REVISED CSIS

CAPTI ALIGNMENT METRICS

A companion document of the Caltrans System Investment Strategy (CSIS) to assess alignment with the Climate Action Plan for Transportation Infrastructure (CAPTI)

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1.0 – Introduction

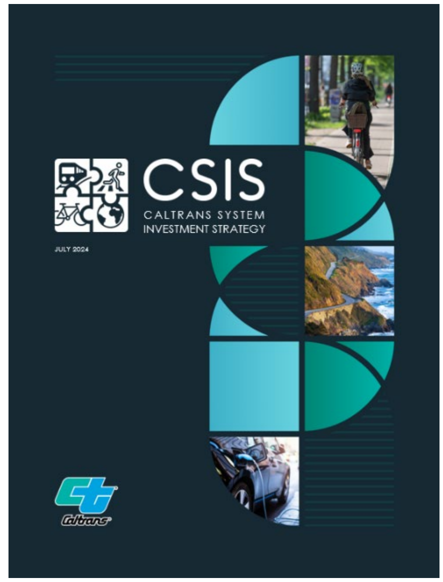

Figure 1: CSIS policy document.

The California Department of Transportation (Caltrans) is committed to one of the key actions of the California State Transportation Agency's (CalSTA) Climate Action Plan for Transportation Infrastructure (CAPTI, July 2021), which is to develop and implement the Caltrans System Investment Strategy (CSIS). CSIS is Caltrans' investment framework for assessing and prioritizing transportation infrastructure projects in alignment with CAPTI Guiding Principles.

Prior to the release of CSIS in 2024, Caltrans had committed to future refinements based on emerging priorities, evolving data and methodologies, and the feedback received through prior CSIS engagements. After its release, CSIS was piloted on Caltrans' Senate Bill (SB) 1 project nominations for Cycle 4 of the Trade Corridor Enhancement Program (TCEP) and Solutions for Congested Corridors Program. This Revised CAPTI Alignment Metrics document is the follow-up on the commitment to refine the eleven (11) metrics. There are no new or additional metrics. Herein are the eleven (11) revised metrics and their associated methodologies and scoring rubrics.

1.1 – Purpose of the Revised CAPTI Alignment Metrics

The Revised CAPTI Alignment Metrics is a companion document to CSIS, the main policy document (Figure 1). CSIS establishes the process for evaluating projects for various state and federal discretionary grant programs. CAPTI Alignment Metrics operationalize CSIS through a data-and-performance-driven approach that evaluates a project's alignment with the State's climate and equity goals and the ten (10) CAPTI Guiding Principles. The metrics assess project competitiveness through the lens of CAPTI to inform the prioritization and nomination process. CSIS will result in greater collaboration with external partners, as well as consistency and transparency in the decision-making process.

CSIS establishes eleven (11) CAPTI Alignment Metrics that assess and evaluate transportation projects for measurable outcomes that align with the 10 CAPTI Guiding Principles. These are 1) Safety, 2) Vehicle Miles Traveled (VMT), 3) Accessibility, 4) Disadvantaged Communities (Access to Jobs and

Destinations), 5) Disadvantaged Communities (Traffic Impacts), 6) Passenger Mode Shift, 7) Land Use and Natural Resources, 8) Freight Sustainability and Efficiency, 9) Zero-Emission Vehicle Infrastructure, 10) Public Engagement, and 11) Climate Adaptation and Resiliency. These nine (9) quantitative and two (2) qualitative metrics assess the extent to which a project aligns with one or more CAPTI principles.

1.2 – Applicability of CSIS Investment Framework

The CSIS investment framework is applicable to non-SHOPP projects that have completed their Project Initiation Document (PID) phase, which are commonly referred to as post-PID projects. CSIS applies to all state and federal discretionary grant programs that make funding available for multi-modal transportation infrastructure projects.

Program Fit: As part of CSIS, the first tier of evaluation is the Program Fit[1] assessment and rating. The Program Fit assessment is unique to each grant program and applies to all projects seeking Caltrans nominations for any discretionary grant program.

CAPTI Alignment Metrics: The second tier of evaluation is the CAPTI Alignment Metrics assessment. Projects are anticipated to be in a post-PID phase and have relevant project scope, data, and information available for assessment.

It is possible to assess projects that are in an earlier project development phase, such as the Project Approval and Environmental Document (PA&ED) phase. This assessment could be based on simpler estimates with less precision, due to uncertainties in the project scope, alternatives, or incomplete analysis. However, preliminary estimates could help inform the project's potential CAPTI Alignment Metric scores as well potential changes in project scope, design, and components for their projects.

CSIS Scoring Cycle: A CSIS scoring cycle is a specific period in which project nominations are being evaluated and prioritized under the CSIS investment framework for a particular discretionary grant program. During a CSIS scoring cycle, a project's overall score will include the Program Fit rating (high, medium, low) and a CAPTI Alignment total score. Projects are first prioritized by their Program Fit rating, followed by their CAPTI Alignment Metrics scores. Projects that

[1] Program Fit is an assessment of a project's competitiveness for a discretionary funding program in which the project is being considered. This assessment mirrors the program guidelines by ensuring the project meets the program objectives, eligibility, and requirements, and that the project is competitive under key program criteria.

are rated low in Project Fit are not likely to proceed further in the nomination process.

The applicability of CAPTI Alignment Metrics may vary depending on the grant program. Therefore, CAPTI Alignment Metrics will be implemented in phases after careful deliberation and collaboration for applicability and feasibility.

It is important to reiterate that while this document establishes the revised CAPTI Alignment metrics, related methodologies, data requirements, and scoring rubrics, project prioritization under the CSIS investment framework considers both Program Fit and the CAPTI Alignment Metric scores, followed by consideration of other factors as discussed in the CSIS policy document.

2.0 – CAPTI Metric Score & Weight

CSIS operationalizes alignment with the CAPTI Guiding Principles through a data-and performance-driven approach. It establishes eleven (11) metrics that assess and evaluate transportation projects for measurable outcomes.

CSIS acknowledges that a one-size-fits-all approach does not meet the need of the state's diverse communities. As such, CAPTI Alignment Metrics are designed for a broad and contextual understanding of performance along these guiding principles for various types of projects.

Figure 2: CAPTI Alignment Metrics

These quantitative and qualitative metrics (Figure 2) are designed to assess a project's ability to provide safer, multi-modal infrastructure that encourages fewer vehicle miles traveled, enables mode shift, and supports transit projects. Projects that support infill land uses, zero-emission vehicle infrastructure, freight efficiency and sustainability, and accessibility to jobs and other destinations, particularly for disadvantaged communities, are also aligned with the CAPTI Guiding Principles.

Project-related information for public engagement and climate change adaptation and resiliency, while qualitative in nature, are assessed with a detailed scoring checklist. These metrics are designed to respond to the diversity of project types and the project's geographical context, such as its urban, suburban, or rural setting.

2.1 – Metrics Scoring

Each CAPTI Alignment Metric score is on a 0-to-10 scale, wherein a project can score a maximum of 10 points and a minimum of 0 points on each metric. Overall, a project can score a maximum of 110 points. When a project does not provide any data or information on a metric, it is assigned a default score corresponding to a “no change” score.

2.2 – Metric Weights

All metrics are weighted equally, and no one metric is given additional weight. Individual metrics may have internal weights, which are described in the relevant methodology and scoring sections of this document. When certain metrics are not applicable to a particular funding program, the metric will be considered “not applicable” while the remaining metrics will remain equally weighted. For example, the Freight Sustainability and Efficiency metric is not a suitable metric for active transportation projects under consideration for nomination for the state Active Transportation Program. Therefore, this metric is considered not applicable and will not be evaluated for the CAPTI alignment scoring.

3.0 – CAPTI Quantitative Metrics

Nine (9) quantitative metrics are established to assess alignment with the CAPTI Guiding Principles. Each metric outlines the methodology and data requirements to perform the analysis, any known constraints, and the scoring rubric.

3.1 – Safety

The safety metric focuses on prioritizing projects that include demonstrated safety improvements, with additional emphasis on areas with observed safety needs.

Methodology

This metric uses the crash history within the project area, Safety Countermeasures, and Crash Reduction Factors (CRFs) to analyze and determine which projects will have the most impactful reduction in crashes, particularly fatal and serious injury (FSI) crashes. In addition, a traffic exposure screen (based on the projects' net effect on vehicle miles traveled (VMT)) is applied to determine the likely changes to the overall safety risk in the transportation system.

Data Requirements

To assess the Safety metric, applicants must work with a registered traffic safety engineer (Professional Civil or Traffic Engineer) to provide the following information:

- **Location data:** Provide project geographic location data using an ArcGIS Editor Form available on the Caltrans intranet.
- **Counts of Crashes:** Provide the following counts of crashes over a five-year lookback period near the project's proposed safety infrastructure, starting from the most recent year of available crash data: 1) all relevant roadway crashes, 2) FSI crashes, 3) Injury and/or Complaint of Pain crashes, and 4) pedestrian and bike crashes. This should include off-system crashes (e.g. from the Transportation Injury Mapping System (TIMS) or local data), if applicable.
- **Safety Countermeasures:** Identify proven safety countermeasures to address the dominant crash patterns aligned with the California Strategic Highway Safety Plan challenge areas. Focus on the 28 FHWA Proven Safety Countermeasures, available at https://dot.ca.gov/programs/safety-programs/proven-safety-

countermeasures/countermeasures. There is an option to add other countermeasures that are not on the FHWA list if the crash reduction factors are appropriately documented.

- **CRFs:** Identify and report context-appropriate CRFs associated with each project countermeasure in terms of expected percent reduction in crashes. This is not to be confused with the CMF (Crash Modification Factor). The CRF should be applicable to all crashes or to pedestrian and bike crashes. Cite the relevant technical reference for each CRF from Caltrans or FHWA. Caltrans CRFs should come from the latest Local Roadway Safety Manual, or Caltrans' extended list of countermeasures. Project sponsor engineers may also report other four- or five-star-rated CRFs from the Crash Modification Factors (CMF) Clearinghouse that are included in the project scope. If claiming credit for multiple countermeasures, the metric scoring team will take the three most impactful countermeasures provided and derive an aggregate project CRF based upon Existing and Alternative Methods for Combining Multiple CMFs (FHWA, 2011) or equivalent.

The metric scoring team will quality check the counts of nearby crashes based on a 30-meter buffer around the project location data. The team will also review the inclusion of all countermeasures and associated CRFs, with careful inspection of CRFs reported above 0.5 (50 percent reduction in crashes).

Metric Constraints

Automobile and roadway safety research has a deeper history, with better availability of data for auto-related crash history, crash reduction factors, and countermeasures, as compared to active transportation. To balance this, the safety metric also utilizes an expanded list of countermeasures with enhanced representation of active transportation CRFs.

Non-roadway projects (e.g., transit, freight rail, or port projects) may not have demonstrable crashes in the area nor applicable proven safety countermeasures. Transit projects will typically not have safety countermeasures unless such projects also include roadway changes as part of the project scope. Projects will receive a CRF-equivalent of 1.0 for the percentage of project scope that does not intersect the roadway, such as transit, rail, or active transportation elements. This reflects the order of magnitude safety benefits of infrastructure that does interact with vehicles within a roadway.

Observed crash history data may not capture actual safety needs. Crash data may be limited due to these reasons: 1) data availability issues (e.g., skewed underreporting of incidents such as by geography or race/ethnicity), 2) small sample sizes at the project area level creating significant variation (e.g., risk of crash may present as near-misses and close-calls), and 3) limited bicycle and pedestrian use of facilities that are deemed too dangerous, suppressing the crash history. Therefore, the metric prioritizes a project's safety improvements for scoring purposes. Safety need (with observed crash history) is a supplemental factor that can boost scores when addressed with appropriate countermeasures.

Scoring Rubric

Projects will be assessed and scored using this methodology/steps:

1. **Safety Impact Score**: This is calculated by multiplying the aggregate project CRF by ten. As such, higher scores are assigned to countermeasures that have demonstrated higher effectiveness in reducing the number and severity of crashes. Projects that eliminate conflicts between users of different modes (e.g., separated bike paths, grade separation, transit services) would receive 10 points (maximum score under Safety metric). For roadway projects containing non-roadway passenger travel components (e.g. off-road multi-use path, passenger rail), the proportion of the project made up of these components is credited with full crash reduction due to the assumption that facility users are moved from the roadway to off the roadway. The remaining proportion uses the aggregate CRF from the roadway safety elements.
2. **Crash Exposure Score**: The project is then attributed up to 4 points for a net reduction of 10 million VMT, or conversely, deducted up to 4 points for a net increase of 10 million VMT. Each project receives an adjustment from -4 to +4 points, based on VMT change divided by 10 million VMT.
3. **Crash History Score**: A crash history factor is then added to the score, which encompasses a normalized, weighted sum of crashes across severity levels, with nearly 96 percent weight assigned to FSI crashes based on monetization estimates from the Federal Highway Administration (FHWA)[2]. This factor is multiplied by 5, corresponding to logic that if a project includes no **proven safety countermeasures** and no observed need, it scores 0 points, whereas a project with no **proven safety countermeasures** and maximum observed need scores 5 points; need alone would amount to a mid-range score and, in practice, every project will include at least one improvement element to complement that need.

[2] FHWA Benefit-Cost Analysis Guidance for Discretionary Grant Programs 2025 Update II, Table A-1: Value of Reduced Fatalities, Injuries, and Crashes lists the following monetized value by crash type. Fatal Crash: $14,806,000; Injury Crash: $329,500; PDO Crash: $9,500.

4. **Total Score**: the aggregate safety score is normalized, capping the maximum score at 10 points.

Table 1: Safety Metric Score Values

Safety Component	Score
Safety Impact	Zero (no crash reduction countermeasures) to 10 points (proposed countermeasure would eliminate conflict between users of different modes). Projects with proposed countermeasures are scored by multiplying the aggregate project CRF by ten.
Crash Exposure	-4 points (net increase of 10 million VMT or more) to +4 points (net decrease of 10 million VMT or more).
Crash History	Zero (no observed history) to +5 points (maximum observed crashes) • Weighted sum of: • # of fatal and serious injuries * 0.96 • # of injury and/or complaint of pain * 0.03 • # of property damage only crashes * 0.01 • Divide weighted sum by constant 600, a reasonable maximum raw, observed crash volume.[3] • Multiply by 5
Normalization Factor	Capped to provide the maximum score of 10 points

[3] The 80th percentile for projects assessed in SB 1 Cycle 4.

3.2 – Vehicle Miles Traveled (VMT)

The VMT metric assesses a project's net effect on VMT for the purpose of prioritizing projects that reduce VMT.

The scoring of this metric is based on the result of project-level VMT analysis that is completed during project development. If the project has identified VMT mitigation strategies, VMT reduction from the mitigation measures is factored into the project's net VMT calculations. Unlike how VMT is evaluated under the California Environmental Quality Act (CEQA), the CAPTI Alignment VMT Metric does not evaluate VMT based on a threshold of significance, nor does it consider the project's significance of impact determination under CEQA.

Methodology

The VMT metric measures a project's net effect on VMT, including induced VMT and/or VMT reduction associated with transportation projects. Applicants will provide annual VMT estimates developed as part of the project's environmental review process. Estimates are verified and confirmed in consultation with the Caltrans Director's Office of Sustainability, VMT Reduction Branch. If necessary, additional information gathered from the project's location and scope provided during the nomination process may be used to verify the estimates. If a full VMT estimate has not been developed (e.g., the project has not yet completed environmental review), the project will be scored based on the estimated range of potential VMT increase or reduction from either the draft environmental document or Project Initiation Document (PID). For projects with multiple alternatives under study, the worst score in the range will be selected.

If VMT mitigation is part of a project, the project sponsor should provide information on the nature of the mitigation, the estimated VMT reduction, and the source of information for calculating the reduction. These mitigations will be factored into the project's net effect on VMT to calculate the project's overall VMT score.

Projects that do not increase VMT are not required to estimate the VMT reduction in the environmental process. However, we encourage applicants to provide estimated VMT reduction based on travel demand model (TDM) outputs, estimated ridership, or usage figures in order to receive additional points for the VMT metric.

Data Requirements

To assess the VMT metric, the required information will vary based on whether the project is VMT reducing or increasing.

- **VMT-reducing Projects:** Provide a VMT estimate based on the Caltrans SB 743 Program Mitigation Playbook and/or the California Air Pollution Control Officers Association GHG Handbook. If an estimate was not prepared, contact the metric scoring team for assistance.
- **VMT-increasing Projects with no Final Environmental Document:** Provide the approved PID and/or any draft environmental documents or analysis.
- **VMT-increasing Projects with Final Environmental Document that Predates SB 743:** Provide a VMT estimate following methodologies described in the most recent Caltrans Transportation Analysis Framework document available on the Caltrans SB 743 Implementation Resources page. This may include using elasticity-based methods such as the National Center for Sustainable Transportation (NCST) Calculator if the project is in an applicable county, and/or a TDM that has been reviewed by the Caltrans Director's Office of Sustainability, VMT Reduction Branch, and deemed adequate for estimating induced travel.
- **VMT Mitigations or other VMT-reducing Elements:** If VMT-reducing elements are identified, either as part of the project scope or mitigation measures, provide information on the nature and specifics of the mitigations, the estimated VMT reduction, and the sources for calculating the reduction.
- **No VMT Impact:** Project type must be non-VMT-inducing (e.g., zero-emission vehicle infrastructure) or provide data and analyses to support a no VMT impact determination.

The metric scoring team will verify the VMT estimates based on project location and scope.

Metric Constraints

Evaluating the scope of VMT mitigations and inclusion into a project may not adequately capture the full scope of VMT reductions or additions. TDM models across different jurisdictions vary in methodology and data quality, and therefore, VMT estimates produced by different TDMs may not compare equally across the board. Projects with environmental documents approved pre-SB 743 may not have estimates on induced VMT. The VMT metric may not be sufficient to meet the California Air Resources Board (CARB) Scoping Plan goals.

Scoring Rubric

For the VMT metric, a neutral score of 5 points is assigned to projects that do not have any net effect on VMT. The project's score is scaled between 5 and 10 points for VMT reducing projects, with 10 points corresponding to a reduction of

10 million VMT annually, and between 0 and 5 points for VMT increasing projects, with 0 points corresponding to an increase of 10 million induced VMT annually.

Table 2: VMT Metric Score Values

Score	**Description**
>**5 to 10**	Scaled between 5 and 10, with a score of 10 representing 10 million Annual VMT reduced
5	No VMT Change
0 to <5	Scaled between 0 and 5, with a 0 representing a 10 million Annual VMT increase

3.3 – Accessibility

The Accessibility metric assesses the change in ability of people to reach work and non-work destinations across different modes of transportation. More specifically, the Accessibility metric measures the expected population-weighted average change (pre- and post-project) in accessible destinations (work and non-work[4]) across four (4) modes (pedestrian, bicycle, transit, and automobile) that are within a two-hour travel time buffer of a proposed transportation project. Accessibility is defined as the ease with which people may reach destinations such as jobs, stores, parks, schools (sometimes referred to as “opportunities”). “Ease” is measured in terms of travel time, with some adjustments to account for how travelers use the system[5] (SSTI, 2021).

Methodology

Overall Metric

The Accessibility metric measures the population-weighted average change in accessibility across four (4) modes, meaning a project’s score is determined by how much it changes accessibility for a given mode, as well as how many modes are impacted. For example, a project may increase the frequency of a local bus service. Another project may provide the same level of transit benefits and construct a bike/ped bridge over a nearby highway. The second project would receive a higher score, since it increases accessibility for three modes (transit, bike, ped), whereas the first project only increases accessibility for one mode, transit.

Accessibility analysis is conducted for two (2) destination types: jobs and non-work destinations (schools, grocery stores, etc.). Destinations are weighted by travel time using an exponential decay function, so that destinations that take longer to reach are weighted less than those that can be reached within a shorter amount of time. A decay function is calibrated for each project-specific mode to best capture the specific accessibility benefits provided in each unique project context.

In practice, a specific decay curve will produce optimal results (the highest score) for a given project depending on the project’s characteristics and surrounding land use context. For example, a steep decay curve (i.e., 30 minutes) would be best suited for modeling a neighborhood-scale pedestrian project, where most of the expected accessibility benefits are realized by shorter

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[4] Non-work destinations are also referred to “points of interest”, or POIs.
[5] https://ssti.us/wp-content/uploads/sites/1303/2020/12/Measuring-Accessibility-Final.pdf

trips (like walking to the corner store). Conversely, a longer decay curve (i.e., 120 minutes) would be best for projects that serve longer trips, such as an intercity rail project where most of the accessibility benefits are realized by longer trips. To account for this effect, the analysis is conducted for five (5) decay curves (30 minutes, 45 minutes, 60 minutes, 90 minutes, and 120 minutes), and the curve producing the highest absolute change in accessibility is used for project analysis purposes. Figure 3 illustrates the exponential decay curves used in all accessibility related metrics within the CSIS.

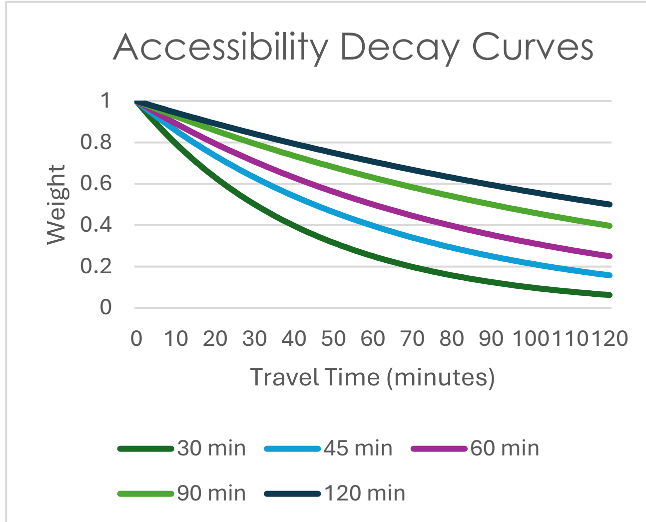

Figure 3: Exponential Decay Curves.

This also resolves the issue of fixed time cutoffs where no accessibility benefits are captured if they occur beneath a certain threshold. As an example, if a one-hour threshold without decay-weighting was utilized, a transportation project that would decrease the travel time to a given destination from one hour and one minute to 59 minutes would result in one additional accessible destination. However, a destination that went from 59 minutes to 30 minutes would have no impact on the metric, despite seeing a much larger decrease in travel time. Decay-weighting ensures that all destinations (and by extension project benefits) are measured.

Accessibility calculations are performed for all origins in a given region, with all destinations in the surrounding region considered[6]. For each project mode, baseline and build scenarios are computed and the difference in accessibility is calculated for each destination type by subtracting the baseline accessibility values from the build accessibility values for each origin. Accessibility change values are then averaged within a fixed buffer area around the project alignment[7] and weighted by the relevant population in each origin.

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[6] Origins and destinations are operationalized as 216 by 216-meter grid cells.

[7] Analysis buffers are drawn based on the distance that someone could hypothetically travel within a two-hour window utilizing a given mode. This approach is straightforward for pedestrian and biking modes as these have fixed speed assumptions. Transit and automobile modes have variable speeds, therefore, average speeds are calculated using average observed speeds. The buffer areas used for this analysis, by each mode are: Biking: 24km, Walking: 7.2km, Transit: 48km, Auto: 90km.

Transportation Networks by Mode

The following sections discuss individual modal and land use modeling methodology and assumptions in further detail.

Pedestrian Mode

For pedestrian accessibility analysis, Open Street Map (OSM) data is utilized to perform routing calculations based on the presence of network links where walking is allowed. Currently, the analysis doesn't explicitly factor in the presence of sidewalks unless specifically identified in the analysis process.

For project analysis purposes, project components that either add new pedestrian network links and/or increase the quality of existing links are considered. For routing purposes, network links are either considered traversable or non-traversable. In some cases, projects include the addition of sidewalks in locations where sidewalks are lacking, but where walking is technically allowed in the underlying OSM network. In these cases, the baseline scenario is modified to prohibit walking on these links to ensure the benefits of the added sidewalk links are captured. An analysis is run using both the baseline and modified networks to isolate the accessibility changes attributable to the project. For all analysis involving walking, a fixed walk speed assumption of 3.6 kilometers/hour is used.

Bicycle Mode

For bike accessibility analysis, OSM data is utilized to perform routing calculations based on the presence of network links where cycling is allowed as well as the Level of Traffic Stress (LTS) of said links. LTS is calculated using a simplified methodology that can be operationalized with limited data. For routing purposes, low-stress network links (LTS 2 and below) can be traversed at normal bike speed (12 kilometers/hour). High-stress links (LTS 3 and above) can only be traversed at walk speed (3.6 kilometers/hour), assuming that a cyclist would walk with their bike on the side of the road if conditions were high-stress.

For project analysis, project components that either reduce the LTS on an existing network link to low-stress and/or create new low-stress network links are considered. An analysis is run using both the baseline and modified networks to isolate the accessibility changes attributable to the project.

Transit

For transit accessibility analysis, General Transit Feed Specification (GTFS) data is utilized to perform routing calculations based on scheduled fixed-route transit service in California. For each Origin-Destination pair, total travel time is calculated, including the access/egress walk legs, time waiting for transit, in-vehicle travel time, and transfer time if applicable.

For each transit analysis, 1,200 trips are simulated for each origin-destination pair using randomly generated departure times during the AM peak period and the 50th percentile (median) travel time. This adjusts for variance in travel time caused by trip start time and which specific transit routing is used (where there are multiple routing options).

For project analysis purposes, project information is translated into GTFS modifications, which are then applied to the overall network. An analysis is run using both the baseline and modified networks to isolate the accessibility changes attributable to the project.

<u>Automobile Mode</u>

For auto accessibility analysis, OSM data is utilized to perform auto routing calculations based on auto-accessible roadway network links and posted speed limits. If alternative speed assumptions are provided for certain links, they can be incorporated into the analysis.

For project analysis purposes, project components that either change auto speeds on the existing network or add/remove network links are analyzed. Project sponsors must provide estimated baseline and build speed assumptions for applicable network links as well as geographic data on any new or removed network links. By default, AM peak period speeds are modeled, but the metric can consider other time periods on a case-by-case basis if a non-AM peak period is more relevant to the project. Speed changes are analyzed in relation to the full network link, so individual lane speeds are averaged, weighted by AADT. This is mainly applicable in the case of managed lane projects, where individual managed and general-purpose lane speeds are typically calculated.

An analysis is run using both the baseline and modified networks to isolate the accessibility changes attributable to the project.

Land Use

<u>Destinations</u>

Employment location (jobs) data is accessed via the U.S. Census Bureau's Longitudinal Employer-Household Dynamics (LEHD) dataset, which is compiled using administrative data from the federal government. The estimated number of jobs in each Census block is interpolated into a regular grid which is used to perform accessibility calculations. For this metric, all job types are considered, although jobs can be stratified by industry as well as various characteristics of the job holder. Jobs are treated as a destination type in the metric.

Non-work destination data was purchased from the data vendor HERE in 2022. Destinations were cleaned and classified as "core" and "other", with other destinations receiving half the weight of core destinations. Core destinations are those of higher importance, such as medical services, grocery stores, and educational facilities. Each core destination is counted as one destination for measurement purposes. Other destinations, while still important, don't have the same importance as core destinations since they are not essential, or aren't visited regularly. As an example, a coffee shop would be an "other" destination. Every "other" destination is counted as one half for measurement purposes. A complete list of non-work destinations can be found on page 42 of the Caltrans Transportation Equity Index (EQI) documentation. Non-work destinations are treated as a destination type in the metric.

Population Data

While destination data represents *what* and *how much* people can access, population data represents *who* is the beneficiary of improved access. This is relevant in two keys ways. First, population data can be used to understand which groups specifically benefit from access improvements. In the CSIS investment framework, access improvements for the total population, workers, and low-income residents are quantified. Secondly, population data can ensure that access benefits serve a maximum number of people as possible. For example, an access-enhancing project (i.e., a new infill rail station) would provide more access if located in a higher density residential area, rather than in a sparsely populated area.

Total population data is accessed via the U.S. Census Bureau's American Community (ACS) Survey 5-Year Estimates B01003 table, at the block group-level. Block group-level data is then interpolated into a regular grid where it is used to weight accessibility analysis results.

For job accessibility analyses, changes in job access are weighted by employee residential location. This data is also accessed via the LEHD dataset and is available at the census block-level. The estimated number of employees in each Census block is interpolated into a regular grid which is used to weight job accessibility analysis results.

Custom Land Use Data

For most projects, the standardized land use datasets discussed above will produce reasonable results. However, there are cases where a planned transportation project is dependent on, or enables, a complementary land use project. For example, a new rail station at an infill site might be proposed to serve a future housing development. If this land use project has not been delivered, it will not be accurately reflected in Census data and may negatively impact the project score. If such land use projects exist, custom land use scenarios can be developed to ensure future project benefits are accounted for.

Modal Score Combination and Threshold Setting

The Accessibility metric calculates the population-weighted change in access to destinations, expressed as the number of additional destinations accessible for the average resident/worker, post-project implementation. For project scoring purposes, thresholds were developed to scale accessibility outputs to the CSIS scoring scale, where accessibility increases that are greater or equal to the threshold value receive full points.

Since accessibility outputs are not on the same scale across modes, destination types, and decay curves, a specific threshold was developed for each scenario[8]. These thresholds are defined as 1 percent of the population-weighted statewide average accessibility for a given mode/destination/decay curve combination. Table 1 shows all threshold values utilized in the Accessibility metric. Each project is assessed using all decay curves and results are scaled between 0 and 10 points using the applicable threshold. As previously discussed, the decay curve producing the highest accessibility change is utilized for CSIS accessibility analysis purposes.

Table 3: Accessibility Decay Curve Thresholds

Mode	Cutoff	Avg. Job Access	Avg. POI Access	Job Threshold	POI Threshold
Pedestrian	30	20,995	255	209.9	2.5
Pedestrian	45	33,611	402	336.1	4.0
Pedestrian	60	43,388	516	433.9	5.2
Pedestrian	90	56,761	672	567.6	6.7
Pedestrian	120	65,243	770	652.4	7.7
Bike	30	83,984	979	839.8	9.8
Bike	45	131,674	1,518	1,316.7	15.2
Bike	60	168,330	1,931	1,683.3	19.3

[8] While a relative metric (percent change) is normalized across modes, destination types, and decay curves, absolute accessibility changes are not. For example, the number of additional jobs accessible for a given auto project will be much higher than for a bike project in most cases, since it is possible to drive much further within two hours than it is to bike.

Mode	Cutoff	Avg. Job Access	Avg. POI Access	Job Threshold	POI Threshold
Bike	90	218,216	2,491	2,182.2	24.9
Bike	120	249,749	2,844	2,497.5	28.4
Transit	30	148,025	1,717	1,480.3	17.2
Transit	45	262,304	3,043	2,623.0	30.4
Transit	60	354,400	4,113	3,544.0	41.1
Transit	90	483,408	5,612	4,834.1	56.1
Transit	120	566,530	6,578	5,665.3	65.8
Auto	30	2,049,624	23,983	20,496.2	239.8
Auto	45	2,899,968	34,232	28,999.7	342.3
Auto	60	3,506,418	41,598	35,064.2	416.0
Auto	90	4,291,222	51,180	42,912.2	511.8
Auto	120	4,769,969	57,047	47,699.7	570.5

Though accessibility is analyzed on a mode-by-mode basis, many transportation projects include components that impact accessibility for multiple modes. For example, a highway project may aim to decrease auto travel times along a corridor, while also providing faster or additional transit service or low stress bike facilities. In such cases, separate accessibility analyses are conducted for each mode.

Modal-specific scores are then combined across modes using a simple average. If a project doesn't impact a given mode, its modal score is set to 5 points to ensure that any additional modal accessibility can only increase the overall metric score. Overall, eight (8) individual accessibility scores are averaged (four (4) modes times two (2) destination types), and the final total metric score is capped at 10 points.

However, individual modal scores are not capped at 10 points if their increase in accessibility exceeds the applicable thresholds. Typically, projects perform well by increasing accessibility for multiple modes, and/or significantly increasing accessibility for a single mode to an extent where it outweighs the zeros of the non-applicable modes in the overall average. For example, project A may impact all four (4) modes, producing eight (8) individual accessibility scores of 7.5 points. When averaged together, project A would receive a score of 7.5 points. Project B would only increase transit accessibility, but do so by a lot, resulting in two (2) transit accessibility scores of 25 (for work and non-work destinations), with all other modal scores set at a neutral 5 points. When averaged, the overall project score would score 10 points, despite accessibility impacts for one mode.

Data Requirements

The following information is required to run the Accessibility metric for a proposed transportation project:

- **Location Data**: Provide project geographic location data using an ArcGIS Editor Form available on the Caltrans intranet.
- **Project Mode(s)**: Provide the mode(s) included in the project scope and which the project scope impacts. For example, a new class I bike/ped path would likely impact bike and ped modes and possibly access to transit modes if it improves first/last mile connections.
- **Transit Schedule Information (for transit only)**: If a project is anticipated to impact transit service, provide schedule information for both the existing and proposed transit service. This information should include frequency, speed (can be expressed as stop times), and new alignments/stops if applicable.
- **Auto Speed Data (for auto projects only)**: If a project is anticipated to impact auto speeds, both baseline and build auto speeds for the impacted network links must be provided. If the project has a completed benefit-cost model, the same speed assumptions can be utilized.
- **Change in Land Use (optional)**: If a project is serving a location with a near-term[9] expected change in land use (i.e., new housing, jobs, or non-work destinations), those can be provided by the project sponsors to adjust the relevant accessibility scores. For future land use to be considered, approximate changes in the number of people, jobs, and or non-work destinations must be provided at the Census block level.

Metric Constraints

The Accessibility metric focuses on the transportation and land use-driven components of access, but it has certain limitations as it pertains to access in a broader sense of the term. For example, access to healthcare services involves much more than physical proximity, as access to these facilities is often determined by insurance status, income, etc.

The current metric measures pedestrian access based on existing facilities, regardless of the presence of sidewalks. If there are no sidewalks and a project proposes to add sidewalks, the model assumes pedestrians can walk along a facility where they could not before. Future revisions to the metric will develop a pedestrian LTS approach, where more nuanced enhancements to the network can be properly analyzed.

[9] "Near-term" is defined as groundbreaking within one year of project opening.

For auto access, the baseline network speeds are derived from posted speed limit data from OSM. For a given project or scenario, these speed assumptions can be replaced with observed speed data from Replica and/or speed data provided by the applicant to account for the difference between project build and no-build speeds to capture the travel time savings benefits of operational improvements.

Lastly, the metric utilizes a simplistic approach to modeling bicycle facilities due to a lack of statewide facility data. For bike access, improvements to existing facilities are measured in terms of LTS, where a project can make improvements to change a formally high stress facility into a low stress one. Future revisions to this metric may take a more nuanced approach to LTS and not simply measure the difference between the high and low stress network.

Scoring Rubric

Table 4: Accessibility Metric Score Values

Score	Description
>5 to 10	Population-weighted average change in access is scaled between 5 and 10 points, where 10 points corresponds to an increase in population-weighted access >= *i*[10]
5	No change in population-weighted access
0 to <5	Population-weighted average change in access is scaled between 0 and 5 points, where 0 points corresponds to a decrease in population-weighted access >= *i*

[10] *i* refers to the applicable threshold value for a given mode/destination type/decay curve combination, shown in Table 1.

3.4 – Disadvantaged Communities (DAC) – Access to Jobs and Destinations

The DAC – Access to Jobs and Destinations Metric assesses a project's ability to provide transportation access to economic opportunities and other destinations for DACs.

This metric is similar to the Accessibility metric but differs in two ways. 1) While the Accessibility metric measures the population-weighted average change in accessible destinations attributable to a project, this metric measures the change in relative terms, as population-weighted percent change. This ensures that even small changes in accessibility, if significant relative to a community's baseline level of accessibility, can yield a high score. 2) This metric utilizes DAC population weights, instead of worker and total population weights, to specifically measure accessibility changes for DAC populations, rather than the population at large.

For the purposes of this metric, DACs are defined in a manner consistent with the Caltrans Transportation Equity Index (EQI) and refer to all people living in Assembly Bill (AB)-1550-defined low-income households. This approach ensures that all low-income residents are captured, even if they live in higher income areas.

<u>Methodology</u>

Overall Metric

This metric measures the DAC population-weighted percent change in access to destinations across four (4) modes (bike, ped, transit, and auto) for two (2) destination types (jobs and non-work destinations). An average is calculated across all eight (8) accessibility change values, and the overall average is rescaled between 0 and 10 points, where 0 points represents a decrease of 1 percent or greater, 5 points represents no change, and 10 points represents an increase of 1 percent or greater. For a given project, modes that don't impact accessibility are assessed as 0 percent change and still contribute towards the overall average, so additional modal components only serve to increase overall accessibility scores.

Similar to the Accessibility metric, analysis is run using multiple decay functions (30 minutes, 45 minutes, 60 minutes, 90 minutes, and 120 minutes), and the highest percent change value is utilized. For a more detailed discussion on decay functions and accessibility calculations, refer to Section 3.3—Accessibility.

DAC Weighting Factor

One of the primary differences between the Accessibility Metric and this metric is the population weighting. Population weighting is a key aspect of accessibility analysis and accounts for where accessibility impacts occur, and which populations are the most impacted. The Accessibility metric utilizes two (2) population weighting factors, the home location of workers and the total population. This particular metric utilizes one (1) weighting factor, the residential location of DAC residents, defined as estimated members of AB-1550[11] low-income households.

The DAC weighting factor is calculated based on three (3) primary components: 1) The county where the block group is located, 2) household income levels, and 3) average household size. American Community Survey (ACS) data is used to estimate the number of low-income households within each block group, and the number of residents is estimated by applying an average household size expansion factor. County-specific income thresholds set by the California Department of Housing and Community Development (HCD) are used in part to establish low-income status, so estimates account for the local cost of living, ensuring lower-income residents in high cost of living areas are captured.

Accessibility analysis results are weighted by the DAC weighting factor, measuring the degree to which members of DACs benefit from increases in accessibility. If the accessibility benefits of a project disproportionately go towards DACs, the project will receive a higher score, whereas it may receive a lower score if the benefits primarily serve more affluent areas.

Data Requirements

To assess the DAC – Access to Jobs and Destinations metric, the following information is required:

- **Location Data**: Provide project geographic location data using an ArcGIS Editor Form available on the Caltrans intranet.
- **Project Mode(s)**: Provide the mode(s) included in the project scope and which the project scope impacts. For example, a new class I bike/ped path would likely impact bike and ped modes and possibly access to transit modes if it improves first/last mile connections.
- **Transit Schedule Information (for transit only)**: If a project is anticipated to impact transit service, provide schedule information for both the existing

[11] AB-1550 defines low-income households as those at or below 80 percent of the statewide median household income and/or below the Department of Housing and Community Development (HCD)-defined low-income limit.

and proposed transit service. This information should include frequency, speed (can be expressed as stop times), and new alignments/stops if applicable.

- **Auto Speed Data (for auto projects only)**: If a project is anticipated to impact auto speeds, both baseline and build auto speeds for the impacted network links must be provided. If the project has a completed benefit-cost model, the same speed assumptions can be utilized.
- **Change in Land Use (optional)**: If a project is serving a location with a near-term[12] expected change in land use (i.e., new housing, jobs, or non-work destinations), those can be provided by the project sponsors to adjust the relevant accessibility scores. For future land use to be considered, approximate changes in the number of people, low-income residents, jobs, and or non-work destinations must be provided at the Census block level.

Metric Constraints

This metric is similar to the Accessibility metric (**Section 3.3**) in terms of metric constraints.

Scoring Rubric

Points are assigned based on the following percent change in accessibility ranges:

Table 5: DAC Access to Jobs and Destinations Metric – Score Values

Score	Description
>5 to 10	Percent change is scaled between this score range, where 10 points corresponds to >1% increase in DAC population-weighted access.
5	0% change in DAC population-weighted access.
0 to <5	Percent change is scaled between this score range, where 0 points corresponds to >1% decrease in DAC population-weighted access.

[12] "Near-term" is defined as groundbreaking within one year of project opening.

3.5 – Disadvantaged Communities (DAC) – Traffic Impacts

The DAC – Traffic Impacts metric evaluates a project's potential to place new or exacerbate existing burdens on DACs, in the form of additional automobile and truck traffic exposure.

<u>**Methodology**</u>

Overall Metric

The DAC – Traffic Impacts metric quantifies the change in projected truck-weighted Annual Average Daily Traffic (AADT) that could impact DACs, based on the Caltrans Transportation Equity Index (EQI) Traffic Exposure Screen. Truck-weighted AADT is defined as AADT where truck traffic is weighted 6 times greater than auto traffic, consistent with the EQI methodology. This is based on emission figures from the California Air Resources Board (CARB) and may be refined in a future version of the EQI. DACs are defined as Census blocks that are either low-income (per AB 1550) and/or intersect a Tribal Land and are at or above the 80th percentile for truck-weighted traffic proximity and volume, consistent with the EQI Traffic Exposure Screen.

To evaluate the effects of additional traffic to DACs, a project's auto component locations are buffered by 500 meters and intersected with the EQI Traffic Exposure Screen. The truck-weighted change in AADT is then multiplied by the number of people residing in each intersected EQI DAC and summed to calculate a truck-weighted AADT impact score. Projects that are not within 500 meters of a DAC will receive a neutral score on this metric, regardless of the change in AADT. Projects that do not change truck-weighted AADT but are within 500 meters of a DAC will also receive a neutral score.

Projects score poorly by increasing truck-weighted AADT within 500 meters of screened communities, especially those with higher population densities. Projects score well by doing the opposite — decreasing truck-weighted AADT within 500 meters of higher-density screened communities. When a project diverts traffic away from a heavily populated DAC but doesn't reduce the traffic (i.e., a bypass project), it can score positively, as the metric is primarily concerned with the geographic location of traffic in relation to DACs, not the total amount of traffic on its own.

Thresholds

Since the DAC – Traffic Impacts metric is a quantitative measure of the interaction between changes in traffic burden and the location of impacted DACs, thresholds were developed to account for both factors.

The truck-weighted AADT impact score threshold of 3 was developed using hypothetical project assumptions based on observed data. The assumption is a 10 percent increase in truck-weighted AADT along a one-mile stretch of busy[13] urban highway, surrounded by low-income, high-density[14] residential development. A project with these assumptions would yield a raw truck-weighted AADT impact score of 293,174,653. For simplicity, this score is rounded to 300,000,000 and divided by 100,000,000 to produce a truck-weighted AADT impact score of 3. Project AADT impact scores are scaled between 0 and 10 points, where 0 points represents an increase in truck-weighted AADT impact score of 3 or greater, and 10 points corresponds to an AADT impact score decrease of 3 or greater.

Data Requirements

To assess the DAC – Traffic Impacts metric, the following information is required:

- **Truck & Non-Truck AADT:** Project sponsors must provide the projected new AADT for cars and trucks in the no-build and build scenarios. Typically, these estimates come from either a Traffic Operations Analysis Report (TOAR) or a Cal B/C model. Other traffic data sources may be appropriate but will need to be evaluated by the metric scoring team to ensure a fair comparison. If the estimate is a range, the lowest-scoring end of the range will be used for this metric scoring.

Metric Constraints

- Projects that increase capacity, or otherwise substantively change the transportation network will likely impact traffic patterns. In reality, these impacts are regional and aren't constrained to the project segment. However, the largest impacts are typically felt in and around the project limits. Since the metric relies on traffic data and spatial data of the project location, it is calibrated to project location-scale impacts and doesn't capture broader regional impacts unless they are specifically identified in the input data. For some project types---such as those intended to divert traffic away from a given route---it may be necessary to identify both the project location and expected traffic diversion route. Lastly, project components that are intended to reduce traffic (i.e., transit) may not have estimated traffic reduction data available on the roadway

[13] "Busy" is defined as the 80th percentile AADT value for highway segments in the state. This figure is 133,000 AADT. Assuming a 15 percent truck share, a 10 percent increase in truck-weighted AADT here is 23,275 AADT.
[14] High-density is defined as the 80th percentile block group population density, which is 13,602 people per square mile.

segment level. If this data is available, projects can receive points for reducing traffic burdens.

- This metric does not distinguish between zero-emission vehicle (ZEV) traffic and non-ZEV traffic. While ZEVs may lessen some traffic impacts, they still emit particulates from tire and brake wear and produce noise[15]. Furthermore, truck traffic is weighted by a factor of 6 relative to auto traffic and does not account for difference in truck type. These weighting assumptions are consistent with the EQI. Future versions of the EQI may be updated to better account for the nuances between different types of vehicles and trucks.

Scoring Rubric

Table 6: DAC Traffic Impacts Metric - Score Values

Score	Description
>5 to 10	Change in truck-weighted AADT impact score is scaled between 5 and 10 points, with 10 points corresponding to a decrease in truck-weighted AADT impact score of 3 or greater.
5	No change in AADT anticipated, or no impact on DACs.
0 to <5	Change in truck-weighted AADT impact score is scaled between 0 and 5 points, with 0 points corresponding to an increase in truck-weighted AADT impact score of 3 or greater.

[15] https://dot.ca.gov/programs/esta/sb-743/resources/10-years-sb743

3.6 – Passenger Mode Shift

The Passenger Mode Shift metric quantifies a transportation project's potential to shift travelers from single occupancy vehicles (SOVs) to higher occupancy vehicles and non-auto modes. Mode shift is primarily measured as the change in ratio between non-auto accessibility and auto accessibility. Additionally, it also considers the presence of certain qualified mode shift-supporting project components that can't be directly quantified using accessibility analysis.

The metric assumes that an increase in non-auto (walk, bike, and transit) access to destinations relative to automobile access to destinations encourages and enables an increased use of non-auto modes. Conversely, an increase in automobile access to destinations relative to non-auto access to destinations would encourage the opposite—more driving.

For example, a project that only increases automobile access to destinations without increasing bike, ped, or transit access to destinations will see a negative change in mode shift ratio, as the utility of non-auto modes decreases relative to auto as a result of the project. A project that increases non-auto access to destinations without increasing automobile access to destinations will see the opposite effect—an increase in the mode shift ratio since the utility of non-auto modes increases relative to auto. In reality, many projects contain elements that impact access to destinations for both auto and non-auto, so the metric determines which impacts are more significant.

Many parts of the state have very low baseline mode shift ratios, where residents can reach fewer than 5 percent of accessible auto destinations by non-auto modes. In some urbanized areas with dense land uses and high frequency transit networks, such as downtown San Francisco and Los Angeles, this ratio can be higher. The metric considers change in ratio, so projects in these lower baseline mode shift ratio areas can still score well, if the change is significant.

Some projects include mode shift-supportive components that can't be directly quantified using accessibility analysis. For example, a highway project may include transit fare subsidies as part of its vehicle miles traveled (VMT) mitigation plan, which wouldn't directly impact accessibility as it is analyzed within the CSIS context. However, lower transit fares encourage transit use and support mode shift away from SOV travel. Therefore, additional points are considered under this metric's methodology based on the presence and expected effectiveness of these components. The scoring rubric for this metric list such project-eligible components and related additional points.

Methodology

Overall Metric

Accessibility Analysis

The metric is measured by calculating the population-weighted average change in mode shift ratio across three modes (transit, bike, and ped) for both work and non-work destinations. The mode shift ratio is calculated as follows for each given non-auto mode $\boldsymbol{i}$:

$$\frac{(Number\ of\ Decay - Weighted\ Destinations\ Accessible\ by\ Non - Auto\ Mode\ \boldsymbol{i})}{Number\ of\ Decay - Weighted\ Destinations\ Accessible\ by\ Auto}$$

This ratio is calculated for each origin point in the region for both the baseline and build scenarios. The baseline ratios are then subtracted from the build ratios to get the change in ratios. Lastly, a population-weighted average of the change in ratio values is calculated within the study area.

While the Accessibility and DAC – Access to Jobs and Destinations metrics define the study area of a given mode as a fixed buffer around said mode's component locations, the Passenger Mode Shift metric defines the study area of a given mode as a fixed buffer around a combination of both non-auto and auto component locations. For example, if a project included a new High Occupancy Toll (HOT) lane and increased transit service, the following study areas would be utilized:

- A 48 km buffer around the combined new HOT lane and impacted transit service
- A 24 km buffer around the new HOT lane (to measure the decrease in bicycle mode shift ratio)
- A 7.2 km buffer around the new HOT lane (to measure the decrease in pedestrian mode-shift ratio)

Similar to the approach utilized in the Accessibility metric, mode shift scores are calculated using five (5) decay functions (30 minutes, 45 minutes, 60 minutes, 90 minutes, and 120 minutes), but the median average change value is used instead of the maximum for scoring purposes.

The population-weighted average change in ratios is calculated for all three (3) non-auto modes (transit, bike, and ped) and two (2) destination types (work and non-work) yielding six ratios. Thereafter, an average of the six (6) ratios is calculated. If a given ratio is zero, that score still contributes towards the final average, so additional non-auto modal components serve to increase the overall average.

Lastly, the average change in mode shift ratio is scaled between 0 and 10 points, with 0 points corresponding to a decrease in mode shift ratio of 0.0013 or greater, 5 points corresponding to no change in mode shift ratio, and 10 points corresponding to an increase in mode shift ratio of 0.0013 or greater.

Components for Additional Points

Though several mode shift-supportive project components can be adequately captured using accessibility analysis (which is the preferred method given its precision and applicability to all modes), some project components are not captured by Caltrans' current accessibility metrics but provide benefits towards mode shift. For example, transit fare reduction can have a direct benefit on mode shift but is currently not captured in the accessibility metrics. Conversely, the construction of high-quality bike facilities is adequately captured using accessibility analysis.

On occasion, projects will include components that can't be captured using accessibility analysis but are mode shift supportive. These project components are often part of VMT mitigation plans, as they also provide quantifiable VMT reduction benefits. Additional points are assigned in the passenger mode shift metric if these types of project components are present, based on greenhouse gas (GHG) reduction measures in the California Air Pollution Control Officers Association (CAPCOA) Handbook for Analyzing Greenhouse Gas Emission Reductions, Assessing Climate Vulnerabilities, and Advancing Health and Equity. The number of available points for each component type is based on the effectiveness of each component, as quantified in CAPCOA.

After a project score is calculated using the mode shift ratio, points are added to the score based on the presence of additional mode shift supportive components. Only 3 points can be added at a maximum, and the final score is capped at 10 points. Table 2 below shows the eligible project components for additional points, as well as the number of available points associated with each component.

Only components that are included in a certified environmental document will be counted towards the final score.

Table 7: CAPCOA Mode Shift Supportive Components

Measures/Components	Added Points
Implement Conventional Carshare Program	.33
Implement Electric Carshare Program	.33
Implement Pedal (Non-Electric) Bikeshare Program	.33
Implement Electric Bikeshare Program	.33
Implement Electric Scooter share Program	.33
Reduce Transit Fares	.33
Provide Community-Based Travel Planning	.33
Implement Commute Trip Reduction Program (Voluntary)	.33
Implement Commute Trip Reduction Marketing	.33
Provide End of Trip Bicycle Facilities	.33
Implement Subsidized or Discounted Transit Program	.33
Provide Ridesharing Program	.33
Implement Employee Parking Cash Out	.67
Limit Residential Parking Supply	.67
Unbundle Residential Parking Costs from Property Costs	.67
Price Workplace Parking	1
Provide Employee-Sponsored Vanpool	1
Implement Commute Trip Reduction Program (Mandatory Implementation and Monitoring)	1
Implement Market Price Public Parking (On-Street)	1

Data Requirements

To assess the Passenger Mode Shift metric, the following information is required:

- **Location Data**: Provide project geographic location data using an ArcGIS Editor Form available on the Caltrans intranet.
- **Project Mode(s)**: Provide the mode(s) in which the project scope impacts. For example, a new class I bike/ped path would likely impact bike and ped modes and possible transit if it improved first/last mile connections.
- **Transit Schedule Information (for transit only)**: If a project is anticipated to impact transit service, provide schedule information for both the existing and proposed transit service. This information should include frequency,

speed (can be expressed as stop times), and new alignments/stops if applicable.

- **Auto Speed Data (for auto projects only)**: If a project is anticipated to impact auto speeds, both baseline and build auto speeds for the impacted network links must be provided. If the project has a completed benefit-cost model, the same speed assumptions can be utilized.
- **Change in Land Use (optional)**: If a project is serving a location with a near-term expected change in land use (i.e., new housing, jobs, or non-work destinations), those can be provided by the project sponsors to adjust the relevant accessibility scores. For scoring purposes, new land use projects that are in or through the entitlements phase will be considered. For future land use to be considered, approximate changes in the number of people, jobs, and or non-work destinations must be provided at the Census block level.
- **List of additional mode shift-supportive project components and supporting documentation (if applicable)**.

Metric Constraints

The Mode Shift metric is not designed to be a predictive model. It simply quantifies how non-auto access changes relative to auto access to assess the mode shift potential of a given project. Furthermore, the additional component list may not be comprehensive, and their point value is generalized based on the anticipated effectiveness of each component.

Scoring Rubric

A project's population-weighted change in mode shift ratios is calculated and points are assigned based on the following criteria. Where applicable, additional points will be added to the base score shown in Table 2, but only three points can be added at a maximum, and the final score is capped at 10.

Table 8: Mode Shift Metric Score Values

Score	Description
>5 to 10	Change in ratio is scaled in this score range, where 10 points corresponds to >= 0.0013 change in the average population-weighted mode shift ratio across the region.
5	No change in population-weighted mode shift ratio.
0 to <5	Change in ratio is scaled in this score range, where 0 points corresponds to a <= -0.0013 change in the mode shift ratio corresponding to a shift towards more auto-accessible destinations post-project implementation.

3.7 – Land Use and Natural and Working Lands

The Infill Land Use and Natural Working Lands metric responds to two (2) CAPTI principles: 1) promote compact infill land uses for walkable communities to reduce the burden of transportation costs, and 2) protect natural and working lands from conversion to a more developed or intense land use.

Infill development promotes use of underutilized or undeveloped lands within established urban and non-urban communities, which are considered transportation-efficient places. Transportation infrastructure that supports or advances infill development, in turn supports housing for walkable communities that are affordable, reduces the transportation cost burden of auto trips, and encourages transit use to reduce VMT.

Local and regional conservation planning that focuses land development within existing communities reduces the likelihood of natural and working lands being converted to developed lands. Transportation investments that are consistent with conservation planning principles are prioritized. Generally, such projects would protect natural and working lands from conversion to developed lands.

Collectively, these two principles are operationalized with this metric for transportation projects that support infill land uses or prevent conversion of natural and working lands. Generally, projects in urban and suburban areas score well in this metric by increasing the efficiency of existing transit, creating new transit connections, providing multimodal travel options, and promoting infill affordable housing. Generally, projects in rural areas score well in this metric by either avoiding impact to natural and conservation land, or by incorporating appropriate mitigation measures to reduce the project's impacts on the natural environment.

Methodology

This metric assesses a project's potential to either support infill land uses or land conservation associated with the proposed project.

Data Requirements

To assess this metric, the following information is required:

- **Location Data:** Provide the project geographic location data for all modes using an ArcGIS Editor Form available on the Caltrans intranet.
- **Transit Schedule Information**: Projects with transit elements should provide information about the specific transit operator, routes that will be augmented, and specific service change (e.g., routes, frequency, hours of operation) that would be implemented or enabled by the project.

- **Project Mode(s)**: Clearly identify non-single-occupancy vehicle (SOV) infrastructure.
- **Identify project elements** that support the protection of natural/undeveloped and working lands in addition to ecological enhancements.
- **Environmental mitigations** for preservation of natural and working lands should be provided in the project narrative documents and the environmental review documents.

Metric Constraints

For projects intersecting urbanized areas, this metric does not yet incorporate the distinction between new-built high occupancy vehicle (HOV) or managed lanes and converted HOV or managed lanes.

Scoring Rubric

Projects are assessed and scored based on the following steps and criteria:

Spatial Screening:

First, Caltrans screens projects into urban/suburban and rural land use categories. Urban and suburban transportation projects that overlay or intersect Urbanized Areas (as defined by Caltrans and FHWA on the Caltrans Open Data Portal) are subject to the Infill Land Uses part of the Metric. Rural projects that do not intersect with an Urbanized Area are subject to the Natural and Working Lands part of the Metric.

Infill Land Uses Supportive Metric:

Based on the spatial screening, transportation projects that intersect Urbanized Areas are scored as follows:

New High Quality Transit Areas (HQTA): The top scoring projects create new HQTAs, as defined by PRC – 21155[16], 21064.3[17]. HQTAs trigger a variety of infill-friendly policies, including no parking minimums, CEQA streamlining, and other pro-housing policies. This is the most direct way that transportation policy supports infill development. HQTAs can be created in the following ways:

- Increase service frequency of bus service along a bus corridor to less than every 20 minutes in the morning and afternoon peak periods (Monday through Friday, 6:00 a.m. to 9:00 a.m. and 3:00 p.m. to 7:00 p.m.)
- Create a Major Transit Stop via the following actions:

[16] California Code, PRC 21155

[17] California Code, PRC 21064.3.

- Create or enhance rail stations and ferry terminals with bus connections,
- Create bus rapid transit stations as defined by PRC 21060.2[18], or
- Establish bus stops at the intersection of two or more major bus routes.

Scoring will use the HQTAs data on the Caltrans Open Data Portal to assess whether a transit service change takes place in an existing HQTA or creates new HQTAs. Projects that have transit service increases that fully overlap with existing HQTAs will be scored based on the criteria below.

Multimodal Projects that do not create new HQTAs should include transit, active transportation, and other housing and placemaking elements that provide or support multimodal travel options and promote infill development in an urbanized environment. Multimodal project elements that do not create new HQTAs will be credited as follows:

Transit Operations: Projects receive scoring credit based on their inclusion of one or more of the following transit operation components. Higher credits are assigned to components with more impactful transit benefits. A project can earn a sum of 3 credits for including all components. By multiplying the sum of transit operation credits by 3, the transit operations components are weighted most heavily among all multimodal components in the scoring calculation.

Table 9: Transit Operation Credits for projects that do not create new HQTAs

Benefits	Credits	Transit Operation Component
High	1	Transit service increase commitment (that does not create new HQTA).
Med-High	0.8	Dedicated transit lanes, operational station improvements (e.g., bus islands/bulbs), existing bus service running on future HOV/HOT lanes.
Medium	0.6	Transit Signal Priority (TSP), other transit operations technology.
Med-Low	0.4	Customer experience station improvements (e.g., ADA/Universal Design, digital signage).
Low	0.2	Microtransit, vanpool service.

Active Transportation: Projects receive scoring credit based on their inclusion of one or more of the following active transportation components. Higher credits

[18] California Code, PRC 21060.2.

are assigned to components with more impactful active transportation benefits. A project can earn a sum of 3 credits for including all components. By multiplying the sum of active transportation credits by 2, the active transportation components are weighted second-most heavily among all multimodal components in the scoring calculation.

Table 10: Active Transportation Credits for projects that do not create new HQTAs

Benefit	Credits	Active Transportation Components
High	1	Major pedestrian/bike bridge
Med-High	0.8	Dedicated biking infrastructure (Class I, IV lanes)
Medium	0.6	Wider sidewalks, enhanced crossings
Med-Low	0.4	Bike lanes (Class II, III)
Low	0.2	Bike parking, charging, other amenities; reduction of auto parking

Other Housing/Placemaking Elements: Projects receive scoring credit based on their inclusion of one or more of the following housing and placemaking components. Higher credits are given to components with more impactful housing and placemaking benefits. A project can earn a sum of 3 credits for including all components. By multiplying the sum of housing/placemaking credits by 1, these are weighted least heavily among all multimodal components in the scoring calculation.

Table 11: Other Housing and Placemaking Credits for projects that do not create new HQTAs.

Benefit	Credits	Other Housing and Placemaking Components
High	1	Infill affordable housing/affordable housing fees
Med-High	0.8	Pedestrian plazas/parks from closing roadway to cars
Medium	0.6	Mobility hubs, other road diet
Med-Low	0.4	Transit shelters, other public placemaking structures
Low	0.2	Signage/wayfinding program

<u>Scoring Values</u>

Table 12: Infill Land Uses Supportive Metric - Score Values

Score	Description
8 to 10	Projects creating new HQTA are scored on a range from 8 to 10 points, with 10 points corresponding to 10 square miles of new HQTA.
0 to <8	Projects that do not create new HQTA are scored with the following equation: 3 x [Transit operation credits] + 2 x [Active Transportation credits] + [Other Housing/Placemaking element credit]. Inclusion of all the above components would yield an intermediate score of 18, but because most projects are reasonably expected to have only one or two components in each category, non-HQTA projects will receive a final score that is capped at 7.99 points.

Natural and Working Lands Metric:

Projects that do not intersect an Urbanized Area (rural projects) will be assessed using the Natural and Working Lands metric. The assessment begins with spatial screening using an existing tool, Site Check ✓ (ca.gov),[19] to determine proximity and potential overlap with natural and working lands. Site Check data identifies whether a parcel is in an urbanized area or located in environmentally sensitive areas like wetlands, farmlands, or habitats. These listed data collectively represent natural and conservation areas to enable spatial analysis:

- Special Habitats
- Prime Farmland or Farmlands of Statewide Importance
- Wetlands
- State Conservancy Areas, and
- Riparian Areas

Caltrans will identify if any of these natural and conversation areas are present within 200 meters of the project alignment(s) drawn in the ArcGIS Editor form. Projects are scored based on the following criteria:

- Projects that protect natural and working lands by avoiding permanent conversion of these natural and conservation areas.
- Projects located within or in proximity to these lands need to identify project elements, such as land banking, wildlife bridges, wetlands

[19] Site Check is a free and publicly available mapping tool funded by the Department of Housing and Community Development as part of the technical assistance for Senate Bill 2, the Building Homes and Jobs Act. Site Check data is hosted by Databasin and is available on LCI's website. Note that LCI will also develop an urban infill site layer and update other relevant data layer by June 2027 per SB 131.

protection berms or other elements that supports the protection of these natural/undeveloped and working lands, consistent with the CAPTI and the CTP 2050 recommendations to expand protection of natural resources and ecosystems.

Other relevant examples of project elements include but are not limited to: establishment of conservation areas or environmental mitigation banks, wildlife bridges or aquatic passage elements in culverts, natural infrastructure solutions such as bioswales, rainwater storage systems, and permeable pavements, and explicit partnership with resource agencies and Tribal nations on environmental preservation. Inclusion of any of these elements should be documented in other project planning documents or the environmental documents.

Scoring Values:

Table 13: Natural and Working Lands Metric - Score Values

Score	Description
>5 to 10	Rural projects with centerline alignment outside the 200-meter buffer of a protected/natural area will receive 5.1 points for each CTP 2050 recommended natural resource protection project element listed above, with a maximum of 10 points. Other elements may be submitted and subject to subject matter expert review.
5	Rural projects with centerline alignment outside the 200-meter buffer of a protected/natural area would score 5 points.
0 to <5	Rural projects with centerline alignment within the 200-meter buffer of a protected/natural area that do not include one or more natural resource protection elements will score 0 points.

3.8 – Freight Sustainability and Efficiency

The Freight Sustainability and Efficiency metric assesses roadway projects' ability to improve truck travel time and reliability, as well as their inclusion of sustainable freight elements. Rail projects are evaluated based on their ability to improve freight rail operations and support long-term network goals identified in the 2024 California State Rail Plan.

Methodology

Roadway Projects

Roadway projects are scored for both sustainability elements and truck efficiency improvements. The points gained from each of the two (2) categories are summed to obtain the final score, with the maximum possible score being 10 points.

Freight sustainability for roadway projects is scored based on the project's inclusion of sustainable elements, including truck parking facilities, freight rail grade separation, bridge improvements, truck lanes, and freight technology-based approaches. These elements are identified in the California Sustainable Freight Action Plan (CSFAP) and the California Freight Mobility Plan. These are considered a priority for the State as they aim to improve freight operations, enhance safety, and reduce emissions. Freight sustainable elements eligible to receive points are defined below in the scoring rubric section.

Freight efficiency for roadway projects is evaluated based on a project area's existing Truck Travel Time Reliability Index (TTTRI), existing truck traffic volume, and the estimated truck travel time improvements that would result in a proposed project's opening year. Each variable is described below.

TTTRI: TTTRI measures the consistency of commercial truck travel times on the Interstate system, calculated as the worst travel time divided by the median travel time over a 12-month period. An index value of 1.0 is the lowest possible value and means truck travel speeds are perfectly uniform. A higher index value indicates higher delays and inconsistent travel times for trucks and goods, which correlate to higher fuel usage and emissions, increased shipping costs, and increased risk for crashes.

The metric scoring team will perform TTTRI calculations using Streetlight data. For each street segment in the project corridor, 50^{th} and 95^{th} percentile truck travel times are downloaded from Streetlight using the Segment Analysis tool. In the resulting downloaded table of travel times and segment lengths, the TTTRI is calculated as follows:

1. Level of Truck Travel Time Reliability (LOTTR) = [95th Travel Time Percentile] / [50th Travel Time Percentile]
2. Weighted LOTTR = [LOTTR] x [Line Zone Length (miles)]
3. Across all segments, get the sum of Weighted LOTTR and the sum of Line Zone Length
4. TTTRI = [Sum of Weighted LOTTR] / [Sum of Line Zone Length]

<u>Existing Truck Volume</u>: The metric scoring team will obtain truck volumes using Streetlight data. For this metric, truck volume is defined as the annual average daily volume of medium- and heavy-duty trucks[20] entering the project area. Truck volume will be obtained in the same time intervals as truck speeds. For example, if truck speed is reported separately for peak and off-peak periods, truck volume will also be obtained for each corresponding time period.

Alternatively, truck volume by time period can be provided by the project sponsor where Streetlight data might not be the most reliable provider of this information. This may include rural areas with low or seasonal truck traffic, or areas with near-completion freight industry development that would substantially increase truck traffic by the project's opening year. For projects that opt to submit peak season truck volumes, peak season is defined as three (3) consecutive months of the most recent 12 months where data is available. Peak Season Truck ADT is calculated as [Sum of Daily Truck ADT during the peak season] / [Sum of days during the peak season].

<u>Truck Travel Time</u>: Applicants will provide truck speeds or truck travel times through the project area under Opening Year No Project and Opening Year with Project conditions. Truck speed or truck travel time may be estimated using a travel demand forecast model or a traffic operations analysis software such as SimTraffic and Vissim. Peak and off-peak period truck speed should be reported separately. If off-peak data is not available, travel time improvements will be calculated using AM and PM peak period data only, with the understanding that most roadway delay and potential travel time improvements occurs during the peak. Applicants may identify the specific hours during which the project site experiences peak conditions (e.g., 7 a.m. to 9 a.m., 4 p.m. to 6 p.m.).

With the three (3) input values above, the project's Truck Efficiency Improvement Index is calculated and converted to points, as described in the scoring rubric section.

[20] Defined as Class 5 (two axle, six tire, single unit) trucks and above.

Rail Projects

The State's goal is to enable continued, market responsive growth in goods movement by freight rail and promote mode shift from truck to rail, while providing increased passenger capacity. The scoring scale reflects this by awarding points to freight rail projects that increase existing rail operation flexibility and enhance network efficiencies. Additional points are given to projects that support long-term network goals identified in the California State Rail Plan, as well as those that expand freight rail operational capacity or reduce freight rail operational impact on DACs (defined as all people living in AB 1550-defined low-income households). The scoring rubric section below defines the freight rail scoring scale.

Data Requirements

To assess the Freight Sustainability and Efficiency metric, the following information is required:

- **Location Data*:*** Provide project geographic location data using an ArcGIS Editor Form available on the Caltrans intranet.

Roadway Projects

- **TTTRI** provided by Caltrans or Project Applicant.
- **Existing Truck Volume by Time Period** provided by Caltrans or Project Applicant.
- **Truck Travel Time by Time Period** for Opening Year No Project and Opening Year with Project conditions.
- **Sustainable Freight elements** identified in the scoring rubric.
- **Presence of Freight Rail Activity** (Yes/No) if project proposes new grade separation over freight rail.

Rail Projects

- **Is the project identified in the California State Rail Plan**, Appendix 2: Capital Projects (Yes/No)?
- **Type of work proposed**
- **Does the project relocate freight rail operation away from DACs** (Yes/No)?

Metric Constraints

Due to data collection and processing differences, Streetlight traffic volume data may be different than volume data collected from other sources. Applicants have the option to provide their own data if Streetlight data does not adequately capture travel patterns unique to the project area (e.g., rural areas or seasonal traffic). Truck volume and travel time improvements by time of day most accurately captures truck efficiency improvements; however, data at this level of detail may not always be available. The rail project scoring rubric assigns scores based on project work type. Because freight rail operational data is often limited or difficult to obtain, this rubric does not require quantification of rail operational or sustainable benefits.

Scoring Rubric

Roadway Projects

The freight efficiency score is calculated based on the project's Truck Efficiency Improvement Index, calculated as follows:

1. No Project Truck Vehicle Hours Traveled (VHT) =
   [AM Peak Period Truck Volume] x [No Project AM Peak Period Truck Travel Time] +
   [PM Peak Period Truck Volume] x [No Project PM Peak Period Truck Travel Time] [21]

2. With Project Truck VHT =
   [AM Peak Period Truck Volume] x [With Project AM Peak Period Truck Travel Time] +
   [PM Peak Period Truck Volume] x [With Project PM Peak Period Truck Travel Time] [22]

3. Truck Efficiency Improvement Index =

   [TTTRI] x ([No Project Truck VHT] – [With Project Truck VHT])

A score of 0 to 5 points is calculated based on the Truck Efficiency Improvement Index, with an index of 0 corresponding to 0 points (e.g., the project does not result in any truck travel time improvement), and an index of 400 corresponding to 5 points.

The freight sustainability score is calculated based on the project's inclusion of the following sustainable elements. If multiple elements are included, points for each element are summed. The maximum possible score is 10 points.

[21] Applicants may define the specific hours for each time period and provide data for more than two time periods.
[22] Applicants may define the specific hours for each time period and provide data for more than two time periods.

Table 14: Freight Sustainability Metric - Score Values for Roadway Projects

Points	Sustainable Elements
5	• New or expanded truck parking facilities that addresses the statewide truck parking deficit. • New grade separation over freight rail. • New or improved bridges that shorten travel distance by creating a more direct route, address existing asset's poor conditions, or accommodate oversized truck or trains.
3	• Dedicated truck lanes, truck climbing lanes, or runaway truck lanes. • Intelligent transportation systems (ITS) and other technology to improve the flow or efficiency of freight.
2	• Real-time traffic, truck parking, roadway condition, and multimodal transportation information systems. • Electronic screening and credentialing systems for vehicles, including weigh-in-motion truck inspection technologies. • Electronic cargo and border security technologies that improve truck freight movement. • Physical separation of passenger vehicles from commercial motor freight.

For example, a project located on a freeway corridor with a TTTRI of 1.75 and a peak period truck volume of 4,000 proposes improvements to reduce truck travel time by three (3) minutes during the peak period and includes freight ITS elements to support those efficiencies.

The project's score will be calculated as follows:

$$\text{Truck Efficiency Improvement Index} = 1.75 \times 4{,}000 \times \frac{3\text{ minutes}}{60\text{ minutes/hour}} = 350$$

Project freight efficiency score = 350 / 400 * 5 points = **4.38 points**

Project will receive **3 points** for the inclusion of freight ITS elements.

Project total score = 4.38 + 3 = **7.38 points**.

Rail Projects

The rail project scoring rubric is presented below. This rubric applies to rail projects that do not include any roadway capacity improvements. This is inclusive of projects at ports with rail components.

Table 15: Freight Sustainability Metric - Score Values for Rail/Port Projects

Score	Criteria
8	• Project increases operational flexibility to maximize existing capacity, with corridor and/or network efficiencies for freight rail (e.g., siding, positive train control, track and signal improvements, etc.).
9	• Project increases operational flexibility to maximize existing capacity, with corridor and/or network efficiencies for freight rail; AND • Project is identified in the California State Rail Plan Appendix 2: Capital Projects.
10	• Project improves freight rail operational capacity by adding new infrastructure (e.g., tracks for new rail routes, intermodal railyard capacity improvements, grade separations without roadway widening, etc.); or • Project relocates freight rail operations away from DACs (defined as all people living in AB-1550-defined low-income households); or • Project includes construction or rehabilitation of rail bridges that shorten travel distance by creating a more direct route, address existing asset's poor conditions, or accommodate oversized trains.

3.9 – Zero-Emission Vehicle (ZEV) Infrastructure

The ZEV Infrastructure metric assesses the extent of ZEV infrastructure investments in a project.

The metric is based on the type of project and the vehicular traffic volume near the project site.

Methodology

The level of investment in ZEV infrastructure is evaluated on a scale of 0 to 10 points. For passenger vehicle charging infrastructure (Level 2 and Level 3 charging ports), the ZEV metric intends to measure whether the project proposes an adequate number of chargers to serve the potential charging demand in the project area; therefore, the number of passenger vehicle chargers required for a project to receive 10 points is scaled based on the vehicular traffic volume on nearby highway segments. Highway traffic volume is selected as an obtainable data source that reflects the project area's population density, the urban/rural setting, and the potential demand for ZEV charging. To receive 10 points, projects near a higher-volume corridor would need to install more chargers, whereas projects near a lower-volume corridor would achieve the same score with fewer chargers. The same logic applies to medium- and heavy-duty truck charging, for which the number of chargers required is scaled based on the highway truck volume near the project site.

Less common ZEV technologies, such as hydrogen and ZEV transit infrastructure, are prioritized. The number or capacity of the charging infrastructure required was determined with consideration to the cost, difficulty of implementation, and desirability of the infrastructure type.

For projects that propose multiple ZEV infrastructure types (e.g., passenger vehicle chargers and medium- and heavy-duty truck chargers), each type will be scored separately then summed into a final ZEV metric score. The maximum possible score for this metric is 10 points.

All charger installations will follow the latest federal and state regulations and requirements.

Data Requirements

To assess the ZEV Infrastructure metric, the following information is required:

- **Charging Ports:** Provide information on the number of charging ports, power levels, and the location.

- **Highway Segment Annual Average Daily Traffic (AADT):** The metric scoring team will obtain AADT and truck AADT data using Streetlight.

Metric Constraints

The metric does not account for areas where ZEV infrastructure cannot be installed (i.e., lack of power sources) and does not account for all types of ZEV technologies. Although highway traffic volume generally correlates with the population density and vehicle charging demand, it may not fully capture demand for vehicle charging at unique hotspots. Locations of existing and planned ZEV infrastructure are not considered.

Scoring Rubric

The score is calculated by establishing a ratio of ZEV infrastructure to the number or capacity required to obtain 10 points, as shown in the table below.

Table 16: ZEV Metric Score Values

ZEV Infrastructure Type	Number or Capacity Required to Obtain 10 points
Level 2 Charging Ports	Charger requirement is scaled based on AADT: • Four (4) charging ports for areas with 6,000 or less AADT on nearby highway • One (1) additional charging port for each 3,300 increase in AADT • Seventy (70) charging ports at the maximum for areas with AADT above 220,500
Level 3 Charging Ports	Charger requirement is scaled based on AADT: • Four (4) charging ports for areas with 6,000 or less AADT on nearby highway • One (1) additional charging port for each 11,000 increase in AADT • Twenty-four (24) charging ports at the maximum for areas with AADT above 215,000
Medium- and Heavy-Duty Truck Charging Ports	Charger requirement is scaled based on Truck AADT • Four (4) charging port for areas with 500 or less Truck AADT on nearby highway • One (1) additional charging port for each 3,000 increases in Truck AADT • Eight (8) charging ports at the maximum for areas with Truck AADT above 9,500 • Hydrogen: 4,000 kg of site per day capacity with two (2) nozzles

ZEV Infrastructure Type	Number or Capacity Required to Obtain 10 points
Rail/Transit ZEV Infrastructure	• Six (6) medium- and heavy-duty truck charging ports • Hydrogen: 4,000 kg of site per day capacity with two (2) nozzles
Rail/Transit ZEV Rolling Stock	• One (1) ZEV locomotive • Ten (10) battery-electric buses • Five (5) hydrogen buses

As an example, a project located near a highway segment of 30,000 AADT proposes four (4) Level 2 charging ports, four (4) Level 3 charging ports, and one (1) medium- and heavy-duty charging port for transit. The project's score would be calculated as shown in the table below. Although the sum of the individual scores exceeds 10 points, the project would receive the maximum possible score of 10 points for the ZEV metric.

Table 17: ZEV Metric Example Project Score

ZEV Infrastructure Type	Number of Charging Ports Required to obtain 10 points	Number of Charging Ports Proposed	Ratio of proposed to required charging ports	Points received
Level 2 Charging Ports	12	4	0.33	3.3
Level 3 Charging Ports	7	4	0.57	5.7
Medium- And Heavy-Duty Charging Ports for Transit Vehicles	6	1	0.16	1.6
			Total Points Received	**10.6**
			Total Score	**10**

4.0 – CAPTI Qualitative Metrics

The CSIS investment framework includes two (2) qualitative metrics – Public Engagement and Climate Adaptation and Resiliency – to meet the overall intent of the CAPTI Guiding Principles. These qualitative metrics aim to measure a project's responsiveness to its unique community and climate needs, guiding investments towards a more equitable outcome.

The evaluation for these qualitative metrics is conducted by a project review committee (PRC) comprised of Caltrans HQ staff, including subject matter experts. As described in the CSIS, new PRCs are established for each program and funding cycle.

4.1 – Public Engagement

The Public Engagement metric measures the adequacy, appropriateness, quality, and effectiveness of engagement activities during project development. This metric addresses the CTP 2050 and CAPTI equity goal, with emphasis on equitable engagement demonstrated by the representation and involvement from disadvantaged, low-income, and Black, Indigenous, and People of Color (BIPOC) communities. For this metric, meaningful engagement should extend beyond the standard public scoping and meeting requirements under the environmental review process for CEQA and NEPA.

Methodology

This metric is assessed with a checklist approach that gauges the quality of public engagement and measurable actions undertaken. The performance-based metric considers three key areas of assessment:

- **The Public Engagement Plan (PEP), or Equivalent:** This document should clearly outline the overall approach and purpose of engagement. An engagement plan should be tailored to the project and community needs, address community history and past sentiments, and demonstrate consideration and implementation of community input in project scope.
- **Public Engagement Actions Undertaken:** This pertains to the timing, frequency, audience, and methods used for outreach and engagement. The project should clearly demonstrate past and planned engagement from pre-planning through various phases of project development with the appropriate audiences for the project (i.e., local governments, community leaders, disadvantaged communities, underrepresented groups, advocacy groups, Tribal Organizations, etc.). It is important that a project provides ample and easily accessible opportunities for the public

and members of disadvantaged groups to engage in the process.

- **Project Responsiveness to Public Input:** The project should clearly demonstrate that the design or scope was or will be responsive to accommodate the needs and input from the public engagement process. Responsiveness may be in the form of refinements or modifications to the project's design, scope, timing, aesthetics, or other elements.

Data Requirements

To assess the Public Engagement metric, the following information is required:

- **Public Engagement Plan or equivalent document**: This document should describe the outreach and engagement methods tailored to the project. It can also include the history of engagement undertaken through the prior phases of the project.
- **Outreach & Engagement Undertaken:** Provide evidence to demonstrate the adequacy, appropriateness, quality and effectiveness of engagement activities, which should include the following:
    - Summary of stakeholder and community meetings or events occurred and planned throughout project development. This may include but is not limited to open houses, pop-up events, community charrettes, city/county council meetings, and regional agency board meetings.
    - Meeting and event materials: This may include but is not limited to fact sheets, meeting/event agendas and minutes, flyers (all languages used), presentations, public comments, project website, focus group notes, summary of feedback, polling results, list of organizations contacted, contact list, and photos of event.
    - Documentation of project sponsor meetings that include local partners/stakeholders. This may include but is not limited to technical advisory committees and citizen advisory committees.
    - Documentation of community meetings that include disadvantaged and vulnerable communities, Tribal Organizations, and other interest groups.
    - Feedback surveys that document the responses to public engagement.
- **Responsiveness to Public Input:** The public engagement process resulted in a project that is responsive to community input. This may include meeting minutes, responses to comments, follow-up stakeholder/public meetings, and surveys.

Metric Constraints

This metric acknowledges that there will be varying levels of engagement depending on the project type, size, location, audience, and other factors. A larger, more complex project may require a more comprehensive public engagement plan and process, while a smaller project may not necessitate an extensive engagement process. Regardless of the project size and other factors, the project should demonstrate a strong public engagement effort that is appropriate for the project through well-documented activities, events, and outcomes.

Due to the qualitative approach of this metric, project scores are assigned based on information and materials made available to the PRC. Therefore, it is important that the applicant provides all pertinent information, including measurable components (number of meetings/events, outreach methods, participants, comments received, etc.) and narratives to demonstrate meaningful public engagement. Engagement activities that are not documented or documents and materials that are not submitted to the PRC will not be scored.

Scoring Checklist

Projects are evaluated on a continuous scale of 0 to 10 points, with 0 points corresponding to a project that does not include any engagement checklist items and 10 points demonstrating engagement that meets and exceeds the engagement checklist items enumerated below.

Table 18: Public Engagement Metric - Score Values

Public Engagement Plan (PEP), or equivalent (2 points total)
The project has a published Public Engagement Plan (or equivalent): • PEP identifies prior engagement conducted. (0.5 point) • PEP identifies community-specific context and key stakeholders, including local and regional partners. (0.5 point) • PEP identifies disproportionately impacted disadvantaged, low-income, and Black, Indigenous, and People of Color (BIPOC) communities. (0.5 point) • PEP identifies several outreach strategies and engagement methods that are appropriate and adequate for the community-specific context and key stakeholders identified above. (0.5 point)

Public Engagement Actions Undertaken (4 points total)
Diverse group of stakeholders were engaged. • Local and regional partners, local businesses, and the general public were engaged. (0.5 point) • Disadvantaged, low-income, and BIPOC communities were included. (0.5 point) • Tribal Organizations and leaders were included. (0.5 point) • Community-Based Organizations (CBOs) were included. (0.5 point) Project enumerates multiple methods of outreach conducted that were appropriate and adequate for the community-specific context and key stakeholders involved (e.g., fact sheets, meeting agendas and minutes, flyers in multiple languages as appropriate, presentations, public comments, project webpage, focus group notes, summary of feedback, polling results, photos). • At least three (3) methods were used. (0.5 points) • More than five (5) methods were used. (0.5 point) • Time and location of outreach events were appropriate for the community. (0.5 point) • Number of events held was appropriate for the scale/impact of the project. (0.5 point)
Project Responsiveness to Public Input (4 points total)
Project is responsive to community input. • Comments from members of the public were collected during engagement. (0.5 point) • Project scope incorporated input from stakeholders identified above. This should be demonstrated by public comments that express support for the project, <u>OR</u> that the project scope has been modified or refined as a result of community input, either in early planning or through project development. (1 point) • Project incorporated feedback from low income, tribal organizations and leaders, BIPOC communities and/or CBOs. (1 point) Project has documented support from the diverse group of stakeholders and community members that were engaged, such as agency partners, Tribal organization(s), and multiple community groups (businesses, CBOs, etc.). • Project has documented support from agency partners. (0.5 point) • Project has documented support from at least four (4) community groups. (0.5 point) • Project has documented support from at least two (2) disadvantaged groups such as tribal organizations and leaders, and CBOs. (0.5 point)

4.2 – Climate Adaptation and Resiliency

The Climate Adaptation and Resiliency metric evaluates how well a project assesses historic and forecasted climate risks to transportation infrastructure and communities, in addition to how well a project incorporates adaptation strategies to bolster resilience of at-risk infrastructure and communities.

Climate risks refer to vulnerabilities of physical transportation infrastructure to climate stressors, such as sea level rise, storm surge, cliff retreat, wildfire, extreme temperatures, flooding, or other extreme weather events, in addition to potential impacts to facility performance, users, and nearby economic, environmental, or community resources from these stressors. Climate adaptation is defined as steps taken to modify the project components and prepare the community to minimize or avoid these risks from climate change stressors. Resiliency is an ability to recover and adapt to the adverse events.

While greenhouse gas emissions, air quality, and VMT-related assessment are commonly included in the environmental documents, the intent of this metric is to measure a project's assessment of climate stressors and vulnerabilities to infrastructure and communities, and the extent to which a project applies adaptation measures that could reduce or ameliorate climate risks. The metric requires use of relevant climate change data sources to evaluate the potential impacts from climate change stressors on the transportation facilities, its users, and to surrounding economic, environmental, or community assets.

Methodology

The metric requires project sponsors to provide a preliminary assessment of climate stressors and risks, as well as enumerate vulnerable transportation assets and community impacts, demonstrating that these were considered throughout project planning, scoping, and design. To earn maximum points, the project must include adaptation and disaster management strategies (consistent with the state, regional, and local climate adaptation and hazard mitigation plans) that make applicable transportation assets and vulnerable communities more resilient to climate change as primary objectives of the project.

This performance-based metric considers three key areas of assessment:

- **Identification of climate change stressors, risks, and vulnerabilities to transportation infrastructure and communities**: A climate risk assessment must include a description of the historic and forecasted conditions, and the potential exposure to climate stressors that could affect the system's performance for goods movement, economic prosperity, roadway safety, and/or other secondary impacts from climate change.

- **Identification of adaptation strategies for vulnerable transportation infrastructure and communities**: Adaptation Strategies, including nature-based solutions, should correspond to the findings of the climate risk assessment above. Strategies should be referenced in project scoping documents.
- **Emergency response and evacuation components of larger projects**: Disaster management projects should consider all phases of the FEMA emergency management cycle, such as mitigation, preparedness, response, and recovery, for a stronger score. Additionally, projects that address multimodal evacuation in alignment with other State and federal transportation policies and goals (i.e., transit, active transportation, etc.) will also receive a stronger score.

Projects are required to demonstrate consideration of and consistency with the state climate change goals and strategies from CalSTA's CAPTI, the California Transportation Plan (CTP) 2050, and Caltrans 2020-2024 Strategic Plan. In addition, projects should advance the goals and actions included in AB 1482, AB 2800, Executive Order (EO) B-30-15, EO N-82-20, and the California Climate Adaptation Strategy, which collectively direct agencies to account and prepare for climate change impacts by incorporating adaptation strategies in all infrastructure investments, including all phases of planning and project delivery. Projects are also required to demonstrate consistency with other regional and local climate change assessments and adaptation plans or policies, where applicable to the projects.

Projects should demonstrate climate adaptation measures and strategies in response to the stressors, consistent with Caltrans guidance in the Adaptation Strategies for Transportation Infrastructure and the State Climate Resilience Improvement Plan for Transportation. Other available regional or local adaptation plans or policies, as appropriate, could also be used to supplement the evaluation and application of adaptation strategies and measures.

Projects on the State Highway System (SHS)

Projects on the SHS should use Caltrans' studies and plans on climate vulnerability, including the District Climate Change Vulnerability Assessments to identify climate stressors. Project-level climate risk assessments or similar studies evaluating segment(s) on the SHS should also refer to the District Adaptation Priorities Reports to identify all assets in the study area as well as their assigned priority level(s).

Projects off the State Highway System (SHS)

When the project scope and limits include facilities off the SHS, other state or federal climate data sources may be utilized to supplement the identification of climate hazards, exposures, and stressors. Past climate events, extreme weather events, or conditions from the changing climate may be used to supplement identification of climate vulnerabilities. When available, granular level data for any climate stressor at the local, regional, or academic level can be used.

Non-Highway Projects

Projected climate stressors and hazards for non-highway projects, such as passenger and freight rail, seaport, transit, or active transportation projects are not available through Caltrans Climate Change Vulnerability Assessments and the Adaptation Priority Reports.

Non-highway projects may use other resources, such as Cal-Adapt.org or other local climate data sources and tools, to identify and assess vulnerability to climate change stressors. Such information, data, and analysis could be used to respond to this metric with references to the studies and data sources. When possible, include images such as screenshots of analyses performed using climate change tools listed below or pictures from past impacts to support an initial climate risk assessment.

Note: Datasets must have climate change incorporated in its methodology to be considered eligible. When a dataset does not include climate change, it could be used in tandem with other climate change data, such as Cal-Adapt.org, to capture the project-related climate vulnerability.

When certain climate stressors, such as wind events, land subsidence and others are not included in Cal-Adapt.org, provide history of such climate events with its effects on the transportation infrastructure, its users, or to surrounding economic, environmental, or community assets. Images of transportation facilities impacted by these events will assist in substantiating the need for projects that will address such impacts.

Recommended climate assessment and adaptation sources:

- Caltrans District Climate Change Vulnerability Assessments
- Caltrans District Climate Change Adaptation Priorities Reports
- Adaptation Strategies for Transportation Infrastructure
- Caltrans Climate Change Emphasis Area Guidance for Corridor Planning
- State Climate Resilience Improvement Plan for Transportation

- Climate Mapping for Resilience and Adaptation
- Cal-Adapt

Data Requirements

To assess the Climate Adaptation & Resiliency metric, the following information is required:

- Using existing resources, a preliminary assessment of climate change impacts that identifies Climate Stressors, Risks, and Vulnerabilities to Transportation Infrastructure and Communities. When applicable, provide history of climate events and their effects (such as wind events, land subsidence, and others) if data is not available in Cal-Adapt.org or other existing resources.
- Identification of Adaptation Strategies, which should correspond to the findings of the climate risk assessment and be referenced in project scoping documents.
- Discussion of disaster management components (e.g., evacuations and emergency response) of transportation projects.

Metric Constraints

The metric is constrained by existing available knowledge, data, tools, and assessment methodologies. Growing scientific and technological understanding of climate and related climate change, stressors, vulnerabilities, and adaptation measures will continually influence this metric and future updates.

Scoring Checklist

Assessment of Stressors/Risks to enable informed decision-making (2 points total)

Climate Risk Assessment – Assessment using existing resources/data is a prerequisite for earning points in the scoring table below.

- Identify applicable historic and forecasted stressors (e.g., sea level rise, storm surge, riverine flooding, extreme temperature, wildfire) that are likely to occur within the expected service life of the project. Provide documentation of findings.

  District Climate Change Vulnerability Assessments provide high-level data about current and forecasted stressors for projects on the SHS. Projects off the SHS can use other state and federal resources such as Cal-Adapt.org.

Where data is lacking, project sponsors can provide narrative details and imagery of past climate-related weather events.

If the project identifies some, but not all, applicable stressors, multiply the extent of the climate risk assessment by the total points earned in the following two (2) criteria. For example, if a project is likely to be impacted by temperature and riverine flooding, but only assesses temperature (i.e., half of the applicable stressors), the project would score only half of the total points earned in the following two (2) criteria.

Table 19: Climate Adaptation and Resiliency Metric - Score Values for Climate Risk Assessment

Vulnerabilities to Climate Change Impacts (2 points total)
Transportation Infrastructure vulnerable to Impacts (1 point) • Identify assets (e.g., roadways, bridges, culverts) in the study area that are vulnerable to potential impacts, including their assigned priority levels according to the District Adaptation Priorities Reports. For assets that are likely to be exposed but not identified in the respective Adaptation Priorities Report, discuss how climate stressors could potentially impact asset performance (throughput) and user safety.
Communities Vulnerable to Impacts (1 point) • Evaluate climate impacts to vulnerable communities, including low-income, disadvantaged, and Black, Indigenous, People of Color (BIPOC) communities, and tribal governments/communities.

Strategies for Adapting / Enhancing Resilience to Identified Stressors/Risks (8 points total)

Consistency with Climate Change Risk Assessments / Adaptation Plans – Project scope and design must be consistent with the climate risk assessment and adaptation plans to earn points in the scoring table below.

- Based on climate risks, vulnerable assets, and vulnerable communities identified above, project utilizes appropriate adaptation strategies described in the Adaptation Strategies for Transportation Infrastructure, the State Climate Resilience Improvement Plan for Transportation (SCRIPT), and other state, regional, or local adaptation policies and plans (such as "Green Streets" on page 58 of Design Information Bulletin 94).

  If the project identifies adaptation strategies for some, but not all, applicable stressors, the following eight (8) criteria are scored with partial points, as applicable. For example, if a project is likely to be impacted by temperature and riverine flooding, but only provides adaptation strategies for temperature (i.e., half of the applicable stressors), the project would score only half of the total points in some of the following criteria. Additionally, if communities near the project are vulnerable to stressors such as temperature and wildfire, but the project provides community resilience strategies against just temperature (i.e., half of the applicable stressors), the project would score only half of the total points in some of the following criteria.

Table 20: Climate Adaptation and Resiliency Metric - Score Values for Adaptation Strategies

<u>Adaptation Strategies, including Disaster Management (8 points total)</u>
Strategies for Transportation Infrastructure (4 points) • Project incorporates strategies to harden assets (e.g., roadways, bridges, culverts) against each historic and forecasted stressor identified in the Climate Risk Assessment. (1 point) • Nature-based adaptation strategies are incorporated into the project scope. (1 point) • Disaster management (emergency evacuations, response, and recovery) prioritizes solutions <u>other</u> than roadway widening, such as ITS, contraflow measures, providing additional ingress/egress/street connectivity, intersection geometric improvements (e.g., larger turning radii), or access to shelter-in-place locations. Reference <u>Design Information Bulletin Number 93 - Evacuation Route Design Guidance.</u> (1 point) • Adapting transportation infrastructure to climate stressors or climate events is a primary objective of the project. (1 point)
Strategies for (Vulnerable) Communities (4 points) • Communities identified as vulnerable in the Climate Risk Assessment have been considered and engaged throughout the project planning, scoping, and design process. (1 point) • Adaptation strategies will improve the resilience of these communities to climate stressors (e.g., shade trees/structures, porous pavement, nature-based solutions, evacuation strategy). (1 point) • The project demonstrates reasonable nexus to an evacuation route (or other route likely to be used for evacuation) that is documented in a Community Wildfire Protection Plan, Local Hazard Mitigation Plan, and/or the Safety element of a local General Plan, <u>AND</u> the project demonstrates it is prepared to handle emergency operations. (1 point) • Enhancing community resilience to climate stressors or climate events is a primary objective of the project. (1 point)

Appendices

Appendix A – Acronyms

AADT	Annual Average Daily Traffic
ACS	American Community Survey
AFC	Alternative Fuel Corridors
BIPOC	Black, Indigenous, and People of Color
CAPTI	Climate Action Plan for Transportation Infrastructure
CARB	California Air Resources Board
CBO	Community-based organization
CEQA	California Environmental Quality Act
CMF	Crash Modification Factor
CRF	Crash Reduction Factor
CSFAP	California Sustainable Freight Action Plan
CSIS	Caltrans System Investment Strategy
DAC	Disadvantaged Community
EQI	Equity Index
FSI	Fatal and Serious Injury
FHWA	Federal Highway Administration
GHG	Greenhouse Gas
GTFS	General Transit Feed Specification
HCD	California Department of Housing and Community Development
HERE	A data vendor producing Points of Interest data
HOT	High Occupancy Toll
HOV	High Occupancy Vehicle
HQTA	High Quality Transit Areas
LEHD	Longitudinal Employer-Household Dynamics
LTS	Level of Traffic Stress
NCST	National Center for Sustainable Transportation

NEPA	National Environmental Policy Act
OSM	Open Street Map
PID	Project Initiation Document
POI	Points of Interest
TOAR	Traffic Operations Analysis Report
SHS	State Highway System
SOV	Single Occupancy Vehicle
TDM	Transportation Demand Model
TIMS	Transportation Injury Mapping System
TOAR	Traffic Operations Analysis Report
TTTRI	Truck Travel Time Reliability Index
VMT	Vehicle Miles Traveled
ZEV	Zero-Emission Vehicle

Appendix B – Glossary

Accessibility: The ability to reach destinations, generally defined as employment and non-work destinations, via the auto, transit, pedestrian, and bicycle networks. Factors affecting accessibility include density and location of destinations, travel times by mode (including first- and last-mile walks for transit), and "level of traffic stress" for cycling.

California Sustainable Freight Action Plan Typologies: Project elements defined by the California Sustainable Freight Action Plan that support sustainable freight. These are: Alternative Fuel Infrastructure, Bridge Improvements, Bridge Replacements, and Intermodal At-grade Crossing Reduction, Modal (Non-highway Mode) Freight Mobility, Freight Safety, Resiliency, and Security, Freight Technology-based Approaches, Sustainable Trucking, and Other Modal and Sustainable Approaches. Other modal and sustainable approaches will require additional review by the Headquarters Freight team to determine alignment with the California Sustainable Freight Action Plan Typologies.

Conveyal: A web-based software tool for calculating accessibility for custom transportation and land use scenarios.

Disadvantaged Community: Members of communities of color and underserved communities that experienced fewer benefits and a greater share of negative impacts associated with our state's transportation system. Within the context of this document, it is defined in a manner consistent with the Caltrans EQI, which includes all people that are part of a low-income household (defined by AB 1550).

Extreme Weather/Events: Defined differently based on the climate stressors or impacts being called out. For example, for an extreme heat day or warm night is defined as a day in a year when the daily max/minimum temperature exceeds in the 98th percentile of daily max/min temperatures based on observed historical data from 1961-1990 between April and October. Generally, an extreme weather event is an occurrence that is significantly different from typical weather at a specific location for that time of year. There is flexibility for what can be considered an "extreme event". More examples "extremes" can be found at https://cal-adapt.org/tools/.

Heavy Duty Chargers: Chargers designed for the use of heavy-duty vehicles, such as trucks or buses.

Location Data: The location and extent of a project, stored in Geographic Information System. To accurately capture standardized Project Geographic

Data, a single Survey123 form has been developed by Caltrans HQ and will be distributed to project sponsors.

Longitudinal Employer-Household Dynamics: The US Census Longitudinal Employer Household Dynamics survey program produces a dataset with origin-destination employment statistics to identify counts of jobs and workers within each Census block.

Low Income: A Census block group is designated as a 'low-income' community if either 1) its median household income was at or below 80 percent of the statewide median household income, OR 2) its median household income was at or below the 2022 county low-income limit established by the California Department of Housing and Community Development. This definition is consistent with AB 1550.

Metric: Performance criteria where a numerical score is assigned to a project based on a set of thresholds or ranges.

Points of Interest: Non-work destinations, including grocery stores, medical facilities, schools, attractions, etc.

Population-Weighted Accessibility: Raw accessibility scores weighted by population to reflect the number of people who would benefit from an improvement, and to avoid showing benefits to zero-population areas. Population weighting may be based on the entire population or the population in a disadvantaged community, depending on the metric.

Program Fit: An assessment of a project's competitiveness for a discretionary funding program in which the project is being considered. This assessment mirrors the program guidelines by ensuring the project meets the program objectives, eligibility, and requirements, and competitive under key program criteria.

Project Sponsor: A project advocate (local/state agency, or private entity) that acquires and ensure adequate project funding.

Rural: An area that does not intersect a US Census Urbanized area.

Scoring Cycle: A particular time period in which project nominations are being evaluated and prioritized under the CSIS framework for a specific competitive program