater, Centralia, Castle Rock, and Ridgefield)
    - Renton – One new DCFC station
    - Kent – One new DCFC station
- **Spokane, Shaw Middle School – Garland Ave Pathway ($1,228,528)** – Funds support pedestrian improvements in Spokane, WA, including curb extensions, marked crosswalks, lane width reductions, median channelization and turn restrictions, parking lane removal, ADA curb ramp retrofits, audible pedestrian signal, leading pedestrian intervals, shared-use path, and trail/driveway crossing.
- **Union Gap Main Street Pedestrian Crossing Improvements ($393,009)** – Funds supported pedestrian improvements in Union Gap, including lane width reduction, stop signs, ADA curb ramp retrofits, and a sidewalk with curb and buffer.
- **Skokomish Indian Tribe, SR 106/Reservation Road Sidewalk Extension ($318,465)** – This project included ADA ramp retrofits, a sidewalk with curb, a walkway with bio-swale and ditch buffer, and pedestrian-scale lighting to improve safe access to the Hood Canal Elementary School.
- **Lakewood, Farwest Drive SW ($1,336,000)** – Funds support pedestrian and bicyclist improvements in Lakewood, including pedestrian lighting, road reconfigurations, ADA curb ramp retrofits, sidewalk, and bike lanes.

2023-2025 Biennium Investments

Looking forward, Washington is expanding emission reduction investments. The Climate Commitment Act (CCA) is generating significant revenue that is being directed to emission reduction investments, including transportation. The 2022 Moving Ahead Washington transportation funding package outlines how CCA funding directed towards transportation will be invested over 16 years. Funds are supporting five broad categories of improvements:[55]

[55] http://leap.leg.wa.gov/leap/Budget/Detail/2022/ctLEAPDocument2022-A-030922.pdf

- Active transportation – $1.2 billion
- Transit programs and Projects – $3.0 billion
- Alternative Fuel and Electrification – $517 million
- Ferries – $435 million
- Rail – $162 million

In addition to state funds, Washington is using federal funds to support investments to reduce carbon emissions. To date, about $16.4 million in Carbon Reduction Program funds have been programmed. Figure 6 identifies currently programed CRP funded projects. In addition, significant amounts of other federal funding types are being invested to support emission reductions. In particular, many roadway projects include an active transportation element and the NEVI program is supporting electric vehicle charging infrastructure.

A list of projects programmed in the current STIP (2023-2026) is in Appendix D. It should be noted that not all transportation investments are programed through the STIP.

Figure 6. Currently programmed Carbon Reduction Program funds

Project Type	Project Name	Federal ($)	State ($)	Local ($)	Total ($)
Active transportation	Boblett St Traffic Channelization and Corridor Improvements	395,288		61,693	456,981
Active transportation	CDTC Interurban Pathways Plan	986,100		153,900	1,140,000
Active transportation	Fish Lake Trail Connection to Centennial Trail Phase 1	2,291,720		703,992	2,995,712
Active transportation	Fish Lake Trail Connection to Centennial Trail Phase 2	650,250		199,750	850,000
Active transportation	Millwood Trail - Children of the Sun Trail to Fancher	237,405		119,595	357,000
Active transportation	Pedestrian Path on Pacific Highway	520,000			520,000
Active transportation	SE 34th Street Safety & Mobility Project	300,000		80,000	380,000
Active transportation	SR 544 S. Everson Sidewalk Improvements	452,642		70,644	523,286
Active transportation	Telegraph Road Multimodal Safety Improvements	641,294		100,086	741,380
Transit	Boeing Access Rd Infill Station	6,250,916			6,250,916
Transit	Highway 99 Bus Rapid Transit	1,500,000			1,500,000
Intersection improvements	Birch Bay Lynden Rd & Blaine Rd Intersection Improvements – adds a roundabout to reduce delay	121,396		18,947	140,343
Intersection improvements	E. Smith & Hannegan Road Intersection Improvements – adds a roundabout to reduce delay	452,642		97,358	550,000
Intersection improvements	NE 119th Street/NE 152nd Avenue Intersection – improve safety – adds a roundabout	975,000			975,000

Intersection improvements	Develop and implement traffic signal timing plans along priority arterials within Clark County	658,413			
Total		**16,433,066**		**1,605,965**	**18,039,031**

Ribbon cutting ceremony for the West Coast Electric Highway. Source: WSDOT

Chapter 4. Next Steps

This first Washington State Transportation Carbon Reduction Strategy (TCRS) describes the many statewide policies, strategies, programs, and projects addressing transportation GHG reductions across the state.

Yet, there is more to do. These next steps highlight actions needed to ensure the existing framework is working effectively, gaps are filled, and progress continues.

4.1. Support strong collaboration

As this strategy documents, meeting state transportation GHG reduction targets requires partnerships to implement solutions across the state. Regional and local transportation jurisdictions must scale this strategy to their local context. Collaboration will be needed to incorporate the information in this document in subsequent planning efforts, from local comprehensive plans, to MPO and RTPO regional efforts, to other WSDOT plans.

While developing this strategy, WSDOT clearly heard that, when initiating transportation decarbonization efforts, the state must provide engagement support and resources for small jurisdictions, overburdened communities, vulnerable populations, and rural communities to participate in the work.

To help address these needs, the 2023-2025 budget includes funding for WSDOT to create a community outreach, education, and technical assistance program for overburdened communities and their partners to develop meaningful community-centered carbon reduction strategies, and to help communities access available funding to implement these strategies, where applicable.[56]

Collaborating with transportation industry partners is also critical to ensure all parts of the transportation sector decarbonize rapidly.

4.2. Expeditiously implement existing policies and programs and track progress

Chapters 2 and 3 show the breadth of existing policies and programs across Washington to reduce transportation GHG emissions. These efforts will reduce emissions, particularly from the light-duty fleet. To be successful, the state needs to ensure that efforts are fully implemented, which will require funding, staffing, and effort over time.

Regularly assessing the effects of investments on emission reductions, equity, and travel efficiency is necessary for evaluating policy and program effectiveness and progress toward these overarching goals.

Similarly, the State Energy Strategy recommends setting “clear and ambitious targets” as the first step toward both improving efficiency and shifting to electric vehicles and alternative fuels. Having targets helps determine if the state is making timely progress, if additional resources or supports are needed, or if the state needs to consider other pathways. The State Energy Strategy recommends targets in several areas:

- Per capita VMT
- Transit and active transportation

[56] 1125-S.PL.pdf (wa.gov) Sect 219(13)

- Broadband
- EV and low-carbon fuel adoption, by vehicle class and aligned with interstate agreements[57]
- EV charging and alternative fuel infrastructure development

4.3. Fill policy gaps

Although implementation of existing policies and programs is making progress on reducing transportation GHG emissions, additional measures are needed to meet the state reduction limits. In addition to what is in the State Energy Strategy, additional analysis and planning efforts are underway to provide more refined recommendations. Three key efforts will provide additional information on how the state can address specific areas of carbon reduction. In particular, the state and partners should begin incorporating the findings from these three reports when they come available:

- **Vehicle Miles Traveled (VMT) Targets Final Report** – released in June 2023, this report completes the work carried out under the "VMT Proviso." The report includes a series of recommendations, including that local per capita VMT targets be set at the regional scale. Additional recommendations address monitoring, modeling, and data acquisition at different levels of government.
- **Transportation Electrification Strategy (TES)** – will identify EV incentives and infrastructure needs to make electric vehicles accessible to everyone in the state. The final report is due in December 2023.
- **Green Electrolytic Hydrogen Study** – will develop a series of recommendations for state decision-makers to consider regarding the deployment of hydrogen and renewable fuels, including production factors, siting, and permitting, with the goal of advancing the 2021 State Energy Strategy and statewide emissions reductions.

In addition to the above efforts underway, and parallel to the TES, the state would benefit from a **statewide multimodal transportation efficiency strategy** to accelerate transportation efficiency improvements**.** This work would identify preferred policies to reduce per capita VMT, meet GHG limits, minimize the need for transportation energy infrastructure investments, and improve equitable access. This strategy would need to be developed in close collaboration with partners and would support future legislative policy development and investment decisions.

4.4. Understand the emission gaps

The Transportation Carbon Reduction Technical Report[58] shows that current emission reduction policies are insufficient to meet state GHG limits. The analysis considered zero-emission vehicle scenarios, both existing law and a potential addition, and the effect of transportation efficiency improvements to reduce vehicle miles traveled.

Closing these gaps will require additional analysis to provide a framework for making informed choices as the state continues to reduce emissions. Specific needs include:

- **Analysis of transportation efficiency improvements –** an analysis of transportation efficiency opportunities and measures is needed to support the development of a **statewide multimodal transportation efficiency strategy**. This analysis would identify how efficiency improvements contribute to emissions reductions and the support needed for their strategic

[57] State Energy Strategy, p 63.

[58] Washington State Transportation Carbon Reduction Technical Report: Transportation Carbon Emissions Scenario Modeling, November, 2023.

implementation. This analysis must account for different types of communities (urban, suburban, small city, rural) and different types of travel (commutes, recreational, errands, etc.).

- **Opportunities analysis for high-capacity inter-city transit and passenger rail –** identify the types of service that best meet traveler needs across the state and where they can be most efficiently implemented throughout the state, expanding beyond the central Puget Sound area and I-5 corridor. This analysis would evaluate efficiency improvements between communities: identifying demand, identifying service levels to meet that demand, and establishing priorities for implementation.
- **Freight analysis (rail, marine, aviation, and on-road freight) –** work with industry partners to characterize emissions and identify opportunities and challenges to improving efficiency from freight to inform the development of effective and efficient policies and programs that address freight-related emissions, specifically:
    - **Baseline emissions profile –** develop a baseline emissions profile of freight and off-road modes to characterize the emissions from these sectors.
    - **Opportunity analysis for freight efficiency improvements –** identify opportunities, challenges, and potential policy and programmatic supports to improve efficiency across all freight modes.
- **Evaluate the role of reducing VMT in lowering energy requirements and associated costs –** While it is generally understood that fewer miles traveled requires less energy, an analysis of the infrastructure and energy cost savings from improved transportation efficiency would support state vehicle electrification efforts and may help direct efforts for the most effective implementation.

4.5. Track and adopt innovation

New technologies and improvements continue to emerge that help make the changes needed to meet statewide GHG reduction limits. Examples include advancements in vehicle batteries, hydrogen fuel cells and refueling, and other alternative fuels, as well as tools and approaches to address embodied emissions.

The state and partners should support promising new research and be ready to fund pilot and demonstration projects. This work is especially important for medium- and heavy-duty vehicles, rail, marine, and aviation.

To accelerate the transportation sector's ability to reduce embodied carbon in building materials and construction, potential policies must support materials suppliers' data reporting and collecting, as well as requirements that construction projects use this information and meet emission targets. This emerging practice will require tracking to identify how emissions can best be considered in transportation construction.

4.6. Track emerging issues

The transportation landscape in Washington State continues to evolve. Work to reduce transportation carbon emissions requires that emerging issues be identified and addressed in a timely manner so that challenges do not grow and opportunities can be expanded upon. In particular, three issues warrant attention as the state works on transportation decarbonization:

- **Transportation network companies** (TNC) (e.g., Uber, Lyft) provide a new transportation and employment model. While these services have replaced transit use in some areas, they also have the potential to fill in gaps in the transportation network. They may be well suited to

providing access to transit, as well as having the potential to provide access for individuals and communities that have historically been underserved by transportation. State and local governments need to work strategically to encourage the use of these services to enhance other modes rather than replace them.

- **Online shopping and home delivery** have increased over time, and dramatically so during the pandemic. Like TNCs, if managed carefully, home delivery providers have the potential to reduce carbon emissions, but currently are likely operating in a less efficient manner. Also, like TNCs, home delivery services can provide access to goods for households that are underserved by transportation.
- **Population** in Washington State's is growing and expected to continue to grow. The state is currently home to almost eight million people and expected to reach almost 10 million by 2050.[59] Where and how communities add housing and jobs will affect transportation needs for both new and current residents. Adding housing in areas already built up is an opportunity to increase density, which can make transit, walking, and biking more viable.

4.7. Identify funding gaps

Many of the strategies identified throughout this report have historically had low funding. The Climate Commitment Act is providing a new revenue source and being used to increase investments in transit, active transportation, electric vehicle charging infrastructure, and other programs that reduce GHG emissions. Even with this implementation, the state will need to assess and identify which strategies and programs require further investment to meet state transportation GHG emissions reduction, equity, and efficiency goals.

4.8. Update the Transportation Carbon Reduction Strategy

Federal law requires that states update their carbon reduction strategies every four years. The first update of this strategy will be due in November 2027, with work on the strategy update kicking off in 2026. The update will review progress to determine what is working, where additional intervention is needed, and what updated information must be incorporated. The TCRS update will also build on planning work WSDOT and other agencies complete in the interim. In the meantime, WSDOT will continue working with partners on engagement and implementation.

[59] https://ofm.wa.gov/washington-data-research/population-demographics/population-forecasts-and-projections/state-population-forecast

Washington Water Power (Avista) by Clay Elliot on Unsplash

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