Appendix C: Performance Measures

US 50 CMCP Performance Measures Memo

Task 3.2

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1. Performance Measures Overview

1.1 Background

Following the approval of the US 50 CMCP's vision statement, goals, and strategies (see *Task 3.1: Performance Policy Framework*), the next step of the planning process is to identify the project **performance measures**, which are specific metrics to evaluate need or effectiveness (Figure 1-1). Performance measures are tied to the plan goals and may be qualitative or quantitative; the feasibility of any given measure will depend on data availability and level of analysis to be conducted. Although a wide range of performance measures can be considered, they should be tied to state policy and funding guidelines.

Figure 1-1. Vision, Goals and Strategies, and Performance Measures

1.1.1 Context in Corridor Planning Process

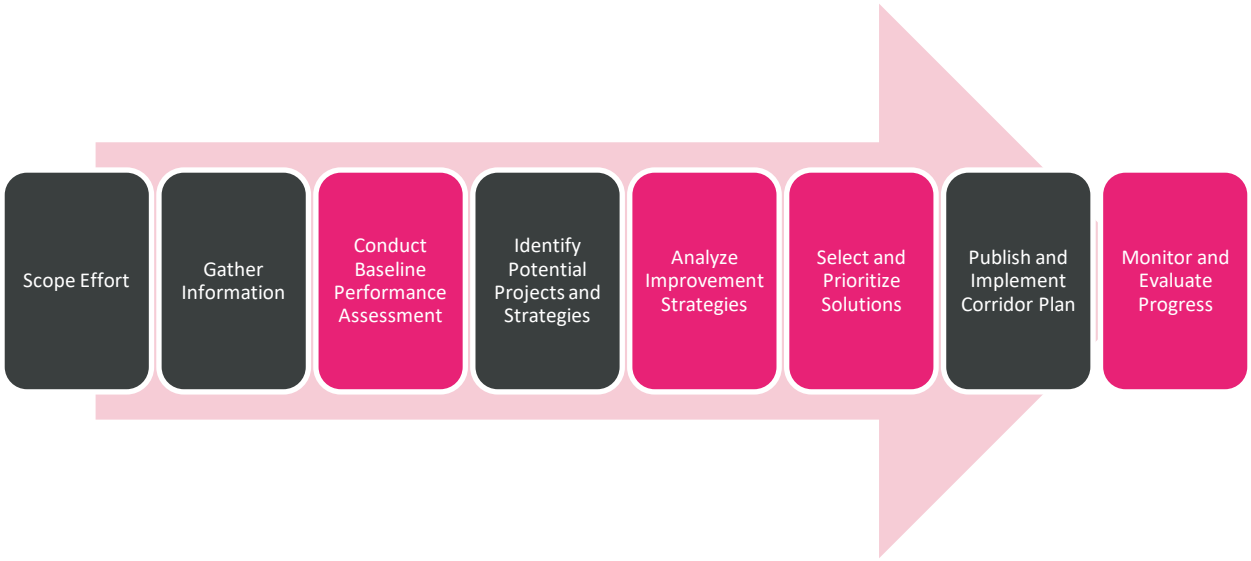
Of the eight-step Caltrans corridor planning process[1] (see Figure 1-2), performance measures are used in the following four steps:

- **Conducting the baseline performance assessment** – Outline system performance and trends, identifying issues and their causes. Develop corridor profiles for mobility, safety, travel time reliability, sustainability, and climate change resiliency and assess future baseline scenarios. Performance measures may be reevaluated based on existing conditions and future scenarios. Key policy documents (see *Task 3.1: Performance Policy Framework*) include the following:
    - **Climate Action Plan for Transportation Infrastructure (CAPTI)**
    - **Caltrans System Investment Strategy (CSIS)**
    - **California Transportation Plan 2050**
    - **California Freight Mobility Plan**
    - **California State Rail Plan**
- **Analyzing improvement strategies** – Group potential improvement projects and strategies into scenarios for evaluation. Conduct corridor analysis to evaluate the impact of potential investments on performance.

[1] California Department of Transportation, *Corridor Planning Process Guide*, April 2022. https://dot.ca.gov/-/media/dot-media/programs/transportation-planning/documents/system-planning/systemplanning/corridor-planning-process-guide-april-2022-a11y.pdf

- **Selecting and prioritizing solutions** – Make decisions on corridor projects and strategies to address goals, objectives, and performance measures. The outcome is a set of multimodal solutions addressing identified issues with estimated implementation timeframes.
- **Monitoring and evaluating progress** – Continuously measure key performance indicators to assess whether the implemented solutions are achieving the desired outcomes. Corridor objectives may be reassessed and refined.

Figure 1-2. Caltrans Corridor Planning Process



1.1.2 Performance Measures Considerations

When developing the performance measures, the CMCP Team considered the following factors:

1) **Policy Framework measures** from documents that affect prioritization or prescribe how projects will be evaluated for funding,
2) **SACSIM regional travel demand model capabilities** will be used to measure CMCP scenarios' performance,
3) **Limitations of travel demand models**, such as the need for projects to be large to show up in the results,
4) **Value of smaller projects,** especially those that support disadvantaged communities or protect vulnerable road users,
5) **Utility of project-level prioritization,** or the usefulness of project-level evaluation that helps with prioritization; and
6) **Resources available** to the CMCP Team, in terms of available data and staff time.

1.2 Approach to Evaluation

Based on the performance measures considerations (see above), the CMCP Team has developed an approach with three types of performance evaluation described below.

1.2.1 SACSIM Travel Demand Model

One type of evaluation will use SACSIM, a travel demand model that predicts how people in the SACOG region travel on a typical weekday and includes details about travel modes used, trip

purposes, and trip destinations. **SACSIM model runs** will be used to conduct the CMCP's baseline assessment, support ongoing evaluation, and provide scenario-level analysis. **Project-level analysis** identifies the need for a project, as it allows for the use of SACSIM model runs to understand regional impacts of implementing a discrete list of projects, while **scenario-level analysis** can model the potential benefits of implementation. SACSIM can provide scenario-level measures, such as delay per year, person hours of travel time saved, and peak period person throughput by mode. By evaluating performance at the scenario level, the results would reflect the total effects of constructing a bundle of projects.

Additionally, SACSIM can account for **induced demand,** the concept that increasing roadway capacity could lead to more roadway usage. Importantly, SACSIM on its own only accounts for *short-term* induced demand resulting from near-term behavior changes like choosing a different mode, travel route, etc. It does not *directly* capture long-term induced demand due to changes in land use caused by transportation projects (e.g., more highway capacity resulting in more peripheral development). However, induced land use is indirectly captured through SACOG's land use forecasting process, which considers how Blueprint transportation projects could influence land use development. Therefore, scenarios with transportation projects that are similar to the ones within the Blueprint will reasonably capture long-term induced demand from land use changes. Scenarios with transportation projects that do not closely resemble those in the Blueprint should be accompanied by modifying the land use forecast or applying other methods if long-term induced VMT is of concern.

Recognizing the importance of accounting for long-term induced demand, the CMCP Team is considering additional tools to supplement the SACSIM model runs. Tools like the National Center for Sustainable Transportation (NCST) California Induced Travel Calculator (CITC), which is not corridor-specific and uses research literature averages to estimate how adding lane miles to roadways would induce VMT annually, could help ensure long-term induced demand is also considered.

The baseline assessment will compare the existing conditions scenario for the existing year (2024) and the no build scenario for the horizon year (2050), demonstrating how the CMCP will improve transportation compared to the regional transportation plan. Once new solutions beyond the Blueprint are identified, the CMCP Team will run the build horizon year scenarios to evaluate how the CMCP will improve transportation by 2050.

Table 1. Model Scenarios

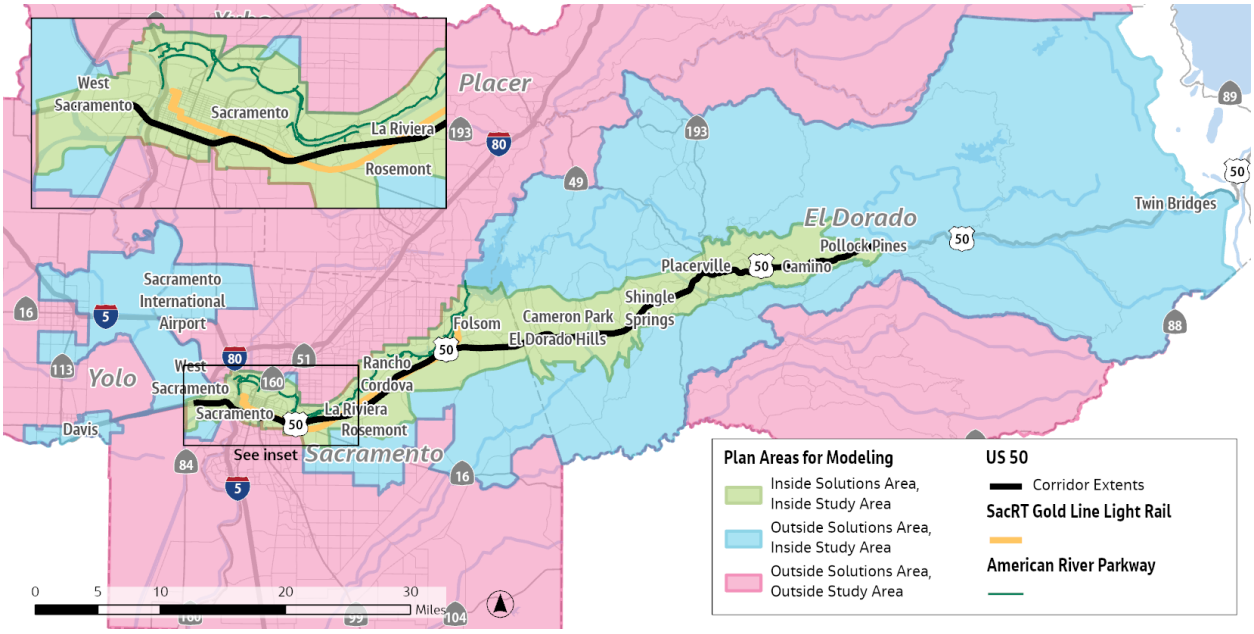
<table>
<tr><th></th><th>"Existing" Year (2024)</th><th>Horizon Year (2050)</th></tr>
<tr><td rowspan="3">No Build</td><td rowspan="3">Whole Region
2024 network
2024 land use</td><td>Inside Solutions Area
2027 network
2035 land use
2035-2050 growth will be redistributed outside the Solutions Area</td></tr>
<tr><td>Outside Solutions Area, Inside Study Area
2027 network
2050 land use + redistributed growth from inside the Solutions Area</td></tr>
<tr><td>Outside Solutions Area, Outside Study Area
2050 network
2050 land use + redistributed growth from inside the Solutions Area</td></tr>
<tr><td>Build</td><td>(none)</td><td>TBD</td></tr>
</table>

As shown in Table 1, the **existing conditions scenario** would encompass the whole region and use the 2024 transportation network and land use. Transportation capacity projects constructed by 2024 would be included, and travel behavior would include post-pandemic travel assumptions. Although using 2024 land use is not consistent with the 2025 Blueprint, it is a forecast based on an interpolation between 2020 and 2027 from the Blueprint and accounts for significant land use growth that has occurred between 2020 and 2024.

For the 2050 horizon year no build scenario, there are three analysis zones (see Figure 1-3). 1) inside the solutions area, 2) outside the solutions area, inside the study area, and 3) outside the solutions area, outside the study area. The **inside solutions area** zone would use the 2027 network, which includes transportation projects from the Metropolitan Transportation Improvement Program (MTIP). It also uses 2035 land use assumptions, which would be in line with MTIP projects. The land use growth from 2035 to 2050 will be redistributed outside the solutions area.

The **outside solutions area, inside study area** zone would have the 2027 network and 2050 land use with redistributed growth from inside the solutions area. The 2050 land use scenario assumes that the rest of the region grows. Finally, the **outside solutions area, outside study area** zone has the 2050 network and 2050 land use paired with redistributed growth from inside the solutions area. The assumption is that Blueprint implementation continues outside of the solutions and study area while it lags within these areas.

Figure 1-3. Plan Areas for Modeling



1.2.2 CAPTI/CSIS Alignment

To analyze, select, and prioritize potential solutions, the CMCP Team proposes using a qualitative evaluation to determine how each CMCP solution or project aligns with the CAPTI and CSIS policies. Aligning with the California State Transportation Agency's latest greenhouse gas and equity-focused policies and Caltrans' methods of analysis for project benefits would help increase success toward state funding opportunities. This evaluation builds upon the methodology used in the SR 99 CMCP, which assigns each measure a high, medium, or low rating based on project type. Once the list of project types is finalized, the CMCP team will create and agree upon a rubric to ensure consistency in scoring all projects. Table 2 provides a sample of this scoring methodology.

Table 2. Sample CAPTI Alignment Scoring by Mode

Solution Mode, Type	Improves Safety	Reduces VMT	Acces-sibility	Encourages Mode Shift to Non-auto modes	Disadvantaged Communities Benefit	Preserves Natural Resources	Improves Freight Sustainability and Efficiency	Investment in ZEV Infra-structure	Addresses Climate Risks and Improves Climate Resilience	CAPTI Alignment Score
Active Transportation	High	Med	High	Med	High	Med	N/A	N/A	Low	**High**
Transit	Low	High	High	High	High	Low	N/A	Low	Low	**High**
Freeways, Safety	High	Low	Low	Low	Low	N/A	Low	N/A	N/A	**Low**
Roads and Streets, Operations	Med	N/A	High	N/A	Low	Low	Med	N/A	Low	**Med**
Roads and Streets, Maintenance	Low	Low	Low	Low	Low	N/A	N/A	N/A	Low	**Low**

Based on the SR 99 CMCP CAPTI/CSIS Alignment Memo and current project modes and types from the US 50 CMCP Solutions Draft List, Table 2 shows an example of what CAPTI alignment scoring may look like. Measuring CAPTI and CSIS alignment would be useful for solution prioritization, as both policies align well with the US 50 CMCP's goals. Table 3 demonstrates the US 50 CMCP goals and which CAPTI 2.0 guiding principles and CSIS-established CAPTI metrics.

Table 3. US 50 Goal Alignment with CAPTI and CSIS

CAPTI 2.0 Guiding Principles	CSIS Metrics
US 50 CMCP Goal: Enhance travel reliability within the corridor	
Promoting projects that do not significantly increase passenger vehicle travel	Climate Resilience Freight sustainability and resiliency
Assessing physical climate risk	
US 50 CMCP Goal: Improve safety for all transportation system users	
Investing in networks of safe and accessible bicycle and pedestrian infrastructure	Safety
Making safety improvements to reduce fatalities and severe injuries of all users towards zero	
US 50 CMCP Goal: Increase multimodal travel options and access to destinations	
Building toward an integrated, statewide rail and transit network	Vehicle Miles Traveled Accessibility Passenger Mode Shift Climate Resilience Land Use and Natural Resources
Investing in networks of safe and accessible bicycle and pedestrian infrastructure	

1.2.3 Project-level Evaluation

Conducting project-level evaluation will help prioritize solutions. The CMCP Team has drawn upon additional project-level measures previously used by SACOG. These measures would be quantitative and measure existing and projected conditions in the project area, allowing the CMCP Team and partners to compare the relative need for individual projects.

Given the anticipated large quantity of solutions in the plan, performing any of these additional project-level analyses would be resource-intensive. Accordingly, a short-list of priority solutions, identified in collaboration with TAC partners, would be evaluated to ensure efforts are focused on the most critical projects.

After the CMCP Team shares a draft of the solutions list, partners will have an opportunity to identify their priority projects for evaluation. As we get into project prioritization tasks, we will work with the TAC to index/score/weight these measures to identify top priorities. We will also be considering local support and project readiness to help determine key projects ready to go to SB1 after the plan is adopted.

2. Potential Measures

2.1 Measure Sources

To gather an inventory of potential measures, the CMCP Team evaluated the following key sources.

2.1.1 Solutions for Congested Corridors Program (SCCP) Guidelines

The SCCP is a competitive statewide SB-1 program that provides funding for projects designed to reduce congestion, as well as environmental benefits, community access, and transportation improvements. The SCCP Guidelines describe the program's policy, criteria, standards, and procedures for the development, adoption, and management of the program; it also provides detailed methodologies about how to calculate its measures. As projects must be part of an existing CMCP to qualify for SCCP funding, the SCCP and CMCP are closely related. Accordingly, the CMCP Team has identified potential scenario-level measures and project-level measures from the SCCP guidelines, with outcomes such as safety, accessibility, and congestion reduction.

2.1.2 CMCP Guidelines

The California Transportation Commission (CTC) developed the CMCP Guidelines to explain the statutory requirements that CMCPs must fulfill for agencies to apply for SCCP funding and to provide implementing agencies with planning practice examples about the planning process and plan content development. These guidelines serve as a companion document to the SCCP guidelines, promote planning processes that use a multimodal and holistic approach, and aim to achieve a balanced transportation system consistent with SB 1.[2]

Final adoption of the updated 2025 CMCP guidelines is anticipated in December 2025.[3] The main changes include highlighting equity, emphasizing state planning guidance like Caltrans modal plans and CAPTI, incorporating references to rail planning, and including new planning resources.

2.1.3 SACOG Project Evaluation Process (PEP)

The SACOG PEP is designed to rank and assess a set number of projects based on their alignment with various policy goals. Initially developed to identify the best projects from a group, PEP combines multiple metrics to provide a relative ranking of how projects perform in terms of specific outcomes. PEP categorizes evaluation metrics into three major policy buckets that align with SACOG's Strategic Plan goals of equity, economy, and environment. PEP's metrics allow for alternatives analysis and modifications to ensure they are meaningful in their raw form. As this structured approach provides a balanced and effective evaluation of transportation projects, the CMCP Team has identified several scenario-level measures from PEP.

2.1.4 SACOG Project Performance Assessment (PPA)

The SACOG PPA tool draws from various data sources to provide a consistent and transparent baseline for the SACOG region to measure performance for transportation projects across the region. It provides quantitative indicators that help inform regional decision making, analyze transportation investments at the project level, and ensure performance-based planning. To align with the SACOG region's method of measuring performance, the CMCP Team has selected potential project-level measures from the PPA tool and its guidelines.

2.1.5 Placer-Sacramento Gateway Plan (PSGP)

The PSGP is a CMCP for the I-80 Placer-Sacramento Gateway Corridor, which serves various transportation needs between Sacramento County and Placer County. It includes segments of US 50 and the US 50 CMCP study area. Due to the regional overlap and the PSGP's success securing

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[2] California Transportation Commission, *Comprehensive Multimodal Corridor Plan Guidelines*, December 5, 2018, p. 1. https://www.preview-catc.catc.ca.gov/-/media/ctc-media/documents/120518-approved-cmcp-guidelines-a11y.pdf

[3] California Transportation Commission. *2025 Comprehensive Multimodal Corridor Plan Guidelines Update: Second Workshop Presentation*, July 22, 2025. https://catc.ca.gov/-/media/ctc-media/documents/programs/sccp/comprehensive-multimodal-corridor-plan/2025/cmcp-guidelines-update-second-workshop-pp-final-a11y.pdf.

more than $100 million in SCCP funding, the CMCP Team has evaluated and identified scenario-level measures from the PSGP.

2.2 Applicability and Feasibility Considerations

The CMCP Team evaluated the applicability and feasibility of scenario-level, project-level quantitative, and project-level qualitative measures from the sources described in Section 2.1. This section describes the evaluation process of these measures.

2.2.1 Scenario Measures

The CMCP Team identified quantitative measures from the CMCP guidelines, SCCP guidelines, SACOG PEP, and PSGP. **Table A-1** displays all the preliminary measures considered, which include seat utilization, greenhouse gas emissions, hours of delay, vehicle miles traveled (VMT), and impact to mode share. Although SACSIM is the primary tool for these measures, off-model calculations are required for some measures.

To evaluate the applicability of these measures, the CMCP Team aligned each measure with a related US 50 CMCP goal, evaluated how these measures aligned with CAPTI/CSIS, and determined if they could be candidates for quantitative scenario-level analysis. CAPTI/CSIS alignments for the measures consist of the following:

- Reducing VMT,
- Preserving natural resources,
- Encouraging mode shift,
- Freight sustainability and efficiency, and
- Improving safety and accessibility.

For feasibility, the CMCP Team evaluated SACSIM's capability of running each measure. SACSIM could analyze most of the measures, but some would need to be paired with tools like CITC or EMission FACtor (EMFAC), which is a model that estimates official emission inventories of on-road mobile sources in California. Other measures do not require SACSIM, or they would be better analyzed with other tools, such as CITC, Replica, or Conveyal.

The CMCP Team rated the required level of effort from a scale of 0-5, with 5 indicating the highest level of effort. The level of effort accounts for data availability, required staff time, and required expertise. Scenario-level measures generally have a high level of effort because they require coding and running a model (see **Table A-1**).

2.2.2 Project Measures – Quantitative

The CMCP Team identified potential quantitative measures from the CMCP guidelines, SCCP guidelines, PPA, and PEP. Measures are listed in **Table A-2** and include fatal and injury collisions, travel time reliability, and metrics that capture outcomes for low-income/disadvantaged populations.

Like the scenario measures, the CMCP Team used a binary yes/no determination to assess how each project measure aligns with a corresponding US 50 CMCP goal and CAPTI/CSIS for applicability. Most of the measures align with CAPTI/CSIS by improving safety and accessibility. Some measures did not align directly with CAPTI/CSIS priorities, while others aligned with one or more of the following categories: freight sustainability and efficiency, natural resource preservation, climate resilience, VMT reduction, or mode shift.

The CMCP Team identified two primary criteria for determining whether a measure is appropriate for project-level analysis: 1) data must be available for the project area, and 2) analysis must not rely on coding and running a model due to time and resource constraints associated with running SACSIM or similar tools at the individual project level.

Accordingly, the CMCP Team evaluated feasibility by rating the level of effort needed from 0-5, with 5 indicating the highest level of effort (see **Table A-2**). Only measures with a level of effort rating of 3 or lower were considered suitable for recommendation.

2.2.3 Project Measures – Qualitative

To implement key CAPTI actions, CSIS references alignment metrics established by Caltrans to evaluate project consistency with State policy goals. The CSIS framework uses a performance and data-driven approach to evaluate transportation projects and provides a clear framework for transportation investments supporting the State's climate goals. To ensure alignment with State policy, the CMCP Team has incorporated these metrics as a qualitative screening tool into the performance measures approach.

The Caltrans Draft CAPTI Alignment Metrics, published in March 2024, established the following metrics:

1. Safety
2. Vehicle-miles traveled
3. Accessibility
4. Passenger mode shift
5. Disadvantaged communities - traffic impact
6. Disadvantaged communities - access to jobs and destinations
7. Land use and natural resources
8. Zero-emission vehicle infrastructure
9. Freight sustainability and efficiency
10. Climate resilience
11. Public engagement

These metrics were originally intended to evaluate projects past the environmental stage, when more detailed design and quantifiable impact data is available. Given that most US 50 CMCP projects are still in conceptual or planning stages, the CMCP Team will score these metrics qualitatively, as described in Section 1.2.2. To measure CAPTI and CSIS alignment, this same qualitative scoring approach was used successfully in the Caltrans SR 99 CMCP and provided a useful framework for evaluating early-stage concepts.

3. TAC Feedback

At the third TAC meeting held April 30, 2025, the CMCP Team conducted a live poll to solicit TAC members' feedback on potential performance measures. The CMCP Team took these poll results and feedback into consideration when developing the list of recommended performance measures, shown in **Table A-1** and **Table A-2**.

3.1 Scenario-Level Measure Takeaways

TAC members prioritized scenario-level measures that reflect mode shift, VMT reduction, and person throughput. As shown in the poll results, measures such as "increase in non-single occupant vehicle mode share," "increase in non-vehicle mode share," "vehicle miles traveled," and "peak period person throughput by mode" received strong support. They also expressed strong interest in accounting for induced demand and requested that long-term VMT impacts are demonstrated in analysis. Additional feedback highlighted the relevance of climate resilience and freight efficiency as components of travel reliability.

In contrast, measures such as “truck delay” and “change in commercial vehicle-hours of delay” received minimal support (5% each), which suggests that freight-related delay metrics are not a priority for most TAC members. “Person-hours of delay” and “change in person-hours of delay” received moderate support, demonstrating a preference for wider system-level metrics over individual-delay-based measures. Table 4 shows the scenario-level measures the CMCP Team used based on TAC feedback.

Table 4. Recommended Scenario-level Measures Based on TAC Input

Measure
Goal: Enhance travel reliability within the corridor
Person hours of delay on US 50 (daily)
Vehicle hours of delay on US 50 (daily)
Transit passenger hours of delay on US 50 (daily)
Person throughput by mode on US 50 and Gold Line (peak periods)
Congested VMT on US 50 (daily)
Goal: Increase multimodal travel options and access to destinations
High-occupancy vehicle mode share on US 50 (daily)
Non-driving mode share in the Study Area (daily)
VMT per capita in the Study Area (daily)

3.2 Project-Level Measure Takeaways

Feedback on project-level measures highlighted the value of normalizing safety metrics by VMT or facility length, with a majority of respondents rating this as highly important. TAC members also prioritized measures related to equity and accessibility, as the “jobs accessible by mode,” “neighborhood services accessibility,” and “percentage of population defined as low income or disadvantaged within ½ mile of a rail station or high-frequency bus stop” measures received the highest number of votes.

Measures such as “educational facilities,” “street intersections per acre,” and “environmental justice population” received little to no support, as each measure resulted with 0-6% of votes. Table 5 displays the project-level measures the CMCP Team used based on TAC feedback.

Table 5. Recommended Project-level Quantitative Measures Based on TAC Input

Measure
Goal: Increase multimodal travel options and access to destinations
Jobs and dwelling units within ½ mile
Jobs accessible by mode

Measure
Neighborhood services accessibility
Low-income or disadvantaged residents (percentage of total) within ½ mile of a rail station or high-frequency bus stop (peak periods)
Residents within ½ mile of a rail station or high-frequency bus stop (peak periods)

4. Lessons Learned from Prior CMCPs

To inform the development of performance measures for the US 50 CMCP, the CMCP Team reviewed lessons learned and best practices from prior planning efforts, including SR 99 and PSGP CMCPs, and met with staff who managed these plans for PCTPA and Caltrans. Key considerations to apply to the US 50 CMCP are outlined below.

- Prioritization can be challenging. Throughout the process, the CMCP Team should emphasize alignment with SCCP criteria and goals to guide decision-making.
- The PSGP team prioritized inclusion in the Metropolitan Transportation Plan. Initially, their model included many freeway capacity-increasing projects. However, these projects were removed because the team understood that they could not deliver a plan that increases VMT. Although VMT may increase in the US 50 CMCP due to high baseline vehicle volumes based on increasing population and employment, the PSGP team demonstrated that normalizing VMT measurements was useful and was able to show a decrease in VMT per capita, which was well received by CTC. Accordingly, the US 50 CMCP Team should consider adopting a VMT per capita metric.
- Screen lines can help evaluate travel flows and may be used to assess transit seat utilization across downtown, suburban, and rural areas.
- Incorporate metrics such as number of people and jobs with transit access, which can improve performance evaluations.
- The CMCP Team should consider measuring travel time reliability at the scenario level.
- Transit delay metrics, such as travel time index, may require coding. The CMCP Team should consult SACSIM subject matter experts and SACOG staff before committing to this measure. Consider using the metric for baseline only to understand current delays without intervention.
- It has been observed that the SACOG PEP tool may yield more favorable results for projects located in Downtown Sacramento and West Sacramento. The CMCP Team should be conscious of this when interpreting evaluation results.
- The SACOG Blueprint recommends converting existing US 50 HOV Lanes to priced/dual priced managed lanes.
- Modeling for the peak period person throughput by mode measure would create separate datasets for each mode, likely resulting in at least four datasets. The CMCP Team should account for this when selecting and analyzing this measure.

5. Recommendations

To develop the final lists of recommended performance measures, the CMCP Team has established an approach for evaluation, gathered and evaluated an inventory of performance measures, solicited

feedback from TAC members, and reviewed lessons learned from previous CMCP efforts. The CMCP Team recommends the performance measures in Table 6 based on relevant state guidance, technical feasibility, and partner input.

5.1 Scenario-level Measures

As shown in Table 6, the scenario-level measures were selected based on alignment with CMCP goals, TAC and partner feedback, and consistency with State policy priorities. Most of these measures also align with one of the US 50 CMCP goals; the remaining measures address important State priorities regarding climate change and air quality. For instance, measures such as VMT reduction and GHG emissions support both corridor-specific goals and CAPTI objectives.

Table 6. Recommended Scenario-level Measures

Measure	Source	Justification
Goal: Enhance travel reliability within the corridor		
Person hours of delay in personal vehicles on US 50 (daily)	SACOG PEP	26% of TAC ranked in their top 3
Vehicle hours of delay on US 50 (daily)	SCCP Guidelines	47% of TAC ranked in their top 3
Transit passenger hours of delay on US 50 (daily)		42% of TAC ranked in their top 3
Person throughput by mode on US 50 and Gold Line west of Watt Avenue (peak periods)		47% of TAC ranked in their top 3
Transit seat utilization on US 50 and Gold Line west of Watt Avenue (peak period peak direction)*	PSGP	Communicates the potential to increase throughput without needing to increase capacity
Vehicle seat utilization on US 50 west of Watt Avenue (daily)*		
Non-highway vehicle miles traveled per capita in the Study Area (daily)		Responds to goal to reduce diversion to local roads
Congested VMT on US 50 (daily)	TAC Ideation	Responds to TAC member's request to consider congested VMT
Goal: Increase multimodal travel options and access to destinations		
High-occupancy vehicle mode share on US 50 (daily)	CMCP Guidelines	70% of TAC rated in their top 3
Non-driving mode share in the Study Area (daily)		
VMT per capita in the Study Area (daily)†	SACOG PEP	Responds to partners' concerns about induced demand
Residents in the Study Area within ½ mile of a major transit stop or high-quality transit corridor (peak periods)	SACOG Ideation	Responds to SACOG's suggestion to consider % of people near high-quality transit
Additional measures		
Reduction of GHG emissions‡	CMCP Guidelines	Address air quality and climate change, which are State
Carbon dioxide (CO2)‡	SCCP Guidelines	

Measure	Source	Justification
Nitrogen oxides (NOx)‡		priorities; commonly incorporated into CMCPs
Particulate matter (PM 2.5)‡		
Volatile organic compounds (VOC)‡		

*Recommended if the required data can be obtained
† Requires use of the CITC tool or another off-model tool
‡ Requires use of the EMFAC21 off-model tool

5.2 Project-level Quantitative Measures

Each of the recommended project-level measures, shown in Table 7, aligns with at least one US 50 CMCP goal. Measures related to improving transportation system safety also build upon data analyzed in the existing conditions report. The remaining measures are supported by TAC members and help expand multimodal travel options and improve access to key destinations.

The CMCP Team will first scale the results for each quantitative measure using a minimum score of zero and maximum score of one. Then, the CMCP Team will apply a weight to the measure based on TAC member input. Finally, measure-level scores will be totaled by project, enabling projects that have mid-level performance across several measures as well as projects that have high-level performance for a few measures to be prioritized.

Table 7. Recommended Project-level Quantitative Measures

Measure	Source	Justification
Goal: Improve safety for all transportation system users		
Fatal and injury collisions	CMCP Guidelines	Builds upon data analyzed for the existing conditions report
Non-motorized fatalities and serious injuries	SCCP Guidelines	Builds upon data analyzed for the existing conditions report
Goal: Enhance travel reliability within the corridor		
Bus travel time reliability (80th percentile to 20th percentile ratio)*	CMCP Guidelines	Extends travel time reliability measure to transit
Travel time reliability (80th percentile to 20th percentile ratio)		Include a project-level reliability measure
Goal: Increase multimodal travel options and access to destinations		
Multimodal access to destinations	CMCP Guidelines	Addresses a State priority; builds upon the Caltrans Equity Index
Jobs and dwelling units within ½ mile	SACOG PPA	35% of TAC members ranked in their top 3
Jobs accessible by mode		59% of TAC members ranked in their top 3
Neighborhood services accessibility		53% of TAC members ranked in their top 3
Environmental justice population (percentage of total)		Extends disadvantaged populations measure to solutions of all modes
Low-income or disadvantaged residents (percentage of total) within ½ mile of a rail station or	SCCP Guidelines	47% of TAC members ranked in their top 3

Measure	Source	Justification
high-frequency bus stop (peak periods)		
Residents within ½ mile of a rail station or high-frequency bus stop (peak periods)		

*Recommended if the required data can be obtained

5.3 Project-level Qualitative Measures

As described in Section 1.2.2, the CMCP Team proposes a qualitative evaluation of how each solution in the CMCP aligns with CAPTI and CSIS. The metrics listed in Table 8 display the recommended measures for assessing CAPTI and CSIS alignment.

Table 8. Recommended Project-level Qualitative Measures

Measure
Goal: Improve safety for all transportation system users
Improves safety (reduces collisions)
Goal: Enhance travel reliability within the corridor
Improves climate resilience
Freight sustainability and efficiency
Goal: Increase multimodal travel options and access to destinations
Reduces VMT
Improves accessibility
Encourages mode shift
Improves climate resilience
Preserves natural resources
Additional Measure
Project readiness

A project readiness measure was added after receiving TAC feedback to prioritize projects that are ready for SB 1 grant applications. The measure accounts for the following factors: inclusion in the Blueprint, inclusion in the MTIP, self-funding pre-construction (because projects that have this do not get included in the MTIP), and programmed partial funding.

For each factor that the solution has achieved, it would receive one checkmark. Based on the total number of checkmarks a solution receives by the end of the evaluation, it would receive a project readiness score of high, medium, or low. A solution would need all three checkmarks for a “high” rating, 2 checkmarks for “medium,” and 0-1 for “low.”

Each solution’s expected environmental clearance will also factor in project readiness. SB 1 funding requires environmental clearance within six months of award. Thus, solutions will be grouped by the SB 1 cycle at which they expect to achieve environmental clearance (or exemption). These groups align with the SB 1 cycles within the expected life of the CMCP: 2026, 2028, and 2030.

Table 9 displays three examples of how project readiness would be measured. The scores and environmental clearance information will be considered together to recommend solutions for funding by SB 1 cycle.

Table 9. Project Readiness Measure Examples

Solution Name	Included in the Blueprint	Included in the MTIP	Self-Funded Pre-Construction	Programmed Partial Construction Funding	Environmental Clearance / CEQA Exemption	Score
Solution 1	✓	✓		✓	By 2026	**3 - High**
Solution 2	✓	✓			By 2026	**2 - Medium**
Solution 3	✓	✓			By 2028	**2 - Medium**
Solution 4	✓		✓		By 2028	**2 - Medium**
Solution 5	✓				By 2030	**1 - Low**
Solution 6					By 2030	**0 - Low**

5.4 Next Steps

This performance measures memo will guide and inform the next phases of the US 50 CMCP, including modeling and project prioritization. The CMCP Team will use the performance measures outlined above to evaluate how well potential solutions address project goals, align with state policy priorities, and meet regional needs.

As detailed in Section 1.2.1, the CMCP Team will calculate baseline existing conditions and a no-build in the horizon year. After identifying build scenarios, their performance will be measured by SACSIM measures. Project-level performance will likely be calculated concurrently with the build scenarios.

Attachment: Inventory of Measures

Table A-1. Scenario Measures

Measure	US 50 CMCP Goal	CTC 2018 CMCP Guidelines	CTC 2024 SCCP Guidelines	SACOG PEP	SACOG 2025 PPA	PCTPA 2020 PSGP	Level of Effort Rating
Vehicle Hours of Delay)	Enhance travel reliability within the corridor	✓	✓				5
Person hours of delay	Enhance travel reliability within the corridor	✓		✓			5
Change in Vehicle Miles Traveled	Enhance travel reliability within the corridor, Increase multimodal travel options and access to destinations	✓	✓	✓			5
Passenger rail delay	Enhance travel reliability within the corridor	✓					4
Person throughput	Enhance travel reliability within the corridor	✓					4
Truck or commercial vehicle delay	Enhance travel reliability within the corridor	✓		✓			5
Delay per capita per year	Enhance travel reliability within the corridor		✓				5
Delay per year	Enhance travel reliability within the corridor		✓				5
Person hours of travel time saved	Enhance travel reliability within the corridor		✓				5
Peak period travel time reliability index (no build)	Enhance travel reliability within the corridor		✓				4
Level of transit delay (travel time index)	Enhance travel reliability within the corridor		✓				5

Measure	US 50 CMCP Goal	CTC 2018 CMCP Guidelines	CTC 2024 SCCP Guidelines	SACOG PEP	SACOG 2025 PPA	PCTPA 2020 PSGP	Level of Effort Rating
Peak period person throughput by mode	Enhance travel reliability within the corridor		✓				5
Change in non-highway vehicle miles traveled per capita (total population)	Enhance travel reliability within the corridor					✓	5
Transit seat utilization	Enhance travel reliability within the corridor					✓	5
Vehicle seat utilization	Enhance travel reliability within the corridor					✓	5
Expected net change in total 3-year collisions	Improve safety for all transportation system users			✓			5
Collision cost savings	Improve safety for all transportation system users		✓				5
Change to access to jobs and education for disadvantaged populations within 30 minutes (45 minutes for transit)	Increase multimodal travel options and access to destinations	✓					5
Change to access to jobs and education within 30 minutes (45 minutes for transit)	Increase multimodal travel options and access to destinations	✓					5
Households within 45-minute transit ride of major employment center or college	Increase multimodal travel options and access to destinations	✓					5

Measure	US 50 CMCP Goal	CTC 2018 CMCP Guidelines	CTC 2024 SCCP Guidelines	SACOG PEP	SACOG 2025 PPA	PCTPA 2020 PSGP	Level of Effort Rating
Improvement in jobs/housing balance or fit	Increase multimodal travel options and access to destinations	✓					5
Increase in non-single occupant vehicle mode share	Increase multimodal travel options and access to destinations	✓					5
Increase in non-vehicle mode share	Increase multimodal travel options and access to destinations	✓					5
Percent change in non-single occupancy vehicle travel	Increase multimodal travel options and access to destinations		✓				5
Jobs accessible by mode	Increase multimodal travel options and access to destinations		✓				5
Key destinations by mode	Increase multimodal travel options and access to destinations		✓				5
Jobs created	Increase multimodal travel options and access to destinations		✓				5
Transit boardings per vehicle service hour	Increase multimodal travel options and access to destinations		✓				5
Change in 3-year collisions in disadvantaged communities vs. non-disadvantaged communities	Increase multimodal travel options and access to destinations			✓			4

Measure	US 50 CMCP Goal	CTC 2018 CMCP Guidelines	CTC 2024 SCCP Guidelines	SACOG PEP	SACOG 2025 PPA	PCTPA 2020 PSGP	Level of Effort Rating
Share of project users who belong to disadvantaged populations	Increase multimodal travel options and access to destinations			✓			5
Truck time reliability	N/A	✓					4
Cost-benefit ratio	N/A	✓					5
Reduction of criteria pollutants	N/A	✓					5
Reduction of greenhouse gas emissions	N/A	✓					5
Carbon dioxide (CO2)	N/A		✓				5
Carbon monoxide (CO)	N/A		✓				5
Nitrogen oxides (NOx)	N/A		✓				5
Particulate matter (PM 10)	N/A		✓				5
Particulate matter (PM 2.5)	N/A		✓				5
Sulphur oxides (SOx)	N/A		✓				5
Volatile organic compounds (VOC)	N/A		✓				5

Table A-2. Project Measures

Measure	US 50 CMCP Goal	CTC 2018 CMCP Guidelines	CTC 2024 SCCP Guidelines	SACOG PEP	SACOG 2025 PPA	Level of Effort Rating
Average daily traffic volume	Enhance travel reliability along the corridor				✓	3

Measure	US 50 CMCP Goal	CTC 2018 CMCP Guidelines	CTC 2024 SCCP Guidelines	SACOG PEP	SACOG 2025 PPA	Level of Effort Rating
Complete Streets index	Enhance travel reliability along the corridor				✓	3
Percent jobs within industrial sectors	Enhance travel reliability along the corridor				✓	2
Percent STAA truck route centerline miles	Enhance travel reliability along the corridor				✓	2
Traffic congestion ratio	Enhance travel reliability along the corridor				✓	3
Travel time reliability	Enhance travel reliability along the corridor	✓			✓	1, 3
Truck volumes	Enhance travel reliability along the corridor				✓	2
Collisions involving a pedestrian and/or bicycle	Improve safety for all transportation system users	✓			✓	0, 1, 3
Collisions per 100 million vehicle miles traveled	Improve safety for all transportation system users				✓	3
Consideration of policies that support public safety and security (e.g. lighting)	Improve safety for all transportation system users	✓				1
Fatal and injury collisions	Improve safety for all transportation system users	✓				0
Fatal and/or injury collisions per 100 million vehicle miles traveled	Improve safety for all transportation system users	✓	✓			1
Fatalities	Improve safety for all transportation system users		✓			0
Fatalities per 100 million vehicle miles traveled	Improve safety for all transportation system users		✓			1

Measure	US 50 CMCP Goal	CTC 2018 CMCP Guidelines	CTC 2024 SCCP Guidelines	SACOG PEP	SACOG 2025 PPA	Level of Effort Rating
Non-motorized fatalities and serious injuries	Improve safety for all transportation system users		✓			0
Non-serious injury collisions	Improve safety for all transportation system users		✓			0
Non-serious injury collisions per 100 million vehicle miles traveled	Improve safety for all transportation system users		✓			1
Property damage only collisions	Improve safety for all transportation system users		✓			0
Property damage only collisions per 100 million vehicle miles traveled	Improve safety for all transportation system users		✓			1
Serious injuries	Improve safety for all transportation system users		✓			0
Total collisions	Improve safety for all transportation system users				✓	3
Access to multimodal choices	Increase multimodal travel options and access to destinations	✓				0
Addresses climate adaptation	Increase multimodal travel options and access to destinations	✓				0
Average vehicle occupancy	Increase multimodal travel options and access to destinations				✓	2
Change in driving access to jobs for disadvantaged workers vs. non-disadvantaged workers	Increase multimodal travel options and access to destinations			✓		5
Change in jobs accessible by non-driving modes	Increase multimodal travel options and access to destinations			✓		5

Measure	US 50 CMCP Goal	CTC 2018 CMCP Guidelines	CTC 2024 SCCP Guidelines	SACOG PEP	SACOG 2025 PPA	Level of Effort Rating
Change in non-driving access to jobs for disadvantaged workers vs non-disadvantaged workers	Increase multimodal travel options and access to destinations			✓		5
Change in non-driving access to non-work destinations for disadvantaged populations vs. non-disadvantaged populations	Increase multimodal travel options and access to destinations			✓		5
Change in non-work destinations by non-driving modes	Increase multimodal travel options and access to destinations			✓		5
Consideration of complete streets policies and the creation of network of non-motor vehicle facilities	Increase multimodal travel options and access to destinations	✓				1
Current and projected jobs and dwelling units within ½ mile	Increase multimodal travel options and access to destinations				✓	2
Educational facilities accessible by mode	Increase multimodal travel options and access to destinations				✓	2
Environmental justice population	Increase multimodal travel options and access to destinations				✓	2
First/last-mile considerations	Increase multimodal travel options and access to destinations	✓				0
Jobs accessible by driving	Increase multimodal travel options and access to destinations			✓	✓	2, 5

Measure	US 50 CMCP Goal	CTC 2018 CMCP Guidelines	CTC 2024 SCCP Guidelines	SACOG PEP	SACOG 2025 PPA	Level of Effort Rating
Jobs accessible by mode	Increase multimodal travel options and access to destinations				✓	2
K-12 enrollment	Increase multimodal travel options and access to destinations				✓	2
Land use diversity index	Increase multimodal travel options and access to destinations				✓	2
Neighborhood services accessibility	Increase multimodal travel options and access to destinations				✓	2
Percent bike path/lane centerline miles	Increase multimodal travel options and access to destinations				✓	3
Percent environmental justice population	Increase multimodal travel options and access to destinations				✓	2
Percentage of population defined as low income or disadvantaged within ½ mile of a rail station or high-frequency bus stop	Increase multimodal travel options and access to destinations		✓			0
Projected growth in jobs	Increase multimodal travel options and access to destinations				✓	2
Projected growth in jobs and dwelling units	Increase multimodal travel options and access to destinations				✓	3
Qualitative engagement/empowerment assessment	Increase multimodal travel options and access to destinations			✓		1
Residential mode split	Increase multimodal travel				✓	3

Measure	US 50 CMCP Goal	CTC 2018 CMCP Guidelines	CTC 2024 SCCP Guidelines	SACOG PEP	SACOG 2025 PPA	Level of Effort Rating
	options and access to destinations					
Street intersections per acre	Increase multimodal travel options and access to destinations				✓	3
Supports interconnected streets and corridor access management policies	Increase multimodal travel options and access to destinations	✓				1
Supports mixed-use and infill development with multimodal choices	Increase multimodal travel options and access to destinations	✓				0
Weekday transit boardings	Increase multimodal travel options and access to destinations				✓	2
Weekday transit frequency	Increase multimodal travel options and access to destinations				✓	3
Improvement of freight	N/A	✓				0
Pavement condition index	N/A				✓	3
Percent land in agricultural use	N/A				✓	2