Washington State Department of Transportation

Highway System Plan Scenario Documentation

A technical report developed in support of the Highway System Plan

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Executive summary

Scenario planning informs decision-makers and helps them navigate the uncertainty of the future by bringing together technical information and stakeholder input to build a shared understanding of the outcomes of potential choices. The 2024 Highway System Plan (HSP) used a scenario planning approach to explore difficult tradeoffs, increase awareness of funding level performance differences, identify preferred funding and performance levels, and develop a future investment recommendation.

WSDOT uses a number of internal funding programs to address the needs of the state highway system. To support the scenario development process, subject matter experts from each of these program areas prepared technical reports covering their program backgrounds, strengths and challenges, and priorities and future needs. In addition to these programmatic technical reports three additional technical reports explored internal and external connections and trends that impact WSDOT or the state highway system.

The scenario planning process was divided into 4 steps. The first step was to discover and assess needs, beginning with a review of other state and regional plans in order to craft a 20-year vision for the state highway system. To understand how much transportation funding could potentially be available over the 20-year plan horizon, a Financial Technical Advisory Group reviewed past, current, and forecasted revenue data. Subject matter experts projected future performance levels for several different potential funding levels to gauge theoretical performance outcomes.

The second step in the scenario planning process was identifying a range of potential scenarios. Using survey and interview feedback from the public, WSDOT leadership, and the Advisory Committee, a series of scenarios were created. In the third step, each of these scenarios were reviewed in greater detail since it was not feasible to analyze the full outcomes of all of them. Based on guidance and feedback from the Steering Committee a set of three finalists were selected for further analysis. Each of these were evaluated against the six state transportation policy goals and additional Steering Committee guidance. Outreach with WSDOT regions, the public, and online surveys, including specific workshops targeting equity populations, provided further insights into scenario preferences.

The fourth and final step was to develop a recommended scenario to serve as the foundation of the 2024 HSP. Based on the analysis and feedback throughout the scenario planning process, WSDOT recommends new revenue for state highways be dedicated first to adequately funding preservation and maintenance and critical programs such as fish passage and program support. Two dollars of any additional funds should be spent on safety and efficiency strategies for every dollar spent on highway expansion projects. This “recipe for resilience” will provide more positive economic, safety, and equity benefits to more Washingtonians across the state, enhanced by the state’s new complete streets and environmental justice requirements. It will enable WSDOT to progress toward making the system as safe as possible and getting the most we can out of the existing system.

Background & purpose

Scenario planning informs decision-makers and helps them navigate the uncertainty of the future by bringing together technical information and stakeholder input to build a shared understanding of the outcomes of potential choices. The 2024 Highway System Plan (HSP) used a scenario planning approach to:

- Explore difficult tradeoffs and increase staff, stakeholder, and public awareness of the performance implications of different levels of transportation program funding.
- Identify the preferred combination of program funding levels and set program performance expectations.
- Make recommendations on investing transportation funds and stewarding the transportation system.

For this plan, scenarios consisted of three parts: the amount of funding overall with the split for each WSDOT program, the anticipated performance outcomes, and an overall description of each scenario.

This document summarizes the process used to build the components of the scenarios during a discovery phase, identify the range of possible scenarios, narrow scenarios for analysis and feedback, and construct recommended scenarios. WSDOT integrated community engagement into each step in the scenario process. The methodologies used for technical work related to that process are described in the appendices.

Strategies and programs

Programs describe major WSDOT activities, such as preservation, maintenance, safety, or transportation operations. Through the planning process, funding programs were grouped into the following layout:

Title in Final Plan	Names used in Outreach	WSDOT Programs Included*
Highway Repair	Fix it First Pavement Repair Bridges Maintenance	Preservation (P) Highway Maintenance and Operations (M) Toll Operations and Maintenance (B)
Safety and Efficiency	Safety and Efficiency Stormwater Treatment Increasing Travel Options Increase Travel Choices Walking and Bicycling Active Transportation Innovation	Safety Improvements (I-2) Environmental Retrofit Improvements (I-4) Traffic Operations (Q) Public Transportation Programs (V) Active Transportation (N/A)

Title in Final Plan	Names used in Outreach	WSDOT Programs Included*
Highway Expansion	New and Bigger Highways Highway Improvements Strategic Highway Investments Capacity Expansion	Mobility Improvements (I-1) Economic Initiatives Improvements (I-3)
Support/Other	(Not listed. These expenses are a cost of doing business and do not vary between the investment scenarios.)	Capital Facilities (D) Program Delivery Management and Support (H) Transportation Management and Support (S) Transportation Planning, Data and Research (T)

*Table 1: WSDOT program and activity groups used in the Highway System Plan outreach. *Note: Program titles are from WSDOT's Chart of Accounts.*

PROGRAM NARRATIVES AND TECHNICAL REPORTS

As a foundation for the planning process, WSDOT subject matter experts provided program narratives for each major highway program. These narratives included:

- Program background
- Strengths
- Current challenges
- Program priorities
- Anticipated future issues and needs

The information gathered in the program narratives are shared in eight technical reports and are grouped together as follows:

- State of Good Repair
  - ADA Accessibility
  - Bridge & Structure Preservation
  - Capital Facilities
  - Environmental
  - Geotechnical
  - Hydraulics
  - Maintenance
  - Pavement Preservation
  - Roadside Management
  - Safety Rest Areas

    - Transportation Equipment Fund
    - Tolling
    - Weigh Stations
- Safety
- Operations
    - Transportation Operations
    - Major Electrical, Delineation & Signing
- Transportation Demand Management (TDM)/Travel Choices
    - Active Transportation
    - Public Transportation
    - Travel Demand Management
- Capacity Expansion
    - Highway Improvement (Mobility & Economic Initiatives)

In addition to the programmatic technical reports, there are three other technical reports:

- Trends & Cross-Cutting Issues
    - Describes trends and issues external to WSDOT that affect state highway sustainability, change travel demand, and transform transportation technologies.
- Connections to Other Modes
    - Describes state highway connections to truck freight, ferries, aviation, rail, and ports (marine freight).
- Connections to Other WSDOT Work
    - Describes WSDOT work that may affect or be affected by HSP recommendations including public health, encampments on state rights of way, resilience, emergency management, land use integration, TSMO, and scenic and recreational highways.

The technical reports are building blocks for the final HSP, providing important foundational knowledge to understand plan recommendations.

Process

The scenario process consisted of four steps:

1. Discover and assess needs
2. Identify range of scenarios
3. Narrow scenarios for analysis and feedback
4. Construct recommended scenario

Step 1: Discover and assess needs

The first step in the scenario process was to develop the background information needed to begin building the scenarios including:

- Vision for state highways
- Reasonably expected revenues
- WSDOT program needs

Vision for state highways

The HSP team gathered information on transportation aspirations during the discovery phase by reviewing state and regional transportation plans.

Regional transportation plans vary across the state and represent each region's vision for the future. All plans supported the state's six transportation policy goals. The most common themes in these plans were preservation, sustainability, safety, and economic vitality. Regional transportation plans addressed mobility in different ways. Some regions focus on freight mobility, while others emphasize transit or active transportation. Some regional transportation plans address land use and its impact on the roadway network and the amount people drive. Many regions highlight the importance of cooperation, leadership, and management.

The team also reviewed past engagement efforts that were conducted by state and regional governments to determine transportation priorities. Most planning documents reported support for highway investment. For more information see Appendix C: Legislative policy direction and past engagement report.

Additionally, the Steering and Advisory Committees articulated their 20-year aspirations for achieving the Washington Transportation Plan (WTP) Vision for state highways.

State highways are:

- **Financially Sustainable**. Highway assets will be proactively maintained and preserved to achieve and sustain a state of good repair and operation.
- **Safe**. There will be zero fatal and serious injury crashes on Washington highways.
- **Equitable**. Transportation policies and investments will effectively respond to the needs of historically underserved and overburdened communities, resulting in the equitable improvement of all types of transportation infrastructure and services and the reduction of environmental health disparities.

- **Integrated**. To ensure transportation strategies are integrated across agencies and modes and the system operates seamlessly across boundaries, proposals for new highway investments will be informed by:
  - Engagement with the public.
  - Consultation with local governments and tribes.
  - Prioritization through applicable metropolitan or regional planning processes.
  - Coordination with the state ferry system and other transportation service providers.
- **Multimodal**. Pedestrians, bicyclists, ferry users, and transit riders of all ages and abilities, as well as motorists and freight transporters, will have improved access along and across Washington highways.
- **Environmentally Sustainable**. Transportation policies and investments will result in lower per capita vehicle miles traveled, reduced emissions, improved health, long-term resilience, and increased fish habitat.

Estimated future revenues[1]	20-year revenue	20-year debt service	20-year net revenue
Current law revenues	$48.9 billion	$11.1 billion	$37.8 billion
New funding #1: Future revenue increases mirror past increases	$69.3 billion	$11.1 billion	$58.2 billion
New funding #2: Ambitious-but-reasonable future revenues	$91.0 billion	$11.1 billion	$79.9 billion

Table 2: Options for estimating reasonably expected revenues. Analysis for 2021-2040 is based on the November 2020 forecast and current debt service. Estimating reasonably expected revenues provides useful reference points for long-range planning. Any new bonds will increase the amount of funds available for project spending in the short term, while the additional debt service will decrease the amount of revenue available in the long run. All revenues are in fiscal year 2020 current dollars, not adjusted for inflation.

Factoring in realistic budget constraints increases the value of long-range planning for evaluating investment tradeoffs and setting priorities. The HSP Financial Technical Advisory Group (TAG) produced a range of options for estimating reasonably expected revenues for consideration in the scenario analysis. Using historical and current information, in addition to the best available revenue forecasts provided by WSDOT's Budget and Financial Analysis Office, the TAG looked at various alternatives for estimating future revenues for Washington's highways over the next

[1] More information is available in the Financial Technical Advisory Group Summar of Findings HSP Revenue Technical Report.

two decades. The three future revenue levels considered were current law, future revenue increases mirror past increases, and ambitious-but-reasonable future revenues.

WSDOT program needs

Before initiating the scenario planning process, staff assessed highway-related program needs by interviewing WSDOT subject matter experts and drafting program narratives. An overview of WSDOT's programs can be found above in Strategies and Programs.

PROGRAM PERFORMANCE PROJECTION

To simplify the analysis, HSP staff worked with the following major programs to project future performance:

- Pavement Preservation
- Bridge Preservation
- Stormwater
- Maintenance
- Safety
- Operations
- Active Transportation
- TDM/Increase Travel Options
- Highway Expansion

These nine programs represent a substantial portion of the budget related to state highways not including fish passage. The project team assumed full funding to correct fish passage barriers, since that work is required by court order. While each of these program's accomplishments over the next twenty years depend on the amount of funding it receives, the performance returned may not be the same for every dollar spent. For example, funding some programs may have diminishing performance returns over time because the most cost-effective investments are generally prioritized first. The HSP team worked with program leads to understand how program funding would affect performance. The goal of this work was to help decision-makers recommend levels of program funding based on performance tradeoffs.

Each WSDOT program had a different approach to projecting performance based on funding. It is not standard practice for programs to estimate performance at a wide range of funding levels because the agency budget process is incremental, using the previous year as a baseline and adding or subtracting based on new work, completed work, or changes in material or labor cost. The HSP team worked with each program to develop an approach that made sense based on the data available. Some programs looked at what it would take to restore previous levels of performance while others looked at the level of funding it would take to meet aspirational goals. For more on how each program approached projecting performance based on funding, please see Appendix C for the Basic Program Performance Methodology. The results of the program performance projection were used for the Public Engagement Survey in Step 2 and the Policy Performance Analysis in Step 3.

STEP 2: IDENTIFY RANGE OF SCENARIOS

The second step in the process was to understand the full range of transportation investment scenarios that might be explored in the plan. This expanded the conversation, brought others into the process, and helped WSDOT find the edges of the conversation so we could consider all relevant possibilities.

To inform the range of scenarios, the HSP team relied primarily on the results of a public survey administered by the University of Washington, Washington State Transportation Center (TRAC), and interviews with WSDOT Leadership and Advisory Committee members. The conceptual scenarios heard throughout the discovery phase of the project include themes such as: resiliency, safety, environment, climate change, health, equity, freight, and public-private partnerships.

Statement	Phone (n=1,000)	VOWS (n=7,327)
Maintaining and Repairing Existing Roads, Highways ,and Bridges	83%	89%
Making Sure Rural and Mountain Roads Remain Open Year-Round	61%	44%
Expanding Public Transit Services (Vanpools, Dial-a-Ride)	58%	55%
Operating and Maintaining Washington's Ferry System	56%	43%
Increasing Law Enforcement and Public Safety Efforts on WA Highways	54%	40%
Widening and Building More Roads and Highways	51%	51%
Building or Improving Sidewalks	49%	40%
Improving Regional Airports	40%	23%
Building Bike Lanes	38%	25%

Figure 1: 2017 Voice of Washington Survey, Importance of Transportation Aspects. Source: Washington State Transportation Commission (2017). Statewide Voice of Washington Panel & Phone Surveys Final Report.

Voice of Washington Survey

As a starting point, the HSP team reviewed the results of the 2017 Voice of Washington Survey, which focused on statewide attitudes toward key transportation issues. When asked to rank the importance of different transportation issues, survey respondents indicated maintaining and preserving existing roads, highways, and bridges was their highest priority by a significant margin. Other top priorities included keeping rural and mountain roads open year-round, expanding public transit services, operating, and maintaining the ferry system, and increasing law enforcement and public safety efforts on Washington highways.

HSP Transportation Investment Preference Survey

Next, WSDOT commissioned an HSP Transportation Investment Preference Survey to understand Washington state residents' relative priorities for investment in the state's highway

system. The survey was designed and administered by University of Washington's Washington State Transportation Center (TRAC). It was statistically representative of the state as a whole and three subareas within the state. The survey was offered in English and Spanish, and the mailer offered translation services for Simplified Chinese, Vietnamese, Korean, Tagalog, and Russian.

Mailed survey invitations were sent to Washington state residents and 1,484 completed the survey. Respondents prioritized a hypothetical annual budget of $3 billion across nine highway-related budget categories including: Pavement Preservation, Bridge Preservation, Maintenance, Stormwater, Operations, Safety, Walking and Bicycling, Increasing Travel Options, and New and Bigger Highways. Their choices were constrained by minimum spending levels and two to four additional set spending steps for each budget category. Minimum spending levels were based on current law budgets approved by the Washington State Legislature in 2020.

Notable survey results included:

- Respondents held consistent priorities both across regions within the state and demographic groups – because of this, analysts noted high confidence in the statistical validity of the survey's results.
- Respondents prioritized repair funding (Pavement & Bridge Preservation, Maintenance,). 78 percent of respondents chose to increase funding to Pavement Preservation and 69 percent of respondents chose to increase funding to Bridge Preservation.
- Of the nine funding categories, Pavement Preservation was the only one where the "maximum funding" option was selected by most respondents.

A cluster analysis of the results was conducted to identify groups of respondents with similar investment preferences. The eight primary clusters are described in Figure 2 below. The bars labeled A through H represent the most common clusters of investment preferences, sorted from the most popular (A, which was the investment preference of 37 percent of respondents) to the least popular (H, which was the investment preference of 4 percent of respondents).

Current spending is depicted in the bar on the bottom of the graph and the colors represent the following three general categories of investment:

- The grayscale colors represent Pavement Preservation, Bridge Preservation, and Maintenance spending (referred to collectively as the "Maintain Category."
- The shades of blue and green represent Stormwater, Safety, Operations, Walking and Bicycling, and Increasing Travel Options (referred to collectively as the "Innovate Category."
- The red represents New and Bigger Highways, or "Expand Category."

A few trends to note for the identified clusters with respect to current spending:

- All clusters supported spending more in the Maintain Category.
- One cluster (B) would spend more in the Expand Category. four clusters (C, F, G, and H) would spend less, and three clusters (A, D, and E) would spend the same (finish projects with a legislative commitment).
- All clusters supported spending more in the Innovate Category but differed in how they would distribute funding among the five programs within it.

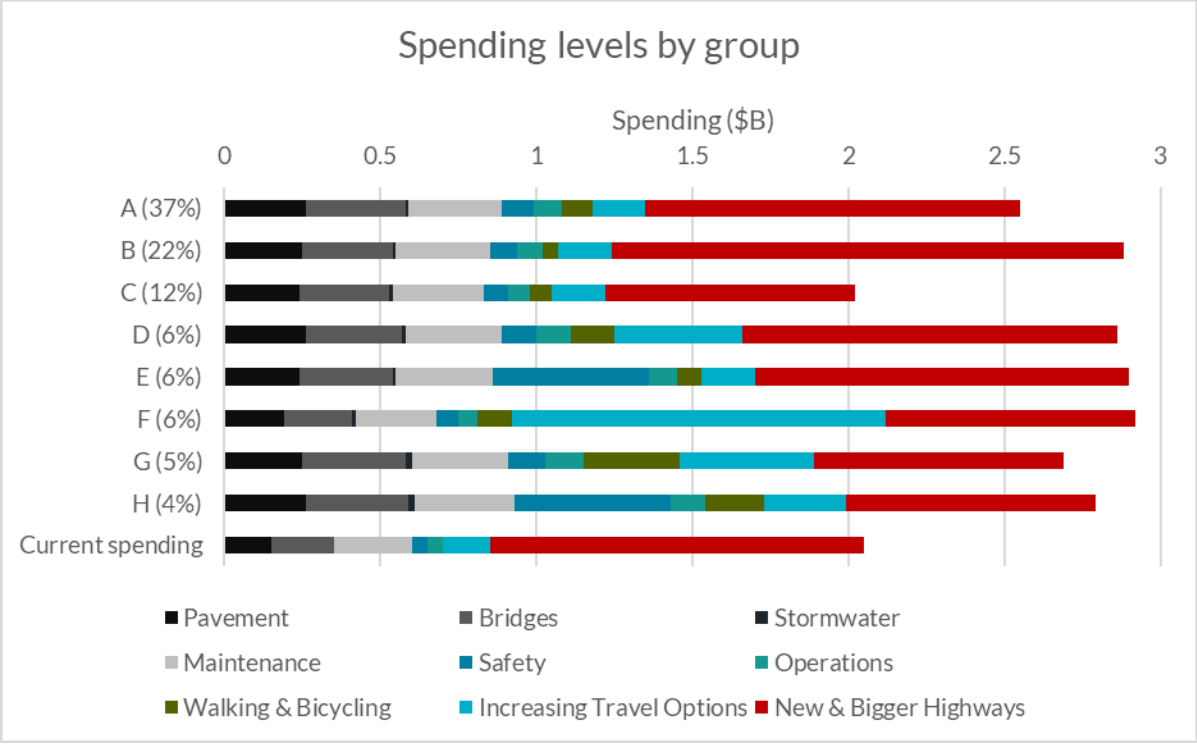


Figure 2: HSP Transportation Investment Preference Survey cluster.

A series of optional demographic questions followed the spending priority questions. The same survey questions were used in an online opinion poll discussed later under the heading "Online Opinion Poll."

To learn more about the survey analysis, refer to the Community Engagement Support for the Highway System Plan Update research report.

WSDOT Leadership and Advisory Committee interviews

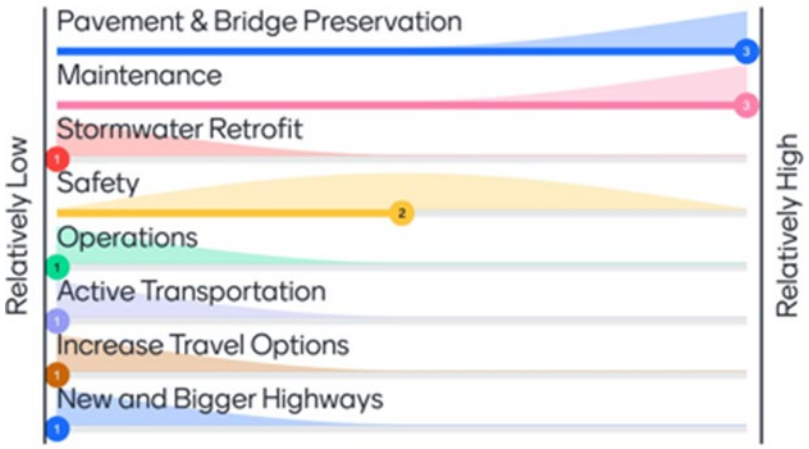
In the fall of 2021, WSDOT leaders with responsibility across multiple programs were interviewed to identify the types of scenarios they were interested in discussing and to begin to identify common priorities. Members of the HSP Advisory Committee were also interviewed to better understand their investment scenario preferences and goals for the transportation system; identify topics or issues we should avoid; invite feedback they are hearing from their stakeholders; and identify big picture trends and takeaways.

WSDOT LEADERSHIP FEEDBACK

The WSDOT leaders with responsibility across multiple programs interviewed included: Assistant Secretaries, Regional Administrators, the Chief Financial Officer, the Director of Multimodal Planning and Data, and the Director of Capital Program Development and Management. The two representatives of MPOs and RTPOs on the Steering Committee were also interviewed. Interviewees were asked about their program priorities and their ideas for scenarios. Based on

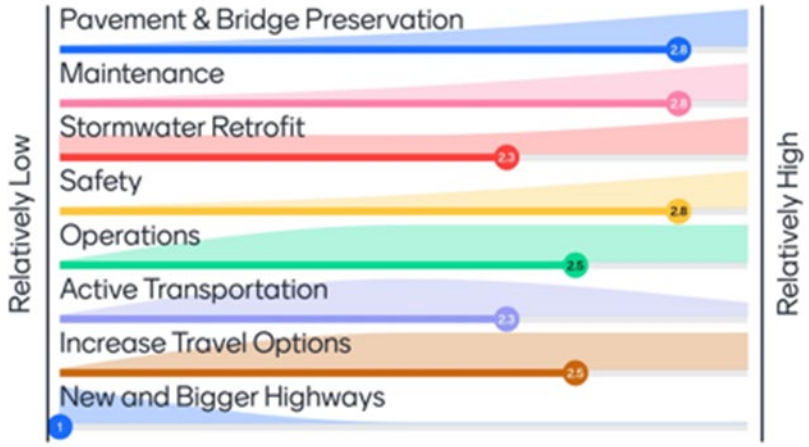
these interviews and the results of the public survey, the following five preliminary investment scenario concepts emerged:

Sustain & Maintain: Prioritize preserving and maintaining our roads and bridges.



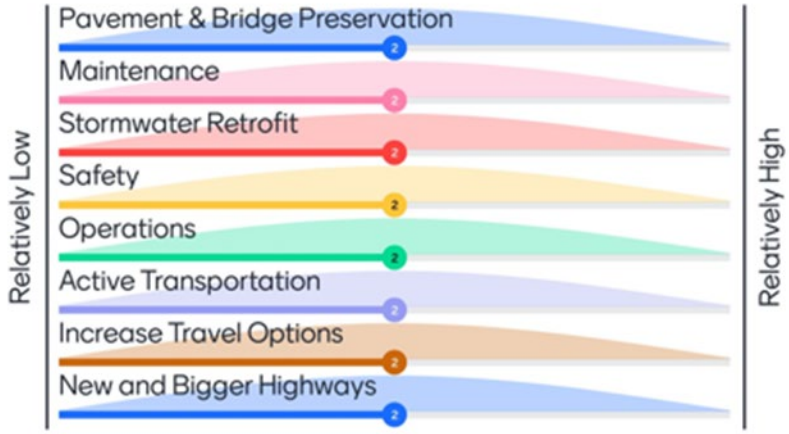
Expansion Focus: Emphasize new interchanges and big projects.

Variations on the 5 Buckets: Prioritize state of good repair funding (preservation, maintenance, and stormwater) and safety outcomes and emphasize multimodal travel choices over expanding highways.



TSMO Fantasy: Emphasize multimodal and efficiency measures through the application of transportation systems management and operations strategies. Note: this scenario is named TSMO Fantasy because if Pavement & Bridge Preservation are not adequately funded, TSMO strategies will be ineffective. Fully funding TSMO at the expense of preservation will impact the current systems that TSMO strategies rely on.

Balanced Outcomes: Invest new funds proportionally in each investment category.



Other scenario concepts noted included: focusing on resiliency; focusing on safety; focusing on addressing climate change; health, and equity; freight; and partnerships.

Advisory Committee feedback

The HSP Advisory Committee is made up of representatives of local agencies, transportation, advocacy groups representing various statewide interests, MPOs and RTPOs, and tribal governments. The HSP staff engagement goal for the Committee was to ensure members' concerns and aspirations were considered and understood.

HSP staff began interviews with the Advisory Committee members by reviewing the five preliminary investment scenario concepts described above. Advisory Committee members were then asked if any of these scenarios resonated with them, or if they wanted to describe their own investment scenario for consideration. In addition, the committee members shared their goals for the transportation system, potential pitfalls to avoid in creating a scenario, and additional feedback from their stakeholders.

The preliminary investment scenario concept with the most support was *Sustain and Maintain* with 32 percent of interviewees selecting this scenario concept. *TSMO Fantasy* was second with the support of 20 percent of interviewees, while the *Variation of the Five Buckets* received the support of 16 percent of interviewees. The fourth most popular scenario was tied between *Aligning with Policy Goals and Strategic Capacity Investments* with 12 percent of support.

The scenarios were grouped by how they addressed the mix of expansion versus safety and efficiency.

- 32% - Gray – Sustain and Maintain was neutral towards the mix of other investments
- 12% - Red – Strategic Capacity Investments is strongly leaning towards highway expansion
- 12% - Purple - Aligning with Policy Goals shows a relatively equal weighting of investment between highway expansion and safety and efficiency

- 20% - Blue – Variations on the 5 buckets and Safety First – Target Zero show heavy support of safety and efficiency investments, with some value for highway expansion
- 24% - Teal – TSMO Fantasy and Climate Action Plan show extremely strong support for safety and efficiency investments, with no support for highway expansion

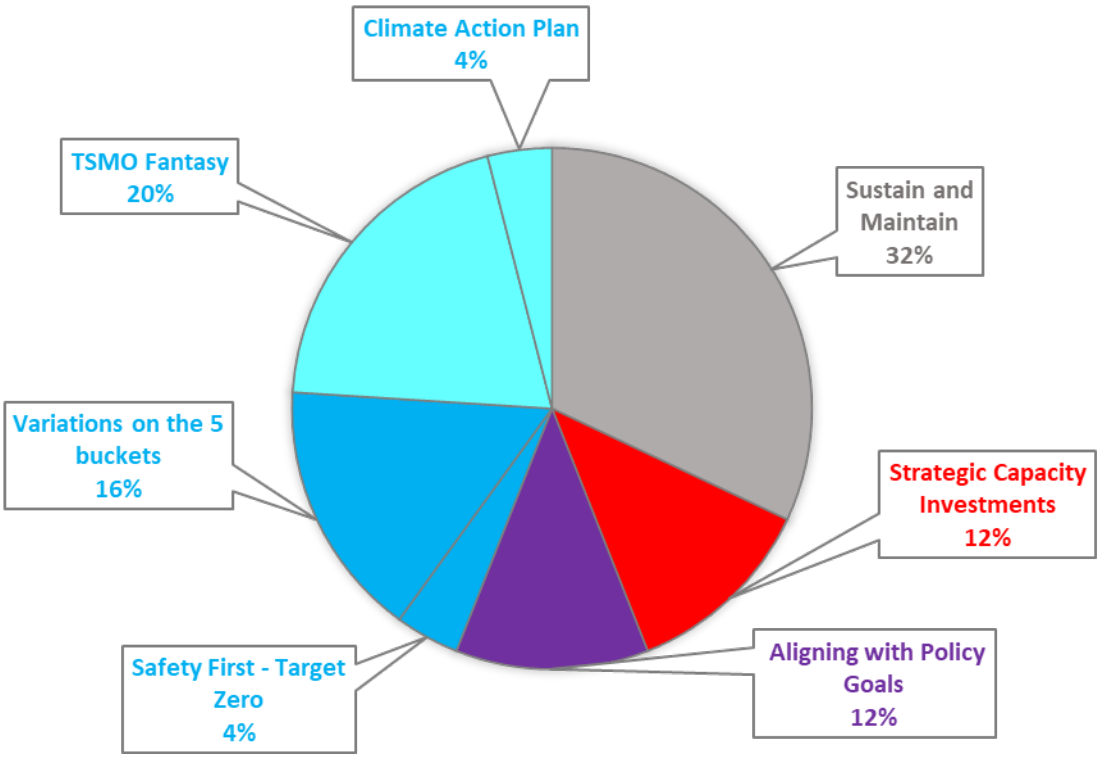


Figure 3: Advisory Committee investment concepts.

Key themes that emerged from the Advisory Committee members' interviews included:

- Strong support for keeping the system in a state of good repair.
- Freight is critical.
- Each area of the state has different needs.
- It's important to address climate change and resilience.
- Avoid system expansion, environmental impacts, incentivizing sprawl, and induced demand.

Please see Appendix C: Legislative policy direction and past engagement report.

Synthesis of the survey and interviews

Looking across all the expressed priorities in surveys plus interviews through 2021, as well as funding changes at the state and federal level, several tradeoffs emerged as key considerations to carry forward:

- Should preservation and maintenance (repair) be adequately funded, or partially funded?

- What is the right mix of safety and efficiency strategies and highway expansion strategies?

Answering these questions would address the issues of interest to most survey respondents (82%) and the majority of the advisory committee.

STEP 3: NARROW SCENARIOS FOR ANALYSIS AND FEEDBACK

With a handle on the range of scenarios to consider, the next step was to start narrowing down the conversation to find the common ground. It is not practical or financially feasible to analyze every potential investment scenario. Industry practice points to identifying three or four scenarios for consideration during the engagement process. WSDOT's Steering Committee provided the following guidance for narrowing down the scenarios:

- At least one scenario should align with…
  - WSDOT's priorities, mission, and values.
  - The expressed interests of cities and counties and the public.
- All scenarios should…
  - Be financially feasible.
  - Demonstrate real differences between potential decisions.
  - Align with state and federal requirements.
  - Link to performance.

Three scenario archetypes for new revenue

Based on the guidance of the Steering Committee, a baseline scenario and three scenario archetypes were selected for further discussion. The baseline scenario carried forward the 2021 budget for 20 years into the future. The Move Ahead Washington revenue package approved by the 2022 Legislature was too new and created too many uncertainties to include in the baseline during the spring of 2022.

The three scenario archetypes, informed by the public survey and interviews in Step 2, identified three distinctly different approaches to investing new revenue. Unlike a typical transportation alternatives analysis, these three scenario archetypes were selected not because one of them would emerge as the WSDOT recommended scenario. Instead, the archetypes clarify the outcomes of pivotal choices in how to invest transportation dollars. They do not represent every position and they are not equally supported. The intent was to use them to better understand stakeholder preferences during the engagement process.

Each of the scenario archetypes used the same estimate of reasonably expected revenue. The Steering Committee advised using the "Ambitious-but-reasonable" estimation of reasonably expected revenues from Step 1 for all new revenue scenarios. This recommendation was based in part on the passage of the Move Ahead Washington package in the 2022 Legislative Session, adding nearly $17 billion for transportation over the next 16 years, of which approximately $11 billion were related to state highways. The "Ambitious-but-reasonable" estimate assumes that in

addition to the MAW package, another similarly sized new revenue package will pass the Legislature in the next 20 years.

All scenarios fund the fish passage barrier removals required by court injunction. The three scenario archetypes for new revenue were (also depicted in Figure 4):

- **Maintain & Innovate**: Adequately fund preservation and maintenance needs. All remaining funds are split among the five innovation programs (environment, safety, transportation operations, active transportation, and transportation demand management).[2]
- **Maintain & Expand**: Adequately fund preservation and maintenance needs. All remaining funds are invested in capacity expansion (e.g., widening roads, expanding intersections, adding new interchanges or passing lanes).
- **A Bit of Everything**: Increases funding for, but does not adequately fund, preservation and maintenance. Divides remaining funds across the other six programs.

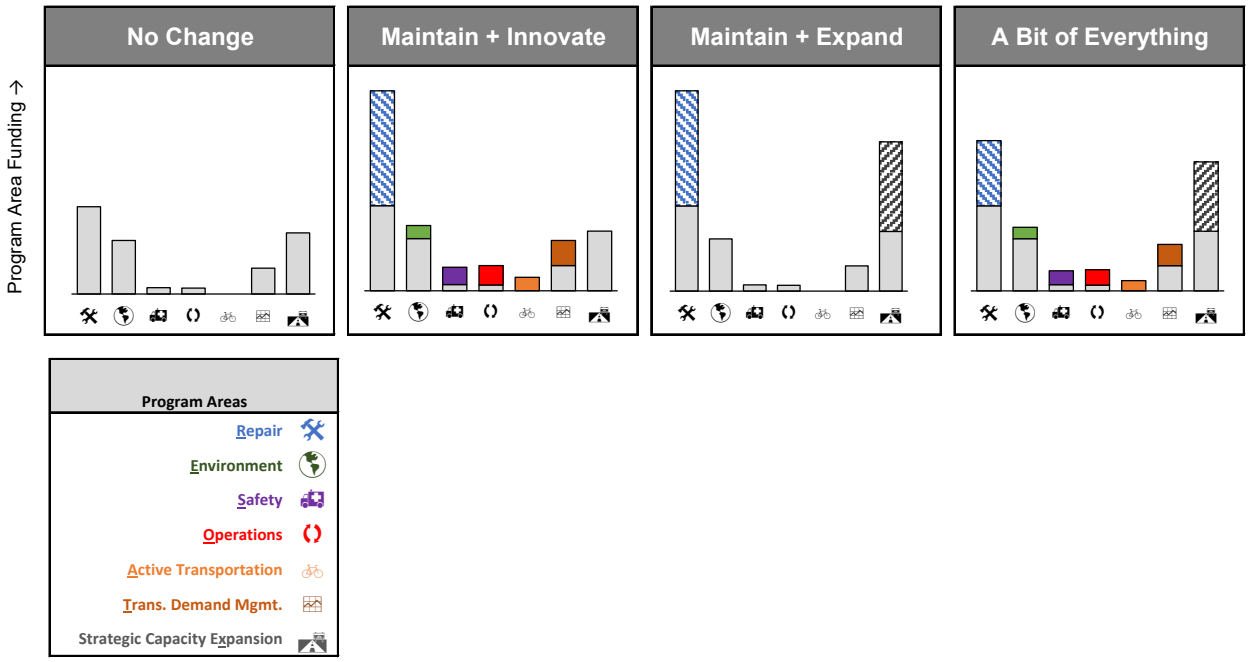


Figure 4: HSP Investment Scenarios for new revenue (for discussion purposes).

These three scenario archetypes were evaluated against the six state transportation policy goals and the results were shared during scenario outreach. Engaging the community with conversation allowed for participants to identify with one scenario, several scenarios, combinations of any of the scenarios, or to identify other priorities.

[2] Environmental work includes plant management, fish barrier removal, stormwater management, Chronic Environmental Deficiency (CED) remediation, noise reduction, and wildlife connectivity.

Several scenarios did not garner sufficient support for further development

Views across Washington are diverse, and the choice to move forward with a smaller set of scenarios meant some scenarios without a reasonable level support were not pursued further. While WSDOT welcomes all perspectives, and opportunities to express preferences, this planning process was intended to establish common ground as a basis for recommending future program investments.

- The project team excluded scenarios with dramatically lower or higher revenue assumptions – Assumptions informed by industry experts around reasonably expected revenues (described earlier) screened out scenarios that were out of alignment with the incremental approach to funding that policy makers in Washington have supported for decades. The study team's confidence in these assumptions increased with the passage of Move Ahead Washington, which committed significant new revenue to transportation over 16 years of the 20-year horizon for this plan.
- The project team excluded scenarios with polarized views around modes – Highway transportation includes trucks, cars, transit, walking, biking, and rolling. When it comes to balancing investments across modes, there are a few advocates whose views are outliers. For example, a few might suggest eliminating all transportation investments that benefit car travel while a few others propose eliminating all transportation investments that improve highway conditions for pedestrians and bicyclists. However, in our engagement we found most people supported a multimodal approach using all modes. Therefore, no scenarios were considered that removed funding from existing programs on a modal basis.

Policy goal performance analysis

The three scenario archetypes were evaluated against the state's transportation policy goals. Washington state statute directs public investments in transportation to achieve these six transportation policy goals:[3]

- **Preservation**. To maintain, preserve, and extend the life and utility of prior investments in transportation systems and services, including the state ferry system.
- **Safety**. To provide for and improve the safety and security of transportation customers and the transportation system.
- **Stewardship**. To continuously improve the quality, effectiveness, resilience, and efficiency of the transportation system.
- **Mobility**. To improve the predictable movement of goods and people throughout Washington state, including congestion relief and improved freight mobility.
- **Economic vitality**. To promote and develop transportation systems that stimulate, support, and enhance the movement of people and goods to ensure a prosperous economy.

[3] Revised Code of Washington (RCW) 47.04.280. Transportation system policy goals. https://apps.leg.wa.gov/rcw/default.aspx?cite=47.04.280.

- **Environment**. To enhance Washington's quality of life through transportation investments that promote energy conservation, enhance healthy communities, and protect the environment.

Additionally, the statute requires WSDOT to perform its powers, duties, and functions in a manner consistent with these policy goals, with preservation and safety being priorities.

These statewide transportation policy goals help align transportation investments across levels of government and geographies. They have been in place since 2006, and are well integrated into state, regional, and local plans. They provide a good foundation for facilitating consistency between statewide policy and the day-to-day decisions and investments carried out by local, regional, and state partners. This makes them a useful framework for the evaluation of transportation investment scenarios.

The Steering Committee provided the following additional guidance on evaluating scenarios:

- Consider all relevant and available information that helps evaluate tradeoffs among the policy goals—both qualitative and quantitative information may be appropriate.
- Some program funding levels may achieve multiple policy goals (e.g., preservation funding also contributes to achievement of the safety, mobility, and economic vitality goals).
- Consider the evaluation criteria when developing strategies that implement the recommended scenario and when explaining the extent to which the agency can align with proposed local and regional strategies.
- Integrate emerging issues like equity into the evaluation of the policy goals.

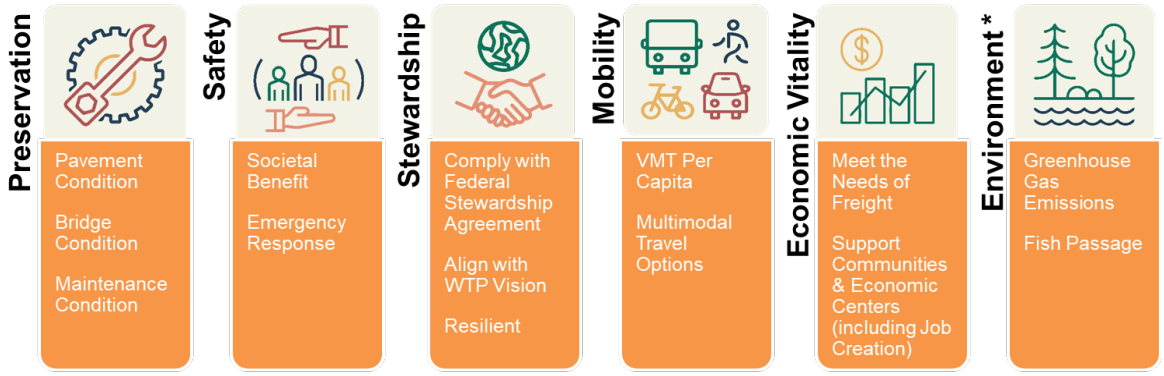


Figure 5: Scenario evaluation criteria.

Figure 5 contains the criteria used to evaluate the transportation policy goals. Some of the information used to evaluate the criteria came from the Program Performance Projection from Step 1 (e.g., pavement condition, safety societal benefit). These methodologies are described in more detail in Appendix C. Other information used to evaluate the criteria came from sensitivity testing of the input variables for the VisionEval modeling tool. VisionEval is a sketch level tool used to estimate the vehicles miles traveled and greenhouse gas emissions associated with different transportation policy options. Please see Appendix F for documentation of the VisionEval modeling.

The draft evaluation matrix (depicted in Figures 6 and 7 below) was shared during scenario outreach.

Updated 5/9/2022

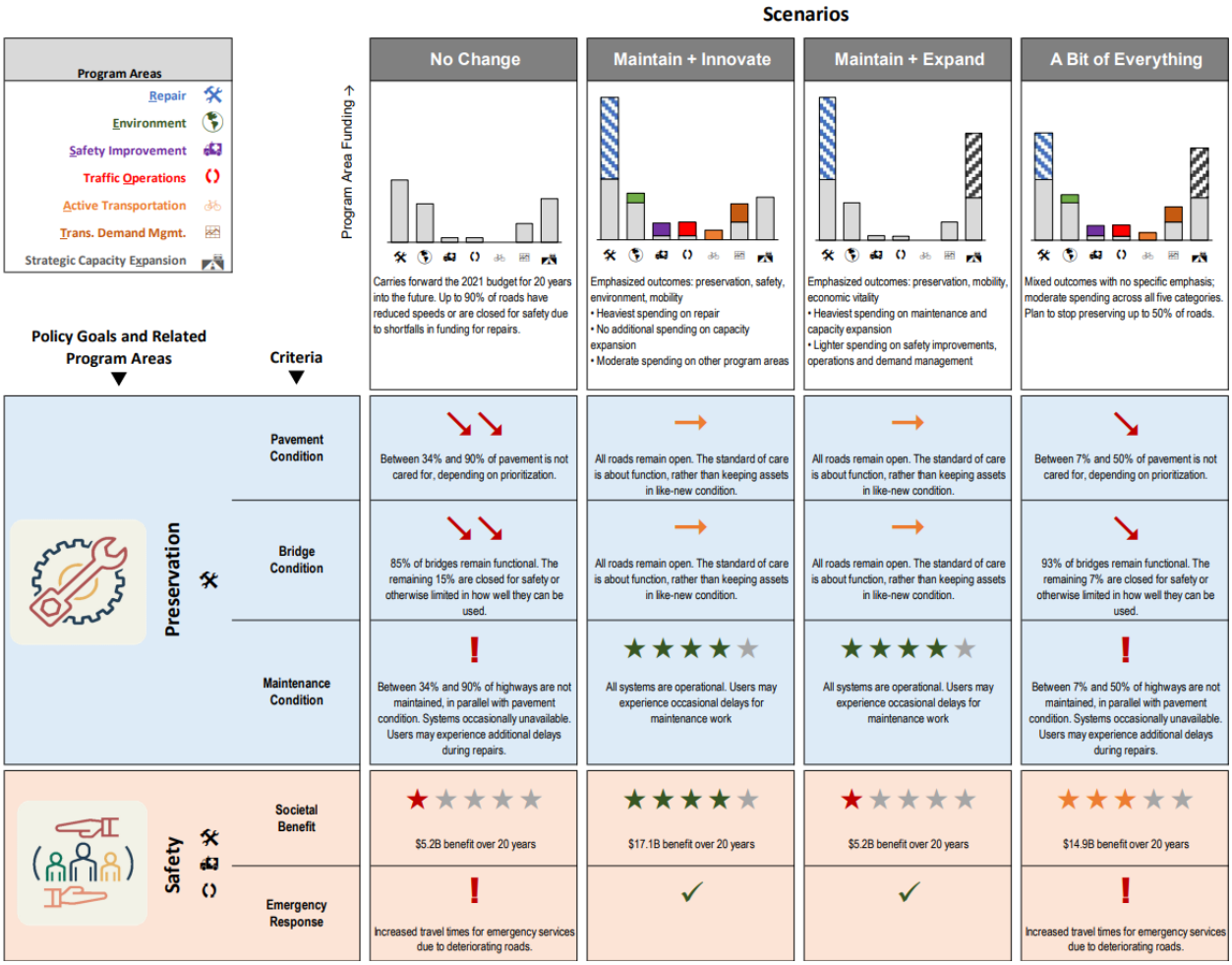


Figure 6: Scenario evaluation matrix (Part 1 of 2).

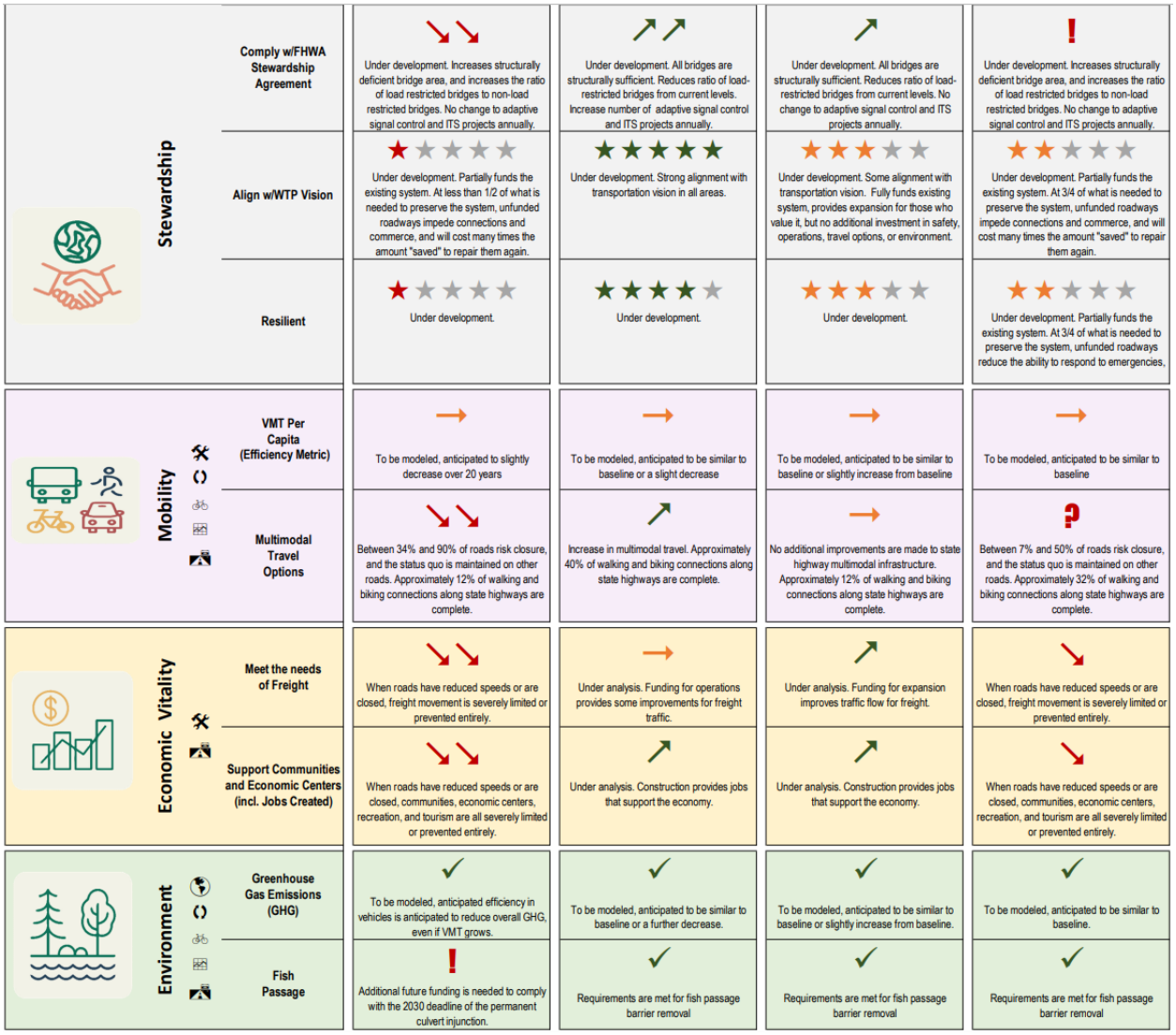


Figure 7: Scenario evaluation matrix (Part 2 of 2).

Scenario outreach

To collect input on the three scenario archetypes, we conducted a series of virtual public meetings, scenario workshops, and equity workshops. The outreach was supported by a media campaign to draw the public to the online open house and take the online opinion poll. The opinion poll was in the same format and had the same questions as the public survey, but it was online only and open to the entire population of Washington state.

The virtual public meetings and workshops were region-specific, focusing on the system needs and issues in WSDOT regions. The regions included:

- Northwest
  - King and Snohomish counties (NW Sno-King)
  - Island, San Juan, Skagit, and Whatcom counties (NW Mt Baker Office)
- Olympic
- North Central
- South Central
- Eastern
- Southwest

Virtual public meetings

The virtual public meetings targeted a general audience. These meetings intended to inform the audience about the Highway System Plan update and encourage participants to take the opinion poll. Seventy-three individuals attended these meetings.

Key takeaways

The key takeaways from the meetings included:

- All regions strongly supported adequately funding preservation and maintenance.
- Attendees showed interest in prioritizing safety improvements.
- Participants generally displayed willingness to hear about options to increase efficiency that did not include expansion.
- Areas outside of the Central Puget Sound (Management of Mobility) region and the Olympic region garnered more support for expansion, especially to support freight and improve safety.
- Attendees often mentioned expansion as a way to address freight needs and manage congestion.
- Some attendees in the North Central, South Central, and Eastern regions felt their respective regions received less funding and support than other regions.

Across the regions, participants expressed that transportation systems (e.g., highways and ferry systems, or roadway infrastructure and multimodal infrastructure), and decision makers (e.g., WSDOT and local jurisdictions) could work better together to create a more integrated system that improves connectivity for communities, commerce, and individual community members.

Scenario workshops

WSDOT held one scenario planning workshop within each region between May 10 and June 7, 2022, for a total of seven workshops. Seventy individuals attended the workshops. The goals of the workshops were to share information on the HSP update, explore the three scenario archetypes, and gather feedback on preferred investment approaches. Scenario workshops were targeted at local governments, MPOs and RTPOs, and tribal transportation organizations.

After providing an overview of the HSP purpose and process and the three scenario archetypes, the workshop participants were asked for their feedback.

Key Takeaways

The key takeaways from the scenario workshops included:

- Safety is most important; followed by preservation efforts.
- Consider thinking about mobility as moving people, not vehicles.
- Needs vary drastically between rural and urban settings.
- Advanced technology and innovation could be utilized in any funding scenario.
- Develop the HSP using an equity lens.

Scenario Feedback

The majority of participants felt that "Maintain and Innovate" was the most appropriate scenario for their region. Table 3 compares the ratings from each region. A rating of 5 means most appropriate, and 1 means not appropriate.

Regions	Maintain + Innovate	Maintain + Expand	A bit of everything
Eastern	4.1	2.4	2.1
North Central	4.1	3.2	1.7
NW Mt. Baker	4.1	1.7	3.4
NW Sno-King	3.8	3.2	2.6
Olympic	4.5	4.0	1.8
South Central	3.3	4.0	2.7
Southwest	3.6	2.9	3.0
Average	3.9	3.0	2.4

Table 3: Average scenario ratings.

Safety, preservation, and multimodal travel options were among the most frequently mentioned priorities. Other priorities include maintenance levels, social equity, connectivity, stewardship, transportation demand management (TDM), and bridge condition.

When asked to allocate 100 points across the innovative program areas, the workshop participants rated safety improvements as their top funding category. Figure 8 illustrates the collective responses.

Figure 8: Collective responses for Innovation Category funding responses.

In terms of balancing funding between innovation and expansion, the majority preferred more funding for innovation with some funding for expansion. Figure 9 illustrates each region's preference for balancing funding between expansion and innovation. Figure 10 illustrates the distribution of those responses, with a clear average (mode) and a wide range of responses, with less support at the extremes of the distribution. This distribution reenforces what we heard in previous outreach and helps pinpoint where that balance point is in the conversation.

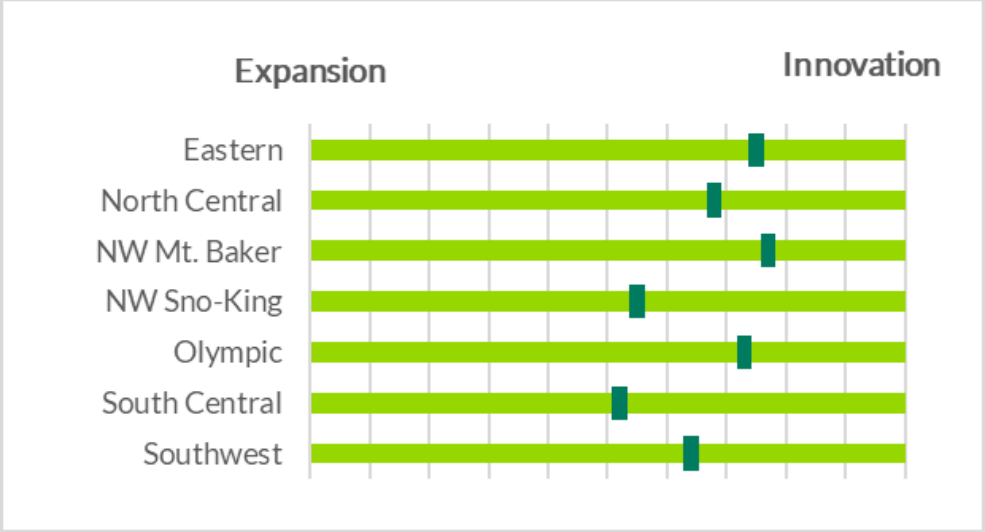


Figure 9: Midpoint of funding innovation category and expansion category for each WSDOT region.

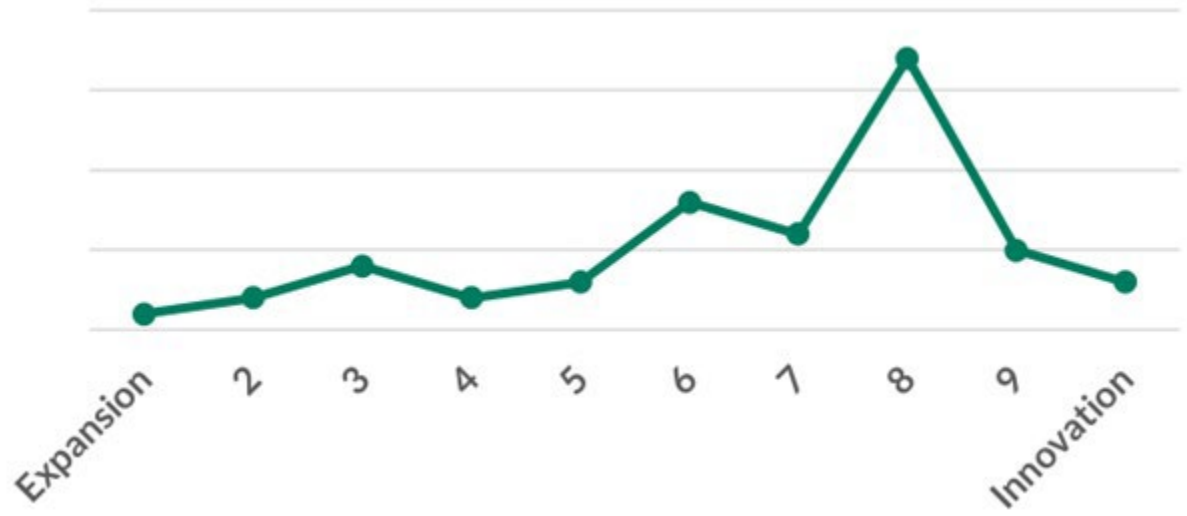


Figure 10: Collective distribution of funding between the innovation and expansion categories from the scenario workshops.

EQUITY WORKSHOPS

Consistent with the HSP Approach to Equity, equity workshops were geared to the four populations of focus: communities of color, those with limited English proficiency, low-income communities, and persons with disabilities. The central equity question was, "How might different investment choices in state transportation programs increase or decrease equity?"

A total of five region equity workshops were held. The North Central and Southwest regions were cancelled due to poor turnout or registration at scheduled workshop times.

ATTENDANCE

A total of 30 participants were present at the workshops that took place from May 17 to June 9, 2022. Twelve individuals represented various local transit agencies, transportation planning organizations or other professional groups. Eighteen were concerned citizens and there were six professionals and citizens who were members of the populations of focus.

Most of our feedback came from workshop participants who were not members of the populations of focus but were advocates for these groups. Some of these attendees had experience working with vulnerable population groups through their work or other activities. The Snohomish and King County workshop did include participants who were members of the populations of focus.

PRELIMINARY TAKEAWAYS

Although there was effort to reach overburdened and underrepresented communities, members of those communities were generally not present. These takeaways were only initial takeaways, and the key takeaways from the equity workshops included:

- Safety, security, and preservation were priorities for most participants.
- There should be an effort to provide people of color opportunities (jobs and business) that stem from the implementation of the HSP.

- There is a need to expand transportation options for low-income and disadvantaged communities.
- Unprecedented population growth has caused more problems (accessibility to affordable housing) for vulnerable communities.
- The population we were hoping would attend these meetings were generally not present.

Second round of equity workshops

Despite providing incentives to respond to the survey and oversampling geographic areas with high percentages of groups from overburdened communities, some demographic groups remained underrepresented. The survey respondents underrepresented residents between the ages of 18 and 44 and overrepresented residents ages 55 and older. In particular, respondents over 65 composed over 42 percent of the survey sample, but seniors over 65 are only 15.1 percent of the state's population. Survey respondents slightly underrepresented people identifying as female (42.1 percent, 50.0 percent statewide) and slightly overrepresented people identifying as male (56.2 percent, 50.0 percent statewide). An underrepresentation of the state's lowest income residents occurred despite the effort to oversample low-income neighborhoods (7.2 percent of respondents had incomes below $25,000 compared to 13.9 percent statewide). The respondents represented a higher than proportionate share of people with incomes in the $75,000 to $99,999 range (16.8 percent versus 13.3 percent statewide). The survey sample contained a less than proportional sample of the state's Black (1.3 percent versus 4.0 percent statewide), Asian/Pacific Islander (5.8 percent versus 9.7 percent statewide), and Hispanic/Latino/Spanish (4.3 percent versus 13 percent statewide) populations. More than 15 percent of HSP survey respondents identified as having a disability, a slightly greater proportion than the statewide rate of 12.7 percent as reported by the 2019 ACS. The results of the demographic analysis informed future engagement efforts, including prioritizing engagement with overburdened communities that were underrepresented in the survey, including low-income populations and communities of color.

WSDOT's Office of Equity and Civil Rights and WSDOT regional planning offices suggested that meeting these groups at community spaces and gatherings would to be more successful than inviting them to a WSDOT organized meeting. New changes to statewide legal guidance also allowed us to compensate members of the public for their time spent sharing their perspectives and lived experiences. WSDOT approved another series of targeted engagement to improve the response rates from these underrepresented groups and improve the overall results and analysis of the statewide feedback. Project staff worked with a range of community-based organizations to organize intercept interview opportunities and focus group discussions.

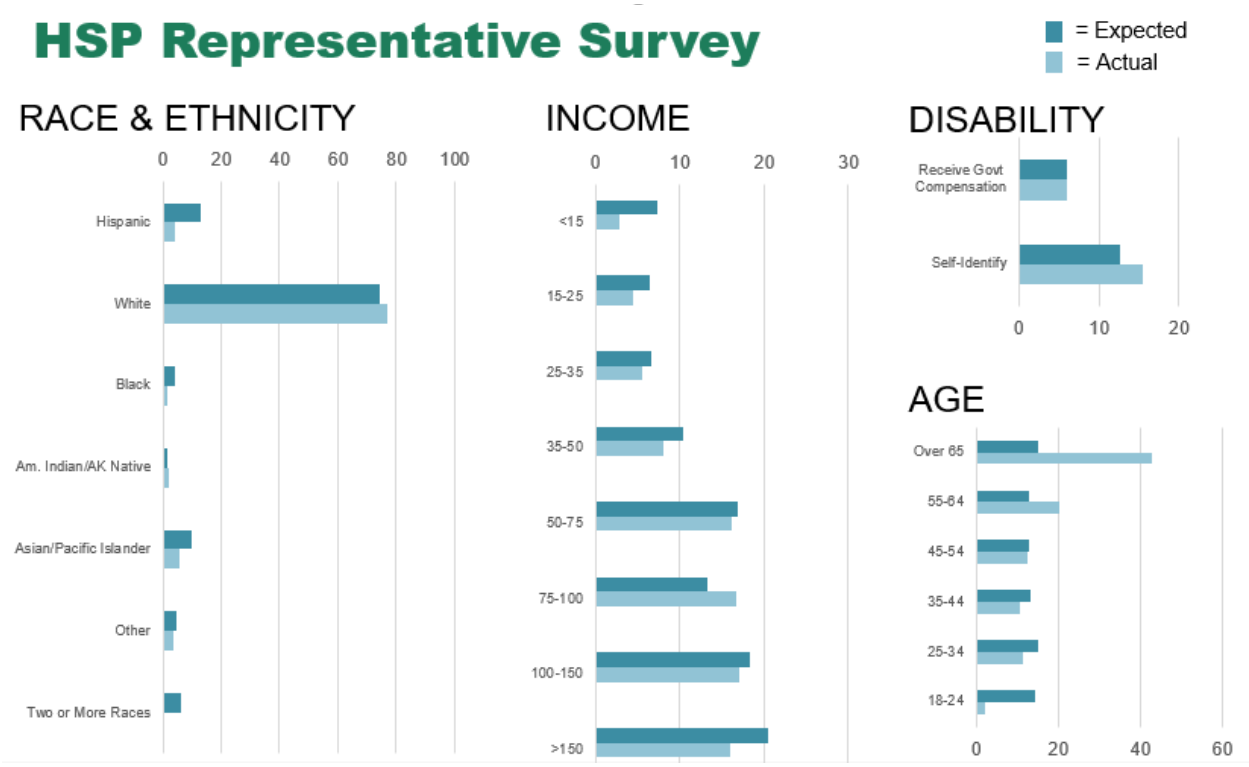


Figure 11: HSP representative survey results.

Attendance

A total of 210 people participated in this series of eleven equity events. Of these, 157 people participated in intercept interviews and 53 participated in the four focus groups. Improving on engagement with non-English speaking populations, 61 people gave their feedback in Spanish. There were 101 people who identified as female. For low-income populations, 128 people provided their perspectives. The 18-34 age range was represented by 39 individuals.

For race and ethnicity, 69 identified as American Indian or Alaska Native and 51 identified as Hispanic Latino/Spanish origin. Importantly, this series of events was able to collect responses from all other Census racial and ethnic groups.

Key takeaways:

- Public transportation, safety, and active transportation were all primary concerns.
- Road maintenance important to prevent vehicle damage.
- Respondents framed expansion projects as providing more room for people walking or bicycling, or separating modes for safety.
- Public transportation is critical to safe mobility for tribal communities.
- Public transportation is essential to low-income communities to reach economic opportunities, education, resources, and independence.
- The most common suggestion heard was to improve PT frequency, routes, and earlier/later service for public transportation.

Online opinion poll

The online opinion poll is similar to the HSP Transportation Investment Preference Survey (see summary in Step 2). In contrast to the survey, the poll was accessible to anyone via hyperlink from the Highway System Plan webpage and online open house. The survey, on the other hand, was distributed to a random sample of Washington residents. The HSP team performed a preliminary analysis on poll responses through September 15, 2022.

As of September 15, 2022, we received 747 responses to the online opinion poll. Notable poll results include:

- Respondents held consistent priorities across regions within the state.
- Respondents preferred spending more than current funding for state of good repair (pavement and bridge preservation, maintenance, and stormwater), safety, and walking and bicycling.
- The average respondent preference for funding for New and Bigger Highways was $1.02 billion, which is lower than the current funding for this category, $1.2 billion. The lowest funding option was $800 million.

Regions	Pavement Preservation (million $)	Bridge Preservation (million $)	Stormwater (million $)	Maintenance (million $)	Safety (million $)
Northwest	210	270	20	280	290
South Central	200	260	10	280	190
North Central	240	300	10	310	150
Eastern	250	310	10	300	220
Olympic	230	290	20	300	260
Southwest	230	300	10	280	150
Current funding	**150**	**200**	**0**	**250**	**50**
Survey Average	**220**	**280**	**10**	**290**	**260**

Table 4: Average funding selected for the Pavement, Preservation, Bridge Preservation, Stormwater, Maintenance, and Safety program areas (in millions of dollars).

Regions	Operations (million $)	Walking & Bicycling (million $)	Increase Travel Options (million $)	New & Bigger Highways (million $)
Northwest	80	230	590	980
South Central	70	250	410	940
North Central	80	130	340	1,150
Eastern	90	120	380	1,150
Olympic	90	170	410	1,060
Southwest	90	130	270	1,190
Current funding	**50**	**0**	**150**	**1,200**
Survey Average	**80**	**200**	**510**	**1,020**

Table 5: Average funding selected for the Operations, Walking & Bicycling, Increase Travel Options, and New & Bigger Highways program areas (in millions of dollars).

So far, the poll respondents have been largely male (62.2 percent). Only 7.6 percent of the respondents are between the ages of 18-24, and only 26.4 percent are between the ages of 25-34. More than half the respondents (53.7 percent) have a household income of more than $100,000. Most participants identify as White (76.4 percent), which is similar to the proportion in the state as a whole (78.3 percent as of 2020).4 More than 12 percent of respondents are living with a disability. Also, 16.5 percent of respondents speak another language.

After combining public survey and opinion poll responses, there were more than 450 responses from younger demographics, people between the ages of 18 and 34. When comparing the younger respondents' preferred program spending to the survey and opinion poll spending averages, younger respondents preferred spending less on new and bigger highways and more on walking and bicycling, increasing travel options, and safety. This group also preferred spending slightly less on maintenance and bridge and pavement preservation.

[4] Office of Financial Management (2020). Population Estimates.

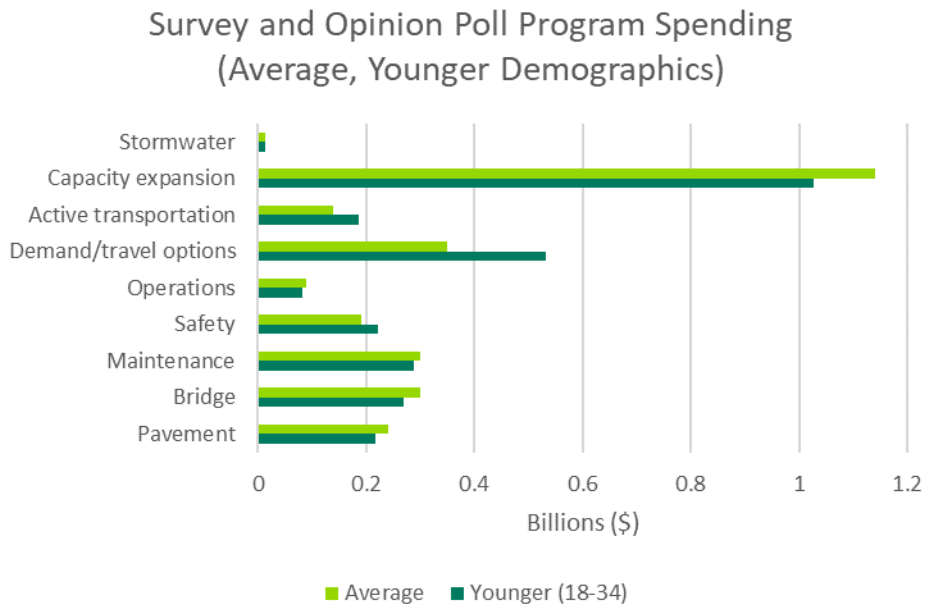


Figure 12: Survey and opinion poll program spending (average, younger demographics).

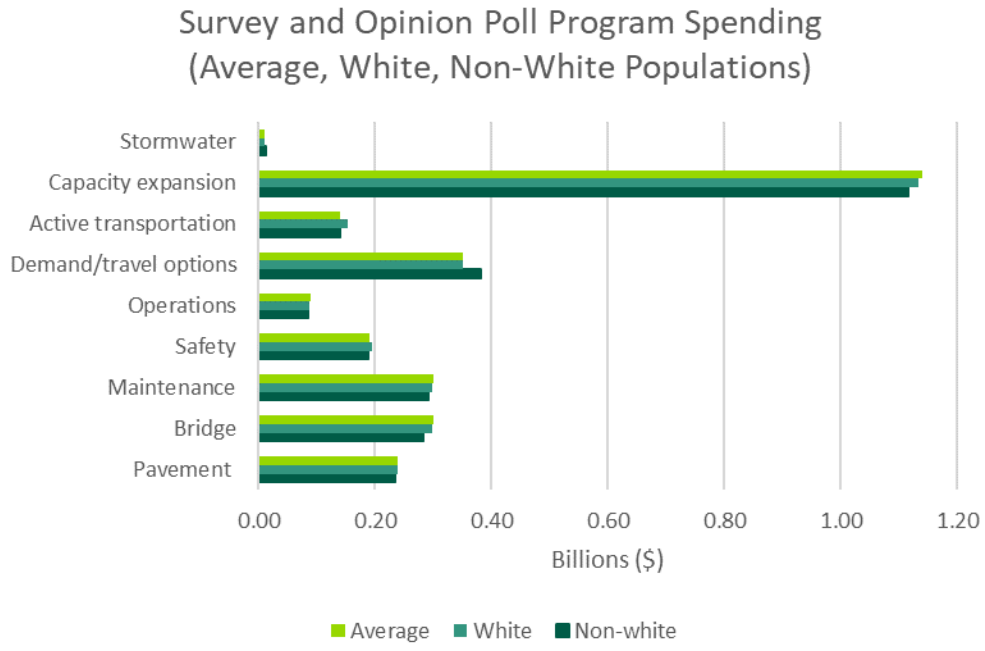


Figure 13: Survey and opinion poll program spending (average, white, non-white populations).

The combined survey and opinion poll results also indicated that people who identified as non-white would spend slightly less on New & Bigger Highways and Bridge and Pavement Preservation. This group would spend slightly more on Increasing Travel Options.

The Online opinion poll program spending results did not differ substantially from the public survey results. Combining the survey and opinion poll results did, however, give the HSP team insight into the spending preferences of certain demographic groups.

STEP 4: DEVELOPING A RECOMMENDED SCENARIO

The final step in the process was to select a recommended scenario. The recommended scenario will provide the foundation to create the plan itself. The selection of a recommended scenario was based on both the performance analysis and the outreach described in Figure 14 below. Consistent with how the initial scenarios were developed, the HSP Steering Committee first considered whether the recommended scenario should adequately fund the functional preservation and maintenance of roads and bridges, including the court-ordered removal of fish passage barriers. Then, it explored the optimal balance between A) safety and efficiency improvements and B) new and bigger highways.

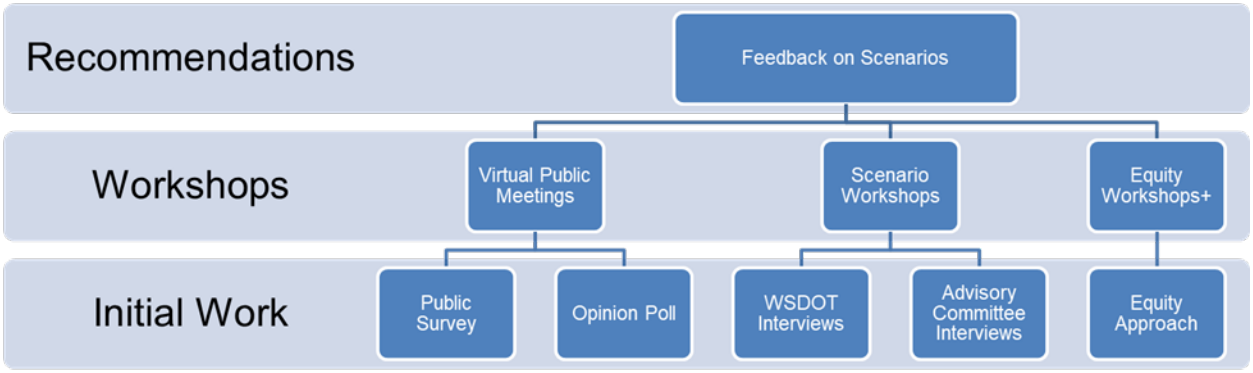


Figure 14: Outreach work leading to WSDOT's recommendation.

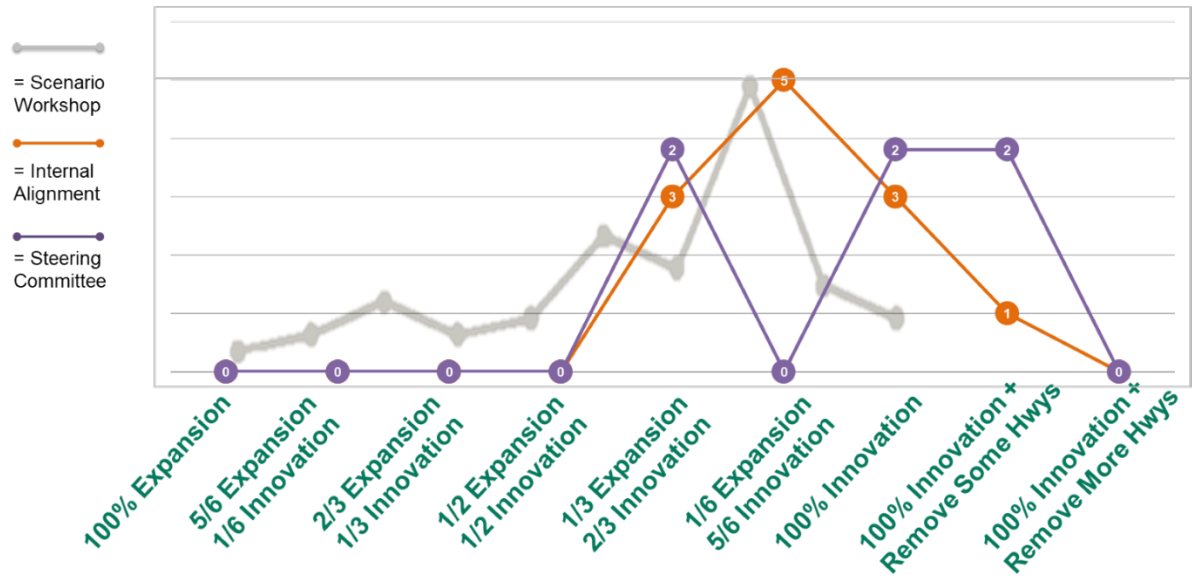


Figure 15: Preferred balance of expansion to innovation for amounts beyond current funding (preliminary).

Based on the work in Step 3, the Steering Committee suggested further analysis of three scenarios for new revenue, assuming fish passage barrier corrections required by the injunction and preservation and maintenance are fully funded. The three scenarios differ based on the split of the remaining funding between expansion and innovation as follows:

- Fix it first and a ratio of 1/3 new and bigger highways to 2/3 safety and efficiency
- Fix it first and a ratio of 1/6 new and bigger highways to 5/6 safety and efficiency
- Fix it first and all remaining funding for safety and efficiency

THE RECOMMENDED SCENARIO – THE RECIPE FOR RESILIENCE

WSDOT recommends – based on broad public engagement – that new revenue for state highways be dedicated first to adequately funding operations maintenance, capital preservation, and critical programs such as fish passage and program support.[5] Two dollars of any additional funds should be spent on safety and efficiency strategies for every dollar spent on highway expansion projects.

While this recommendation is a significant shift from current methods, it responds to public preferences and is consistent with professional best practices. It provides acceptable performance and emphasizes the legislative priority goals of preservation and safety. This recipe for resilience will provide more positive economic, safety, and equity benefits to more Washingtonians statewide, enhanced by the state's new complete streets and environmental justice requirements.[6] This approach will include strategic expansion projects that focus on moving people and goods safely and efficiently.

Recipe for:
Resilient Highways

There is not enough funding to meet all highway needs, therefore WSDOT recommends the following recipe to spend our limited funds.

Serves:
All Washingtonians

Ingredients:
- Baseline funding
- Move Ahead Washington funding
- New revenue

Preparation:
1. First fund operations maintenance, capital preservation and critical programs such as required fish passage projects and program support.
2. Then for any remaining funds, $2 should be spent on safety and efficiency strategies for every $1 spent on highway expansion projects.

Chef's note: Keeping the existing system open depends on two programs that work together. Preservation in the capital budget addresses large fixes. Maintenance from the operations budget keeps the roads open in between preservation fixes through more than two dozen separate activities.

Figure 16: 2022-2041 Recipe for resilient state highways.

If this plan's recommendations are realized, our future state highway system will be resilient and:

- **SOUND**. All bridges and highways, critical to supporting Washington's existing economy, remain open and are maintained in working condition – a condition that last occurred in 2009.
- **SAFE**. WSDOT decreases serious injuries and saves lives by providing safer spaces for people who walk, bicycle, and roll, new guardrails and roundabouts, and intersection

[5] Keeping the existing system open depends on two programs that work together. Preservation in the capital budget addresses large fixes. Maintenance from the operations budget keeps the roads open through more than two dozen separate activities.

[6] Complete streets information is available at: https://wsdot.wa.gov/construction-planning/complete-streets.

improvements. This also results in an $8.9 billion reduction in the costs to society from crashes over 20 years.

- **SMART**.
  - **Healthier environment.** The removal of fish passage barriers required by court injunction are complete. Daily vehicle miles traveled are 3.7 percent lower and greenhouse gas emissions are 2.3 percent lower than baseline.
  - **More equitable outcomes.** Agency investments and policy decisions are equitable and inclusive, creating outcomes that benefit historically underserved and overburdened communities and reduce environmental health disparities.
  - **More walking, bicycling, and rolling.** WSDOT closes most walking, bicycling, and rolling gaps along, across, and adjacent to state highways identified in the Active Transportation Plan, resulting in safer and more efficient travel.
  - **More travel options.** Employers increasingly encourage their workers to take the bus, carpool, bicycle, walk, and work from home. More cities are given support to implement strategies for transportation-efficient communities. WSDOT-provided grant support helps transit agencies improve bus service, deliver more service for people with disabilities, and deploy more vanpools for ridesharing.
  - **Smoother transportation operations.** Crashes are cleared faster, travelers are provided with more information, and other low-cost changes are made that benefit all highway users.

Appendix A: References

Brown, R. et al. (2022). Community Engagement Support for the Highway System Plan Update Research Report. University of Washington, Washington State Transportation Center (TRAC).

Washington Department of Transportation (2017c). Washington Transportation Plan Phase 2 – Implementation 2017-2040.

Washington State Department of Transportation (2021). The Highway System Plan's Approach to Equity.

Washington State Department of Transportation (2022). Financial Technical Advisory Group Summary of Findings.

Washington State Department of Transportation (2022). Maintenance Accountability Process.

Washington State Department of Transportation (2022). Transportation Asset Management Plan.

Washington Department of Transportation (2022). Washington State Pavement Management System (WSPMS). https://webapps.wsdot.loc/Materials/WSPMS/Users/Login.aspx?wantsURL=/materials/wspms/default.aspx.

Washington State Transportation Commission (2015). WTP 2035.

Washington State Transportation Commission (2017). Statewide Voice of Washington Panel & Phone Surveys Final Report.

Appendix B: Highway System Plan governance structure and committees

Committees, technical advisory groups guided and assisted the HSP project team. The groups included:

- HSP Project Sponsor Team
- HSP Steering Committee
- HSP Advisory Committee
- WSDOT Internal Alignment Group
- Align Investments Working Group
- Technical Advisory Groups
  - Community Engagement TAG
  - Financial TAG
  - Modeling TAG
- Interested parties

Project sponsor team

WSDOT's Deputy Secretary was the Project Sponsor for the Highway System Plan. The Deputy Secretary guided the project team at monthly meetings on risk mitigation, communication within the agency, and process and policy direction. The project sponsor team supported and advised the project sponsor and included the Assistant Secretary and Deputy Assistant Secretary for Multimodal Development and Delivery, the Multimodal Planning and Data Division Director, and the Chief Financial Officer. The WSF Chief of Staff and a Regional Administrator was added to the project sponsor group partway through the process. This group also advised when to consult the Secretary of Transportation, who signs and approves the final 2024 HSP.

Steering Committee

The Steering Committee was chaired by the WSDOT Deputy Secretary and made up of four of five WSDOT Assistant Secretaries, the WSDOT Chief Financial Officer, two WSDOT Regional Administrators, the Deputy Assistant Secretary of Multimodal Development and Delivery, the Multimodal Planning and Data Division Director, and two MPO/RTPO Directors. Their role was to deliberate, make recommendations, advise, and provide strategic oversight to the HSP planning process. They commented on draft documents and findings and provided input on needs and priorities. If the committee reached an impasse, the decision was made by either the Chair or the Project Sponsor Team.

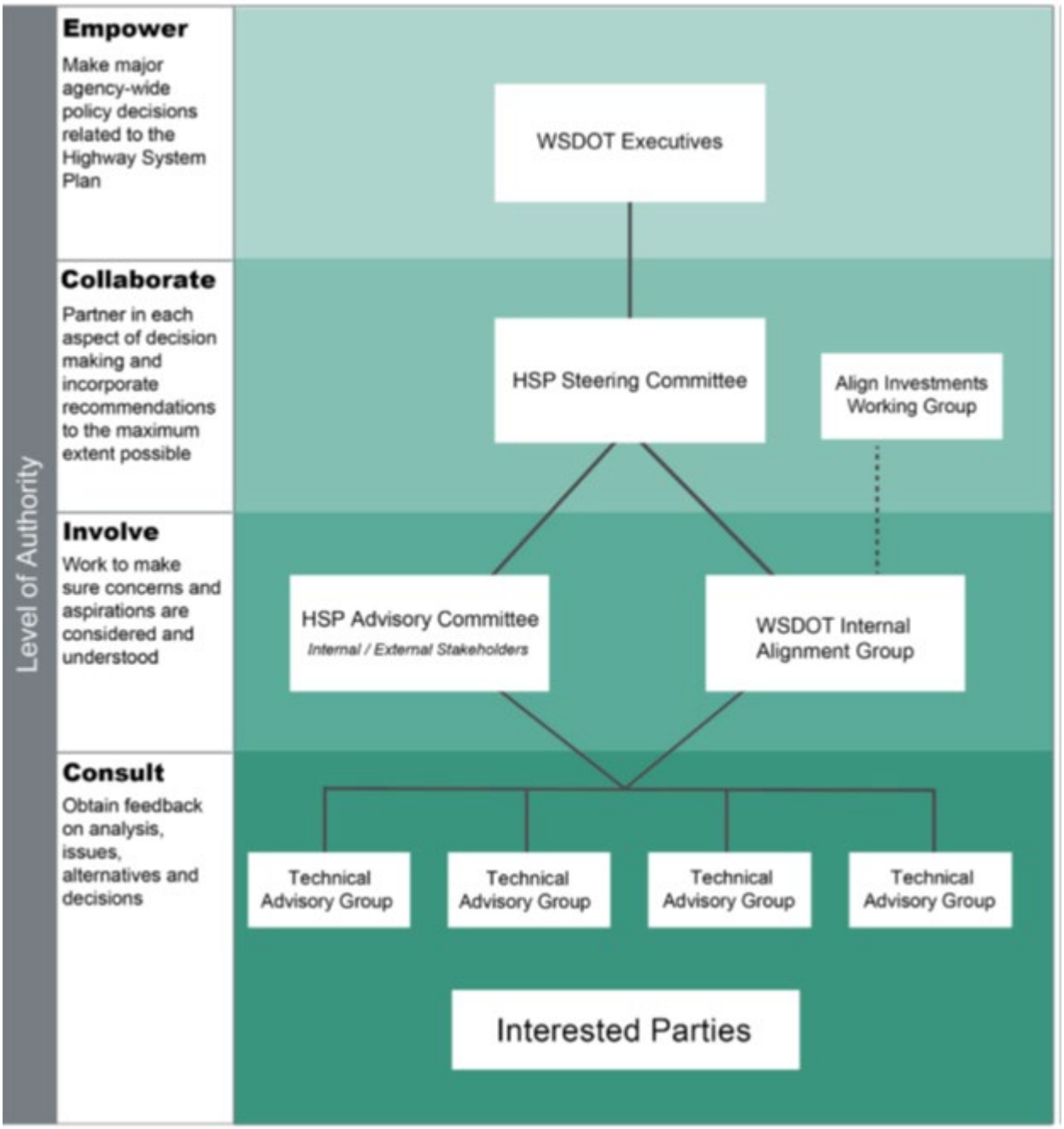


Figure 17: HSP committees and groups.

ADVISORY COMMITTEE

This committee provided advice and recommendations to the HSP Steering Committee in a bottom-up manner. It was comprised of stakeholders external to WSDOT, including representatives from the Washington Transportation Commission; tribes; the FHWA and FTA; ports, agriculture, business and trucking associations; MPOs/RTPOs; cities; counties; transit organizations; active transportation and environmental advocacy organizations; the engineers union; and other state agencies. Legislative transportation committee staff were also invited to

attend in a non-voting role. The group provided "wise counsel" and expertise on issues, offered insights and ideas, acted as a resource for the Steering Committee, and encouraged and supported the exploration of new approaches and ideas.

WSDOT Internal Alignment Group

The WSDOT Internal Alignment Group was comprised of internal stakeholders who understand the business practices of WSDOT, including most Division Directors and all Regional Administrators. The group served as a sounding board and resource for the HSP Steering Committee as well as a forum for debate and deliberation. The group represented programs and interests within WSDOT. They provided context and perspectives to inform how decisions affect business groups within WSDOT.

WSDOT's Align Investments Working Group (AIWG)

This group served as a sounding board for the scoping of the Highway System Plan and identified members of the Steering Committee.

Technical Advisory Groups

The Technical Advisory Groups (TAGs) provided a formal structure to gather input and advice from subject matter experts on specialized and technical topics, track progress, vet recommendations, and hear various perspectives. The goal was to provide expert technical advice to the HSP team, by ensuring cross-sectional representation of WSDOT's technical experts. Members provided recommendations on specific issues within areas of their experience and expertise. Some TAGs also included MPO and RTPO representatives. Four TAGs were created to focus specifically on: finances, community engagement, level of service standards, and VisionEval modeling. Existing groups at WSDOT provided input on multimodal integration and preservation and maintenance.

Interested parties

Interested parties comprise all remaining internal and external stakeholders with an interest in WSDOT's HSP update. While not an official committee or group, the interested parties designation sets expectations about how feedback of others is included in the decision-making process for the Highway System Plan.

Appendix C: Legislative policy direction and past engagement report

Overview

WSDOT is conducting community outreach and collecting data to determine funding priorities for the highway system in Washington state. This literature review was conducted to supplement information from the Highway System Plan community outreach through examination of published local and statewide transportation plans. This literature review analyzed the planning documents to assess if community outreach included inquiries or comments about highway system funding areas. To align with the "Five buckets" concept introduced in Step 2: Identify Range of Scenarios, this analysis uses five highway system funding areas to summarize prior feedback.

This literature review summarizes information from the following transportation planning documents:

- Quad County Regional Transportation Plan 2017-2037
- 2040 Regional Transportation Plan for The Okanogan Region
- 2018 Coordinated Public Transit – Human Services Transportation Plan for Benton and Franklin Counties
- Transition 2040 - Metropolitan Regional Transportation Plan for The Tri Cities and Benton and Franklin Counties
- Chelan-Douglas Human Services Transportation Plan
- Chelan-Douglas Regional Transportation Plan Update
- Cowlitz-Wahkiakum 2045 Regional Transportation Plan
- Island Access 2040 – Regional Transportation Plan for The Island Region
- Lewis and Clark Valley Destinations 2.0 Long Range Transportation Plan Update
- Northeast Coordinated Public Transit – Human Services Transportation Plan
- Northeast Washington Regional Transportation Plan 2042
- Palouse 2040 Regional Transportation Plan
- Peninsula Coordinated Public Transit – Human Services Transportation Plan
- Peninsula Regional Transportation Plan 2040
- San Juan County Comprehensive Plan – Section B, Element 6 – Transportation
- Skagit 2045 Regional Transportation Plan
- Horizon 2040 Spokane Metropolitan Transportation Plan Executive Summary
- Horizon 2040 Spokane Metropolitan Transportation Plan Appendix A – Outreach Process and Comment Summary
- Walla Walla Valley 2045 Plan

- Whatcom Mobility 2040
- Yakima Valley Transportation Plan
- Washington State Rail Plan 2019-2040
- Washington State Active Transportation Plan Part 1 – 2020 And Beyond
- Washington Aviation System Plan (WASP)
- Freight System Plan – Technical Update to the 2014 Freight Mobility Plan
- Washington State Multimodal Permeability Pilot
- Washington Statewide Human Services Transportation Plan
- Washington State Freight and Goods Transportation System (FGTS) 2019 Update
- Washington State Ferries 2040 Long Range Plan
- Performance-based Project Evaluation Feasibility Report
- Highway System Plan Charter
- Performance-based Project Evaluation Feasibility Report, December 2020
- Coordinated Public Transit – Human Services Transportation Plan Guidebook
- Expanding Travel Options: Faster, Smarter and More Affordable – A 2019-2023 Strategic Plan
- 2016 Washington State Public Transportation Plan
- State Planning & Research Program – 2021-2023 Biennium
- Washington State Strategic Highway Safety Plan 2019
- Washington Transportation Plan 2035
- Washington Transportation Plan Phase 2 – Implementation 2017-2040

DEFINING FUNDING AREAS

The community input gathered and summarized below informed WSDOT's understanding of previous work on funding priorities. This review captures community feedback from transportation plans that have done community outreach related to the five funding areas, including: preservation and maintenance, innovation, safety, multimodal and active transportation, and expansion.

Preservation and maintenance

Funding preservation and maintenance would mean keeping the highway system in a state of good repair to keep infrastructure lasting as long as possible. This includes investing in pavement repairs, bridge repairs and safety updates, replacing damaged guardrails, temporarily patching potholes, clearing snow and ice, and responding to emergency road closures.

Safety

The number of deaths and serious injuries from transportation is rising, especially for people who walk and bicycle. Spending on highway safety makes crashes less likely and less serious by investing in things such as guardrails and roundabouts, wider intersections, and separate spaces for people who walk, bike, and roll.

Operations

Operations helps get the most from existing highways without spending more on larger highway projects. It includes improvements to keep traffic moving like traffic lights, highway lighting, and intelligent transportation systems technology. It funds small-scale changes to intersections, like turn lanes and crosswalks that make them work better. Operations also provides traveler information and emergency services to help keep highways open and, moving smoothly and safely.

Other travel options

Multimodal and active transportation include those traveling by walking, biking, or rolling on scooters, skateboards, and wheelchairs. This priority area aims to make a more comfortable network for people who walk, bike, and roll by investing in sidewalks and bicycle lanes and separated paths along or near highways. This category focuses on increasing safe connections between homes, businesses, local trails, schools, etc.

Expansion

Prioritizing expansion would mean investing in new and bigger highways by widening roads, expanding intersections, adding new interchanges, adding more passing lanes, and improving ramps. It also includes projects funded from the gas tax increase in 2015.

DETAILED FINDINGS

The details below are grouped to show how frequently each funding priority area was included in the reviewed literature. “Many”, in this case, means more than half (20) of the reviewed sources, “some” means more than ten, and “few” means ten or fewer sources.

Whether a funding priority area was included by many, some, or few sources does not reflect the importance of the priority. Rather, this grouping is meant to help understand how frequently community members, organizations, and advisory groups were consulted on these funding priorities. There is an additional “Other” category that denotes how many sources did not report any engagement on the funding priority areas.

Priority Area Findings	
Preservation and Maintenance	Some • Thirteen of the reviewed planning documents reported preservation and maintenance as a priority during their community engagement process. • This category was reported through survey responses, planning goals, activity questions, sticky dot voting, public comment, and key findings from outreach.
Safety	Some • Fifteen of the reviewed planning documents safety as a priority during their community engagement process. • This category was reported through survey responses, planning goals, activity questions, sticky dot voting, public comment, discussions with community members and organizations, and key findings from outreach.
Transportation Operations	Few • Six of the reviewed planning documents reported operations as a priority during their community engagement process. • This category was reported through survey responses, planning goals, and public comments.
Other Travel Options	Some • Fourteen of the reviewed planning documents reported multimodal and active transportation as a priority during their community engagement process. • This category was reported through survey responses, planning goals, activity questions, sticky dot voting, public comment, discussions with community members and organizations, and key findings from outreach.
Highway Expansion	Few • Three of the reviewed planning documents expansion as a priority during their community engagement process. • This category was reported through survey responses, public comment, and discussions with community members and organizations.
Other	Some • Eighteen of the reviewed planning documents did not report any funding priority areas during their community engagement process.

Appendix D: Advisory Committee interview results

This appendix summarizes information and findings collected during the HSP's Advisory Committee interviews. Staff conducted one-on-one interviews with committee members to supplement the formal committee meetings by providing the time to better understand the preferences and perspectives of each of the members. The more personalized interviews allowed staff to have discussions in which they could understand members' concerns in more detail. The goals of the interviews were to:

- Better understand advisory committee member's investment scenarios preferences and goals for the system.
- Identify what we should avoid in the future.
- Be aware of what feedback the advisory committee members are hearing from their stakeholders.
- Identify big picture trends and key takeaways.

Scenario and methodology

During the Advisory Committee interviews, participants were asked to answer a series of open-ended questions and were encouraged to share some of their professional experiences and perspectives. The interview questions consisted of:

- Which of the five preliminary investment scenario concepts is closest to your perspective?
- What would you like to accomplish with highways?
- What do you want to avoid?
- Are there other priorities that you hear?
- What is important to your stakeholders?

Interviews

WSDOT staff began the interviews by reviewing the five preliminary investment scenario concepts that were developed during the project's discovery phase. Advisory Committee members could also provide a description of their own investment scenario for consideration. The preliminary investment scenario concepts included:

Sustain & Maintain: Prioritize preserving and maintaining our roads and bridges.

Transportation Systems Management and Operations (TSMO Fantasy): Emphasize multimodal and efficiency measures through the application of transportation systems management and operations strategies. Note: this scenario is named TSMO Fantasy because if Pavement & Bridge Preservation are not adequately funded, TSMO strategies will be ineffective. Fully funding TSMO at the expense of preservation will impact the current systems that TSMO strategies rely on.

Variations on the 5 Buckets: Prioritize repair funding (preservation and maintenance) and safety outcomes and emphasize multimodal travel choices over expanding highways.

Expansion Focus: Emphasize new interchanges and big projects.

Balanced Outcomes: Invest new funds proportionately in each investment category.

Several participants offered their own investment scenario concepts which included: WSDOT's Six Policy Goals, Climate Action Plan, Make Strategic Investments, and Reliable Transportation System (Freight Predictability). Due to the complexity of the subject matter, most participants included caveats with their preferred investment scenarios, which are described further below.

PREFERRED SCENARIO

The preliminary investment scenario concept with the most support was Sustain and Maintain with 32 percent of interviewees selecting this scenario concept. TSMO Fantasy was second with the support of 20 percent of interviewees, while the Variation of the Five Buckets received the support of 16 percent of interviewees. The fourth most popular scenario was tied between Aligning with Policy Goals and Strategic Capacity Investments with 12 percent of support.

The scenarios were grouped by how they addressed the mix of expansion versus safety and efficiency.

- 32% - Gray – Sustain and Maintain was neutral towards the mix of other investments
- 12% - Red – Strategic Capacity Investments is strongly leaning towards highway expansion
- 12% - Purple - Aligning with Policy Goals shows a relatively equal weighting of investment between highway expansion and safety and efficiency
- 20% - Blue – Variations on the 5 buckets and Safety First – Target Zero show heavy support of safety and efficiency investments, with some value for highway expansion
- 24% - Teal – TSMO Fantasy and Climate Action Plan show extremely strong support for safety and efficiency investments, with no support for highway expansion

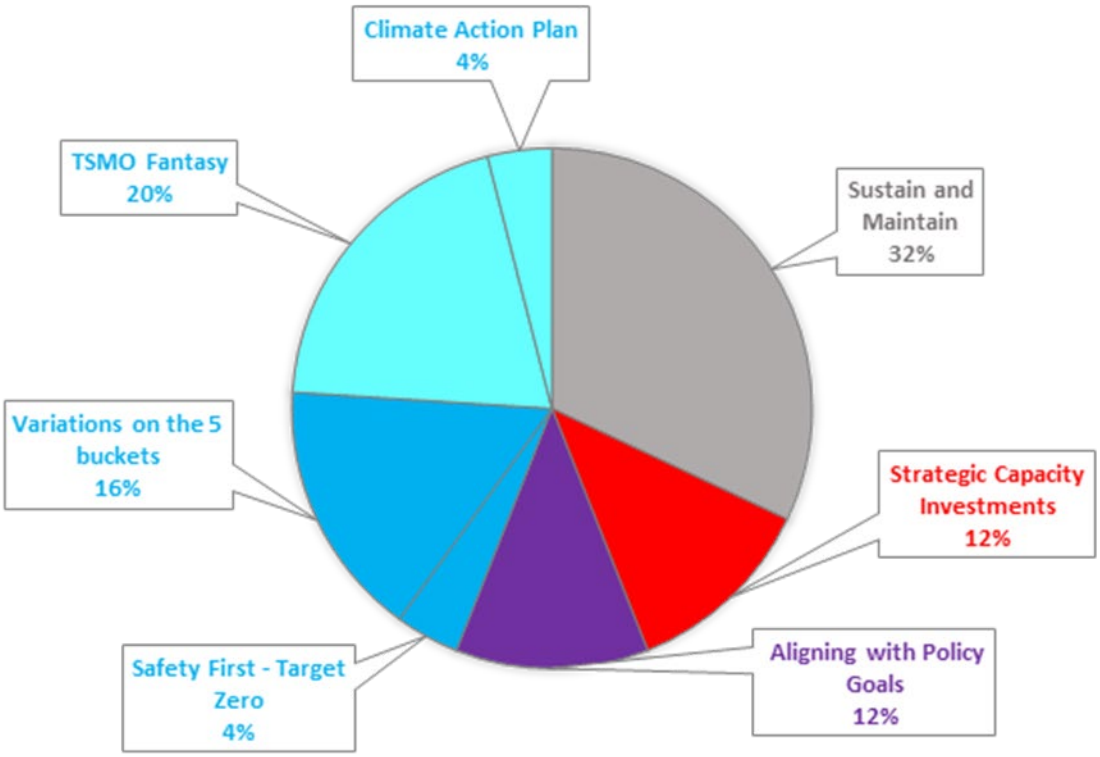


Figure 18: Advisory Committee investment concepts.

SCENARIO CAVEATS FROM THE ADVISORY COMMITTEE

Sustain and Maintain

Sustain and Maintain received the most support; members recognized the current need and cost savings realized by maintaining and preserving the state system in a state of good repair. However, some members noted that a "one size fits all approach" will not work for every geographic region and community. They recommended that the scenario include flexibility to address regional challenges and to keep Washington economically competitive in the local, national, and global markets. Some members also recommended that the scenario include some strategic expansion to address safety, mobility, and freight. They suggested a hierarchical investment approach, starting with funding maintenance and preservation, then optimizing the system and making mobility improvements, and lastly investing in strategic projects and expansion to address issues such as safety, freight, and congestion.

WSDOT's six policy goals

Some committee members expressed support for a scenario proposed by one of the Advisory Committee members based on WSDOT's legislative policy goals found in RCW 47.04.280. The goals include:

- Preservation
- Safety
- Stewardship

- Mobility
- Economic vitality
- Environment

Participants noted that WSDOT will have to be strategic about expansion to accommodate the needs of ports and freight. Environment, safety, and preservation are areas that need to be addressed as part of this potential scenario. Land-use considerations and the growth of communities onto outdated highways was called out as a concern.

Variations of the five buckets

Some committee members expressed support for this scenario, but recommended the expansion category needs to be prioritized at a higher level of funding.

HIGHWAY ISSUES TO AVOID

As part of the interview, members were asked what they would like the state highway system to avoid. Responses varied greatly but several themes emerged as part of the exercise. The top four most common answers were: system expansion, environmental impacts, incentivizing sprawl, and induced demand.

Figure 19: Highway issues to avoid based on Advisory Committee feedback.

Members also expressed a desire to avoid a wide range of outcomes to include:

- Decline of pavement, bridge, and safety

- Loss of other modes, barge and rail
- Weight restrictions on bridges
- Disruption to operations
- Rural accessibility issues
- Lack of coordination
- Loss of capacity
- Congestion
- Inequity

Advisory Committee priorities

Even though the priorities for the state transportation system are as diverse as the Advisory Committee members, several themes emerged from the interviews. The top priorities for the members are safety, maintenance and preservation, mobility, and accessibility. The next most popular priorities are equity and truck parking.

Key takeaways

The key takeaways from these interviews included:

- Investment priorities are relatively close, with only a few differences.
- We heard recognition that the state has challenges ahead to preserve and maintain the highway system and keeping it in working condition.
- Freight is critical for the state and investments help meet the evolving needs.
- Geographical areas have specific needs. We need to customize our investments, no “one size fits all”.
- Resilience of the system is needed to protect from natural disasters and climate change. The environment needs protection.

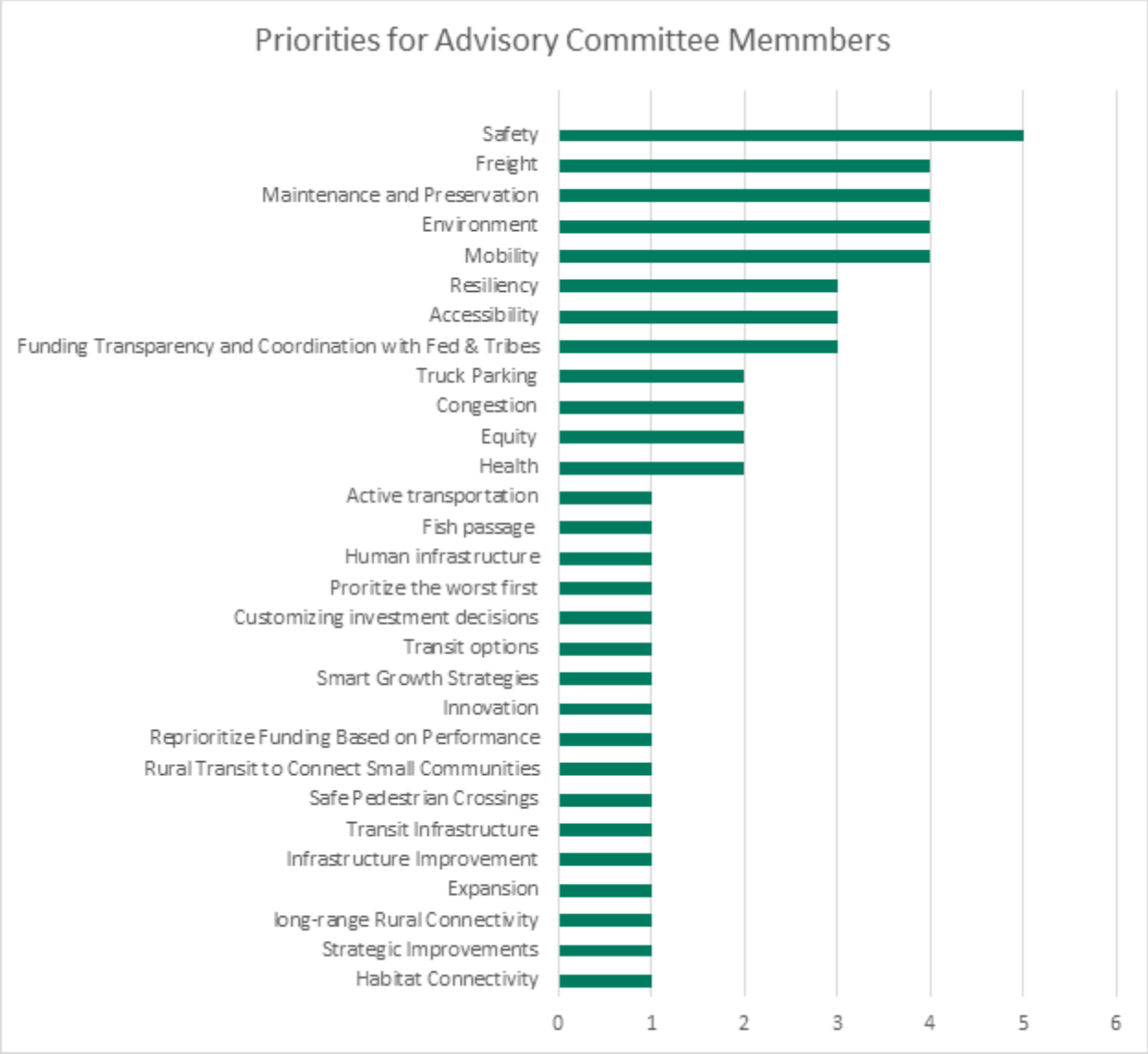


Figure 20: Priorities for Advisory Committee members.

Appendix E: Basic analysis for individual program areas to support the public survey

Nine program areas were considered in the HSP Transportation Investment Preference Survey developed by the University of Washington. Programs describe major WSDOT activities, such as preservation, maintenance, or safety. The survey was designed to understand Washington state residents' relative priorities for investment in the state's highway programs. This appendix summarizes WSDOT's methodology for estimating and describing the performance outcomes for these nine programs that would result from various funding scenarios. More information on all programs can be found in the individual technical reports for State of Good Repair, Safety, Operations, Transportation Demand Management & Travel Choices, and Capacity Expansion.

Each of these program areas has individual management and approaches to their work, though there are connections between them.

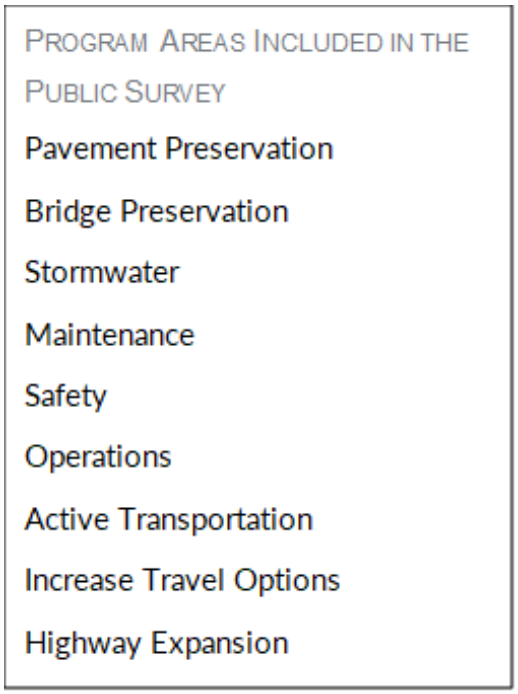


Figure 21: Program areas included in the public survey

This section summarizes each program area's analysis approach, notable assumptions, performance curves (if applicable), and estimated performance outcomes at different funding levels. Performance curves relate performance outcomes to levels of funding. For example, as program funding increases, performance outcomes for some programs may initially increase rapidly, but slow down as the most efficient investments are made. Other programs may work differently, which why each one is analyzed independently.

This basic analysis was used to characterize the outcomes of different investment choices selected by survey respondents as they allocated their hypothetical annual budget of $3 billion across the nine highway-related budget categories. The performance outcomes are based on program-specific cost estimates based on key variables, assumptions, and historical data.

KEY CONCEPTS & CORE ASSUMPTIONS

- The nine programs do not account for the entire WSDOT budget.
  - The nine programs are a good proxy to understand financial tradeoffs, as they cover the biggest share of the overall budget and represent most types of work.
  - Although the Fish Passage program represents a good portion of WSDOT's budget, it was not included in the survey because all scenarios assumed it was fully funded, since it was required by a federal court injunction.

- Cost of doing business items that exist regardless of the funding allocation between the nine programs have been excluded. These cover items like facilities, executive management, planning, IT and human resources.
- Programs that comprise small percentages of the overall highway budget were excluded. For example toll maintenance and operations or preservation of highway assets other than pavement and bridge (such as culverts) were not included.

The precision of the analysis aligns with the decision-making level. This long-range plan informs decisions about the overall allocation of funds among programs over twenty years. Subsequent decisions, like biennial budget recommendations or individual project decisions should be informed by more detailed analysis. Basic analysis is not a substitute for more detailed analysis.

Whenever possible, performance outcomes for different funding levels were estimated by applying program-specific performance curves. Each performance curve is program-specific and based on assumptions. The curves were based on WSDOT analysis and input from subject-matter experts. Some programs do not currently have enough information about the outcomes of different levels of funding to develop curves at this time.

The preservation program is fully funded by default. The benefits of all programs require a functional highway, so failing to fully fund preservation will undercut their performance. Except for the pavement and bridge preservation performance curves, all other performance curves assume that pavement and bridge preservation is fully funded. The consequences of underfunding capital preservation are explored further in the State of Good Repair Technical Report.

All dollars are 2020 dollars unless stated otherwise.

All analysis was done prior to the passage of Move Ahead Washington in 2022.

PERFORMANCE WITHIN INDIVIDUAL PROGRAMS

Pavement preservation

WSDOT repairs highway pavement to keep it in service as long as possible. Over the last 20 years, the budget for repairing highways has not kept up with the cost to repair them. Currently, there is only enough money to pay for less than half of repairs. Repairing poor and damaged pavements costs five times more than timely preservation repairs. Failing to invest in preservation now costs a lot more later, requiring more expensive preservation, rehabilitation, or reconstruction work.

ANALYSIS APPROACH FOR PAVEMENT PRESERVATION

Long-range pavement planning manages assets to achieve lowest lifecycle costs. Lifecycle costs are the dollar amounts needed to keep pavement functional throughout its entire lifecycle. Year-to-year costs vary and depend on several variables, such as recently deferred repairs, climate, pavement damage, traffic loading, and timing of pavement due years. Pavement cost specifics are documented in WSDOT's Asset Management Plan. For this analysis, surface type and climate were the factors representing the largest variations of cost between individual road segments.

Information on surface type and other pavement data can be found in Washington State Pavement Management System (WSPMS) data.

Notable assumptions for pavement preservation

The design of the survey focused on the options of preserving roads at lowest lifecycle cost or allowing them to fall into disrepair. Other strategies will result in higher costs or fewer miles of roadways preserved, such as a "worst-first" approach used in previous decades. Repairing the roads that are the worst condition seems logical at first but does not allow for any preservation techniques to be employed. The cost difference between roads repaired in fair condition and those allowed to further deteriorate is on average five times greater, leading toward long-term unsustainable approaches or eventual increased investment at the cost of other needs and opportunities. For more details on WSDOT pavement preservation business strategies and priorities see the State of Good Repair Technical Report.

The standard of care for "full" funding is keeping roads open, in fair or good condition, and functional. This approach excludes higher standards of care that cost more, such as keeping roads "like new." As of 2011, the cost for paving does not include the cost of any other non-paving preservation fixes, such as replacing signs.

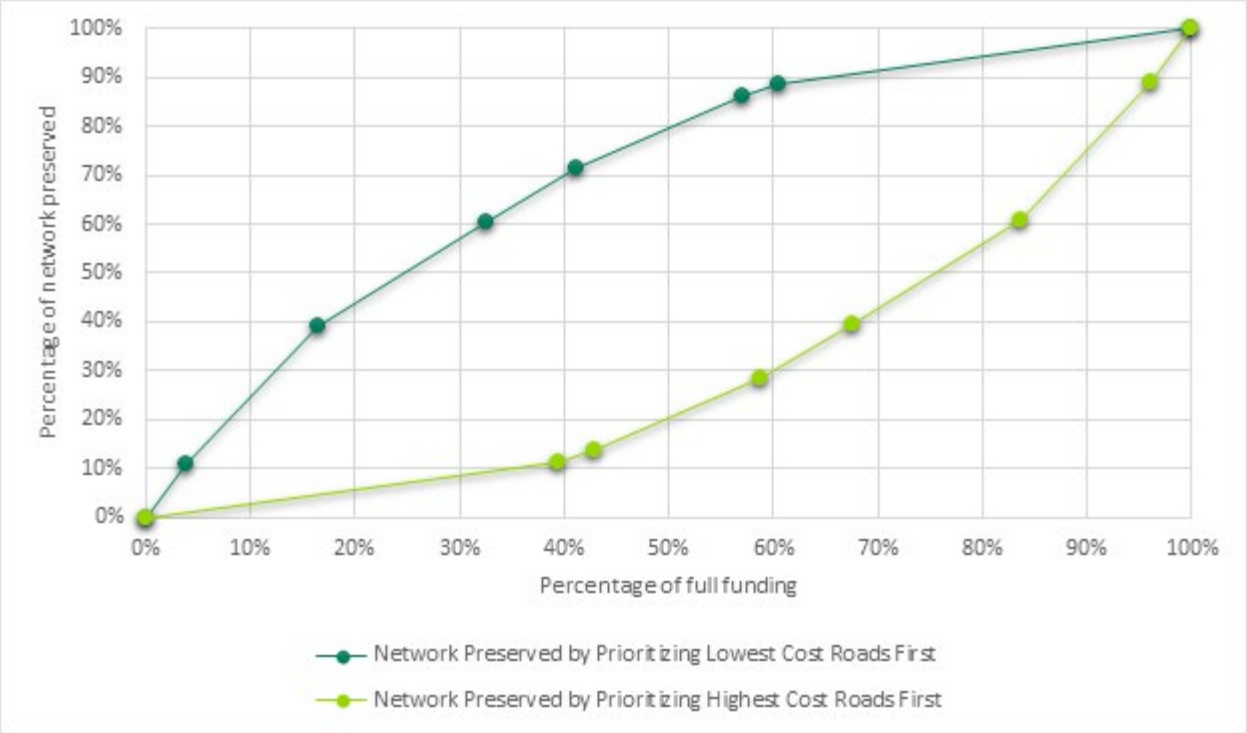


Figure 22: Pavement performance curve which shows the percentage of the highway network preserved by the percentage of full funding (for prioritizing lowest cost roads first and, alternatively, by prioritizing highest cost roads first). Note: The two curves here are bookends. Every other possible prioritization method falls between the two approaches listed below in Table 6.

Project prioritization is outside the scope of the HSP, so the HSP will share the mathematical range of how much of the system could be preserved based on a given funding level. The lower curve illustrated in Figure 22 (light green) assumes funds are prioritized for the highest cost roads

first (in other words concrete roadways which are commonly interstates that are highly traveled), while the higher curve (dark green) assumes funds are prioritized first for those that are least expensive to preserve (in other words chip seal roadways that are typically lower volume rural routes). WSDOT's current pavement prioritization approach is closer to the curve prioritizing highest cost roads first.

Question: How much would you like to spend on pavement repair?	
Yearly spending	***Results***
$150 million (current funding)	By 2030, WSDOT will lower speeds on many state highways or close them for safety. By 2040, up to 80 percent of state highways will have lower speeds or be closed for safety.
$250 million	By 2030, WSDOT will lower speeds on some state highways. By 2040, up to 45 percent of state highways will have lower speed limits or be closed for safety.
$300 million	All state highways remain open, and no speeds are reduced.

Table 6: Pavement repair options in survey.

Bridge preservation

Bridges require repairs to remain open and working. Aging bridges require more work and may be more susceptible to earthquakes. WSDOT replaces bridges and repairs them to improve conditions and extend service life. However, many replacements and repairs are delayed due to lack of funding.

Analysis approach for bridge preservation

Three funding levels were developed to understand future deterioration under different levels of funding:

- Stop funding bridge preservation.
- Continue current funding levels (50 percent of full funding).
- Fully fund bridges at a level consistent with Asset Management outcomes.

Notable assumptions for bridge preservation

The standard of care for "full" funding is keeping bridges open and functional. This approach excludes higher standards of care that cost more, such as keeping bridges in "like new" condition.

These funding forecasts include assumptions about the prioritization of bridge assets, such as prioritizing lowest cost or highest cost bridges first. Actual outcomes depend in part on what prioritization is chosen, though this provides a reasonable starting point to understand the magnitude of changes in outcomes. Further information on how WSDOT prioritizes bridge preservation can be found in the State of Good Repair Technical Report.

Bridge preservation performance curve

The figure below illustrates bridge asset deterioration over time under the three different funding scenarios:

- Do nothing (percent in poor condition)
- Current funding (percent in poor condition)
- Full fulling (percent in poor condition)

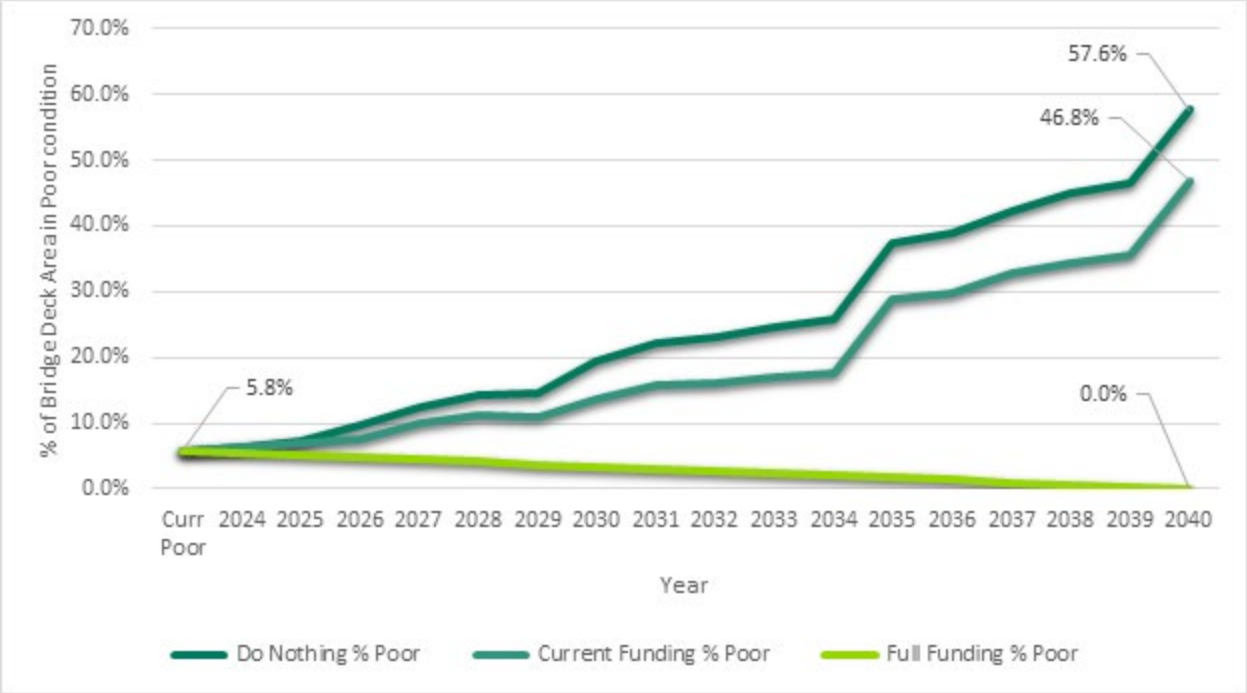


Figure 23: Bridge deterioration over time under different funding scenarios. Note: Federal law requires states to inspect public road bridges periodically and to report their findings to FHWA. This information permits FHWA to characterize the existing condition of bridges as good, fair, or poor. A bridge is considered in good condition if the deck, superstructure, and substructure are rated at least 7 on a 0-to-9 scale. If any of these bridge elements is rated 5 or 6, a bridge is considered in fair condition. A bridge is considered in poor condition if any element is rated 4 or less.

Funding Scenario	20-year Spending (2020$)	Annual spending first 10 years for survey (2020$)	Bridge deterioration over 20 years	Source
Stop all repairs	$0	$0b	57.6%	WSDOT Bridge Office
Current funding (50% of full funding)	$4.1b	$2.05b	46.8%	WSDOT Bridge Office
75% of full funding	$5.8b	$3.1b	23.4%	Interpolation between current funding and full funding
Full funding to meet repair needs	$7.7b	$4.1b	0%	WSDOT Bridge Office

Table 7: Funding scenarios and 20-year spending, annual spending for first 10 years, and bridge deterioration over 20 years.

BRIDGE FUNDING LEVELS FOR SURVEY & OPINION POLL

For the survey, an additional funding alternative was added for consideration. Deterioration for 75 percent of full funding was calculated based on the halfway point between full funding (100 percent) and current funding (50 percent).

To develop the survey, funding levels for the first 10 years were used since that need is more immediate and can be used to better-inform funding tradeoffs for the next several years.

Question: How much would you like to spend on bridges?	
Yearly spending	***Results***
$200 million (current funding)	By 2030, some highway bridges will have weight limits or be closed for safety. By 2040, up to 15 percent of bridges will have weight limits or be closed for safety.
$310 million	By 2030, a few more highway bridges will have weight limits or be closed for safety. By 2040, up to 7 percent of bridges will have weight limits or be closed for safety.
$410 million	All highway bridges remain open with no weight limits for legal truck loads.

Table 8: Bridge funding options in survey.

Stormwater

Stormwater comes from rain or snow that runs off roads. Without treatment, stormwater carries pollutants to nearby rivers and streams. It can also increase flooding and erosion. WSDOT recognizes that the state transportation system contributes to stormwater impacts on ecosystems and communities and is committed to avoiding, minimizing, and mitigating the harmful effects of stormwater.

All new highways meet current stormwater treatment standards. However, most highways were built before treatment was required. WSDOT adds treatment for stormwater flowing off highways without existing treatment facilities through stormwater retrofits selected through a prioritization method. As of the time of the survey WSDOT had 221 prioritized stormwater treatment locations.

The major components of WSDOT's stormwater management efforts include formulating stormwater policy for permit implementation, mapping our stormwater conveyance system, constructing new stormwater management facilities, inspecting and maintaining existing facilities, and performing monitoring and research. For more information on WSDOT's stormwater program, please see the Stormwater Runoff chapter in the State of Good Repair Technical Report or WSDOT's Stormwater Management Program Plan.

Analysis Approach for Stormwater

Locations for stormwater retrofit shown in the map below were based on prioritization completed by WSDOT in 2017.

Factors affecting prioritization were:

- Large, frequently traveled highways within the urban fringe
- Proximity to public drinking water supply sources, fish bearing or small streams, summer spawning areas, high quality receiving water bodies, or waters identified by WDFW and Tribal biologists as having important habitat value.
- Known erosion, pollution, or flooding problems

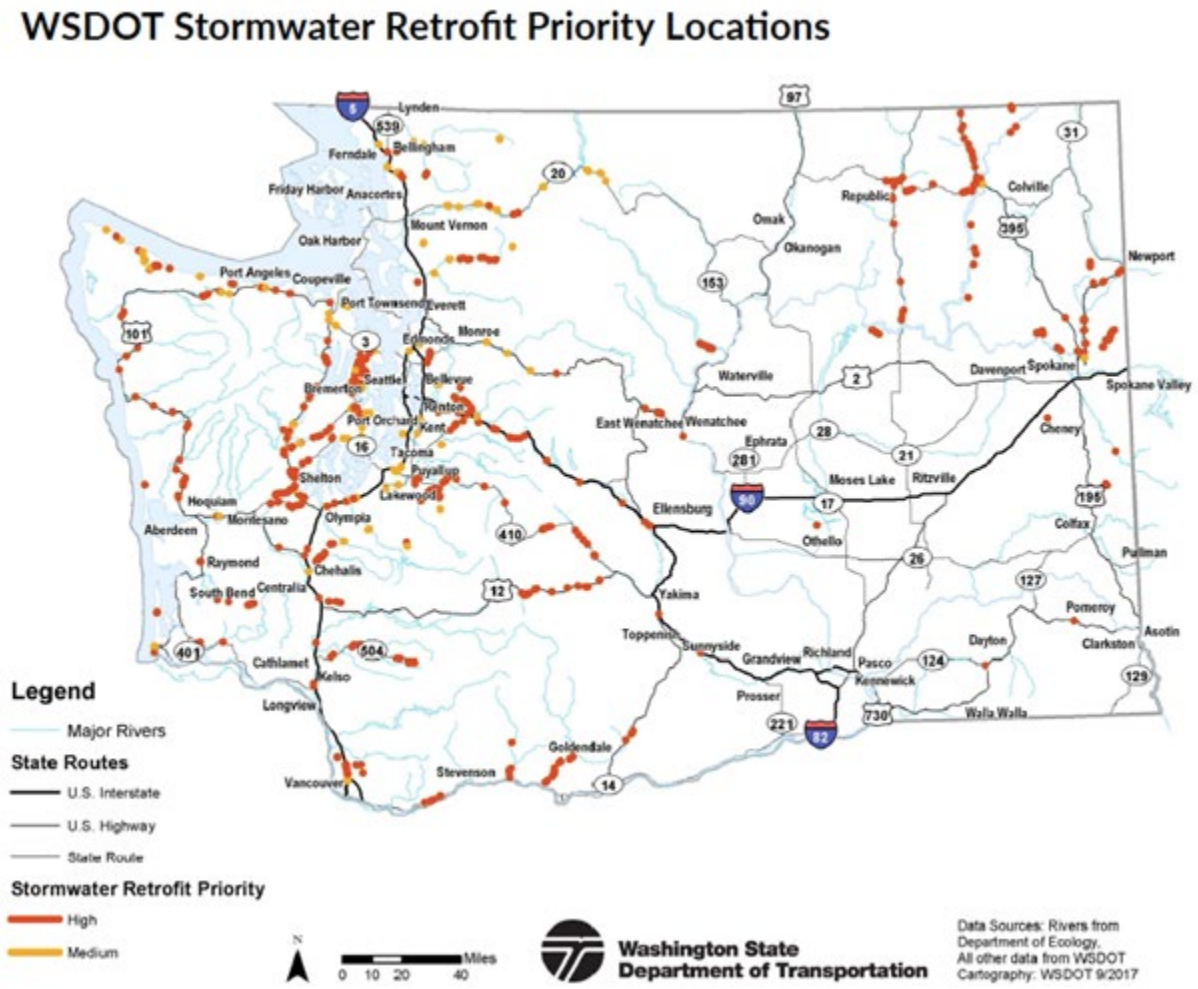


Figure 24: WSDOT stormwater retrofit priority locations.

Notable Assumptions for Stormwater

Fully fund preservation. The basic analysis assumes that preservation is fully funded.

Average cost per each location based on recent experience rather than detailed analysis of each location.

The stand-alone stormwater retrofit design approaches locate stormwater treatment infrastructure to the maximum extent possible in the available space in existing right-of-way to avoid taking property or triggering costly rebuilds.

Note: this analysis was done prior to the passage of Move Ahead Washington, which funded $500 million for stormwater retrofit over 16 years. Future investments may include larger and more expensive facilities when significant environmental benefit and local support justify investment in higher cost investments.

Question: How much would you like to spend on stormwater treatment?	
Yearly spending	***Results***
$2 million (current funding)	Fund 2/3 of prioritized stormwater treatment locations.
$3 million	Fund all prioritized stormwater treatment locations.
$10 million	Fund all prioritized stormwater treatment locations and some urban locations.
$50 million	Fund all prioritized stormwater treatment locations, some urban locations, and additional locations.

Table 9: Stormwater funding options in survey.

Maintenance

Maintenance keeps the highway in operating condition by replacing damaged guardrails, fixing potholes, clearing snow and ice, and responding to emergency road closures. Roads close due to events like rockslides, avalanches, road washouts, and falling trees.

WSDOT's maintenance program maintains the condition of transportation system assets and restores assets to a functional state of operation in between preservation projects. Maintenance activities go hand in hand with preservation work to keep infrastructure in good working order.

For more information on WSDOT's Maintenance program, please see the maintenance chapter in the State of Good Repair Technical Report.

ANALYSIS APPROACH FOR MAINTENANCE

WSDOT measures 27 maintenance activities using an A-through-F level of service (LOS) grading method to evaluate performance. The overall grade is the average across all of them.

NOTABLE ASSUMPTIONS FOR MAINTENANCE

Fully fund preservation. The basic analysis assumes that preservation is fully funded.

Combined LOS target. The basic analysis averages all individual activities into an overall score.

Consistent priorities. While priorities in individual areas can vary year to year, the basic analysis assumes that future priorities will be similar enough to current priorities to provide consistency. Substantial changes to this assumption would require additional analysis to draw meaningful conclusions.

MAINTENANCE PERFORMANCE CURVE

The performance curve for maintenance is measured by performance grade and investment level. As detailed in the Maintenance Accountability Process (MAP) Manual, an LOS target is identified for each maintenance asset category. As investments increase, the average grade of the asset categories improves, as shown below.

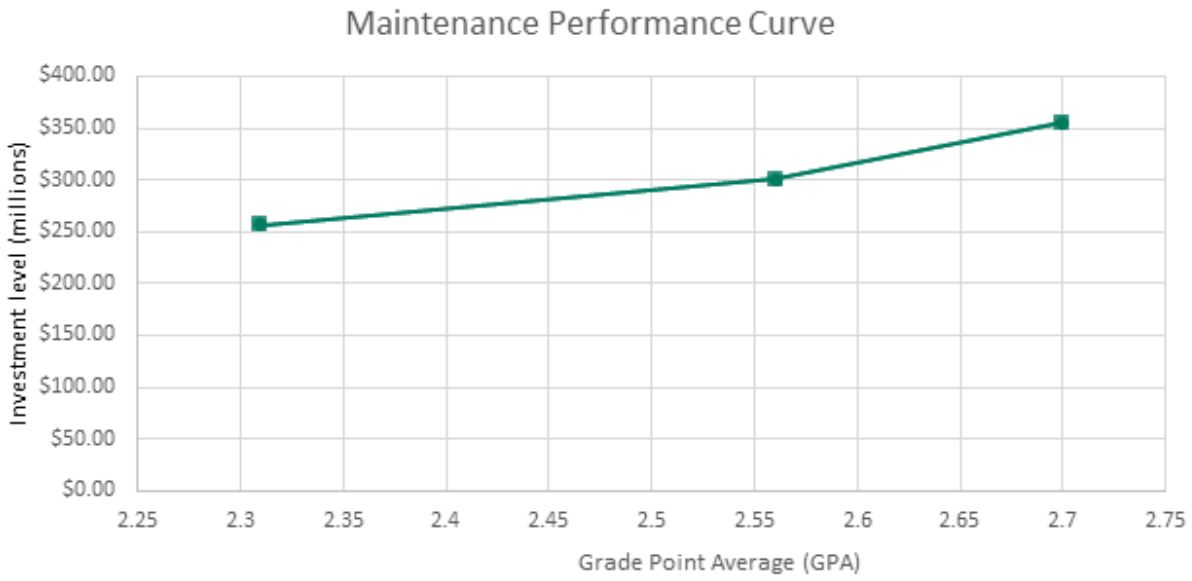


Figure 25: Maintenance performance curve.

The performance curve reflects existing targets, which is to bring the average across all asset categories up from a C+ (about 2.3) to a B- (about 2.7). Funding levels to meet this target vary but are estimated to be from $300 million to $355 million annually depending on the range of improvement.

	Grade	GPA	Yearly cost (in millions)	Increase (in millions)
2019 Actuals	C+	2.31	$256.3	(base)
Meet Current Targets	B-	2.56	$300.5	+$44.2
Improve LOS	B	2.70	$355.5	+$55.0

Table 10: Grade, GPA, yearly cost, and increase for 2019 actuals compared to what meets current targets and improves level of service.

For these calculations, points were assigned to each grade level (e.g., A = 4 pts, B = 3.0, C = 2.0). For the current year (2019), the yearly cost reflects the actual cost of providing level of service (GPA = 2.31). To meet current targets, the $300.5 million per year reflects the amount needed (in 2019 dollars) to achieve a level of service B-, which was the 2020 maintenance target set by the Regional and State Maintenance Engineers on October 6, 2016. To improve LOS, the $355.5 million per year reflects the amount needed to achieve WSDOT's 2007 level of service target (B) for maintenance in 2019 dollars.

		2019	
MAP Activity	MAP Activity Name	LOS Actual	GPA
1A3	Shoulder Maintenance	C	2
1A4	Sweeping & Cleaning	B	3
2A1	Maintain Ditches	B	3
2A2	Maintain Culverts	D	1
2A3	Maintain Catch Basins/Inlets	A	4
2A4	Maintain Stormwater Facilities	A	4
2A5	Slope Repair	D	1
3A1	Litter Pickup	F	0
3A2	Noxious Weed Control	B	3
3A3	Nuisance Vegetation Control	D	1
3A4	Control Of Vegetation Hazards	C	2
3A5	Landscape Maintenance	C	2
4A3	Bridge Cleaning	B	3
4B1	Movable & Floating Bridge Ops	A	4
5B1	Snow & Ice Control Operations	A	4
6A1	Pavement Striping Maintenance	B	3
6A2	Raised/Recessed Pavement Marker Maint.	C	2
6A3	Pavement Marking Maintenance	D	1
6A4	Regulatory Sign Maintenance	D	1
6A5	Guide Sign Maintenance	D	1
6A6	Guidepost Maintenance	F	0
6A7	Guardrail Maintenance	B	3
6B1	Traffic Signal Systems	C	2
6B2	Highway Lighting Systems	B	3
6B3	Intelligent Transportation Systems	A	4
7B1	Rest Area Operations	B	3
	Overall GPA	C+	60/26 = 2.3

Table 11: Maintenance Accountability Process activity, LOS actual and GPA for 2019.

In addition to the costs listed above, final scenario calculations include the additional maintenance funding needed to address any new infrastructure or services built as part of the overall scenario.

Question: How much would you like to spend on maintenance?	
Yearly spending	*Results*
$250 million *(current funding)*	Most highways are in fair condition. They are occasionally closed for repairs. WSDOT's overall maintenance grade: C+
$300 million	Some critical maintenance activities are rated good (guardrails, rest areas, snow removal, draw bridges). Others are fair or poor. Highways are closed for repairs less often. WSDOT's overall maintenance grade: B-.
$350 million	Most highways are in good condition. Highways rarely close for repairs. In 2007, the state invested at a level to get this result. WSDOT's overall maintenance grade: B.

Table 12: Maintenance funding options in survey.

Safety

The number of deaths and serious injuries are rising, especially for people who walk and bicycle. The personal, financial, and societal loss is enormous. There are no acceptable deaths from crashes. In 2019, crashes cost the Washington economy $14 billion. This includes the costs of lost lives, hospitals, slow traffic, and damage to the roadway, vehicles and other property. Spending on highway safety reduces crash exposure, likelihood and severity resulting in fewer fatal and serious injuries to the people of Washington.

WSDOT has set highway safety as one of the top priorities in carrying out its transportation mission. Many of the capital, maintenance, and operational programs that WSDOT carries out have safety performance elements embedded through the policies, processes, and criteria regarding how the roads are planned, designed, operated, and maintained. This is important, as road modifications occur, they will have an effect in reducing crash potentials across Washington's roadways. However, the safety performance curve only includes stand-alone safety improvements, not those elements embedded in constructing new and bigger highways.

For more information on WSDOT's safety program, please see the Safety Technical Report.

ANALYSIS APPROACH FOR SAFETY

- Fully fund preservation. The basic analysis assumes that preservation is fully funded. The targets and associated funds in this performance curve do not work without fully funded preservation.
- The amounts calculated reflect annual spending.

- WSDOT's approach to safety is based on the available funding so the current funding level reflects the most accurate estimates of costs.
- The upper limit of investment in this category was sized based on dedicating all available funding to this category at the expense of all others.

NOTABLE ASSUMPTIONS FOR SAFETY

- Current funding as baseline.
- Fully fund preservation. The basic analysis assumes that preservation is fully funded.
- Based on a federal estimation methodology, the cost of all crashes in Washington state was $14 billion in 2019.[7]
- The benefit-cost estimates for the first two funding increments ($50 million and $140 million) are based on the same federal estimation methodology.
- The cost of the larger two funding increments ($500 million and $1.2 billion) are estimated based on professional judgment for the types of safety strategies that could be delivered if funding were available. Benefits are not estimated because the additional analysis needed to make these estimations are beyond the scope of this study.

Question: How much would you like to spend on safety?	
Yearly spending	***Results***
$50 million *(current funding)*	Minor changes to highways that decrease injuries and deaths. This level of funding saves $260 million in crash costs each year.
$140 million	The results from current funding are obtained plus additional safety work in identified areas that decrease injuries and deaths. This level of funding saves $630 million in crash costs each year.
$500 million	The results from current funding are obtained plus begin larger-scale changes such as new guardrails and roundabouts, and widespread work on intersections that decrease injuries and deaths.
$1.2 billion	Previous results plus additional major changes to highways and separated spaces for people who walk and bicycle. Lowers deaths and serious injuries on highways significantly.

Table 13: Safety funding options in survey.

Operations

Operations helps get the most from existing highways without spending more on larger highway projects. It includes improvements to keep traffic moving like traffic lights, highway lighting, and intelligent transportation systems technology. It funds small-scale changes to intersections, like

[7] Societal costs of crashes calculated using methods described in Crash Cost for Highway Safety Analysis (FHWA-SA-17-071), Chapter 6, Federal Highway Administration, Office of Safety 2018. Economic cost components include: medical care, emergency services, market productivity, household productivity, legal costs, insurance administrative costs, workplace costs, property damage and congestion.

turn lanes and crosswalks that make them work better. Operations also provides traveler information and emergency services to help keep highways open and, moving smoothly and safely.

In the 2019 update of the WSDOT Strategic Plan, WSDOT identified Practical Solutions (the prioritization of innovative, timely, and cost-effective considerations for decision-making) as a primary goal for the agency. The Transportation Operations Division supports these efforts through the deployment of various Transportation System Management and Operations (TSMO) principles that maximize the mobility and safety of existing infrastructure and systems.

The primary objective of the Transportation Operations Division is to deliver solutions that are quickly implemented at relatively lower cost and defer the need for investment in larger capital roadway expansion projects. Regulatory measures, traffic control devices, and innovative operational techniques are used to maximize the capacity of the system. Transportation Operations also provides services and information that travelers need to use the transportation system safely and efficiently.

For more information on WSDOT's operations program, please see the Operations Technical Report.

Analysis approach for operations

Operations does a lot of small-scale changes. Its primary benefits are safety and mobility.

The individual projects are relatively lower cost. The cost to analyze the benefit and cost is often more than it would cost to implement the improvement. Therefore, we do not have benefit estimates. We can, however, describe the kind of work that you can do at different levels of funding.

Notable assumptions for operations

Fully fund preservation. The basic analysis assumes that preservation is fully funded.

The first increment ($48 million) is based on current funding.

The second, third, and fourth funding increments are based on an assessment of need for the transportation operations business area provided by subject matter experts in response to a legislative study request.

Question: How much would you like to spend on operations?	
Yearly spending	***Results***
$48 million (current funding)	Fund less than 30 percent of needs. At this level, WSDOT delivers a fraction of basic functions. Crashes are cleared more slowly. Less technology, like traffic signals or electronic message signs, is used to keep traffic running smoothly. New turn lanes and other changes are delayed.
$100 million	Provide additional information for travelers and more low-cost changes for road users who walk, bicycle, and have disabilities. Technology is used to keep traffic moving smoothly and crashes are cleared more quickly.

$136 million	Expand traveler information and services to more areas and improves highways for buses. Expands use of technology to keep traffic moving smoothly and crashes are cleared more quickly. Ensures current operations strategies continue to work and plans for future needs.
$207 million	Fund higher-cost strategies that keep highways moving smoothly and safely. Examples include new technology that improves travel time reliability and statewide intersection improvements for all highway users.

Table 14: Operations funding options in survey.

Active transportation

Walking and bicycling are the most common types of active transportation. This category also includes rolling on scooters, skateboards, and similar small devices, and use of wheelchairs and other mobility assistive devices. The goal is to make a comfortable network for most people walking, bicycling, and rolling. Investing in this category builds sidewalks and bicycle lanes. It also builds separated paths along or near highways. It makes walking and bicycling to school safer. It connects homes and businesses across highways. It provides connections to local trails.

State highways, except for portions of interstates within urban areas, are available for active transportation users. However, WSDOT found that 1,998 lane miles of state highways in population centers either do not have facilities, or the facilities do not provide adequate separation from motor vehicle traffic. Adequate separation considers factors such as driving speed, traffic volume, and roadway design.

There is no dedicated funding program for active transportation (walking and biking) on state highways. Some active transportation improvements are made as part of other programs. When building newer and bigger roads, WSDOT can incorporate walking and bicycling improvements where those projects are located. However, that funding does not connect the network between those projects. Grant funding programs, such as the Pedestrian and Bicycle Program and Safe Routes to School Program, are available to improve walking and biking infrastructure for cities and counties. Most grant projects are not on state highways.

For more information on WSDOT's active transportation program, please see the Transportation Demand Management/Travel Choices Technical Report.

Analysis approach for active transportation

The highway connections described in the results column are based on the needs in the Active Transportation Plan Part 1.

Needs were identified in the plan based on two measures: level of traffic stress and identified active transportation gaps.

Notable assumptions for active transportation

Fully fund preservation. The basic analysis assumes that preservation is fully funded.

The first increment ($0 million) is based on current funding. Currently, there is no designated program budget for active transportation.

Other dollar amounts are notable reference points for connections identified in the Active Transportation Plan.

Question: How much would you like to spend on active transportation?	
Yearly spending	***Results***
$0 (current funding)	Today the network is inconsistent and incomplete. About 12 percent of the connections along state highways are complete today. Spending in this category builds walking and biking connections on existing highways.
$100 million	Build sidewalks and bicycle facilities along and across highways. Complete 50 percent of highway connections in population centers.
$270 million	Build sidewalks and bicycle facilities along and across highways. Complete 100 percent of highway connections in populations centers.
$400 million	The results from current funding are obtained plus connect 100 percent of regional trails between communities.

Table 15: Active transportation funding options in survey.

Increase travel options

This category increases the use of trains, buses, and carpools. It helps people work from home more. It helps people with disabilities travel and may decrease the number of cars on state highways.

Program V (Public Transportation) is one of many state transportation budget programs that support travel options with the widest array of multimodal strategies. Public transportation refers to a broad array of transportation services and systems, public and private, that are accessible and available to the public and do not involve a single person in a motorized vehicle.

Program V supports state and federal grant programs that, as of 2020, provide approximately $150 million per year to support public transportation. Funds are provided to community-based public agencies and for-profit and non-profit transportation service providers.

For more information on WSDOT's Program V, please see the Transportation Demand Management/Travel Choices Technical Report.

Analysis approach for increase travel options

Public transportation subject matter experts within the department developed scenarios and spending levels using professional judgment.

Each set of increments is based on a set of strategies with professional judgement used to estimate the cost of deploying those strategies on a statewide scale.

The upper limit of investment in this category was sized based on dedicating all available funding to this category at the expense of all others.

Notable assumptions for increase travel options

Fully fund preservation. The basic analysis assumes that preservation is fully funded.

The proportion of state, local agency and private funding stays consistent (on average).

Changes to funding levels will take time to ramp-up because of limited local organizational capacity.

Current geographic distribution of development stays relatively consistent.

Services provided are balanced between providing high-capacity efficiency services and basic human services transportation strategies.

Increase travel options performance curve

Table 16 was the basis for the final survey text.

Budget (annual)	Spending level	Description	Regional examples
$150 million	Low (Existing)	Use existing transportation facilities and services more efficiently. Strategies: Encourage more people to carpool, walk, telework, etc. for trips to and from work. Provide some paratransit to people with special transportation needs; some rural communities have no service.	I-5 Corridor: Work with some urban employers to charge for parking and offer transit passes to employees; maintain HOV lanes and park and ride lots. Rest of Washington: Support existing community nonprofits that help some elders get to medical appointments; support rural transit; work with businesses to help employees coordinate carpools or telework.
	Medium-Low	Increase availability of existing TDM services Strategies: Increase transit speed, frequency, and reliability on some existing routes. Increase intensity of existing Commute Trip Reduction program. Offer more paratransit trips under existing conditions (e.g., during the same hours of operation	I-5 Corridor: Invest in some crosswalks and bicycle racks at transit stations; support subsidized transit passes for people with low incomes. Rest of Washington: Run existing transit routes more often; invest more in local agencies that work with employers to increase the use of transit, carpools, walking, bicycling and telework; provide more paratransit rides and turn fewer people away.

Budget (annual)	Spending level	Description	Regional examples
		and in the same geographic area).	
	Medium	Expand and incentivize TDM services. Strategies: Increase opportunities and incentivize more people to take transit and carpool, walk, telework, etc. for commute trips, shopping, medical appointments, recreation, school, etc.	I-5 Corridor: Expand transit routes, frequency, speed, and reliability; expand availability of vanpools; expand commute trip reduction to more communities and all type of trips. Rest of Washington: Expand long-distance bus routes that connect rural communities to cities; provide more service hours, geographical coverage, and rides for paratransit; expand commute trip reduction to more communities and all types of trips.
	Medium-High	Support TDM through construction and smart land use. Strategies: Construct facilities that support transit and carpooling; zone and develop land to make it easier for people to use transit and to bring them closer to the things they need.	I-5 Corridor: Build ramps, roadways, and shoulders to be used by transit vehicles; build more high occupancy vehicle and high occupancy toll lanes; develop land around transit stations so people can live closer to these options. Rest of Washington: Invest in rural broadband expansion; allow zoning development that provide services (e.g., restaurants, cinemas, grocery stores, medical facilities) closer to where people live.
	High	Make large capital and operations investments in TDM services and options. Strategies: Vastly expand rail and paratransit options throughout the state.	I-5 Corridor and rest of Washington: Start building high-speed rail between major cities; expand light-rail options throughout the state; provide paratransit options everywhere and serve all eligible people.

Table 16: Increase travel options spending levels and strategies.

Question: How much would you like to spend on Increasing Travel Options?	
Yearly spending	***Results***
$150 million (current funding)	Help employers in cities encourage their workers to take the bus, carpool, bicycle, walk, and work from home. Maintain carpool (HOV) lanes and park and ride lots. Provide a small amount of support for local bus routes. Provide special bus service for people with disabilities in cities and suburbs.
$200 million	Help more employers in cities encourage their workers to take the bus, carpool, bicycle, walk, and work from home. Improve bus service on a few routes. Pay for crosswalks and bicycle storage at

Question: How much would you like to spend on Increasing Travel Options?	
	train and bus stations. Provide more special bus service for people with disabilities in larger cities. Pay for part of train and bus passes for people with low incomes.
$350 million	Help employers have even more people work from home. Encourage people to take trains, buses, carpools, or bike or walk for work and personal travel. Provide more vans that employees can use to go to work together. Build more carpool (HOV) lanes. Work with cities to plan to build housing around train and bus stations.
$600 million	Work with cities to allow building houses closer to places like grocery stores, medical offices, restaurants, and movie theaters so people do not need to go as far to get to the things they want. Build things like ramps and special lanes that only buses can use to help them avoid congestion. Spend a lot more to provide additional bus options for people with disabilities.
$1.2 billion	Greatly expand commuter rail across Washington. Start building high-speed rail between major cities. Expand light-rail options in all parts of the state. Provide travel options for all people with disabilities in all parts of the state.

Table 17: Increase travel options funding levels in survey.

Highway expansion

Examples of spending on new and bigger highways (highway expansion) include widening roads, expanding intersections, adding new interchanges, adding passing lanes, and improving ramps. It includes projects funded from the gas tax increase in 2015.

Highway expansion, called "new and bigger highways" in the survey, refers to capital construction activities that add capacity to our state's transportation system. These projects fall under the Improvement subprograms for Mobility (I1) and Economic Vitality (I3), and more information is available within the Capacity Expansion Technical Report.

ANALYSIS APPROACH FOR HIGHWAY EXPANSION

WSDOT does not have a statewide travel demand model, only Metropolitan Planning Organizations (MPOs) do that type of modeling in Washington. As a result, there was no network analysis done to compare available capacity to anticipated demand.

WSDOT determined that there are upwards of $45 billion in potential highway expansion needs for projects identified by metropolitan and regional transportation planning organizations over the next 20 years statewide. We based this estimate of the total unfunded highway projects dollar amount listed in MPO and RTPO regional transportation plans. The estimate was made based on plans from the following MPOs and RTPOs:

- Chelan-Douglas Transportation Council
- Cowlitz-Wahkiakum Council of Governments
- Northeast Washington Regional Transportation Planning Organization
- Palouse Regional Transportation Planning Organization

- Peninsula Regional Transportation Planning Organization
- Puget Sound Regional Council
- Skagit Council of Governments
- Southwest Washington Regional Transportation Council
- Spokane Regional Transportation Council
- Thurston Regional Planning Council
- Walla Walla Sub-Regional Transportation Planning Organization
- Whatcom Council of Governments
- Yakima Valley Conference of Governments

For the survey, the upper limit of investment in this category was sized based on dedicating all available funding to this program at the expense of all the other programs.

WSDOT is an executive agency, implementing the laws and policies enacted by the Washington State Legislature. The approach did not consider eliminating funds already approved by the legislature for highway expansion projects in recognition of that role.

Recognizing some public discourse around the idea of spending less than the Legislature allocated for this purpose, we did provide an option to delay spending resulting in the only category of investment where survey participants could elect to reduce spending from current levels.

NOTABLE ASSUMPTIONS FOR HIGHWAY EXPANSION

- Preservation is fully funded.
- The MPO and RTPO plans sampled were representative of MPOs and RTPOs statewide.
- We can make investments that address congested areas, but we cannot solve congestion.
- The project cost estimates listed in regional plans may not accurately reflect the actual strategy scoped to address the problem after further study.

Question: How much would you like to spend on new and bigger highways?	
Yearly spending	***Results***
$800 million	Delay some projects to spend more in other categories. Delays benefits of projects.
$1.2 billion *(current funding)*	Complete funded projects as planned.
$1.6 billion	Complete funded projects as planned. Address some locations with known congestion today.
$2.0 billion	Complete funded projects as planned. Address all locations with known congestion today.

Table 18: New & bigger highways funding levels in survey.

Appendix F: Greenhouse gas and Vehicle Miles Traveled (VMT) modeling with VisionEval

To evaluate how Highway System Plan funding scenarios affect greenhouse gas emissions and vehicle miles traveled, WSDOT used VisionEval, an open-source model collaboratively developed by several state DOT's and the FHWA. The model combines rich demographic and socioeconomic data customized to Washington state with information about travel aggregated at the county level. The model differs from a travel demand model in that it does not assign trips to detailed roadway networks. For this reason, the tool cannot be used to evaluate the performance of specific projects or corridors. However, it is a very useful tool to efficiently evaluate large numbers of scenarios and to explore how different combinations of alternative future conditions affect performance. Alternative future conditions might include different types of policy interventions, funding levels, and travel behaviors.

ANALYSIS ORGANIZATION

Program funding categories were grouped into three areas for analysis, Maintain, Innovation, and Expansion. Seven program funding categories and their specific analysis groups are shown in Table 19 (the three program funding categories of pavement preservation, bridge preservation, and maintenance are merged into the repair funding category for the purpose of this analysis). Funding levels were translated into model inputs based on extensive coordination with WSDOT subject matter experts through the Modeling Technical Advisory Group.

The benefits modeled with VisionEval are around VMT and GHG. The table below shows which program funding categories have an effect on VMT and GHG.

Program funding categories	Benefits modeled with VisionEval	Analysis Groups
Repair (paving, bridges, other assets, and maintenance)	No	Maintain
Environment (fish passage, noise walls, stormwater, etc.)	No	Innovation
Safety improvement	No	Innovation
Transportation operations (ramp meters, incident response, signal coordination, access management)	Yes	Innovation
Active transportation (walking, bicycling, and rolling)	Yes	Innovation
Travel options (public transportation, vanpools, TDM program)	Yes	Innovation
Highway expansion (adding lane miles to roadway system)	Yes	Expansion

Table 19: Program funding categories and analysis groups.

DESCRIPTION OF SCENARIOS ANALYZED

Following the guidance of the Steering Committee, WSDOT initially developed six scenarios (Baseline, Scenarios A, B, C, D, and E) to explore different combinations of funding and the resulting changes in Vehicle Miles Traveled (VMT) and Greenhouse Gas (GHG) emissions. Funding level details for each scenario are shown in Figure 26. The Project Team added an additional scenario, "Scenario F: VMT Reduction", to begin exploring how much VMT could be reduced when the analysis is not constrained by the scope of the Highway System Plan.

The Baseline scenario represents no change in future funding from 2020 levels and estimates 2040 VMT and GHG to establish comparison values for alternate scenarios. This Baseline scenario uses 2020 input data where available. To eliminate the traffic anomalies experienced in 2020, 2019 traffic-related data was considered as 2020 data. Unless noted otherwise, all dollars are shown in year of expenditure. The analysis assumes that all passenger and light duty vehicles of model year 2030 or later that are sold, purchased, or registered in Washington state are electric vehicles in alignment with statutory targets.[8]

Modeling Scenario	Step 3 Outreach Name	Step 4 Outreach Name
Baseline	Baseline Scenario	Baseline Scenario
A	Maintain + Innovate	Fix it first and all remaining funding for safety and efficiency
B	N/A	Fix it first and a ratio of 1/6 new and bigger highways to 5/6 safety and efficiency
C	N/A	Fix it first and a ratio of 1/3 new and bigger highway to 2/3 safety and efficiency
D	Maintain and Expand	N/A
E		Draft Recommended Scenario
F	N/A	Explore stronger Greenhouse Gas Reduction (requires action outside the HSP scope)

Table 20: Connection between modeling scenarios A-F and scenarios used in engagement.

[8] Section 415(1) of the Senate Bill ESSB 5974, https://lawfilesext.leg.wa.gov/biennium/2021-22/Pdf/Bills/Senate%20Passed%20Legislature/5974-S.PL.pdf.

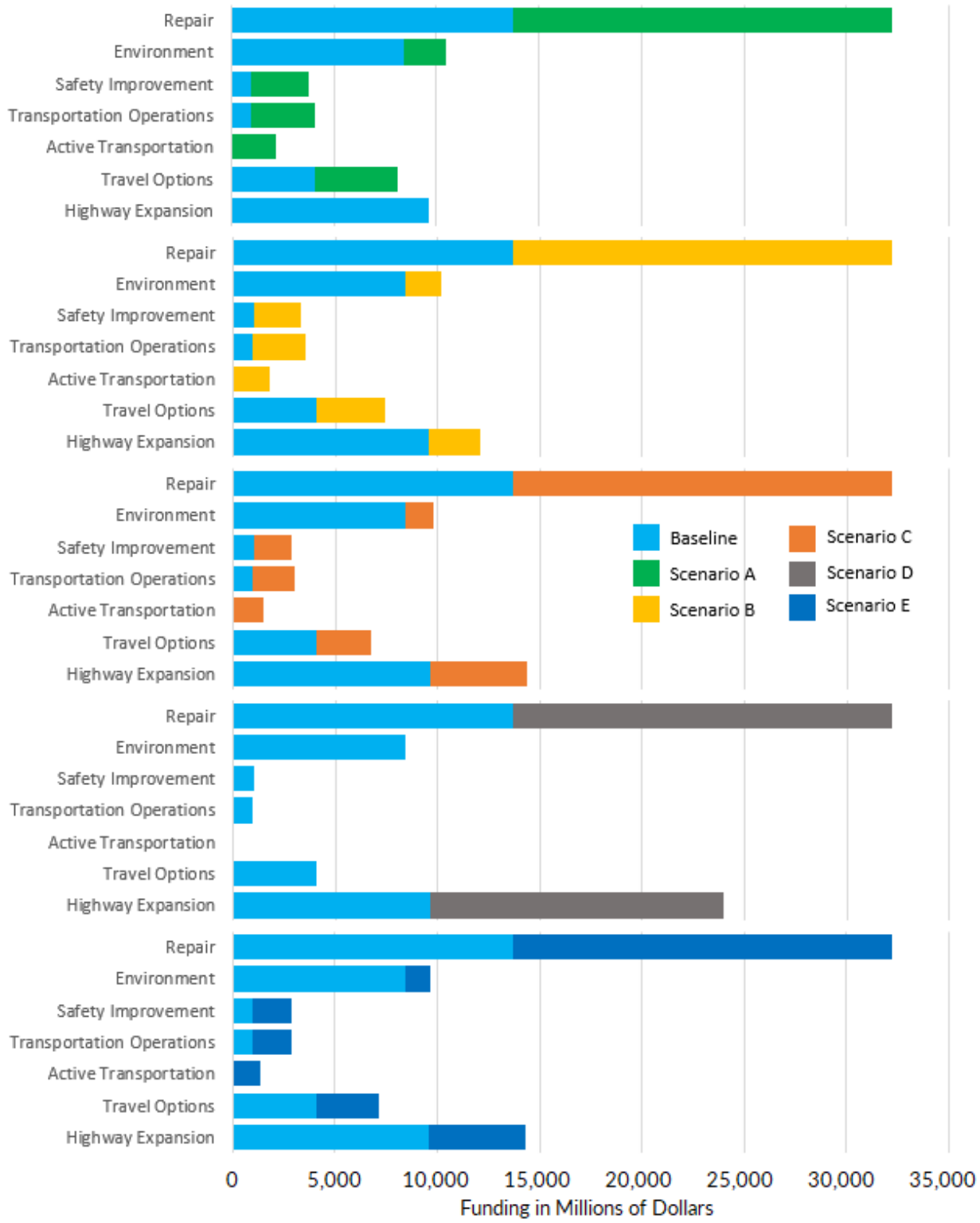


Figure 26: Funding levels for scenarios.

Repair, environment, and safety funding are held constant across scenarios since the model does not address benefits from those programs. However, these changes to road costs have minimal

influence (less than 1 percent) on household VMT. It is important to note the environment program funding category does not include funds that directly impact climate change.

The scenarios the Steering Committee proposed analyzing are presented in Figure 27. All scenarios fully fund repair (preservation and maintenance) over the next 20 years, with the remaining funds being distributed in different proportions between innovative investments (environment, safety, transportation operations, active transportation, and transportation demand management) and capacity expansion investments.

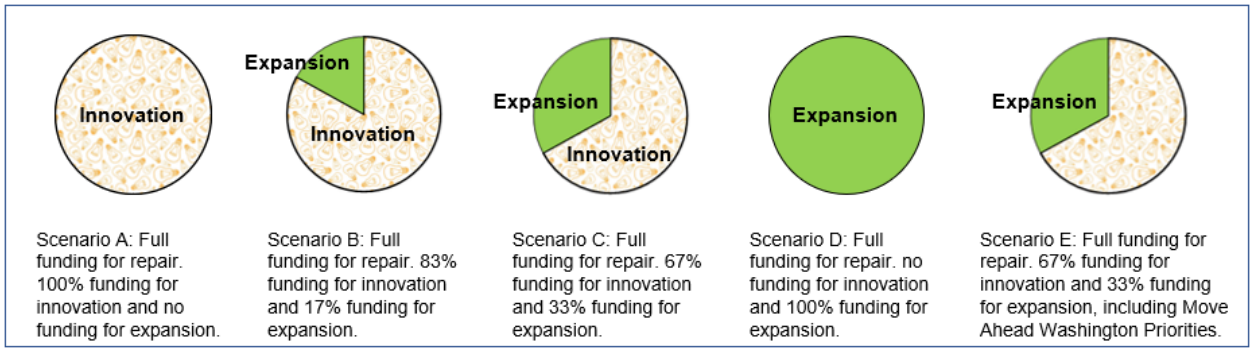


Figure 27: Program funding by scenario (all scenarios fully fund repair).

THE VISIONEVAL MODEL

To assess these scenarios, a statewide model, VisionEval, was used. The VisionEval statewide modeling tool was developed by the Federal Highway Administration (FHWA) & Volpe Center with pooled funds from several state Departments of Transportation and Metropolitan Planning Organizations. Details about the model are available through the VisionEval Concepts Primer.

VisionEval is a data-intensive statewide model requiring specific data at three levels of geography - the entire state, metropolitan area, and county. Data elements cover many different but interrelated topics such as – household demographics, land use, transportation supply characteristics, and vehicle statistics. This data is used to develop synthetic households statewide, create synthetic sub-county zones, and assign households, jobs, and land use characteristics. The model also uses vehicle and transportation characteristics to calculate the number of household walking, biking, and transit trips as well as household vehicle trips. Finally, the model calculates the energy consumption and emissions from public transportation vehicles, heavy trucks, and commercial service vehicles.

ESTIMATED GHG AND VMT REDUCTIONS FROM INITIAL SCENARIOS COMPARED TO BASELINE

The primary output of the model is VMT and GHG emissions from on-road vehicles. The following graphs present the estimated changes in VMT and GHG emissions for each scenario compared to the baseline. Every scenario reduces VMT and GHG when compared to the baseline scenario (Figure 28 and Figure 29).

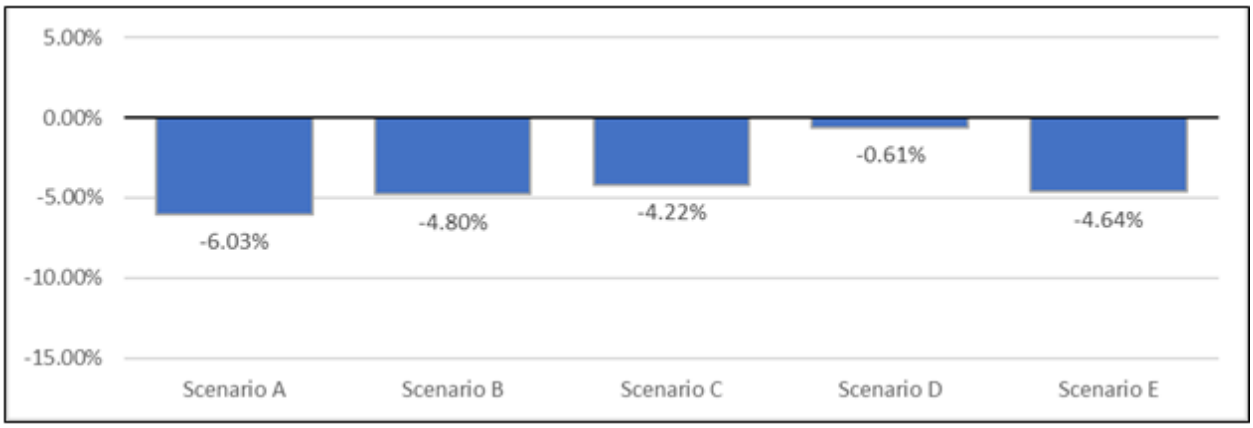


Figure 28: Changes in VMT by scenario.

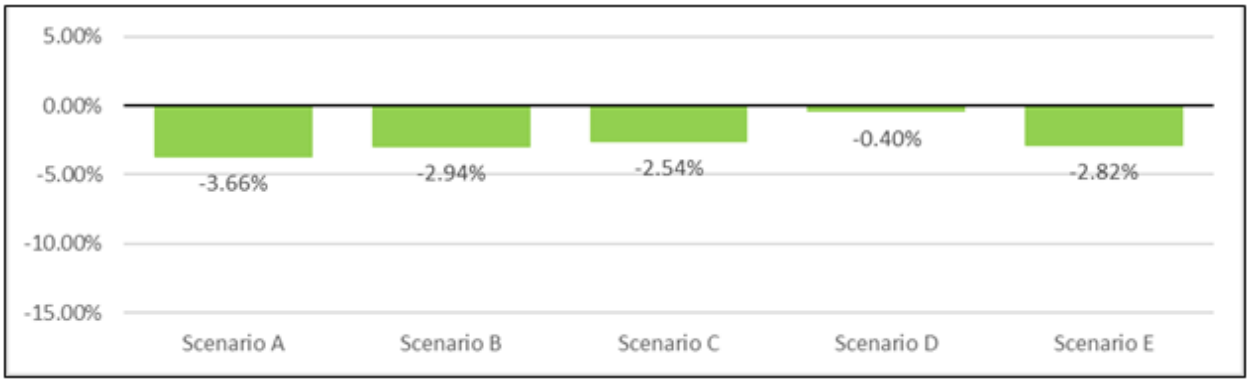


Figure 29: Changes in GHG by scenario.

Scenarios A and B result in the highest benefits in terms of both VMT and GHG reductions, although it's important to note the differences among four of the five scenarios are relatively small.

WHAT KINDS OF INVESTMENTS AND POLICY INTERVENTIONS WOULD BE REQUIRED FOR GREATER REDUCTIONS IN VMT?

The final scenario, Scenario F: VMT Reduction, explores various policy changes to determine their effects on VMT. Unlike the other scenarios, this scenario is not limited by the scope of the Highway System Plan. The scenario's only objective is to begin exploring opportunities to achieve the greatest possible reduction in VMT. More work will be required to adequately explore this topic.

It is imperative to note this scenario does not identify every single factor that may reduce VMT but rather the most likely options with the shortest implementation times within the life of a 20-year state plan. As WSDOT's broader carbon reduction planning efforts unfold, we will continue to refine the analysis and evaluate additional combinations of variables to meet policy objectives. Many of the strategies modeled in this scenario are outside the scope of the Highway System Plan because they would require Legislative action, more extensive stakeholder outreach, and further research to determine feasibility.

Strategies analyzed in Scenario F included:

- Increased number of walking and biking trips by reducing the number of single occupancy vehicle round trips of less than 20 miles
- Added parking restrictions and pricing options
- Increased Transportation Demand Management (TDM)
- Increased transit service
- Added congestion pricing options
- Increased fuel tax
- Increased annual flat rate tax per vehicle

As an example of the limitations of this analysis, land use considerations need exploration. While the tool is capable of analyzing land use policies and decisions, more work is needed to explore which alternatives should be considered in future modeling.

The outcomes of Scenario F presented below are preliminary and should be identified as such. This scenario can potentially reduce VMT and GHG by about 23 percent and 12 percent, respectively.

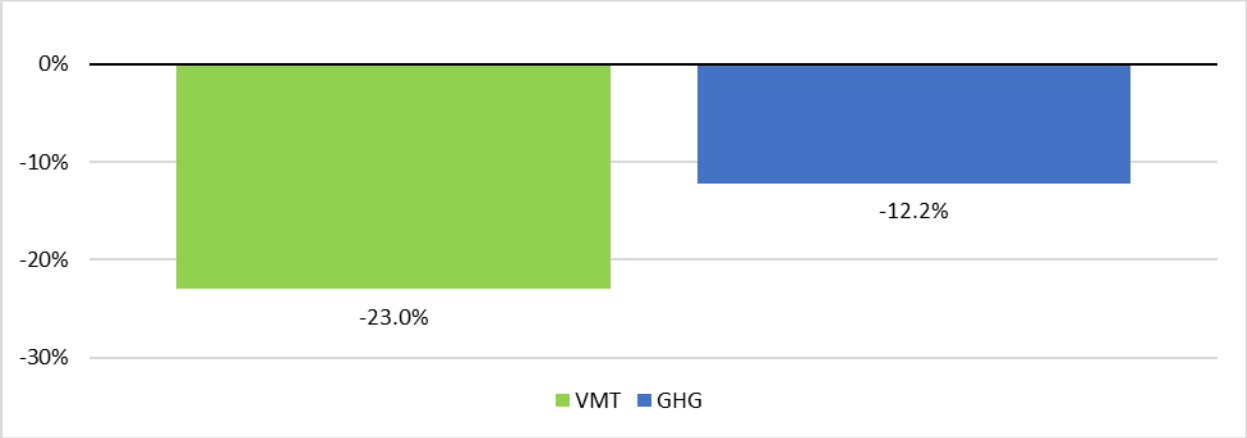


Figure 30: Preliminary changes in GHG and VMT from Scenario F.