Oregon Statewide Transportation Strategy
A 2050 Vision for Greenhouse Gas Emissions Reduction

Executive Summary

Oregon Sustainable Transportation Initiative (OSTI)

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Dedicated to the legacy of Gail Achterman’s leadership for Oregon’s natural resources and sustainable transportation.

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Why was the STS developed?
The Statewide Transportation Strategy (STS) was developed in response to legislative direction. In 2010, the Oregon Legislature passed Senate Bill 1059 (Chapter 85, Oregon Laws 2010, Special Session) which requires:

“...the Oregon Transportation Commission, after consultation with and in cooperation with metropolitan planning organizations, other state agencies, local governments and stakeholders... shall adopt a statewide transportation strategy on greenhouse gas emissions to aid in achieving the greenhouse gas emissions reduction goals set forth in ORS 468A.205 [a 75 percent reduction below 1990 levels by 2050]...”

What is the STS?
In accordance with the legislative direction, the Statewide Transportation Strategy: A 2050 Vision for Greenhouse Gas (GHG) Emissions Reduction describes what it would take for the transportation sector to get as close to the 2050 goal as is plausible. The STS, itself, is neither directive nor regulatory, but rather points to promising approaches for further consideration by policymakers at the national, state, regional, and local levels. Policymakers will need to decide if all or select strategies are to be pursued, how, and when. Many of the strategies in the STS require further analysis and consideration before the right approach can be chosen or action taken.

The STS examines all aspects of the transportation system including the movement of people and goods, and identifies transportation system, vehicle and fuel technology, and urban land use pattern strategies. Based on policy discussions and analysis, the STS 2050 Vision results in a future with 60 percent fewer GHG emissions than 1990.¹ The broad 40 year course of action charted in the STS is agile and can be adapted to an evolving future and unforeseen opportunities. Progress will be monitored over time and the course adjusted accordingly. The STS allows flexibility in what strategies and actions may be pursued and points to those projected to be effective at achieving

¹ The 60 percent reduction in emissions is projected to occur from the implementation of the entire STS, meaning, to reach even this level, all of the strategies would need to be considered.
the intent of the legislation. The STS does not assign responsibility for implementation. By mandate, the STS focus is on prevention and mitigation of climate impacts rather than adaptation.2

How was the STS developed?
A Policy Committee and a Technical Advisory Committee guided the development of the STS over a two year period. Committee members represented a wide range of transportation stakeholders including state, regional and local governments, other state agencies, businesses, and advocacy groups. Based on extensive research, technical analysis using the best available data, and issue papers, the committees crafted the vision, strategies and strategic priorities.3

To inform the process, staff and consultants used analysis tools to model the outcome of plans and trends to determine what the future would potentially look like if the state continued on the current path (business as usual). Alternative scenarios were then created that represented different configurations of technology, pricing, land use, and transportation system conditions. Indicators were used to provide information on the amount of GHG reduced as a result of a scenario, as well as to understand other potential impacts on important societal considerations like health, economic costs, air quality, and transportation system performance. Scenarios were compared to the business as usual projection to understand differences in outcomes. Those strategies included

2 Separate from the STS, ODOT has engaged in adaptation planning activities which are further described on the following site: https://www.oregon.gov/ODOT/Programs/Pages/Climate-Change.aspx

3 A two year extensive analysis process was conducted using a peer-reviewed and nationally recognized tool, GreenSTEP, and assumptions were reviewed by and agreed to by various state agencies, industry and technical experts. The advisory committees assessed the plausibility of assumptions and decided what to include in the STS and how hard things needed to be pushed. Additional details on the STS technical analysis and development process are detailed in the Oregon Statewide Transportation Strategy Volume II: Technical Appendices, which can be accessed at: https://www.oregon.gov/ODOT/Planning/Documents/STS-Technical-Appendices.pdf.
in the STS represent the mix of options with the largest GHG reductions and greatest potential positive impacts on the other goal areas.

Because there are many unknowns about the future, there will be a need to monitor and adapt the strategies as the work moves forward. However, it was also recognized that it is important that the state start exploring or working on what can be achieved; the key to this is an agile and iterative process that responds to and takes advantage of what is learned along the way.

What does the STS call for?

In line with the legislative direction, the STS identifies a possible path forward for the transportation sector to aid the state in achieving its GHG emissions reduction goal. Transportation and land use strategies are included that modeling and analysis have shown to have measurable results. Those chosen for inclusion reflect the mix of options that advisory committees and researchers considered to be plausible and that had the fewest apparent negative impacts. Decision makers will need to agree on which strategies to pursue, and when, given economic considerations, resource implications, and political will. The Oregon Transportation Commission (OTC) is an important decision making body in the effort, for those strategies falling under the authority of the Oregon Department of Transportation, and their approval is required before strategies are further explored or action taken. Additionally, many other strategies will require buy off and commitment by other decision making bodies at the national, state, regional, local, and private sector levels.

Many of the strategies in the document are about providing low carbon transportation options which allow individual choice of the alternative that works best for the situation. Some strategies may be well
understood and have the support to move directly into implementation (e.g. eco-driving), while others will require further analysis to determine economic impacts (e.g. pricing) and the appropriate course of action, if any. In total, the STS contains 18 distinct strategies, with 133 potential elements that generally fall into the following categories:

**Vehicle and Engine Technology Advancements** – Strategies in this category increase the operating efficiency of multiple transportation modes through transition to more fuel-efficient vehicles, improvements in engine technologies, and other technological advances.

**Fuel Technology Advancements** – Strategies in this category increase the operating efficiency of fuel-powered transportation modes through transitions to fuels that produce fewer GHG emissions or have a lower lifecycle carbon intensity.

**Enhanced System and Operations Performance** – Strategies in this category improve the efficiency of the transportation system and operations through technology, infrastructure investment, and operations management.

**Transportation Options** – Strategies in this category increase opportunities for travelers and shippers to use transportation modes that are more energy efficient and produce fewer emissions.

**Efficient Land Use** – Strategies in this category promote more efficient movement throughout the transportation system by supporting compact growth and development. This development pattern reduces travel distances and increases opportunities for using lower energy and zero-energy transportation modes.

**Pricing and Funding Mechanisms** – Strategies in this category support a transition to more sustainable funding sources to maintain and operate the transportation system, pay for environmental costs of climate change and provide market incentives for developing and implementing efficient ways to reduce emissions.

"We need to reach for the economic opportunities that will come from improved technologies, products associated with a low carbon economy. This will create new economic sectors."

— Rex Burkholder, Portland Metro Council

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The STS examines all aspects of the transportation system including the movement of people and goods, and identifies ways to reduce GHG emissions through transportation system, vehicle and fuel technology, and urban land use pattern strategies.

4 For a list of all 18 strategies, please refer to page 12.
While a given strategy will fall into one of the categories above, it is often interdependent, and will achieve its greatest potential for GHG emissions reductions when implemented in conjunction with complementary strategies. For example, strategies that facilitate greater use of transportation options such as public transportation, personal electric vehicles, bicycling, and walking will be far more effective if implemented in conjunction with land use efficiency strategies such as compact, higher-density mixed-use developments that provide proximate destinations and "complete streets" that accommodate multiple modes safely and efficiently.

The STS found that substantial reductions are plausible, but actions by the transportation sector alone cannot reduce transportation emissions enough to meet Oregon’s 75 percent reduction goal. Since the demands for transportation services are derived from demands from other needs and desires of people and businesses, solutions for effectively reducing transportation emissions will require cooperative efforts across sectors. This was found to be particularly the case for freight emissions. Much work will be needed to move forward and significant breakthroughs will be required in a number of disciplines. The STS notes and stresses that some of the most effective elements require state and national cooperation.

Many of the strategies in the STS are not new concepts but rather continue the direction brought forward in the Oregon Transportation Plan. Additionally, the Governor’s 10-Year Energy Action Plan calls for many of the same strategies highlighted in the STS including: increasing the proportion of fuel efficient vehicles; continuing investment in compact, multimodal, mixed use communities; implementing intelligent transportation system (ITS) technology; and innovatively financing a cleaner transportation system.

“The STS was developed in the Oregon way: staff and citizens together crafting a strategy that is equal parts data and sensible, pragmatic choices.”
— Angus Duncan, Oregon Global Warming Commission

The elements of the STS will likely have benefits beyond GHG reductions. These approaches look to: strengthen our communities by creating reliable, flexible transportation options; enhance energy independence; and create a healthier natural environment for generations of Oregonians to come.

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5. The Oregon Transportation Plan, adopted by the Oregon Transportation Commission, is the statewide policy document guiding transportation decisions and investments. For additional information, visit the Plan website at: https://www.oregon.gov/ODOT/Planning/Pages/Plans.aspx.

How will the future be different as a result of the STS?

The STS represents an aspirational vision for a cleaner future that would greatly aid Oregon in achieving its 2050 GHG emission reduction goal, and achieve other benefits. Performance indicators were used to help understand the impacts of the STS Vision on travel and system performance, land use and natural resources, public health, and the economy, in addition to GHG emissions. Results were compared to what Oregon’s future would look like if the trends and plans of today continue and nothing changed. Overall, the STS Vision shows Oregonians better off than the status quo. However, the STS will produce greater benefits for some activities and greater costs for others. Analysis showed that the STS Vision would be likely to produce the following benefits relative to today and the trends of tomorrow:

**Improved public transportation service, bicycling and walking** – Throughout the state, Oregonians would have better access to a range of transportation options (e.g., transit, carpool, bicycling, walking). Communities would have good walking paths, bicycle facilities, and transit service. Improvements in bicycling and walking facilities would increase physical activity and help improve public health and reduce obesity rates. These transportation options, along with carsharing services, would improve mobility while enabling many households to save money by owning fewer cars.

**Fuel-efficient / alternative energy vehicles** – Great strides in technology would allow for the widespread adoption of cleaner and more efficient vehicles by Oregonians. Automobiles powered by electricity would be able to travel hundreds of miles without recharging and an extensive network of recharging stations would extend across the state. Other vehicles would run on compressed natural gas (CNG) and locally-produced biofuels that would be readily available. Most heavy-duty trucks would run on liquefied

“This is also about protecting Oregon businesses. Can the public sector and private sector work together to develop practical energy sources? Will we have energy options? Can we be nimble enough to avoid energy price shocks?”

— Onno Husing, Oregon Coastal Zone Management Association

Big challenges call for innovative solutions. The STS points to promising approaches for further consideration by policymakers at the national, state, regional, and local levels.
natural gas (LNG), and commercial aircraft would run largely on biofuels. These changes would improve air quality dramatically while reducing dependency on foreign oil.

**Enhanced information technology** – People would be able to use technology to easily plan and update their travel routes combining modes as needed such as public transportation, bicycling, and walking in addition to personal vehicles. Improved communication systems would enable individuals and organizations to meet and collaborate virtually, while reducing the need for physical travel. In-vehicle communications technologies and collision avoidance systems in cars and trucks would greatly reduce the number and severity of crashes, resulting in saved lives, reduced damage, improved travel time reliability, and elimination of hundreds of hours of roadway delay each year. New vehicle-to-vehicle communications advancements allow cars and trucks to drive closer together and use less space on the roadway, resulting in more efficient use of existing infrastructure.

**More efficient movement of goods** – Fewer personal vehicles on Oregon roadways frees up capacity for the transportation of goods that support a growing economy. When possible, goods are moved by more efficient modes such as rail and water. New technologies allow freight vehicles to emit lower emissions. Urban consolidation centers allow for more efficient distribution of freight deliveries to final destinations in urban areas.

**Walkable mixed-use communities** – Within Oregon cities, a large share of residents live in walking distance of jobs, stores, services, entertainment, and transit stops. Because of this mix of uses in a geographically small area, commute times are shorter, limiting time spent in traffic. Residents of such communities are afforded increased opportunities to “buy local,” supporting local businesses. Communities across the state are recognized for vibrancy, livability, and safety.

“Interagency collaboration is one of the highlights of the Statewide Transportation Strategy. This effort has led to greater agency coordination in helping to reduce energy costs for Oregonians.”
— Diana Enright, Oregon Department of Energy

Although we can achieve substantial reductions through the STS, the transportation sector alone cannot meet the state’s goal. The STS is one piece of a broader effort needed to address climate change at the local, state, and national level.
While there are benefits of the STS Vision, there are also costs. For example, building infrastructure and providing services necessary to make multimodal travel options available would be costly. The total magnitude and effect of the various costs on Oregon’s economy could not be predicted because of the uncertainty of economic changes across the nation and world and technological and social changes that occur. These things are very uncertain. For example, who 40 years ago would have predicted the impact of the internet and cell phones today? Because of this uncertainty, the pathway forward to implement the STS will include continued monitoring and evaluation of trends that affect the validity of the vision and its implementation. In addition, as implementation of STS strategies moves forward, the potential economic effects of candidate implementation measures will be analyzed to determine the likely effects during the implementation timeframe and to develop programs that minimize adverse effects.

How does the STS move forward?

Through acceptance, the OTC agrees with the findings of the advisory committees, that the general course of action presented in the STS for reducing transportation related emissions is in line with fulfilling the legislative requirements and that the strategies should be further considered. Before any one strategy or group of strategies move forward, however, further buy-in may be required from appropriate decision making groups, including not only the OTC but other public and private sector bodies as well. Some strategies are well understood and are likely to have a high-degree of political acceptance, which can then be acted on quickly. Other strategies, however, will require additional exploration to better understand economic and societal impacts, and if, when, or how it should be pursued. A work plan will be developed detailing potential next steps. Required throughout the decision making process are inclusive and collaborative efforts at the federal, state, and local levels, as well as with businesses and individuals.

"We have a history of doing a lot of good for our community. The STS now gives us additional reasons and tools to do more good things on a larger scale."

— Ali Bonakdar, Corvallis Area Metropolitan Planning Organization

By accepting the STS, the OTC agreed that the strategies in the STS have demonstrated value and should be “on the table” as we move forward to the next step of determining what to implement, how, and when.
Oregon is already pursuing some of the strategies in the STS but the STS identifies ways to augment and build on the good work already being done and planned, and provides additional and new approaches to consider. Current local and regional plans provide a strong foundation for achieving GHG emissions reductions. Additionally, cities and counties in Oregon are already implementing many of the elements to achieve other economic, social or environmental goals. Lastly, industries and companies are making business-driven decisions that have an added co-benefit of emissions reduction. The work that has been done and ongoing efforts provide a foundation to build on as Oregonians move forward to further reduce transportation related GHG emissions.

In developing the STS implementation plan and undertaking actions to realize the STS Vision, the following strategic priorities should be the first considered by decision makers to assess what to pursue, how, and when:

**Funding** – Successful implementation of the STS relies on adequate funding to maintain and improve system performance, provide transportation options, and enhance operations. Projections show gas tax revenues falling short of the money needed to maintain and operate the current transportation system, let alone fund new infrastructure. The lack of sustainable and adequate funding is an issue across all states and current local and national efforts can be built on to find appropriate mechanisms. In addition to a sustainable funding source, the STS points to charging users the true cost of travel including transportation systems costs and social costs. The costs, benefits, and impacts of true cost pricing will need to be assessed.

**Efficient Vehicles and Clean Fuels** – State and national programs and incentives that encourage the use of more efficient vehicles and cleaner fuels are important mechanisms for lowering emissions and should be investigated and supported. Technological advancements that result in more efficient designs of vehicles and ability to use less carbon intensive fuels or alternative propellants, such as electricity, help to achieve the STS Vision. Infrastructure that supports such advancements, like electric vehicle charging stations, should be explored.
Low Carbon Transportation Options – The least carbon intensive mode of transportation is not always desirable or practical. However, when it is feasible to take a trip by transit, walking or biking, or to ship freight by barge or rail, it is important to have viable options available. Work can be done to identify potential barriers and opportunities to those modes.

Land Use – The configuration of land uses to transportation systems can support reduced trips and fewer miles driven. Careful siting of industrial lands and provision of mixed use areas can make for more efficient land uses and livable communities. Potential for sites can be assessed at the regional and local level and state policies investigated.

Each of these priorities is supported in the short term by the Governor’s 10-Year Energy Action Plan, which sets out actions for the next decade. Additionally, other ongoing work will help advance the strategic priorities, including: efforts by the Road User Fee and Non-Roadway Funding Task Forces, and the Oregon Legislature to secure sustainable transportation funding; work by the Departments of Energy and Environmental Quality on standards and incentives for efficient vehicles and clean fuels; and through the Department of Land Conservation and Development (DLCD) management of land uses. Upcoming work on modal plans, such as the Rail Plan, Bicycle and Pedestrian Plan, and eventually the Public Transportation Plan, will look to support the STS through provision of transportation options.

As the Agency and others move forward there will be additional opportunities to incorporate the STS into existing work, such as eco-driving messages into driver education curriculum and public outreach messages, and to consider STS concepts as the future is planned, such as supporting infrastructure technology to allow vehicle to infrastructure communications. To fully aid in achieving the STS Vision, the full array of the strategies, not just the strategic priorities or the other strategies mentioned here, will have to be explored further in order to provide a diversity of choice for the Legislature and other policymakers.

As some of the strategies may be controversial, especially in the short-term, a key to success of the STS will be public acceptance and support that results from participation in implementation planning.

“Towns of all sizes can reap the benefits of many of these strategies.”
— Chris Hagerbaumer, Oregon Environmental Council
Transportation related GHG emissions reduction will require strong partnerships and close collaboration between jurisdictions at the local, regional, state and national levels, as well as with businesses and individuals.

**How does the STS affect transportation and land use planning?**

At this stage, the STS contains no specific policies or goals and was not developed to be a policy document like the Oregon Transportation Plan (OTP). The OTP is the umbrella policy plan that fulfills the statutory planning requirement for the OTC. As strategies in the STS are further considered, the timing and breadth of any needed update or amendment of the OTP and related modal (e.g. Rail) or topic (e.g. Freight) plans will be assessed. The STS furthers and supports the OTP and its goal to provide a safe, efficient and sustainable transportation system that enhances Oregon’s quality of life and economic vitality. Many of the strategies in the STS align with the broad policies and strategies in the OTP, particularly Goal 4: Sustainability. The OTP Goal 4 includes strategies that support creation of an environmentally responsible transportation system (including development and use of technologies that reduce GHG), a more diversified and cleaner energy supply, and compact and mixed use development.

Integrating the STS into regional and local planning processes is important to the successful implementation of the STS. For those areas required (Portland Metro and Central Lane) or choosing to undertake scenario planning for GHG emission reduction, the STS provides information on potential actions that can be undertaken to aid metropolitan areas in meeting their GHG emission reduction targets set by the DLCD. Additionally, the STS will point to efforts that may be engaged in at the state or national level that help the metropolitan areas meet their targets.

“This strategy is the critical next step forward in Oregon’s emissions reduction efforts that began ten years ago. It is precisely the detailed, evidence-and-analysis based focus on transportation emissions that we called for in the Global Warming Commission’s Roadmap to 2020, and that I expect we will incorporate into the next iteration of that Roadmap.”

— Angus Duncan, Oregon Global Warming Commission
STS Strategies

Vehicle and Engine Technology Advancements

*Strategy 1 – More Efficient, Lower-Emission Vehicles and Engines*

Transition to lower emission and fuel-efficient vehicles, enhanced engine technologies, and efficient vehicle designs.

Fuel Technology Advancements

*Strategy 2 – Cleaner Fuels*

Support the development and use of cleaner fuels, including reduction of the carbon intensity of fuels.

Systems and Operations Performance

*Strategy 3 – Operations and Technology*

Enhance fuel efficiency and system investments, and reduce emissions by fully optimizing the transportation system through operations and technology.

*Strategy 4 – Airport Terminal Access*

Increase efficiency in all airport terminal access activities, including shifting to low- and zero-emission vehicles and modes for passengers, employees and vendors.

*Strategy 5 – Parking Management*

Promote better management and use of parking in urban areas to support compact, mixed-use development and use of other modes, including transit, walking and bicycling.

*Strategy 6 – Road System Growth*

Design road expansions to be consistent with the objectives for reducing future GHG emissions by light duty vehicles.

Transportation Options

*Strategy 7 – Transportation Demand Management*

Support and implement technologies and programs that manage demand and make it easier for people to choose transportation options.

*Strategy 8 – Intercity Passenger Growth and Improvements*

Promote investment in intercity passenger public transportation infrastructure and operations to provide more transportation options that are performance and cost competitive.
Strategy 9 – Intracity Transit Growth and Improvements
Investing in public transportation infrastructure and operations to provide more transportation options and help reduce single-occupancy vehicle travel.

Strategy 10 – Bicycle and Pedestrian Network Growth
Encourage local trips, totaling twenty miles or less round-trip, to shift from single-occupant vehicle (SOV) to bicycling, walking, or other zero-emission modes.

Strategy 11 – Carsharing
Enhance the availability of carsharing (short-term self-service vehicle rental and/or peer-to-peer) programs to reduce the need for households to own multiple vehicles and to reduce household vehicle miles traveled.

Strategy 12 – More Efficient Freight Modes
For the commodities and goods where low-carbon modes are a viable option, encourage a greater proportion of goods to be shipped by rail, water, and pipeline modes.

Efficient Land Use

Strategy 13 – Compact, Mixed-Use Development
Promote compact, mixed-use development to reduce travel distances, facilitate use of zero- or low-energy modes (e.g., bicycling and walking) and transit, and enhance transportation options.

Strategy 14 – Urban Growth Boundaries
Create full-service healthy urban areas to accommodate most expected population growth within existing Urban Growth Boundaries (UGB) through infill and redevelopment.

Strategy 15 – More Efficient Industrial Land Uses
Encourage and incentivize more efficient use of industrial land through closer proximity of shippers and receivers, consolidated distribution centers, and better access to low-carbon freight modes.

Pricing, Funding and Markets

Strategy 16 – Funding Sources
Move to a more sustainable funding source that covers the revenue needed to maintain and operate the transportation system and accounts for the true cost of travel.
Strategy 17 – Pay-As-You-Drive Insurance
Promote Pay-As-You-Drive Insurance (PAYD) programs that allow drivers to pay per-mile premiums, encouraging less driving through insurance savings.

Strategy 18 – Encourage a Continued Diversification of Oregon’s Economy
Maintain economic prosperity through an increase in the value per ton (the “value-density”) of goods produced in the state, which is projected to reduce shipping costs and GHG emissions for any given level of economic output.

A special thank you to the following committee members for their contributions during the development of the STS. We also wish to thank the citizens of Oregon, including policy board members and their staff who provided valuable comments and assistance on the STS.

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7The affiliations listed here represent those held at the time of STS development.
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