

Oregon Department of Transportation - September 2023

Greenhouse Gas Emissions Evaluation for the 2024-27 Statewide Transportation Improvement Program - Results Summary & Key Findings

In March 2020, Executive Order (EO) 20-04 directed the Oregon Department of Transportation (ODOT) to **develop and apply a process for evaluating the greenhouse gas (GHG) implications of transportation projects in the Statewide Transportation Improvement Program (STIP)**. The ODOT Climate Office developed an analysis process for multiple phases of STIP decision-making. This STIP emissions evaluation carries out the direction of EO 20-04 and supports statewide goals and policy.

This analysis is a “snapshot in time” of the 2021-2024 and draft 2024-2027 STIPs, based on best available project data collected in August 2021 and November 2022. The STIP is dynamic and changes frequently. Multiple methods were used for assessment, reflecting project data availability and quality, and time constraints.

How does the STIP affect GHG emissions?

The STIP is ODOT’s capital improvement plan for state and federally-funded projects. Transportation projects large and small can impact GHG emissions, by creating more emissions from vehicles traveling on the system, by reducing emissions from vehicles, or having little effect either way. ODOT looked at ODOT-led and -administered projects for:

- **User emissions**, which are generated through drivers using the transportation system through 2050. This includes vehicle tailpipe emissions and fuel production emissions (such as electricity produced elsewhere). These represent the majority of transportation sector emissions.
- **Embodied emissions**, which are generated during the construction of transportation projects. These include emissions from materials production, delivery, and construction.
- **Funding impacts**, which shows *dollars spent* on STIP projects (independent of the *magnitude* of emissions impacts) that advance GHG emission reduction goals, challenge those goals, or maintain the status quo by having little effect either way. This simple accounting method allows ODOT to consider funding from the full STIP and easily compare to the prior 2021-24 STIP.

Examples of STIP projects that potentially increase user emissions are roadway and intersection expansions, while examples of those that decrease emissions are intelligent transportation system (ITS) investments that make the system more efficient, strategic bike and pedestrian infrastructure, roadway reconfigurations, and transit investments that cause people to choose transit use in place of driving.

Key Findings

- **Compared to the 2021-24 STIP, the 2024-27 STIP invests more in projects that have beneficial emissions outcomes.** The Oregon Transportation Commission (OTC) added \$100M to a strategic bicycle-pedestrian program, and federal infrastructure funding prioritized climate, which contributed to this trend. In the draft STIP, ODOT is funding more projects that reduce emissions as compared to the past.
- **Quantified emissions analysis shows a small emissions decrease within the STIP portfolio.** Compared to Oregon GHG targets, the amount is roughly 0.5 percent towards targets. This combines with other ODOT,

state and local partner agency strategies to reduce emissions. In the next ten years, driving emissions will start dramatically reducing through electrification, but current emissions are narrowly changed.

- **Emissions from users driving on the system represent the greatest area to reduce emissions.** User emissions are orders of magnitude higher than embodied emissions from construction. Embodied emissions can be reduced incrementally over time, such as with lower carbon materials, but cannot be eliminated.
- **STIP projects slated for construction after the 2024-27 STIP timeframe can result in impacts later.** While not included in the 24-27 STIP analysis projects that are funded for an early design or environmental phase now start on the path to be built, and indicate emissions gains or losses that may occur out into the future.
- **As the STIP is a dynamic document, amendments that occur in between the three-year STIP approval cycles can create large changes.** Projects received substantial funding between STIP approval cycles. The cumulative effects of these investment decisions change emissions estimates from the initial STIP project portfolio.

This pilot evaluation of the 2024–27 STIP resulted in tangible findings that further Oregon’s understanding of how transportation investments affect GHG emissions and progress toward state goals. It also establishes a baseline for comparing the emissions estimated for future STIP cycles. An evaluation of this scope has never been conducted by a state department of transportation. ODOT will use the lessons learned to help refine the process for future STIP approval and amendment cycles.

Results

Figures 1, 2, and 3 show the emissions results of ODOT-led or administered STIP projects. Figure 1 shows quantitative results for user and embodied emissions: the ODOT-led projects are estimated to have a slight decrease in user (driving) emissions within project boundaries through 2050 and have some embodied emissions from construction.

Figure 2 shows ODOT’s 2023 projections towards meeting state transportation greenhouse gas emissions goals from the Statewide Transportation Strategy: A 2050 Vision for Greenhouse Gas Emissions Reduction. The 24-27 STIP user emissions reductions are a small step towards Oregon’s transportation sector goals for 2050, representing about 0.5 percent of the target. Embodied construction emissions can be reduced incrementally over time, such as with lower carbon materials, and remain a small part of the overall impact.

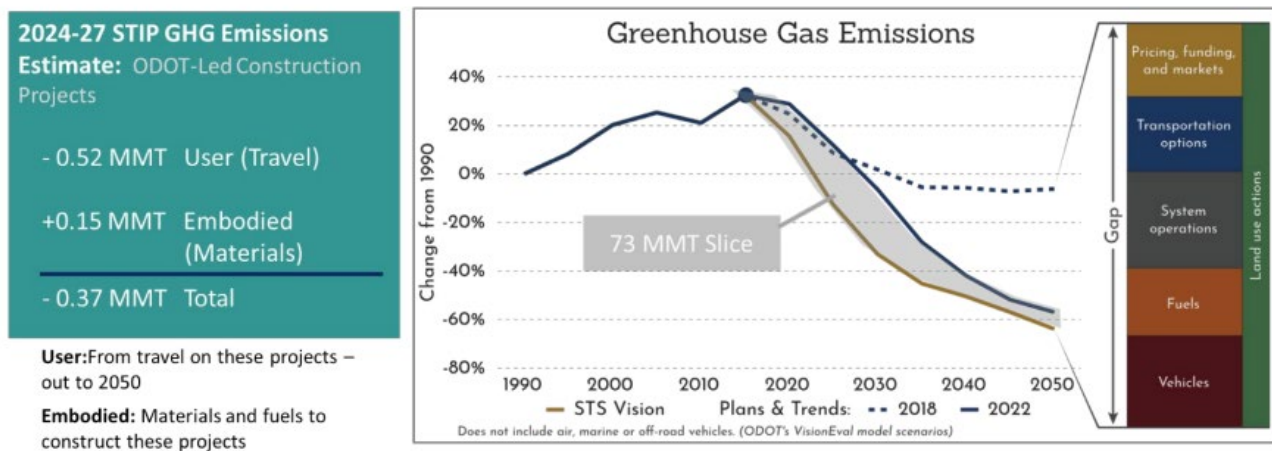


Figure 1 and 2. Emissions Impacts from the 2024-27 STIP

To learn more about these projections, please visit Oregon’s Transportation Emissions Website at www.oregontransportationemissions.com.

Figure 3 shows how ODOT funding advances GHG emission goals across two STIP cycles, using a funding impact evaluation. Compared to the 2021-24 STIP, the 2024-27 STIP invests more dollars in projects that have beneficial emissions outcomes. The federal government and Oregon Transportation Commission (OTC) both directed more funding in the 2024-27 STIP that advances, and reduced funding that challenges, our state climate goals.

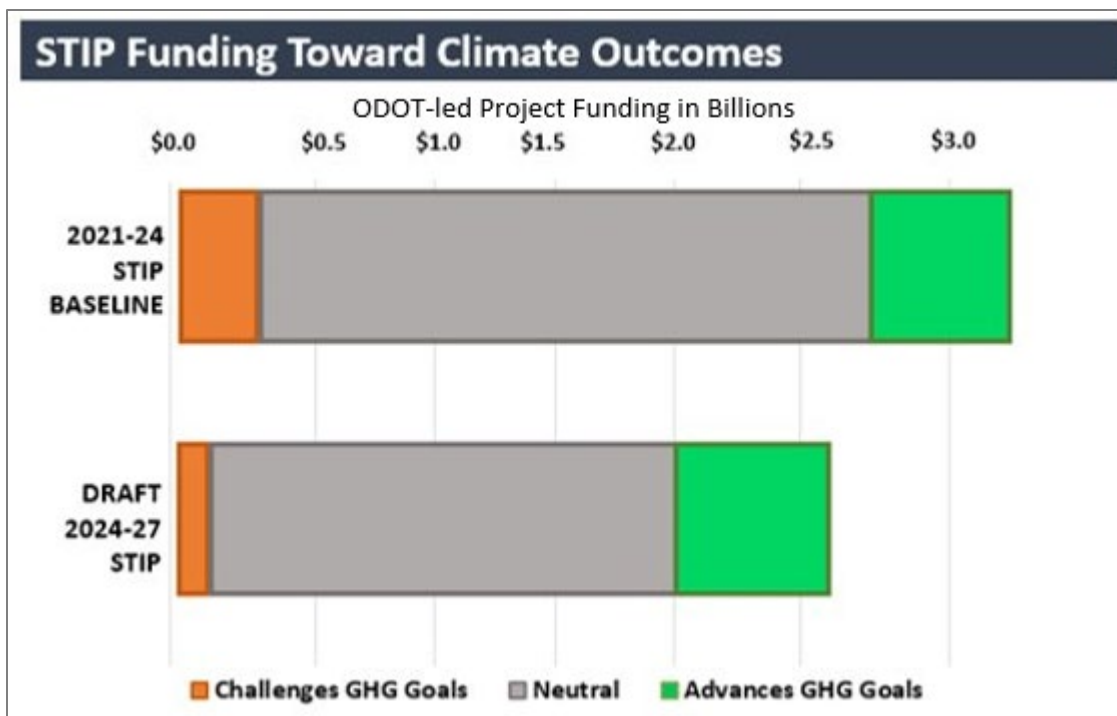


Figure 3. Comparison of baseline and current STIP funding cycles

While 2024-27 STIP funding largely contributes to investments that support emissions goals or are neutral (figure 3), these projects result in a small quantitative decrease in emissions (figure 1). In short, some projects impact emissions more than others, per dollar spent. For instance, strategic bicycle and pedestrian projects fill in key network gaps and help people replace driving trips with walking and biking, with costs that vary. Urban road rebalancing projects can create safe biking lanes in place of car travel lanes and advance GHG goals the most per dollar.

This analysis shows progress in applying climate considerations to ODOT transportation investments, and more work is needed to meet state GHG goals. ODOT will continue to apply this lens to decision making and monitor the impact of funding decisions on GHG emissions.