Federal Transportation Performance Management Framework and California Rural Counties

June 2019

California Rural Counties Task Force

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Executive Summary

The federal Moving Ahead of Progress in the 21st Century Act (MAP-21) of 2012 and the Fixing America's Surface Transportation Act (FAST) of 2015 include provisions for the establishment of a performance and outcome based transportation measures program, including performance goals for safety, infrastructure condition, congestion reduction, system reliability, freight movement, environmental sustainability and transit asset management. These new requirements were passed on to states who, in cooperation with regions and counties, must implement the federal Transportation Performance Management (TPM) framework. In 2017 the California Rural Counties Task Force (RCTF) commissioned this study of the federal TPM framework's impact on California rural counties.

This study evaluates the Federal Transportation Performance Management (TPM) framework with a focus on the rural context. This study reviews TPM requirements for MPOs and non-MPO rural RTPAs, provides guidelines on how rural counties can implement transportation performance management systems, and prepares rural areas to better respond to any future performance based planning requirements. The study also identifies rural needs for more appropriate performance measures and metrics. While non-MPO rural RTPAs are exempt from most federal performance management rules, these agencies may find voluntary adoption of portions of the performance management framework to be beneficial.

Chapter 1: Introduction

The federal Moving Ahead for Progress in the 21st Century Act (MAP-21) of 2012 and the Fixing America's Surface Transportation (FAST) Act of 2015 include provisions for the establishment of a new performance and outcome based program for States and Metropolitan Planning Organizations (MPOs) which includes national performance goals for improving safety, infrastructure condition, congestion reduction, system reliability, freight movement, environmental sustainability and transit asset management. Chapter 1 reviews the background of this legislation including transportation agency roles and responsibilities at the federal, state, and local level. This chapter also provides a short discussion of the structure of the report.

Chapter 2: Safety Performance Measures

MAP-21 established five key performance measures related to roadway safety. Chapter 2 reviews the measures, federal compliance criteria, and the implications for small urban MPOs and Regional Transportation Planning Agencies (RTPAs.) Rural RTPAs are exempt while MPOs are required to comply with safety performance measure target setting rules.

In compliance with the Federal Highway Administration (FHWA) rules, Caltrans has set statewide targets for roadway safety in coordination with MPOs and has given MPOs the option

of either adopting the statewide targets or setting their own regional targets. If an MPO adopts the statewide Caltrans safety performance targets, they will not be required to report on regional progress to Caltrans. Target achievement data will be collected by Caltrans on a statewide level. This report recommends MPOs participate in the statewide framework since this allows Caltrans to take on the bulk of the reporting and program oversight tasks. If an MPO instead chooses to set their own targets, this may incur a significant workload for the MPO related to data collection, target setting, tracking and updating targets.

Each year FHWA will evaluate whether each state has made significant progress towards their targets. If a state is not making sufficient progress they will not be allowed to use Highway Safety Improvement Program (HSIP) funding for non-safety projects and will be required to obligate all baseline HSIP funding to safety capital projects. Since HSIP is already used for safety projects, this would not meaningfully affect how Caltrans funds safety projects nor is it expected to affect RTPAs or MPOs. At the time of writing, there are no direct repercussions or incentives for MPOs for achieving or missing target goals.

While federal measure show urban areas have a higher number of traffic related injuries and fatalities, measures show that in California the injury and fatality rate per mile in rural RTPAs is over two times the rate of urban areas. Rural areas deal with unique safety challenges such as snow, ice, heavy rain, hairpin turns, poor visibility around corners and underfunded enforcement. Rural RTPAs are exempt from this roadway safety management framework, yet safety rates show a clear need to target investments in rural areas to reduce statewide injury and fatality rates.

Weather related performance metrics measuring the extent that roadways are affected by snow, ice, rain, or fog should be compared to safety rates in rural areas to obtain a better understanding of how rural challenges affect roadway safety. RTPAs should identify opportunities over the long term to support efforts on the development of weather related data and safety metrics.

Fatality and injury rates are difficult to improve in rural areas. Additional enforcement is typically budget restricted and speed limits are often ignored by drivers. This report recommends that Caltrans include safety challenges in rural areas and identify rural specific strategies for improving safety as part of the Strategic Highway Safety Program (SHSP).

Chapter 3: Bridge and Pavement Condition Performance Measures

MAP-21 established six key performance measures related to highway roadway and bridge infrastructure condition. Chapter 3 discusses the measures, federal compliance criteria, and implications for small urban MPOs and RTPAs. Non-MPO RTPAs are exempt while MPOs are

required to comply with bridge and pavement condition performance measure target setting rules.

In compliance with FHWA rules, Caltrans has set statewide targets for bridge and pavement condition in coordination with MPOs and has given MPOs the option of either adopting the statewide targets or setting their own regional targets. If an MPO adopts the statewide Caltrans bridge and pavement condition performance targets, they will be asked to do minimal reporting on bridge and pavement condition. Caltrans has provided tools and data to assist with reporting. If an MPO opts out of the statewide framework and chooses to establish their own regional pavement and bridge targets, the agency must provide Caltrans with their methodology, bridge and pavement inventory, funding estimates, targets, performance gap analysis, deterioration rates, and unit prices. This report recommends MPOs participate in the statewide framework since this allows Caltrans to take on the bulk of the reporting and program oversight tasks. If an MPO instead chooses to set their own targets, this may incur a significant workload for the MPO related to data collection, target setting, tracking and updating targets.

Each year FHWA will evaluate whether each state has made significant progress towards their targets. If a state is not making sufficient progress towards pavement condition targets they must obligate a portion of National Highway Performance Program (NHPP) and transfer a portion of Surface Transportation Program (STP) funds to address interstate pavement condition until acceptable levels are achieved. Since a large portion of NHPP and STP funds are already dedicated to pavement maintenance and improvement, this would not significantly affect the State, MPOs or RTPAs.

The vast majority of progress towards targets will be achieved by large urban areas as these areas have more highway lane miles, bridges and resources to implement projects to achieve performance goals. As of August 2018, Caltrans manages over 64 percent of statewide Interstate and Non-Interstate highway lane miles while the largest two urban MPOs in the state, San Francisco and Los Angeles, manage another 26 percent of total Statewide National Highway System (NHS) lane miles. Caltrans is responsible for approximately 80 percent of state NHS bridges.

Rural areas can experience more weather related impacts to infrastructure condition such as snow, ice, and flooding which can cause accelerated deterioration and failure of highway infrastructure. Total roadway failures may be more likely in rural areas due to mountainous terrain, significant riparian zones and associated increased risks of flood related roadway failure. By lumping poor and failed infrastructure into the same category, federal measures may obfuscate the higher incidence of infrastructure failure in rural areas and the associated need to protect roadways against these severe forms of damage. Quantifying and evaluating the

number of total infrastructure failures would reveal how significant this problem is in rural areas and may provide justification for additional funding to address these hazards. Accordingly, this report identified three additional measures that may be useful in assessing rural challenges related to weather impacts: Rate of highway pavement failures, rate of highway bridge failures, and weather related highway damage.

Chapter 4: National Highway System, Freight Movement on the Interstate System, Congestion Mitigation and Air Quality Measures

MAP-21 established six key performance measures related to system performance and air quality. Chapter 4 reviews the measures, federal compliance criteria, and assesses how this will affect small urban MPOs and RTPAs. Non-MPO RTPAs are exempt from this rule while most small MPOs are exempt from reporting and setting targets for some of the performance measures.

Caltrans has set statewide targets for system performance and air quality in coordination with MPOs and has given MPOs the option of either adopting the statewide targets or setting their own regional targets. MPOs which adopt the statewide framework are not required to set regional targets unless they are out of compliance with National Ambient Air Quality Standards (NAAQS) thresholds. This report recommends MPOs participate in the statewide framework since this allows Caltrans to take on the bulk of the reporting and program oversight tasks. If an MPO instead chooses to set their own targets, this may incur a significant additional workload.

FHWA will regularly evaluate whether each state has made significant progress towards their targets. If a state is not making sufficient progress towards achieving system performance and air quality targets, the state must document the actions that will be taken in the future to achieve targets. These consequences would not significantly impact MPOs or RTPAs.

This report finds that all measures of average congestion emphasize urban areas. Since rural areas have low average traffic and little congested related delay, opportunities for rural areas to contribute to travel time reliability measures are limited. The most efficient approach to improving average congestion measures would be to focus resources on traffic congestion reduction in urban areas. However, there is no clear urgency for the state to achieve federal targets or shift resources to urban areas to expedite target achievement since repercussions for failing to meet federal target thresholds are minor. States can set their own targets and can choose to implement sustainable incremental goals without the need to significantly change transportation investment decisions in a way that would negatively impact rural areas.

Rural areas experience traffic differently than urban areas. Increasingly, rural counties face high seasonal tourism traffic, especially on weekends and holidays. As urban population centers grow and the economy thrives, these tourist traffic volumes increase. Average measures of

traffic congestion do not adequately capture these spikes in congestion and rural areas need measures which capture this. Two measures show promise: Seasonal travel time delay and seasonal weekend travel time delay. Data on these measures is not generally collected and rural areas should explore opportunities to encourage this type of data collection in future local, state and federal planning efforts.

The Rural Counties Task Force study "Performance Monitoring Indicators for Rural and Small Urban Transportation Planning" (2015) recommends the use of a peak hour volume/capacity (V/C) measure to quantify congestion. This measure could also be augmented to capture seasonal and weekend tourism traffic impacts. Caltrans publishes vehicle volumes annually which can be used as a data source. Counties often perform their own local traffic counts which can be used to supplement or validate Caltrans V/C data.

Chapter 5: Transit Asset Management Performance Measures

MAP-21 established a system that monitors and manages a transit agency's public transportation assets so that they can be operated and maintained in a state of good repair throughout their lifecycle. This includes a number of associated performance measures. Chapter 5 reviews the federal transit asset management (TAM) framework, FTA compliance criteria, how to develop a TAM Plan, and implications for transit agencies. All Tier I and Tier II transit providers are required to implement this rule. This accounts for the vast majority of transit agencies in the state. MPOs must either adopt the resulting measures found in the TAM Plans of transit agencies within their jurisdiction or set separate regional targets in cooperation with their transit agencies. RTPAs are exempt from implementing this rule.

TAM compliance is overseen directly by the FTA. TAM plans do not need to be submitted to the FTA but must be made available upon request. Transit agencies must indicate they have complied with TAM rules in the annual Certifications and Assurances process. Grantees that cannot self-certify may be unable to obligate new grants. This is a potentially serious repercussion which could impact a transit agency's funding. Triennial and State Management reviews will begin to include TAM compliance starting in 2019. Findings of non-compliance may result in negative impacts to transit agency funding.

The TAM rules allow significant flexibility for small urban and rural transit agencies in setting targets. The rule requires agencies to set a Useful Life Benchmark (ULB) for each category of rolling stock and equipment. ULB is an estimate of the expected life of a piece of equipment. By allowing agencies to set their own ULB and not requiring standard FTA ULBs, the rule allows rural areas to account for vehicles they may have to use longer than normal due to resource limitations. Similarly, the rule allows agencies some subjective interpretation of the quality of their facilities and the determination of whether they are adequate.

While vehicle and equipment age are acceptable measures of TAM in the rural context, other measures may be more useful. This chapter reviews budgetary challenges limiting rural TAM and discusses a number of alternative measures for maintenance cost, vehicle failures, and asset condition. These metrics may be more useful to transit decision makers in the rural context.

Chapter 6: Public Transportation Agency Safety Plans

MAP-21 establishes a system to improve transit agency safety through Public Transportation Agency Safety Plans (PTASPs). The purpose of this rule is to implement performance-based approaches to improving transit safety which emphasize organization-wide safety policy, proactive hazard management, strong safety communication, training, and accountabilities. PTASPs will include a number of safety performance measures as well as new policies and procedures. Chapter 6 discusses the federal PTASP framework, FTA compliance criteria, how to develop a PTASP, and implications for small transit agencies. The majority of transit agencies that are recipients of FTA 5307 funding area required to comply with the PTASP rule. However, most transit agencies within rural RTPAs do not receive 5307 funding and are exempt.

PTASP compliance is overseen directly by the FTA. PTASPs do not need to be submitted to the FTA but must be made available upon request. Transit agencies must indicate they have complied with PTASP rules in the annual Certifications and Assurances process. Grantees that cannot certify compliance may be unable to obligate new grants. This is a potentially serious repercussion which could impact a transit agency's funding. Triennial and State Management Reviews will begin to include PTASP compliance. Findings of non-compliance may result in negative impacts to transit agency funding.

The requirements of the PTASP may be the most challenging of all TPM rules for small urban transit agencies. The PTASP rule requires significant organizational changes and policy setting which could be a significant burden to small transit agencies. The PTASP rule is heavily geared towards agencies with large staffs with significant new policy and administration requirements. PTASPs require new agency-wide policies for safety management, risk management, safety assurance, safety promotion, target setting, and frequent plan updates. Many required procedures are designed to cut through bureaucratic barriers which may suppress the flow of critical safety information to decision makers. However, in small transit agencies with few staff and hierarchies which are often flat, there can be less of a need for bureaucratic efficiencies.

While the compliance burden may not be a challenge for an urban provider, the resource requirements for implementation among small systems may translate into resources

diverted away from transit service. This report recommends that smaller transit agencies seek advice from Caltrans and the FTA on how to most efficiently complete their PTASP.

Chapter 7: Integrating Performance Based Planning into Regional Planning

Each MPO may be required to comply with all or part of each TPM rule regarding safety, bridge and pavement condition, system performance and air quality, TAM, and PTASP. For all performance management areas that an MPO is required to comply with, MPOs must include related goals, objectives, measures, and targets in their RTP and MTIP. This is to help assure that MPOs are partners in achieving federally required targets. Chapter 7 reviews federal rules related to integrating performance based planning into metropolitan and regional planning processes. While RTPAs are not required to integrate the targets into their planning and programming, this report recommends that RTPAs do so where feasible.

For each TPM category, the state and/or transit agencies within MPOs are required to adopt targets. The Regional Transportation Plan (RTP) of an MPO shall include these performance targets and a description of progress made toward target achievement since the plan's last update. This must include a system performance report for each set of targets excluding transit targets. This report recommends coordination with all regional transportation agency partners before adopting targets to assure targets are acceptable to all local agencies involved.

For all federally-required targets, MPOs must show that the TIP makes progress towards achieving the performance targets and that it include a description of the anticipated effect of the TIP towards achieving performance targets. TIPs must also describe how much of an effect the investments are expected to have on target achievement.

RTPAs are exempt from these requirements. However, this report recommends that RTPAs include relevant projects in their TIP if new projects emerge from a partner transit agency's compliance with the TAM rule.

Chapter 1: Introduction

Background and Purpose

The federal Moving Ahead for Progress in the 21st Century Act (MAP-21) was signed into law in 2012 and includes provisions for the establishment of a new performance and outcome-based program, including national performance goals for safety, infrastructure condition, congestion reduction, system reliability, freight movement, environmental sustainability and transit asset management. Signed into law on December 5, 2015, the Fixing America's Surface Transportation (FAST) Act continues MAP-21's overall performance management approach and establishes nationally consistent metrics.

Based on the FAST Act and MAP-21, the U.S. Department of Transportation has issued several rules that establish a set of performance measures for transportation performance management. These rules require Caltrans to set statewide targets for each of the performance measures. The rule also requires transit operators to implement transit asset management and transit safety plans. MPOs must either adopt these statewide and transit agency targets or establish MPO regional targets. The framework established by these rules is known as the Transportation Performance Management (TPM) framework. Under these rules, quantitative oversight of all levels of transportation management has increased greatly.

This study was commissioned by the California Rural Counties Task Force (RCTF) on behalf of the 26 Regional Transportation Planning Agencies (RTPAs) that comprise the group. The purpose of this study is to provide guidance and a framework for rural RTPAs and their transit agencies on implementing the Federal TPM framework. This report builds upon earlier work by the RCTF on rural performance measures, namely the report "Performance Monitoring Indicators for Rural and Small Urban Transportation Planning" of 2015. As the focus of this study is on the rural context, this report focuses on the responsibilities of small MPOs, RTPAs and transit agencies under new TPM rules.

Structure

This report addresses each major Federal TPM rule in its own chapter. Each chapter includes a summary of compliance criteria, performance measures, target setting requirements, data sources, and reporting requirements. Table 1-1 below identifies where each rule within the TPM framework is addressed in this study. As each performance rule is unique, each chapter may vary slightly in its presentation.

Table 1-1: Report Chapters Addressing Transportation Performance Management Framework Rules and Associated Regulations

Performance Area	Code of Federal Regulations	Chapter
Highway Safety	23 CFR 490 Subpart B	Chapter 2
Asset Management	23 CFR 515	Chapter 3
Bridge	23 CFR 490 Subpart D	Chapter 3
Pavement	23 CFR 490 Subpart C	Chapter 3
Freight	23 CFR 490 Subpart F	Chapter 4
Congestion/Mobility	23 CFR 490 Subpart G	Chapter 4
System Performance	23 CFR 490 Subpart E	Chapter 4
CMAQ On-Road Mobile Source Emissions	23 CFR 490 Subpart H	Chapter 4
Transit Asset Management	49 CFR 625	Chapter 5
Transit Safety	49 CFR 670	Chapter 6
Performance based Planning and Programming	23 CFR 450	Chapter 7

Agency Roles and Responsibilities in the Federal Transportation Performance Management Framework

State DOTs are the lead agencies responsible for implementation of the Federal TPM framework. MPOs must assist State DOTs as needed. In California, the California Department of Transportation (Caltrans) has taken the lead by creating a statewide framework for data collection, reporting and compliance. Caltrans has commissioned a number of new data collection and reporting systems which expedite implementation. Under the statewide framework performance measures are aggregated and evaluated at the statewide level. If MPOs adopt state level targets, regional-level performance targets not required. As part of the state framework, Caltrans takes on the majority of the burden of data collection and reporting, and MPOs have only a minor additional work load. MPOs can choose to participate in this framework or create their own regional measures.

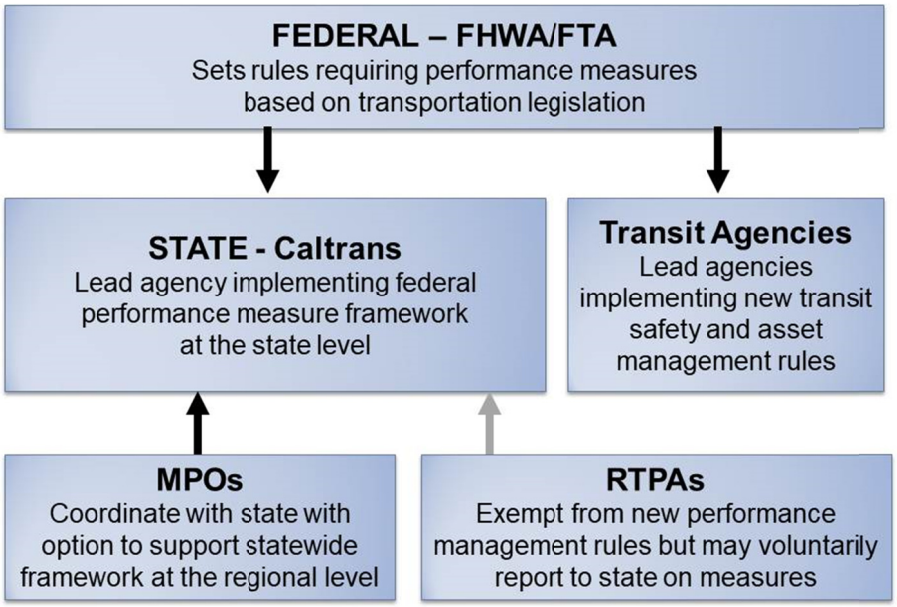
If an MPO chooses not to participate in the Caltrans statewide framework and implement their own regional TPM framework to be compliant with federal rules, they must set regional targets using federally required performance measures and metrics. The associated target setting, data analysis and reporting required may incur a significant additional workload.

Most transit agencies must comply with the Federal TPM framework's new transit safety and asset management requirements. While Caltrans may assist, in general the associated

compliance documents will be completed by each transit agency and submitted directly to the Federal Transit Administration (FTA).

The new transportation performance management requirements found in MAP-21 and the FAST Act are not applicable to RTPAs. However, RTPAs may choose to voluntarily report performance measure data for their region to Caltrans. Transit agencies in RTPAs must comply with new transit safety and asset management requirements and identify related local and regional priority projects. RTPAs should integrate these transit agency priorities into their Regional Transportation Plans (RTPs) and Regional Transportation Improvement Plans (RTIP) as appropriate. Figure 1-1 illustrates the relationship between the agencies involved in implementation of the Federal TPM framework.

Figure 1-1: Federal Transportation Performance Measure Framework Agency Roles



Chapter 2: Highway Safety Performance Measures

Introduction

MAP-21 and subsequent federal rulemaking established five key performance measures related to roadway safety. Each state must use these five measures to set targets for safety improvements in the transportation system to be in compliance with the federal performance management framework. The measures are implemented as five-year rolling averages, defined as the average of the five calendar years ending prior to the year the targets are due. The measures are as follows:

- Number of Fatalities
- Number of Serious Injuries
- Rate of Fatalities per 100 Million Vehicle Miles Traveled
- Rate of Serious Injuries per 100 Million Vehicle Miles Traveled (VMT)
- Number of Non-motorized Fatalities and Serious Injuries

These safety performance measures are applicable to all public roads regardless of ownership or functional classification. Non-MPO RTPAs are exempt from this rule but may choose to voluntarily participate in the statewide framework by following MPO reporting procedures. MPOs are required to comply with safety performance measure target setting rules but may choose to support the statewide targets rather than setting targets for their region. Data on these measures is collected by local and state law enforcement agencies as part of their regular duties.

Target Setting

Federal regulations requires that state departments of transportation establish and report annual targets related to each of these five performance measures by August 31 of each year. As the primary agency responsible to FHWA for implementation, Caltrans Division of Traffic Operations has taken the lead on coordinating the effort to establish statewide safety performance targets.

Caltrans has set statewide targets for improving safety and provides MPOs with the option of either adopting the statewide targets or setting their own regional targets. For each performance measure, MPOs shall choose how they will establish a target six months after State DOTs establishes targets by either: 1) Agreeing to plan and program projects so that they contribute toward the accomplishment of the statewide safety targets; or 2) Setting their own MPO-specific quantifiable target for the five safety performance measures for their metropolitan planning area.

If an MPO chooses to set their own safety performance targets, they must use the five safety targets designated above. If MPOs choose to set their own targets, federal law requires that targets must be set in coordination with the State to the maximum extent practicable, and MPOs will be asked to update and report on these targets annually. If an MPO chooses to set their own targets, significant additional workload may be generated for agency staff for data collection, target setting, tracking and regular updates to targets. Due to the significant additional workload, this is not a recommended approach unless an agency wants to set performance standards significantly higher than the Caltrans statewide targets, or finds the Caltrans targets inappropriate for their roadway system due to unique system features.

At the time of writing, there are no repercussions or incentives for MPOs for achieving or missing target goals.

Reporting

If an MPO adopts the Caltrans safety performance targets, the MPO will not need to set region specific targets, nor will they be required to report on their progress to Caltrans Data on target achievement will be collected by Caltrans at the statewide level. At the end of each reporting period, Caltrans reviews progress toward targets by aggregating performance measures at the statewide level. Caltrans may then adjust statewide target goals annually based on progress. If MPOs choose to set their own targets, they must update and report on these targets annually.

If not participating in the statewide performance target setting framework, MPOs may be required to report on their progress using an alternative process. MPOs following an alternative framework should work with Caltrans to identify the required reporting.

Data Sources

Caltrans provides access to a database that provides data for the five safety performance measures through the Transportation Injury Mapping System (TIMS) which can be accessed here. Data is provided from the Fatality Analysis Reporting System (FARS) from the National Highway Transportation Safety Administration (NHTSA), the Highway Performance Monitoring System (HPMS) from the Federal Highway Administration (FHWA), and the Statewide Integrated Traffic Management System (SWITRS). The list of data sources for each performance measure can be found in Table 2-1.

Table 2-1: Safety Measures and Data Sources

Safety Measure	Data Source
Number of Fatalities	FARS (NHTSA)
Rate of Fatalities (per 100 Million Vehicle Miles Traveled)	FARS (NHTSA) & HPMS (FHWA)
Number of Serious Injuries	SWITRS (CHP)
Rate of Serious Injuries (per 100 Million Vehicle Miles Traveled)	SWITRS (CHP) & HPMS (FHWA)
Number of non-Motorized Fatalities and Non-Motorized Severe Injuries	FARS (NHTSA) & SWITRS (CHP)

Performance Evaluation

Each year, FHWA will evaluate whether each state has made significant progress towards their targets. A state is considered to have made significant progress toward meeting its safety targets when at least four of the five targets are met, or the performance measures improve over the baseline performance the year prior to the target year. Each year that FHWA determines that a state has not made significant progress toward meeting its performance targets, the state will not be allowed to use Highway Safety Improvement Program (HSIP) funding for non-safety projects and will be required to obligate all baseline HSIP funding to safety capital projects. Since HSIP is already used for safety projects, this restriction on HSIP would not meaningfully affect how Caltrans funds safety projects, nor is it expected to affect RTPAs or MPOs. The state would also be required to provide a report to FHWA on how it intends to meet the safety targets in the future.

Safety Performance Measures in the Rural Context

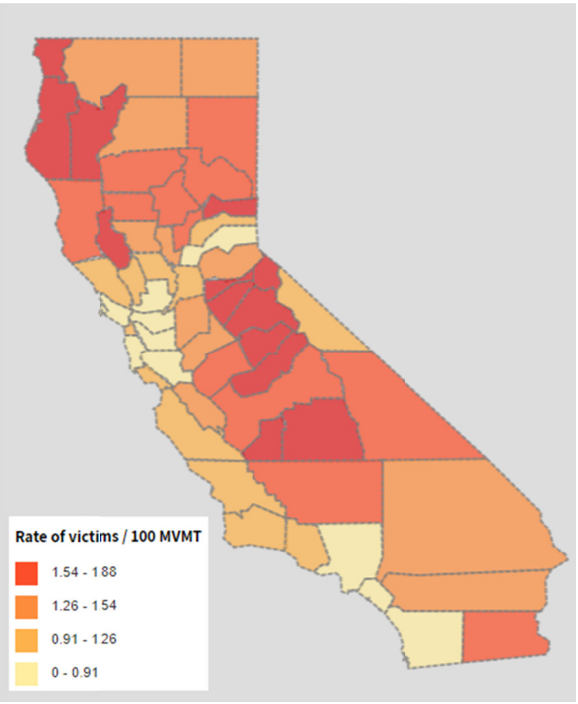
Federal safety performance measures focus on the rate and number of fatalities and serious injuries. These measures are good indicators of safety throughout roadway systems. However, these measures are descriptive, not explanatory. They do not reveal why safety incidents may be occurring at a higher rate in some locations and a lower rate at other locations. Since TPM safety measures are highly correlated with population size, and TPM measures are aggregated at the statewide level for TPM reporting purposes, large populations in urban areas bias the statewide averaged data to reflect urban trends. This section explores the potential for rural areas to contribute towards improving these statewide performance targets and provides considerations for designing future transportation performance measures for rural areas to improve the explanatory power of these safety performance measures.

Measures Using Rate of Fatalities/Serious Injuries per 100 Million Vehicle Miles Traveled (VMT)

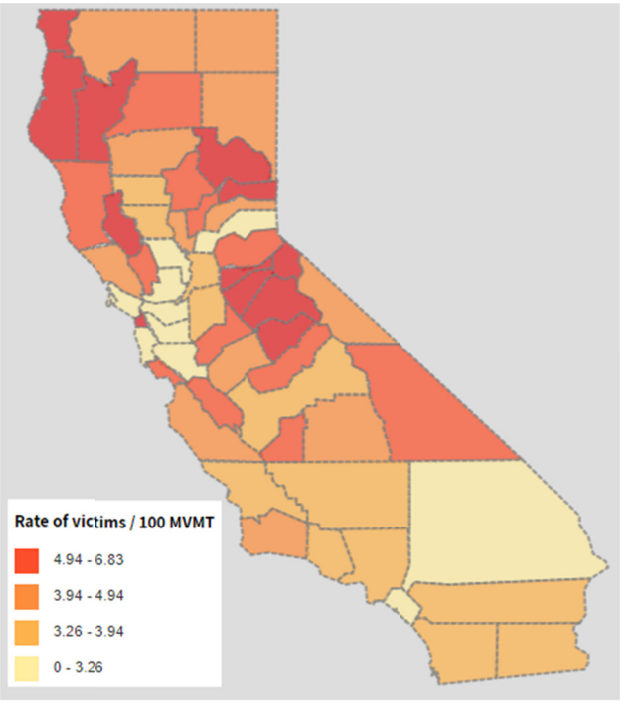
Measures of fatalities and serious injuries per 100 million VMT provide a measure of risk per distance traveled. These measures pose challenges when comparing results of rural and urban areas. Figure 2-1 shows that safety measures measured in 100 million VMT typically result in poorer results for rural counties. This can be due to higher average traffic speeds, more drive-alone trips, and in some cases more curves and weather impacts on highway safety.

Figure 2-1: Rate of Fatalities and Serious Injuries per 100 Million VMT in California

Rate of Fatalities per 100M VMT
(5-year rolling average)



Rate of Serious Injuries per 100M VMT
(5-year rolling average)



Source: Transportation Injury Mapping System (TIMS), March 2019. 5-year rolling average includes data from 2012-2016. 2016 data includes provisional SWITRS data.

Reducing speeds on the roadway system is crucial to reducing the injury and fatality rate. Urban areas have a significant advantage as urban traffic naturally restricts speeds, resulting in lower speed accidents and fewer injuries. Rural areas, on the other hand, typically have less traffic and drivers tend to drive faster. This results in more severe accidents with more injuries and fatalities per 100 million VMT. Rural areas often have more highway mileage with winding roads, poor visibility around corners, and in mountainous areas, seasonal snow and ice which significantly impact accident rates. Higher speeds interact with curved roadway alignments and dangerous highway conditions to magnify rural accident rates.

Fatality/injury rates by VMT cannot be easily improved in rural areas. Additional enforcement is typically budget restricted and speed limits are often ignored by drivers. This report recommends that Caltrans and FHWA include recognition of rural transportation system differences compared to urban systems and that Caltrans provide recommendations for rural agencies for improving these safety metrics. The Caltrans Strategic Highway Safety Program (SHSP) in particular should recognize the safety problems in rural areas are sometimes different than those in urban areas and should provide rural-specific strategies to improve safety. The SHSP guides the implementation of the Highway Safety Improvement Program (HSIP). The HSIP includes funding for safety projects throughout California, including funding for rural projects. Rural areas in need of funding must submit their projects during the HSIP call for projects to be considered for funding.

Measures of Absolute Number of Fatalities/Serious Injuries

Measures of the number of fatalities and serious injuries are key safety measures in the TPM framework. The advantage of using an absolute number for tracking fatalities or serious injuries is that it is simple. These measures show a meaningful change to the general public, elected officials, and decision makers. This provides advantages in communicating the effectiveness of safety interventions.

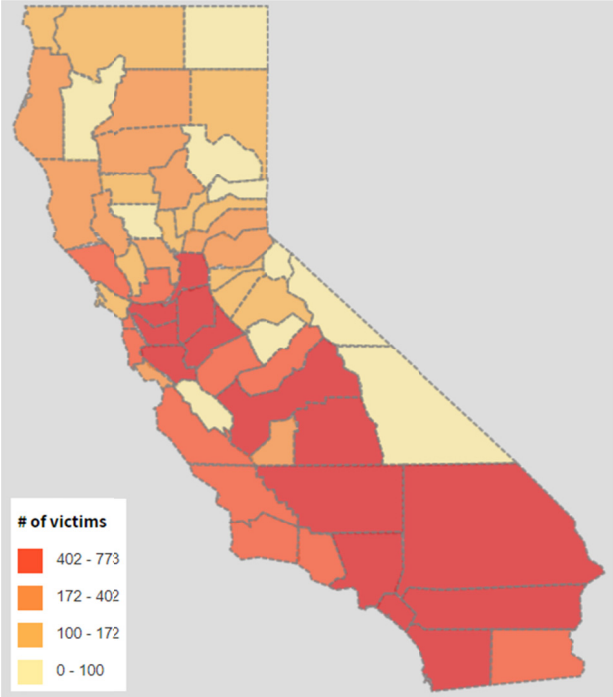
The challenge with absolute measures is that they emphasize the impact of urban areas on the measure and do not capture relative risks compared to rural areas. Due to the larger populations in urban areas, absolute numbers of fatalities and serious injuries will always be higher in urban regions compared to rural regions (see Figure 2-2). However, as seen in the rate per 100 million VMT measures, per capita rates of fatalities and serious injuries are much lower in urban areas, and rural areas are typically more risky to drivers per mile driven. Regardless, absolute measures highlight areas where roadway safety projects are likely to have the greatest effect since more traffic is concentrated on a smaller set of roadways in urban areas. In these areas, urban financial resources are available, and projects can impact areas with the largest number of safety incidents.

Other Potential Measures of Roadway Safety

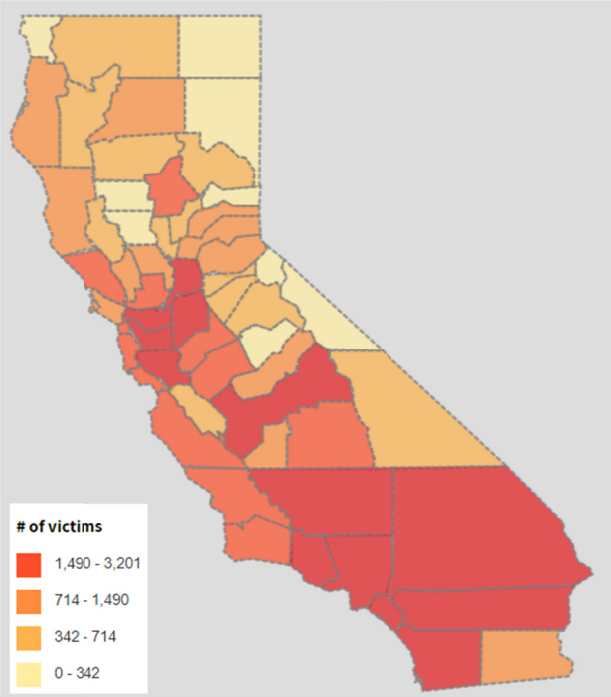
Rural areas are disproportionately affected by inclement weather in California. Figure 2-3 shows that non-MPO rural counties face high average precipitation compared with more urban areas. This includes a higher incidence of snow and ice. Certain performance metrics recommended by the Transportation Research Board (TRB) can be used to account for different weather conditions in rural areas such as the extent of highways affected by snow or ice, rain or fog (see Table 2-2). Comparing these measures to safety measures by rate per 100 million VMT

Figure 2-2: Number of Fatalities and Serious Injuries in California

Number of Fatalities (5-year rolling average)



Number of Serious Injuries (5-year rolling average)



Source: Transportation Injury Mapping System (TIMS), March 2019. 5-year rolling average includes data from 2012-2016. 2016 data includes provisional SWITRS data.

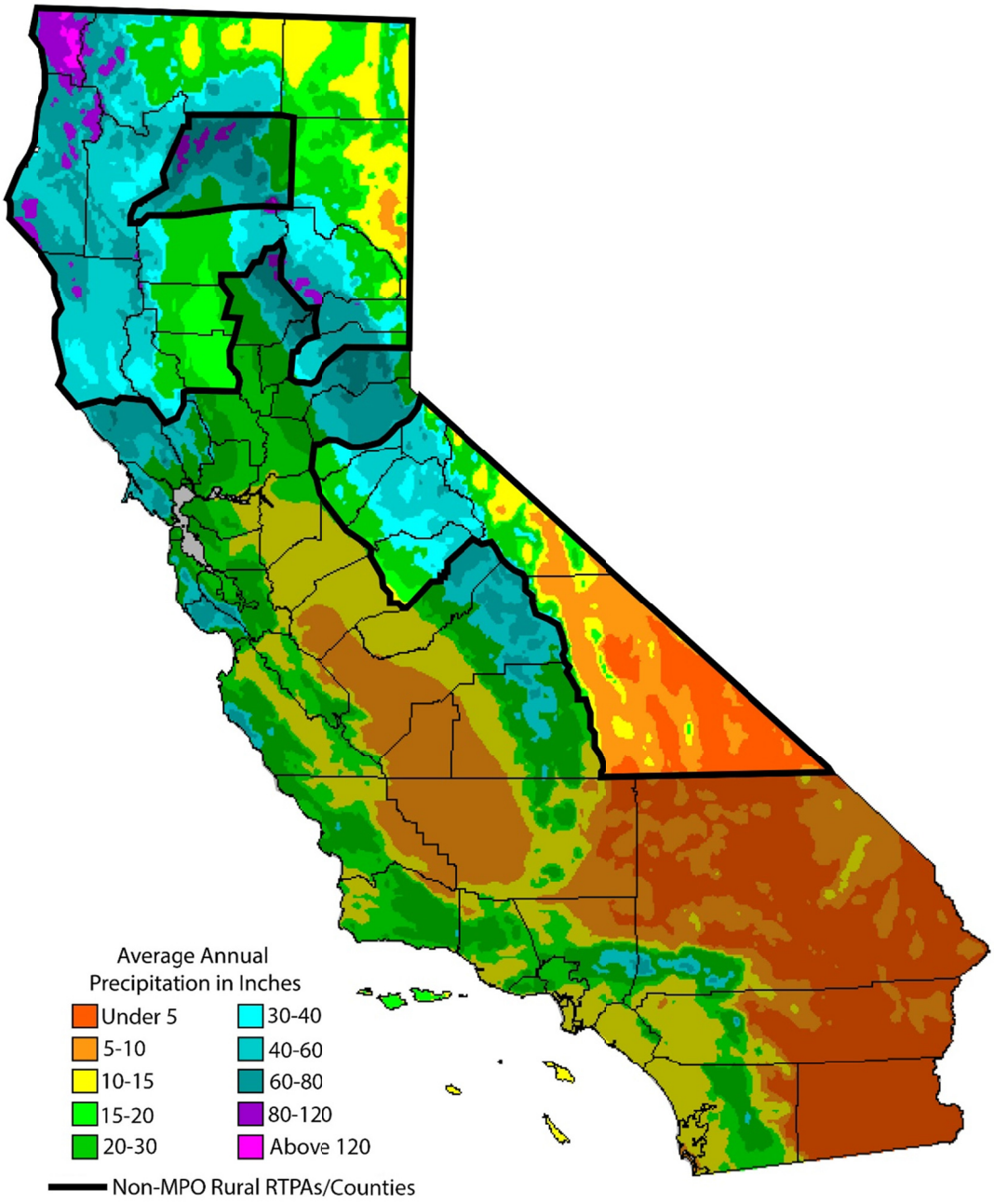
Table 2-2: Highway Weather Performance Metrics

Performance Metric	Definition	Units
Extent of highways affected by snow or ice	Highway centerline mileage under the influence of uncleared snow or ice multiplied by the length of time of influence	Centerline-Miles-Hours
Extent of highways affected by rain	Highway centerline mileage under the influence of rain multiplied by the length of time of the influence	Centerline-Miles-Hours
Extent of highways affected by fog	Highway centerline mileage under the influence of fog multiplied by the length of time of the influence	Centerline-Miles-Hours

Source: Guide to Effective Freeway Performance Measurement: Final Report and Guidebook, TRB, 2007

would reveal if there is a correlation between highways affected by weather conditions and rural areas with higher safety incident rates. This data is not widely collected or tracked by FHWA or State DOTs, and efforts for RTPAs to undertake this type data collection would be

Figure 2-3: Annual Average Precipitation in California 1961-1990, Highlighting Non-Urban Rural Regional Transportation Planning Agencies



Spatial Climate Analysis Service, Oregon State University (2000).

financially restrictive. Instead, RTPAs should identify opportunities over the long term to support federal and state data collection efforts on these types of weather related metrics.

In the report *Transportation Performance Measures for Rural Counties in California* (2015) by the Rural Counties Task Force, a recommended alternative safety measure is total collision cost.

This measure summarizes the total economic costs of accidents and provides a means of judging the cost-effectiveness of potential safety improvements. This feature is particularly important to rural areas with fewer financial resources. The report recommends averaging accident cost on a per capita basis when comparing rural and urban collision costs to provide better parity when evaluating safety measures between urban and rural areas. This measure is best used with measures of the number or rate of fatalities and injuries to supplement this information with the economic cost of safety problems.

RTPA Role in Supporting Safety Targets

Rural RTPAs that are not part of an MPO are exempt from target setting requirements found in the safety performance management rules. RTPAs may choose to voluntarily assist in the statewide effort by prioritizing safety projects in their TIP where possible. As rates of injuries and fatalities are high in rural areas, rural counties have an opportunity to improve these statewide metrics. However, the majority of these improvements would be realized through Caltrans improvements to the highway system, California Highway Patrol (CHP) enforcement, and efforts in urban areas.

Since rural areas have smaller populations, RTPA contributions to statewide performance measures are expected to make minor reductions to the absolute number of serious injuries and fatalities. The vast majority of progress towards targets will be achieved by the state and large urban areas as these jurisdictions have more opportunities and resources to implement projects to achieve performance goals. However, rural RTPAs are significant opportunity areas for state investments to reduce the rate of fatalities and serious injuries, a key statewide safety performance measure.

In the rare case that an RTPA is part of an MPO that adopts the state safety targets, they will not be required to provide any additional data to the MPO for tracking targets. For RTPAs that are part of an MPO, does not adopt the state safety targets, and choose to establish their own targets for their MPO, they may be asked to work with their MPO to identify progress towards targets.

Chapter 3: Bridge and Pavement Condition Performance Measures

Introduction

In 2012 MAP-21 established six key performance measures related to highway roadway and bridge infrastructure condition. The Bridge and Pavement Performance Management Final Rule, codified in 23 CFR 490, establishes performance measures for State DOTs to use in managing pavement and bridge performance on the National Highway System (NHS). This rule establishes the process for State DOTs and Metropolitan Planning Organizations (MPOs) to establish and report their pavement and bridge targets, and the process that the Federal Highway Administration (FHWA) will use to assess whether State DOTs have met acceptable levels for highway and bridge condition.

Caltrans has taken the lead on implementing federal bridge and pavement condition performance measures in California, coordinating with MPOs to the maximum extent practicable. Non-MPO RTPAs are exempt from this rule but may choose to voluntarily participate in the statewide framework by following MPO reporting procedures. The measures are discussed more below.

Highway Pavement Condition Based Performance Measures

Federally designated highway pavement performance measures are as follows:

- Percent of Interstate Pavements in Good Condition
- Percent of Interstate Pavements in Poor Condition
- Percent of Non-Interstate NHS Pavements in Good Condition
- Percent of Non-Interstate NHS Pavements in Poor Condition

State DOTs must establish statewide NHS two year targets and four year targets for each measure. MPOs must set regional targets that either support statewide targets or set their own targets 180 days after statewide targets are established. Data on relevant roadways is collected by Caltrans in cooperation with cities, counties and MPOs.

Bridge Condition Based Performance Measures

Federally designated bridge performance measures are as follows:

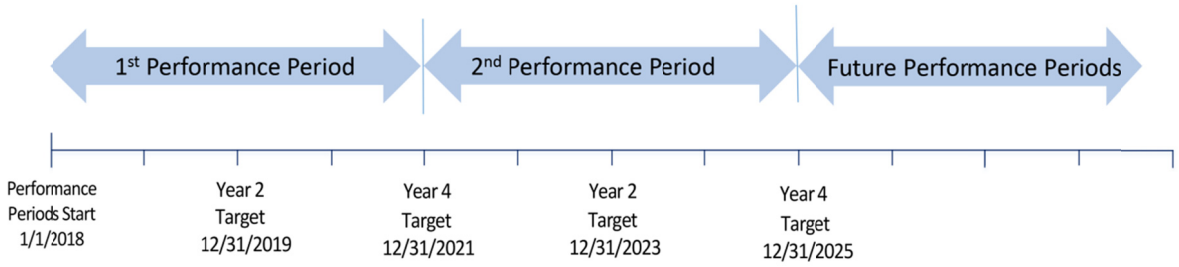
- Percent of NHS Bridges Classified as in Good Condition
- Percent of NHS Bridges Classified as in Poor Condition

States must establish statewide NHS two-year targets and four-year target for each measure. State DOTs may update the four-year targets at the two-year mid-performance period progress report. This allows flexibility in case a state cannot make its' original four-year target.

Performance Periods

Each performance period lasts four calendar years. The first four-year performance period runs from January 1, 20187 – December 31, 2021, the second performance period runs from January 1, 2022 – December 31, 2025, and further periods continue in this pattern every four years.

Figure 3-1: Target Performance Periods for Pavement and Bridge Condition



Within each four year performance period, the state DOT must set targets for pavement and bridge condition, and must report to FHWA at the two-year mark and four-year mark. State DOTs may update four-year targets at the two-year mid-performance period progress report. This allows flexibility in case a state finds that it cannot make its original four-year target.

Target Setting

Caltrans has taken the lead in implementing a statewide bridge and pavement condition performance management framework in coordination with MPOs. If an MPO chooses to adopt the statewide framework, regional targets are not required. Instead, all MPOs will work collectively along with Caltrans to set and achieve statewide targets. MPOs must provide reporting to Caltrans no less than once every two years. The benefit of participating in the statewide framework is that Caltrans handles the majority of implementation, target setting, reporting and federal compliance with a minimal reporting burden on MPO staff. Without state assistance, this additional workload may be difficult to absorb for smaller MPOs.

If an MPO opts out of the statewide framework and chooses to establish their own regional pavement and bridge targets, the agency must provide Caltrans with their methodology for target setting, bridge and pavement inventory, planned funding, target condition, performance gap, deterioration rates, and unit prices. See Appendix A for more information. An MPO setting their own regional targets must use the federally designated measures at a minimum and may use additional measures if they choose. Caltrans and FHWA require targets only for the

federally designated measures. If an MPO chooses to adopt measures in addition to the required measures, the additional measures will not be considered in determining compliance with this rule.

While MPOs may set their own regional targets, target achievement is evaluated by FHWA by aggregating all regional performance measures at the statewide level. MPOs setting regional targets would have their performance measure data aggregated and included in the statewide reporting to FHWA. If an MPO chooses to set high regional targets above the state targets, this may benefit the region by resulting in improved infrastructure and would benefit the State DOT by helping achieve their targets. However, resource-limited rural areas may not be able to meet increased performance targets.

Reporting

If participating in the statewide framework, MPOs should provide Caltrans with two year and four year estimates of lane-mile inventory and condition for the performance period. Caltrans assists with this process by providing a target calculator tool with a table of each MPO's most recent Interstate and non-Interstate NHS lane miles and condition. This is used as a baseline for calculating expected changes to pavement and bridge condition for the performance period. See Appendix B for information that should be reported. See Appendix C for the process for estimating interstate, non-Interstate NHS and bridge condition for an MPO area.

If not participating in the statewide performance target setting framework, MPOs may be required to report on their progress using an alternative process. MPOs following an alternative framework should work with Caltrans to identify the required reporting.

Data Sources

Highway pavement condition performance measure data is provided by the Highway Performance Management System (HPMS), a database operated and maintained by FHWA. The Caltrans Division of Transportation Asset Management provides regions with summarized statewide NHS two-year and four-year HPMS highway pavement performance data broken out by MPO.

Highway bridge condition performance measure data is provided by the National Bridge Inventory (NBI), a database operated and maintained by FHWA. Data is collected by Caltrans in cooperation with cities, counties and MPOs. The Caltrans Division of Transportation Asset Management provides regions with summarized statewide NHS two-year and four-year NBI bridge condition data broken out by MPO.

If additional information is sought on the engineering methodology for determining bridge and pavement condition, this information can be obtained from FHWA. Bridge condition is determined based on three FHWA National Bridge Inventory (NBI) metrics: Deck condition, superstructure condition, and substructure condition. For more details on how bridge condition is determined, see the website of FHWA Office of Bridges and Structures, National Bridge Inventory program. Pavement condition is calculated using four measures: International Roughness Index (IRI), cracking, rutting, and faulting. These metrics and the methodology are prescribed by federal legislation (23 CFR Part 490.300s and 490.400s).

Performance Evaluation

This section discusses the penalties to states for not achieving Federal target thresholds. One set of penalties are for not making sufficient progress towards achieving statewide pavement condition targets and another set of penalties are for insufficient progress towards bridge condition targets. In general, the repercussions for not making adequate progress towards targets are nominal.

If for three consecutive years more than 10 percent of a state DOT's NHS bridges' total deck area is classified as structurally deficient, the State DOT must obligate and set aside a portion of National Highway Performance Program (NHPP) funds for eligible projects on bridges on the NHS until less than 10 percent of the State DOT's NHS bridges are structurally deficient. Since a large portion of NHPP funds are already dedicated to bridges, this would not significantly affect the State, MPOs or RTPAs.

If FHWA determines that 5 percent or more of the State DOT's interstate pavement is in poor condition for the most recent year, the State DOT must obligate a portion of National Highway Performance Program (NHPP) and transfer a portion of Surface Transportation Program (STP) funds to address interstate pavement condition. This provision will continue until the interstate pavement condition has less than 5 percent of lane miles in poor condition. Since a large portion of NHPP and STP funds are already dedicated to pavement maintenance and improvement, this would not significantly affect the State, MPOs or RTPAs.

Bridge and Pavement Condition Measures in the Rural Context

Small urban and rural areas often have the highest proportion of bridges and pavement in poor condition. They experience more inclement weather conditions such as snow, ice, and flooding which can cause accelerated deterioration and failure of highway infrastructure.

In rural areas with snow and ice in particular, weather related factors can significantly degrade highway condition. Snow plows can clip and damage highway pavement. Chemical de-icers may interact with the materials in a pavement leading to damage through stripping, scaling, and

spalling. Sanding roadways can result in pavement joint distress. Chains can seriously damage and degrade highway surfaces. These are challenges that are not typically found in urban regions.

Flooding presents its own challenges. Rural areas in mountainous areas must deal with increased incident of flood related damage and landslides. These factors increase the risk of catastrophic failures such as wash outs, slip outs, culvert failure, severe undermining and other damage which may require full replacement of sections of pavement or bridges. Emergency funding rarely covers the cost of these incidents, and repairs or replacements can quickly consume a rural jurisdiction's entire maintenance budget. The federal performance measures for bridge and pavement do not address these perennial rural challenges.

Total roadway failures, while rare, may be more likely in rural areas to due to mountainous terrain and high levels of precipitation. As currently conceived, the federally required measures for pavement condition only recognize two states: good and poor. High levels of roughness, cracking, rutting and/or faulting qualify a roadway as poor. However, such a roadway may still be useable. Under the current pavement measurement system, a roadway that is poor but still functionally usable is classified in the same category of a roadway that has completely failed. Similarly, a bridge at 50 percent or lower condition is considered poor under the current federal bridge metrics, but this category includes both poor functional bridges and failed bridges. Lumping poor and failed infrastructure into the same category may obfuscate the higher incidence of infrastructure failure in rural areas and the associated need to protect roadways against these severe forms of damage. This points the need for a metric for bridge and pavement condition in rural areas which is based on weather related damage.

Interstate, non-interstate highways and their associated bridges are the focus of pavement and bridge condition targets. These structures are concentrated in urban areas and are under the jurisdiction of Caltrans, and to a lesser extent, large MPOs. As such, most progress towards targets will be achieved by these agencies and only minor impacts will be made by the activities of other MPOs or RTPAs. As of August 2018, Caltrans manages over 64 percent of statewide Interstate and Non-Interstate highway lane miles while the largest two urban MPOs in the state, San Francisco and Los Angeles, manage another 26 percent of total Statewide NHS lane miles. Caltrans is responsible for approximately 80 percent of state NHS bridges. In this context, the remaining highway lane miles in the remaining MPOs and RTPAs do not provide a opportunity for rural areas to make a significant impact on bridge and highway condition measures.

In light of these statistics, the most efficient way for the state to improve pavement and bridge condition targets would be to increase investment in areas with the most highway system mileage. The majority of highway system mileage is found in urban and inter-urban areas. This

may encourage Caltrans to shift financial resources toward improving inter-urban and urban highway systems to achieve targets, which may result in shifting investments away from RTPAs and small urban MPOs. RTPAs and small MPOs in particular must be vigilant of diversions of reductions in existing pavement and bridge funding.

Federal rules indicate that RTPAs are not required to comply with this rule due to their small size. The performance measures that were chosen by FHWA will be achieved primarily by urban MPOs and Caltrans. By requiring the use of these measures, FHWA has inadvertently created a condition where states, desiring to make progress towards federal target achievement, are incentivized to shift resources to improving system conditions for urban MPOs instead of rural RTPAs. This is concerning in an environment where the majority of transportation funding already goes towards urban areas. However, this is not necessarily a dilemma. The state can achieve both federal performance targets and also improve resources for pavement and bridge condition in rural areas.

Since the repercussions for failing to meet federal target thresholds are minor, there is no compelling reason for the state to shift resources away from rural area infrastructure maintenance to achieve federal targets. This report recommends that the State take a longer-term state compliance strategy which improves funding for rural bridge and pavement needs while incrementally achieving federal targets. Urban areas, having greater financial resources than rural areas, may need to increase investments in their regions to contribute to statewide target achievement so the state does not need to shift rural resources towards urban areas.

Alternative Rural Measures for Pavement and Bridge Condition

This report recommends three alternative measures that can be used to supplement the existing federally required performance measures of pavement and bridge condition: Rate of highway pavement failures, rate of highway bridge failures and a weather related highway damage measure. Measures by rate may be evaluated per mile of highway to better evaluate rural and urban rates.

The TPM measures of pavement and bridge condition do not capture the catastrophic effect of total pavement or bridge failure. Quantifying and evaluating the number of total infrastructure failures would reveal how significant this problem is in rural areas and may provide justification for additional funding to address these hazards.

Rural areas may have a higher incidence of infrastructure failure compared to urban areas. Quantifying weather related highway damage has the potential to explain some of these conditions. Since there are currently no commonly accepted measures of weather related highway damage, additional research would be needed to identify a feasible measure. The final measure should be an index between general indicators of inclement weather, such as weather

related highway delay, and percent of highway classified as poor. It would be beneficial to assess this type of measure at the county level to clearly evaluate the differences between RTPAs and non-RTPA areas.

RTPA Role in Supporting Pavement and Bridge Condition Targets

Rural RTPAs that are not part of an MPO are exempt from target setting requirements found in the bridge and pavement condition performance management rules. RTPAs may choose to voluntarily assist in the statewide effort by prioritizing relevant projects in their TIP where possible. However, since rural areas have fewer highway lane miles and bridges, RTPA contributions to statewide performance measures would be minor. The vast majority of progress towards targets will be achieved by large urban areas as these areas have more highway lane miles, bridges and resources to implement projects to achieve performance goals.

In the rare case that an RTPA is part of an MPO that adopts the state pavement and bridge condition targets, they will not be required to provide any additional data to the MPO for tracking targets. For RTPAs that are part of an MPO, does not adopt the state targets, and choose to establish their own targets for their MPO, they may be asked to work with their MPO to identify progress towards targets.

Chapter 4: National Highway System, Freight Movement on the Interstate System, Congestion Mitigation and Air Quality Measures

Introduction

On May 20, 2017, the National Performance Management Measures to Assess Performance of the National Highway System Final Rule and the National Performance Management Measures for Assessing Congestion Mitigation and Air Quality Improvement Program - On-Road Mobile Source Emissions Final Rule were established by FHWA. This instituted six performance measures for State DOTs to use in managing system performance and air quality throughout the interstate and non-interstate NHS system. These measures quantify highway related congestion and air pollution throughout the state. The rule addresses requirements established by MAP-21 and the FAST Act and is codified in 23 CFR 490 Subparts E and H.

The rule establishes the process for State DOTs and MPOs to establish and report performance targets for the Interstate and non-Interstate NHS to carry out the National Highway Performance Program (NHPP), the National Highway Freight Program (NHFP), and the Congestion Mitigation and Air Quality Improvement (CMAQ) Program. The rule includes the process that the Federal Highway Administration (FHWA) will use to assess whether state DOTs have achieved acceptable system performance and air quality targets.

Caltrans has taken the lead on implementing federal system performance and air quality measures in California, coordinating with MPOs to the maximum extent practicable. Non-MPO RTPAs are exempt from this rule but may choose to voluntarily participate in the statewide framework by following MPO reporting procedures. The measures are discussed more below.

System Performance and Air Quality Performance Measures

System performance measures are as follows:

- Percent of Reliable Person Miles Traveled on the Non-Interstate NHS
- Percent of Reliable Person Miles Traveled on the Interstate
- Percent of Interstate System Mileage Providing Reliable Truck Travel Time

All MPOs must report on percent of reliable person miles traveled on the non-interstate NHS. MPOs that do not have interstate NHS mileage are exempt from reporting on the interstate measure and the percent of interstate system mileage providing reliable truck travel time measure. Some measures require only a four-year target and some require both a two-year and four-year target. For a list of target requirements, see Table 4-1.

Table 4-1: System Performance and Air Quality Performance Measures, Metrics and Targets

Performance Measure and Metric	2-year Target Required	4-year Target Required	Source	Performance Period Start
Percent of Reliable Person Miles Traveled on the Interstate	Yes	Yes	NPMRDS	1/1/2018; 1/1/2021; 1/1/2025; and every 4 years thereafter
Metric: Level of travel time reliability (LOTTR), 15 minute intervals				
Percent of Reliable Person-Miles Traveled on the Non-Interstate NHS	No	Yes	NPMRDS	
Metric: Level of travel time Reliability (LOTTR), 15 minute intervals				
Percent of Interstate System Mileage Providing Reliable Truck Travel Time (Truck Travel Time Reliability Index)	Yes	Yes	NPMRDS	
Metric: Truck Travel Time Reliability (TTTR) Index, 15 minute intervals				
Total Emissions Reductions by Applicable Pollutants under the CMAQ Program	Yes	Yes	CMAQ Public Access System	10/1/2017; 10/1/20202; 10/1/2024; and every 4 years thereafter
Metric: Sum of 2- and 4-year totals of emissions reductions of the following pollutants: VOC (kg/day), CO (kg/day), NOx (kg/day), PM10 (kg/day), PM2.5 (kg/day)				
Annual Hours of Peak-Hour Excessive Delay Per Capita	No	Yes	NPMRDS	1/1/2018; 1/1/2021; 1/2/2025; and every 4 years thereafter
Metric: Total peak-hour excessive delay person-hours, 15 minute intervals				
Percent of non-Single Occupancy Vehicle (SOV) Travel	Yes	Yes	ACS, local survey, or local volume counts	
Metric: Census, local survey, or local counts (including bike/pedestrian counts)				

One air quality target is applicable to MPOs which meet certain air quality and urban population size thresholds:

- Total Emissions Reductions by Applicable Pollutants under CMAQ Program (kg/day): VOC, CO, NOx, PM10, PM2.5

While this target is set at the state level, large urban MPOs must contribute to achieving targets only if they have a population more than one million and with an urban area in nonattainment or maintenance for ozone, carbon monoxide, or particulate matter as designated in the National Ambient Air Quality Standards (NAAQS). MPOs will be notified by FHWA if they are in non-attainment or maintenance areas for designated pollutants which will determine whether they must report on this target. MPOs required to implement these targets must establish

regional targets for each of the criteria pollutants and precursor categories (23 CFR 490.803). No RTPAs would be required to implement this measure within the foreseeable future. Two additional system performance measures have similar population size and air quality thresholds:

- Annual Hours of Peak-Hour Excessive Delay (PHED) Per Capita
- Percent of Non-Single Occupancy Vehicle (SOV) Travel

Targets for these two measures are required only for large census designated Urban Areas (UAs) of more than one million people with NHS mileage and in nonattainment or maintenance areas for ozone, carbon monoxide, or particulate matter as designated in the NAAQS. Before January 1, 2022 this only includes six UAs in California: San Jose, Sacramento, Riverside-San Bernardino, San Francisco-Oakland and Los Angeles-Long Beach-Anaheim.

On 1/1/2022 the UA population size threshold changes to greater than 200,000 people. This change will require additional MPOs to set targets for these two metrics (23 CFR 490.703). At the time of writing, no RTPAs are required to implement these two measures, nor would any member be close to the threshold requirements within the next ten years. If an MPO has an UA that goes into non-attainment or becomes a maintenance area for designated pollutants, they will be notified by FHWA.

When setting targets, the MPOs must coordinate with the State DOT to establish regional four year targets for annual hours of peak-hour excessive delay per capita and coordinate to establish regional two-year and four-year targets for percent of non-single occupancy vehicle travel.

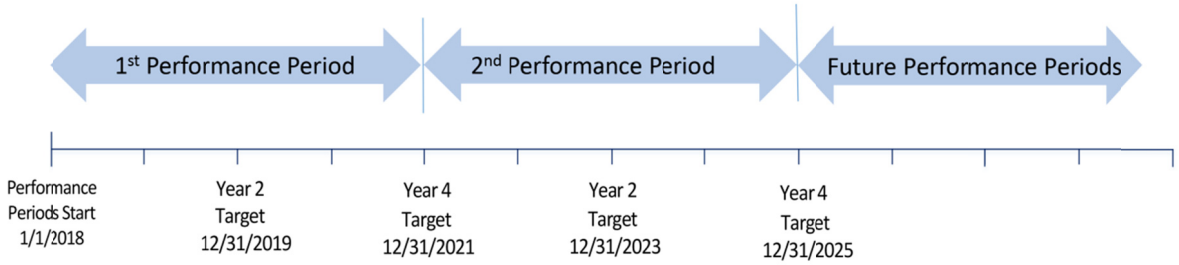
Indefinitely Delayed Implementation of a Greenhouse Gas Performance Measure

Federal performance measure law includes an additional measure: the percent change in tailpipe CO2 emissions on the NHS compared to the calendar year 2017 level. However, the effective date of the portions of the final rule pertaining to that measure has been delayed indefinitely at the time of writing. As a result, this measure has not been adequately evaluated at the federal or state level and a clear an implementation framework has not been established. Due to a lack of clear guidance on implementation, no further information can be provided by this report.

Performance Periods

Each performance period lasts four calendar years. All performance measures besides the CMAQ measure have a beginning four-year performance period of January 1, 2018 – December 31, 2021, with a second performance period of January 1, 2022 – December 31, 2025, and further periods continuing in this pattern every four years. For more detail on performance periods, see Figure 4-1.

Figure 4-1: System Performance and Air Quality Measures Performance Periods, Excluding CMAQ Measure



Within each four year performance period the state DOT must set targets for system performance and air quality, and must report to FHWA at the two-year mark and four-year mark.

Target Setting

Caltrans has taken the lead in implementing a system performance and air quality performance management framework in coordination with MPOs. If an MPO chooses to adopt the statewide framework, regional targets are not required unless an MPO is in an air quality non-attainment or maintenance area and meets population size thresholds. All MPOs will work collectively along with Caltrans to set and achieve statewide and regional targets. MPOs must provide reporting to Caltrans no less than once every two years.

The benefit of participating in the statewide framework is that Caltrans handles the majority of implementation, target setting, reporting and federal compliance with a minimal reporting burden on MPO staff. Without state assistance, this additional workload may be difficult to absorb for smaller MPOs. See Table 4-2 for a list of targets that Caltrans established in cooperation with their MPO partners for the first performance period.

If an MPO opts-out of the statewide framework and chooses to establish their own regional system performance and air quality performance targets, the agency must provide Caltrans with their methodology for target setting, planned funding, and all related technical details. See Appendix D for more information. An MPO setting their own regional targets must use the federally required measures at a minimum and may use additional measures if they choose.

Caltrans and FHWA require targets only for the federally required measures. If an MPO chooses to adopt measures in addition to the required measures, the additional measures will not be considered in determining compliance with this rule.

Table 4-2: Statewide Targets for the January 1, 2018 – December 31, 2020 Period

Performance Measure	2017 Baseline Data	2-year Target	4-year Target
Percent of Reliable Person-Miles Traveled on the Interstate	64.6%	65.1% (+0.5%)	65.6% (+1%)
Percent of Reliable Person-Miles Traveled on the Non-Interstate NHS	73.0%	N/A	74.0% (+1%)
Percentage of Interstate System Mileage Providing Reliable Truck Travel Time (Truck Travel Time Reliability Index)	1.69	1.68 (-0.01)	1.67 (-0.02)
Total Emissions Reductions by Applicable Pollutants under the CMAQ Program			
VOC (kg/day)	951.83	961.35 (+1%)	970.87 (+2%)
CO (kg/day)	6,863.26	6,931.90 (+1%)	7,000.54 (+2%)
NOx (kg/day)	1,753.36	1,770.89 (+1%)	1,788.43 (+2%)
PM10 (kg/day)	2,431.21	2,455.52 (+1%)	2,479.83 (+2%)
PM2.5 (kg/day)	904.25	913.29 (+1%)	922.34 (+2%)
*Annual Hours of Peak-Hour Excessive Delay Per Capita	State and MPO must coordinate on a single, unified 4-year target.		
Sacramento UA	14.9 Hours	N/A	14.7 (-1.0%)
San Francisco-Oakland UA	31.3 Hours	N/A	30.0 (-4.0%)
San Jose UA	27.5 Hours	N/A	26.4 (-4.0%)
Los Angeles-Long Beach-Anaheim UA	51.7 Hours	N/A	51.2 (-1.0%)
Riverside-San Bernardino UA	16.3 Hours	N/A	16.1 (-1.0%)
San Diego UA	18.4 Hours	N/A	18.0 (-2.0%)
*Percent of Non-Single Occupancy Vehicle (SOV) Travel	State and MPO must coordinate on a single, unified 2-year and 4-year target.		
Sacramento UA	22.8%	23.3% (+0.5%)	23.8% (+1%)
San Francisco-Oakland UA	44.3%	45.3% (+1%)	46.3% (+2%)
San Jose UA	24.5%	25.5% (+1%)	26.5% (+2%)
Los Angeles-Long Beach-Anaheim UA	25.6%	26.1% (+0.5%)	26.6% (+1%)
Riverside-San Bernardino UA	22.7%	23.2% (+0.5%)	23.7% (+1%)
San Diego UA	23.8%	24.8% (+1%)	25.2 (+1.4%)

Source data: NPMRDS Analytics Tool (https://npmrds.ritis.org/analytics/), CMAQ Public Access System (https://fhwaapps.fhwa.dot.gov/cmaq_pub/), and U.S. Census Bureau, 2012-2016 American Community Survey 5-Year Estimates.

Target Setting

While MPOs may set their own regional targets, target achievement is evaluated by FHWA at the statewide level, not at the MPO level. MPOs setting their regional targets would still be included in statewide reporting to FHWA. The primary reason for an MPO to set their own regional level targets would be to establish targets significantly higher than statewide goals. If an MPO chooses to set high regional targets to improve system performance and air quality above the state average, this may benefit the region by resulting in improved system performance and air quality and would benefit the State DOT by helping achieve their targets. Small urban and rural areas with limited resources may not be able to meet increased performance targets.

Reporting

If participating in the statewide framework, MPOs should coordinate with Caltrans during target setting periods to the greatest extent practicable. Caltrans may request regional estimates of target data from MPOs to help adjust statewide targets. MPOs not participating in the Caltrans statewide performance target setting framework will be required to report their progress toward target achievement regularly.

If not participating in the statewide performance target setting framework, MPOs may be required to report on their progress using an alternative process. MPOs following an alternative framework should work with Caltrans to identify the required reporting.

Data Sources

See Appendix E for a list of databases which can be used to retrieve performance measure information for the state, region or urban area. If additional information is sought on the methodology for determining system condition and air quality measures, this information can be obtained from FHWA. See Appendix F for more information on the methodology used for calculating measures and metrics. Required metrics and the methodology are prescribed by federal legislation (23 CFR Part 490e).

Performance Evaluation

Caltrans and large metropolitan areas will provide the bulk of contributions for meeting targets as the bulk of the State's transportation system is under their jurisdiction. FHWA will determine whether the state has made significant progress toward the achievement of targets after the State DOT submits the Mid Performance Period Progress Report for progress toward the achievement of two-year targets, and again after the State DOT submits the Full Performance Period Progress Report for progress toward the achievement of four-year targets.

The state will be considered to have made significant progress if the actual performance level is better than the baseline condition or if the actual condition is equal to or better than the established target. The state will be considered to not have made significant progress if the actual performance level is not above the baseline condition or target, or if the State has not provided FHWA with sufficient data, information, required reporting, or failed to meet reporting deadlines (23 CFR 490.109).

If FHWA determines that a State DOT has not made significant progress towards achieving the targets, the State must document the actions that will be taken in the future to achieve the targets. If significant progress is not made towards achieving the freight target, States must submit an analysis of the freight system, and policies, strategies, and investments which will result in the target being achieved in the future. These consequences would not significantly affect MPOs or RTPAs.

System Performance and Air Quality Measures in the Rural Context

System performance and air quality measures prescribed by federal legislation are focused on transportation related problems which are primarily urban. Accordingly, interventions in urban areas are the key activities that will significantly move the state towards achieving this set of targets. These urban areas typically have more tools to address these performance areas, including comprehensive transit systems, significant transportation financing and higher density development. Conversely, non-MPO RTPAs will have few opportunities to contribute to achieving statewide targets. While non-MPO RTPAs are not required to implement system performance and air quality measures, this section evaluates these measures, how they revolve around urban problems and the challenges these measures pose for rural areas.

Three measures in this TPM category focus on improving travel time reliability on the NHS and interstates, and one measure focuses on peak hour excessive delay, another measure of congestion. Travel time reliability and peak hour excessive delay are improved by reducing travel time delay. Since rural areas have low average traffic counts and low congestion related delay, opportunities for RTPAs to contribute to travel time reliability measures are minimal. Meanwhile, urban areas which have the bulk of statewide traffic delay have the greatest opportunities to reduce traffic delays. It is the nature of all average measures of congestion to highlight urban traffic problems, hence encouraging interventions in urban areas. However, rural areas may experience significant seasonal and weekend tourist traffic spikes which are harder to capture in data analysis. This presents an opportunity for the development of alternative measures of rural traffic and congestion challenges.

Two TPM measures deal with total emissions reduction for transportation related air pollutants and percent of non-single occupancy vehicle travel, a measure of alternative mode use and a

proxy for measuring GHG reduction. These measures focus on improving NAAQS air quality standards. While some areas in rural RTPAs are in non-attainment for NAAQS, there are limited options for rural areas to change these metrics when pollutants are often sourced from neighboring urban jurisdictions. Additionally, reducing mobile source pollution is difficult for rural RTPAs because key approaches involve increasing transit use, transportation demand management and denser development. In rural areas, transit service is limited, development is dispersed and severe weather is common. This necessitates more drive-alone trips, a primary source of criteria pollutants.

The most efficient approach to improving these measures is to focus resources on traffic congestion reduction and air quality improvement in urban areas. As with other measures under the TPM, this may encourage the state to shift transportation investments towards urban areas which may result in shifting investments away from RTPAs and small urban areas. However, there is still opportunity for the state to fund both urban and rural areas and achieve their performance targets.

Since the repercussions for failing to meet federal target thresholds are minor, there is no clear urgency to the state to achieve federal targets. While achieving federal targets is a desirable goal, the state does not have a justifiable need to shift resources away from rural areas to achieve those urban-centric performance targets. States set their own targets and can choose to implement sustainable incremental goals that preclude the need to significantly change transportation investment decisions.

Alternative Rural Measures for System Performance

Other measures of congestion may be more feasible in the rural context. Rural areas experience traffic differently than urban areas. Increasingly, rural counties are facing high seasonal tourism traffic, especially on weekends and holidays. As urban population centers grow and the economy thrives, these tourist traffic volumes increase. Average measures of traffic congestion do not adequately capture these spikes in congestion. Rural areas need measures which capture these traffic spikes. Two potential measures are seasonal travel time delay, and seasonal weekend travel time delay. Data on these measures is not generally collected so rural areas should explore opportunities to encourage this type of data collection in local, state and federal planning efforts.

The study “Performance Monitoring Indicators for Rural and Small Urban Transportation Planning” recommends the use of a peak hour volume/capacity (V/C) measure to quantify congestion. In this context, *volume* refers to how many vehicles are using the road and *capacity* refers to how many vehicles the road can accommodate. Caltrans publishes vehicle volumes annually, though not all areas are counted annually so some areas may need to

use data that is up to three years out of date. Counties often perform their own local traffic counts which can be used to supplement or validate Caltrans V/C data. This measure could also be augmented to capture peak seasonal and weekend tourism traffic impacts.

RTPA Role in Supporting System Performance and Air Quality

Rural RTPAs that are not part of an MPO are exempt from target setting requirements found in the system performance and air quality performance management rules. Exempt RTPAs may voluntarily assist in the statewide effort by prioritizing relevant projects in their TIP where possible. However, for the reasons mentioned above, RTPA contributions to these metrics would be minor.

In the rare case that an RTPA is part of an MPO that adopts the state system performance and air quality targets, they will not be required to provide any additional data to the MPO for tracking targets. For RTPAs that are part of an MPO that does not adopt the state targets and choose to establish their own targets for their MPO, they may be asked to work with their MPO to identify progress towards targets.

Chapter 5: Transit Asset Management (TAM) Performance Measures

Introduction

On October 1, 2016, the Federal Transit Administration's (FTA) Transit Asset Management (TAM) Final Rule took effect through 23 CFR 625. As mandated in MAP-21 and the FAST Act, the TAM rule aims to establish a formal administrative system that monitors and manages an agency's public transportation assets so that they can be operated and maintained in a state of good repair throughout their entire lifecycle.

The TAM rule must be implemented by all transit providers that are recipients or subrecipients of most federal financial assistance to own, operate, or manage transit capital assets used in the provision of public transportation. These agencies must produce a TAM plan on a regular basis and submit additional reports to the National Transit Database (NTD) annually. The rule includes the process that the FTA will use to assess whether transit agencies are in compliance.

This section is not meant to be a step-by-step guide to complying with the TAM rule as two comprehensive guides have already been provided by the FTA: The FTA Asset Management Guide for Small Providers and the FTA TAM Plan Template for Small Providers. An overview of what types of agencies must comply, when agencies must produce a TAM plan and the required contents of a TAM plan are discussed below.

Determining Whether a Transit Asset Management Plan is Required

To determine whether this rule applies to a transit agency the agency must identify whether they are a Tier I or Tier II provider. Tier I and Tier II providers must produce a TAM plan. In California it is assumed that Tier I providers will be FTA Section 5307 Urbanized Area Formula Grant recipients, and Tier II providers will be FTA Section 5311 Formula Grants for Rural Areas subrecipients through Caltrans. Transit agencies that are recipients or subrecipients of FTA Section 5310 Enhanced Mobility of Seniors and Individuals with Disabilities Program must prepare a TAM plan only if funds are used in the provision of transportation services to the general public. In California, subrecipients of 5310 from Caltrans are not allowed to use this funding to provide transit to the general public. For more details on compliance and exemption criteria see Table 5-1.

The tier of your agency determines how the TAM plan should be prepared and what must be included, with larger transit agencies being required to include more information and detailed analysis in a TAM plan. If an agency is a Tier I transit provider, they must develop their own TAM plan and report directly to the FTA. As Tier I transit providers are typically larger transit agencies located in more urbanized areas, full details of Tier I TAM plan requirements will not

be included in this study as the purview of this report focuses on small urban and rural areas with smaller transit agencies.

Table 5-1: Determining an Organization's Tier or Exempt Status Under the TAM Rule

Tier or Exemption	Qualifying Criteria
Tier I: Must Produce a TAM Plan	Transit agency owns, operates, or manages transit capital assets used in the provision of public transportation and is recipient/subrecipient of federal financial transit funding (49 USC Chapter 53) **AND** Operates rail **AND/OR** operates more than 100 vehicles across all fixed route modes **AND/OR** operates more than 100 vehicles in one non-fixed route mode
Tier II: Must Produce a TAM Plan	Transit agency owns, operates, or manages transit capital assets used in the provision of public transportation and is recipient/subrecipient of federal financial transit funding (49 USC Chapter 53) **AND** Subrecipient of 5311 funds **AND/OR** is an American Indian Tribe **AND/OR** operates less than 101 vehicles across all fixed route modes **AND/OR** operates less than 101 vehicles in one non-fixed route mode
Exempt: Agency Operates Rail Transit Only	If an agency only operates rail transit and does not operate other forms of public transit, it is exempt from TAM rule
Exempt: Organization Operates 5310 Elderly and/or Disabled Only	If an organization is a recipient/subrecipient of 5310 funds and operates only alternatives to public transportation that assist seniors and persons with disabilities with transportation, that agency is exempt from the TAM rule because assets funded under the program are not used to provide transportation to the general public
Exempt: Organization Receives FTA Funding for Planning or Research Only	If an organization receives any FTA funding for planning or research only and does not operate transit for the public, it is exempt from the TAM rule

A Tier II TAM plan sponsor can be a state, a designated recipient, a direct recipient or a subrecipient. If an agency is a Tier II transit provider, they may either develop their own TAM plan or participate in a group TAM plan. All agencies that are recipients or subrecipients of federal financial assistance and utilize third-party contractors to operate transit service will need to identify the assets utilized by their contractors for local services in their TAM plan. Regional Transportation Planning Agencies (RTPAs) and Metropolitan Planning Organizations

(MPO's) can help facilitate discussions about identifying a sponsor for a group TAM plan among local transit providers in their region if needed. See Table 5-2 for more information on how a TAM plan can be developed for Tier I or Tier II agencies. Tier II transit providers must also provide Useful Life Benchmarks (ULBs) for each asset in their TAM plan.

Table 5-2: TAM Plan Development Options for Tier I and Tier II Agencies

Tier I Agency		
Agency develops own TAM Plan and reports directly to the FTA		
Tier II Agency		
Options		**Details**
Option 1:	Agency develops own TAM Plan	Agency develops own TAM Plan
Option 2:	Agency participates in a single group TAM plan that is sponsored, developed and managed locally	Two or more transit providers choose a TAM Plan sponsor and work collaboratively to develop locally/regionally based Useful Life Benchmarks (ULBs) for each asset class.
Option 3:	Agency utilizes a group TAM plan that Caltrans DRMT sponsors	Transit providers utilize standard ULB's that are set by the DRMT and a TAM Plan Template from the FTA. This standardized approach could promote targets for an asset replacement schedule that may not be completely relevant to local asset replacement needs.

Performance Periods

A TAM plan must be updated in its entirety at least every four years, and it must cover a horizon period of at least four years. This report recommends an agency amend their TAM plan during the four-year horizon period only when there is a significant change to staff, assets, maintenance plans and/or operations. The next TAM plan update is due to Caltrans Division of Rail and Mass Transportation by October 1, 2022. The first four-year period is October 1, 2018 to September 30, 2022, the next is October 1, 2022 to September 30, 2026, and future periods continue in this pattern every four years.

Overview of TAM Plan Elements

A TAM plan is a tool that is meant to assist transit providers in assessing the current condition of its capital assets, determining what the condition and performance of its assets should be, identifying the unacceptable risks of continuing to use an asset that is not in a state of good repair, and deciding how to best balance and prioritize reasonably anticipated funds towards

improving asset condition and performance. TAM plan criteria for large urban provider are not discussed here as rural providers are the focus of this study. TAM plans for small transit providers (Tier II) must include the following elements:

- Designate an Accountable Executive
- Inventory of Capital Assets
- Condition Assessment
- Target Setting
- Decision Support Tools
- Investment Prioritization

Developing a TAM Plan

Designate an Accountable Executive

A key step in TAM plan development is designating an Accountable Executive for each recipient or subrecipient agency which must be included in the TAM plan. The Accountable Executive is the administrator responsible for carrying out asset management practices. This person has control or direction over the human and capital resources needed to develop, implement and maintain the agency's transit asset management plan.

Inventory of Capital Assets, Condition Assessment and Target Setting

A Tier II transit agency must prepare an inventory, condition assessment and set targets for all capital assets. Capital asset categories for Tier II providers are defined as rolling stock, equipment and facilities. This includes assets operated under contract and leased assets. If assets were not acquired using FTA funds, they must also be included. See Table 5-3 for a list of TAM plan asset categories and performance measures.

Each transit provider will set their own ULB for each asset class. ULBs refer to the expected years of service life for each vehicle class or asset before it must be replaced. The FTA has a list of general ULBs which can be found in Appendix G. The TAM rule allows each provider or region to establish their own ULBs for each asset so that replacement planning accurately reflects local system conditions. If an asset is subject to contracted useful life terms, ULB does not change the contracted useful life terms of an asset since these are set by contract.

The variance between the ULB and the average age of each asset class will determine what percent of each asset class is at or past its ULB. This percent is considered the asset class condition. Targets then must be set for each asset class for each year the TAM plan covers. See Table 5-4 for an example of the elements to include when setting asset targets.

Targets should take into consideration the baseline average condition of each asset class. To the extent feasible, targets should be supported by data such as the most recent condition

Table 5-3: TAM Plan Asset Categories, Performance Measures and Asset Class Examples

Asset Category	Performance Measure	Asset Class Examples
Rolling Stock Age	Percent of revenue vehicles within a particular asset class that have met or exceeded their Useful Life Benchmark (ULB)	Bus, over-the-road bus, cutaway bus, mini-van, van
Equipment Age	Percent of vehicles (non-revenue vehicles) that have met or exceeded their Useful Life Benchmark (ULB)	Non-revenue service automobile, trucks and other rubber tire vehicles, revenue collection equipment, miscellaneous equipment
Facilities Condition	Percent of facilities (all buildings or structures) with a condition rating below 3.0 on the FTA Transit Economic Requirements Model (TERM) Scale, including support facilities, parking facilities, and passenger facilities	Administration, maintenance, parking structures, passenger facilities, bus washer, radio communications

Table 5-4: Example TAM Plan Asset Class Targets

Asset Category / Performance Measure	Asset Class	2019 Target	2020 Target	2021 Target	2022 Target	2023 Target
Revenue Vehicles						
Areas - % of revenue vehicles within a particular asset class that have met or exceeded their Useful Life Benchmark (ULB)	Revenue Vehicles	25%	25%	30%	30%	35%
	BU – Bus	25%	25%	30%	30%	35%
	CU – Cutaway Bus	25%	25%	25%	30%	30%
	MV – Mini-van	25%	25%	25%	30%	30%
Equipment						
Age - % of vehicles that have met or exceeded their Useful Life Benchmark (ULB)	Trucks and other rubber tire vehicles	25%	25%	25%	30%	30%
Facilities						
Condition - % of facilities with a condition rating below 3.0 on the FTA Transit Economic Requirements Model (TERM) Scale	Administration	25%	25%	25%	25%	25%
	Maintenance	25%	25%	30%	30%	35%

data and reasonable financial projections for the future. The overall goal is to plot a path for an eventual system-wide state of good repair. While this may not be achieved in the initial four year TAM plan period, it may be achieved in future performance periods. See the FTA TAM Plan

Template for Small Providers and the FTA Asset Management Guide for Small Providers for further guidance on implementing all of the required elements of a TAM plan. These tools focus on assets, practices, and requirements that are directly applicable to small providers.

Decision Support Tools & Management Approach

The decision support section of the TAM plan must include, at a minimum, a description of the analytical processes and decision support tools that the agency uses to estimate capital investment needs over time and develop its investment prioritization. Additional detail may include risk management strategies, maintenance strategies or tools, overhaul strategies, disposal strategies, acquisition and renewal strategies, and any other key agency processes which contribute towards TAM.

Investment Prioritization

The investment prioritization section of the TAM plan must, at a minimum, include a list of prioritized projects based on the agency's prioritization criteria, ranked by year of planned implementation over the plan horizon. Additional detail may include work plans or schedules for capital improvement projects.

Reporting

Agency TAM reports must be reported to the NTD annually. The submission must include asset inventory data, condition assessments and performance results, projected targets for the next fiscal year, and a narrative report on changes in transit system conditions and the progress toward achieving previous performance targets (See Table 5-5). Reporting is due to NTD no later than four months after the end of your agency's fiscal year. If your fiscal year runs July-June, the NTD report is due the following October. If the fiscal year runs October-September, the report is due the following January. If the fiscal year runs January-December, the report is due the following April.

Data Sources

Data on ULBs is collected regularly by each transit agency. Facility data will also need to be collected by each transit agency if it is not already. A guide for how to assess facilities using the FTA TERM scale measure can be found here.

Performance Evaluation

TAM plans do not need to be submitted to the FTA but must be made available upon request. FTA has included TAM rule compliance in the annual Certifications and Assurances process since 2017, and grantees will be required to continue self-certifying compliance. Urban

Table 5-5: Annual National Transit Database (NTD) Reporting Requirements

Report	Details
Asset Inventory Report	There are four categories of capital assets that must be included in a TAM asset inventory: facilities, equipment, rolling stock, and infrastructure. Your TAM plan must include an inventory of all the capital assets in each of the categories that you own, operate, or manage. The inventory must include all service vehicles and any other owned equipment assets over $50,000 in acquisition value. When capital assets are shared among multiple transportation agencies, that asset must be included each agency's asset inventories and reported to the NTD. Agencies must report the inventory of assets in the NTD asset inventory module. Additional data required includes information used to calculate TAM metrics.
Facility Condition Assessments	Agencies must assess the condition of all the capital assets in their TAM plan and report the facility category assets. This includes assets for which the agency has direct capital responsibility, including those that are owned by someone else but for which the agency has at least partial direct capital responsibility.
Annual Targets	Agencies must set and report annual targets for asset performance for each asset class.
Narrative Report	Agencies must provide a description of any change in the condition of their transit system from the previous year and describe progress made during the year to meet the performance targets set in the previous year.

grantees that cannot self-certify due to a failure to comply with the TAM requirements may be unable to obligate a new grant in the Transit Award Management System (TrAMS), the system which awards the majority of federal transit funding. Rural 5311 Caltrans subrecipients must have a current, locally approved TAM plan on file in the BlackCat Electronic Grants Management system in order to be compliant with the TAM rule and continue to receive FTA Section 5311 funding. Non-compliance could seriously impact a transit agency's funding. In fiscal year 2019, the Triennial and State Management reviews will begin to include oversight of TAM rule compliance. Findings of non-compliance may result in similar impacts to transit agency funding.

It is recommended that agencies document their procedures for performing condition assessments, including procedures for performing inspections and data quality control. These procedures may be subject to review by FTA.

Transit Asset Management in the Rural Context

The federal rules for TAM require agencies to use two performance measures to evaluate capital assets:

- Revenue Vehicles and Equipment: Percent of assets exceeding the Useful Life Benchmark (ULB)
- Facilities: Percent of facilities with a condition rating below 3.0 on the FTA Transit Economic Requirements Model (TERM) Scale

TAM rules allow each transit agency to set their own ULB for each asset class. Financial resource limitations in rural transit systems often necessitate using transit assets longer than normal. While measures of transit asset age are generally not a preferred measure for rural transit condition due to the frequent need to use assets beyond their generally accepted useful life, by allowing transit agencies to set the ULB age threshold, this constraint is avoided.

The federal TAM measures encourage transit agencies to average measures for categories of vehicles and equipment, but do not require averaging. Average measures of fleet performance are less useful in small rural transit fleets. Identifying issues with individual vehicles is more important when fleets are small so those vehicles can be targeted for overhaul or replacement.

The facilities measure, percent of facilities with a condition rating below 3.0 on the FTA TERM scale, also allows flexibility. The purpose of the TERM scale is to capture the condition of facilities using a single numeric value. The TERM scale is a system for rating facilities on a scale of 1-5, with 1 being the poorest condition, and 5 being the best. An asset is deemed to be in good repair if it has a rating of 3, 4, or 5 on this scale. Likewise, a facility is deemed to not be in good repair if it has a rating of 1 or 2. See Table 5-6 for a full description of each condition rating.

The facility evaluation process directs assessors to evaluate a number of facility features such a ceilings, floors, walls, and other facility features. Each element of a facility does not need to be given a grade, only a facility as a whole. Each facility is then given a grade of 1-5 based on the assessor's evaluation.

The TERM scale allows for some subjectivity in determining the condition of a facility. For example, a 3.0 on the TERM scale indicates a facility is adequate. Adequate in the rural context may be different than adequate in the urban context and the scale allows for interpretation by the assessor.

Table 5-6: FTA Transit Economic Requirements Model (TERM) Condition Assessment Scale

Rating	Condition	Description
5	Excellent	No visible defects, new or near new condition, may still be under warranty if applicable
4	Good	Good condition, but no longer new, may be slightly defective or deteriorated, but is overall functional
3	Adequate	Moderately deteriorated or defective but has not exceeded useful life
2	Marginal	Defective or deteriorated, in need of replacement; exceeded useful life
1	Poor	Critically damaged or in need of immediate repair; well past useful life

Alternative Rural Measures for Transit Asset Management

While vehicle and equipment age are acceptable measures of TAM in the rural context, other measures may be more useful in rural TAM. There is an extensive body of literature on TAM but little research has been done on transit asset management for rural transit agencies. This study has reviewed general TAM literature and discusses measures that may be useful to rural transit agencies below. The reports "Guidance for Developing a Transit Asset Management Plan" and "State of Good Repair: Prioritizing and Rehabilitation and Replacement of Existing Capital Assets and Evaluation Implications for Transit" by the Transportation Cooperation Research Board (TCRB) offer a number of potential transit asset management measures to consider (see Table 5-7).

Rural transit agencies face unique funding challenges. Rural areas have much smaller populations than urban areas by definition. Rural transit is funded largely by population based federal funds (FTA 5311) and small rural populations result in proportionally small budgets. Due to small dispersed population bases in rural areas, rural transit systems mainly transport small numbers of people long distances, resulting in minimal fare box recovery rates and high operational costs. Meanwhile, urban areas transport larger numbers of people shorter distances which allows for higher cost efficiencies.

These budget challenges impact the quality of rural TAM. Often rural transit agencies cannot afford to maintain significant functional spare fleets to mediate vehicle failures. Vehicles are often older and used past their normal useful life. Older vehicles may result in a higher maintenance cost per vehicle per passenger. Smaller transit vehicles may be used instead of larger buses to accommodate lower demand with more affordable vehicles. Constrained budgets limit the amount and variety of spare parts which can be kept in stock at maintenance facilities, requiring personnel to order parts as needed and resulting in disabled transit vehicles

being out of service for days instead of hours. These types of budget related factors affect the determination of which rural TAM measures are best for each agency.

Table 5-7: Select Alternative Transit Asset Management Measures from Transit Cooperative Research Program (TRCP) Reports 157 and 172

Category	Type	Measure
Asset Condition	Condition	Condition Rating
		Percent of Vehicles with Functioning Climate Control Systems
Reliability	Failure Rate	Mean Time/Distance Between Failures
		Number of Bus Defects Per Vehicle
		Wheelchair Lift Failure Rate
	Number of Failures	Number of Road Calls
Cost	Maintenance Cost	Average Annual Maintenance Cost Per Vehicle Operated in Maximum Service
		Cost of Backlog of Investment Needs

Source: TCRP Report 157 – State of Good Repair: Prioritizing the Rehabilitation and Replace of Existing Capital Asset and Evaluating the Implications for Transit, The National Academies Press, 2012. TCRP Report 172 - Guidance for Developing a Transit Asset Management Plan, The National Academies Press, 2014.

Average age of transit vehicles is a key measure in the federal performance framework. However, age is not always the best indicator of state of good repair in rural transit systems. Due to budget constraints, vehicles often must be used beyond their generally accepted useful life. Due to robust maintenance program investment, these vehicles may still be in adequate condition. Alternative measures of state of good repair may be used, such as vehicle condition rating, or measures of vehicles with functioning critical systems such as engines, suspension and climate control systems.

Measures of the ratio of spare transit vehicles to the active transit fleet may be less useful in the rural context since rural systems often cannot afford to maintain significant numbers of additional spare vehicles. Additionally, the quality of each spare vehicle may be more important than the number of vehicles. Often the oldest vehicles with the lowest state of good repair are put into an agency's spare pool.

Due to smaller rural transit fleets and smaller numbers of spare vehicles, reliability can be more important for rural systems. Measures which capture this include mean distance between failures, number of bus defects per vehicle, and number of road calls. These measures may be of particular use to rural transit agencies. Smaller active and backup fleets in rural areas make vehicle failures more damaging to continuous and reliable operations. These measures would

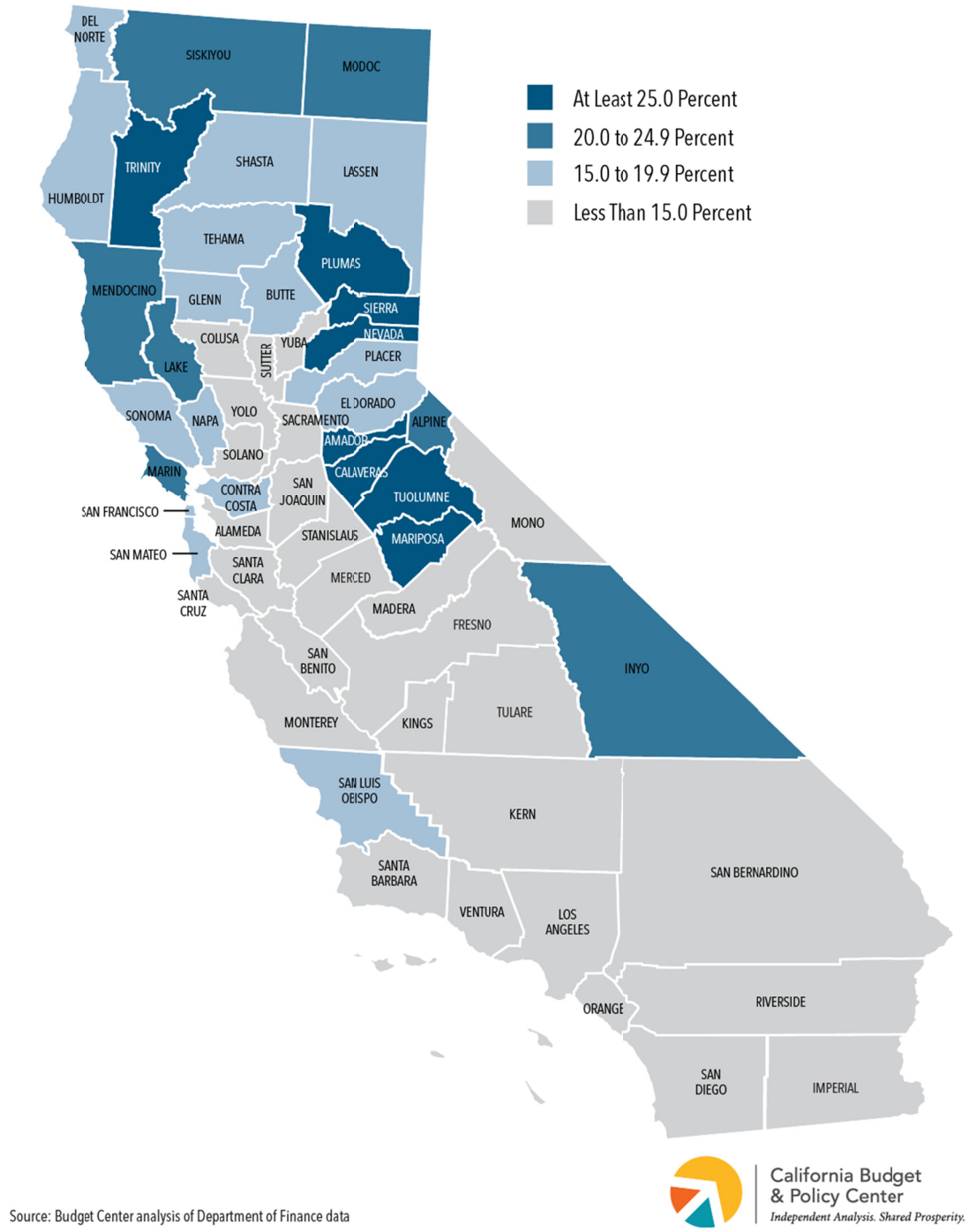
better quantify progress towards reducing the frequency of transit vehicle failures with implications for improving operations.

California's rural counties have a higher proportion of elderly residents compared to urban areas (See Figure 5-1) and a higher proportion of disabled transit users. As a result, paratransit and demand responsive transit such as dial-a-ride service are important needs in rural systems. While standard TAM measures should be applied to paratransit vehicles to assure they are running, a useful supplementary measure is wheelchair lift failure rate. This measure more precisely targets one of most critical pieces of equipment on a paratransit vehicle that can frequently break down.

Cost measures of transit asset condition are important in rural transit asset management. One potentially useful measure is average annual maintenance cost per vehicle operated in maximum service. If a rural transit agency can identify which vehicles are incurring the highest maintenance costs, they can identify vehicle types that have the lowest maintenance costs, and can more easily determine if investing in a new vehicle may be a better long term strategy.

While the federal TAM rule measures must be used in rural TAM, rural agencies should not be limited to these measures. This report recommends rural transit agencies implement one or more of the TAM measures discussed in this section. The alternative measures discussed above have the potential to improve financial management of rural transit fleets. Cost savings resulting from effective TAM may translate into improved rural transit operations.

Figure 5-1: Older Adults Make Up a Higher Share of Population in Rural Counties



Source: Anderson, Alyssa. California Budget & Policy Center, Fact Sheet: Federal Policy Changes Would Threaten the Well-Being of Older Californians, With Harm Magnified as the Population Ages. May, 2017.

Chapter 6: Public Transportation Agency Safety Plans (PTASPs)

Introduction

Through MAP-21 and the FAST Act, Congress required operators of public transportation systems that receive certain FTA funds to develop and implement a Public Transportation Agency Safety Plan. On October 1, 2016, the Federal Transit Administration's (FTA) Public Transit Agency Safety Plan (PTASP) Final Rule took effect through 49 CFR 673. The rule aims to improve public transportation safety by guiding transit agencies to more effectively and proactively manage safety risks in their transit systems. The rule seeks to bring management and labor together to control risk better, detect and correct safety problems earlier, share and analyze safety data more effectively and measure safety performance more precisely.

The rule was published on July 19, 2018 and is effective July 19, 2019. Transit operators must submit PTASPs to FTA by July 20, 2020. PTASPs must be updated annually to be compliant with regulations. While there are increased PTASP compliance requirements for large transit operators, those will not be covered in detail as the focus of this report is on PTASP requirements for small transit operators. Most transit agencies within non-MPO rural RTPAs are exempt from the PTASP rule. However, each transit agency should confirm whether they are subject to the PTASP rule by using the criteria below.

Determining Whether a PTASP is Required

The following steps can be used to determine whether your transit agency is required to produce a PTASP:

- Subrecipients that receive FTA Section 5310 and/or FTA Section 5311 funding, and do not receive 5307 funding do not currently need to develop a PTASP.
- FTA recipients that do not operate transit systems, commuter rail service regulated by FRA, and passenger ferry service regulated by USCG do not need to develop a PTASP.
- FTA direct recipients or subrecipients that receive FTA Section 5307 funding and all rail transit operators that are not regulated by the FRA do need to develop a PTASP.
- Some direct recipients or subrecipients that receive FTA Section 5307 funding are classified as “small operators”, defined as those agencies that operate 100 or fewer vehicles in peak revenue service and that do not operate rail transit systems. These small operators must consult with Caltrans Division of Rail and Mass Transportation (DRMT) regarding the development of their PTASP to determine how to proceed.

Determining How a PTASP Should be Prepared

A small operator may develop their own PTASP or may request technical assistance from Caltrans in the development of their PTASP. There are two options for developing a PTASP:

1. Any agency may develop and self-certify its own PTASP. Rail transit agencies not regulated by the FRA and large bus operators must develop and implement their own safety plans.

2. Small operators that receive 5307 funding and operate 100 or fewer vehicles in peak revenue service can request that Caltrans assist with the development of the PTASP for their agency, or may choose to develop their own PTASP.

All small operators must consult with Caltrans Division of Rail and Mass Transportation (DRMT) regarding the development of their PTASP to determine which approach is most appropriate. Small operators should consider whether they want Caltrans DRMT involvement in their PTASP, and if so, what level of involvement is desired. If assistance is sought from a designated recipient for the 5307 small urban program, DRMT may use 5307 administrative funds from the requesting agency's apportionment to pay for DRMT assistance. Currently, all 5307 Program compliance is handled directly between the FTA and each Small Operator. If DRMT develops PTASPs for a Small Operator, DRMT may need to be included at Triennial Performance Reviews of agencies conducted by FTA which may increase the complexity of this process.

Small operators must notify DRMT in writing of their selected option for developing their PTASP. Those agencies that choose to develop their own PTASP must provide an "opt out" letter to DRMT. Opting out in this case refers to the Small Operator opting out of having DRMT assist with the development of their PTASP. Small operators that request DRMT's assistance in developing their PTASP should provide a written "opt in" letter which must be submitted with adequate notice to DRMT to provide them time to prepare the PTASP before the plan deadline. All letters must be signed by an agency's General Manager or CEO.

While no additional funding will be provided to transit operators for compliance with the PTASP final rule, operators may use certain existing funds to develop and implement the plan. This includes 5303, 5304, 5307, 5309, 5337 and 5339 funds.

Elements of a PTASP

A PTASP involves the Small Operator's management and staff working together to define internal agency policies and processes. While this section provides a detailed overview of PTASP requirements, a full guide and template for implementing a PTASP can be found here. A PTASP must contain four key elements which, together, are referred to as the Safety Management

System (SMS). These elements include (1) a safety management policy, (2) safety risk management, (3) safety assurance, (4) safety promotion and (5) transit safety targets. These required PTASP sections are discussed more below:

Safety Management Policy

Under the safety management policy section of the PTASP, a clear statement of the organization's safety objectives and policies is required. Agencies must establish a written statement of the safety policy that includes safety objectives for the agency and this policy must be communicated throughout the agency. An effective safety management policy statement is a short, straightforward document developed by top executives and management to describe a transit agency's commitment to SMS and the dedication of resources to support it. The statement may also reference the implementation of an employee reporting program.

The employee reporting program is required to be implemented and described in the PTASP under 49 CFR 673.23(b). This program is meant to allow employees who have in-depth knowledge of the transit system to report unsafe conditions to management without fear of reprisal so safety risk can be mitigated.

The employee reporting program must establish and implement a process that allows employees to report safety conditions to senior management, including protections for employees who report safety conditions to senior management and a description of employee behaviors related to safety issue reporting that are unacceptable hence not protected and subject to disciplinary action. Disciplinary actions for employee behaviors may be the subject of collective bargaining agreements and transit agencies may need to work with their labor unions to establish employee safety reporting programs that fit the needs of management and employees.

The employee reporting program guidelines should clarify what to report, what not to report, how to report, what managers should do when employees report safety concerns, how reports are documented, and how employees will receive feedback about the results of their reports. Agencies are given discretion to determine their own approach for meeting this requirement. A reporting program could be based on a hotline, online reporting system; form based reporting system, direct reporting to management or other methods.

The PTASP must include the identification and responsibilities of an accountable executive, chief safety officer, agency leadership, and key staff responsible for safety. This is meant to ensure that management is actively engaged in the oversight of the organization's safety performance and show how safety is integrated throughout the organization.

Safety Risk Management

Safety Risk Management is meant to help the organization better identify safety hazards associated with its operational systems. Under this section of the plan, agencies must establish a process to identify safety hazards, assess the safety risks associated with the identified safety hazards, prioritize safety hazards based on level of risk, and implement safety risk mitigations.

In this context, a hazard means any real or potential condition that can cause injury, illness, or death; damage to or loss of the facilities, equipment, rolling stock, or infrastructure of a public transportation system; or damage to the environment (49 CFR 673.5). FTA does not specify the type(s) of safety data that transit agencies should collect to identify hazards or risks. This can be determined by each agency.

A transit agency must establish methods or processes to identify mitigations or strategies necessary as a result of the agency's safety risk assessment to reduce the likelihood and severity of the consequences. Each transit agency must establish an approach to determining when safety risk mitigation is necessary based on assessed safety risk. This may include setting criteria or thresholds for different levels of risk.

Safety Assurance

The safety assurance section of the PTASP requires an organization to monitor and measure its safety performance to ensure that the organization meets or exceeds its safety objectives through the collection, analysis, and assessment of data. Agencies must establish processes for safety performance monitoring and measurement. This must include processes for monitoring compliance and sufficiency of operations and maintenance safety procedures; identification of mitigations that may be ineffective, inappropriate, or not implemented as intended; investigations of safety events to identify causal factors; and monitoring of safety-related information.

If the organization identifies safety risks through its safety performance assessments, then it must take action to correct any safety deficiencies. Transit agencies are expected to identify and understand the causes of the accidents, incidents, and occurrences in their systems so that the circumstances leading to the events can be mitigated and prevented in the future.

Safety Promotion

The safety promotion section of the PTASP requires implementation of safety training, awareness, and communication that support safety. Agencies must establish comprehensive safety training programs for agency employees and contractors directly responsible for safety. Transit agencies must require employees and contractors, including the Chief Safety Officer or SMS Executive, to complete training to be able to fulfill their safety-related roles and responsibilities. The training program must include refresher training as necessary. FTA is deferring to each transit agency to determine the level of training that is adequate for their employees and contractors. Documentation of this training should be retained for review for at least three years.

Under this section, agencies must also communicate an agency's safety performance throughout the organization that, at a minimum, conveys information on hazards and safety risks relevant to employees' roles and responsibilities and informs employees of safety actions taken in response to reports submitted through an employee safety reporting program. Each transit agency should establish the means and mechanisms for effective safety communication deemed appropriate based on its organization, structure, and size of operations. Documentation of this type of communication should be retained for review for at least three years.

In addition, the PTASP must address all applicable requirements and standards as set forth in FTA's Public Transportation Safety Program and National Public Transportation Safety Plan. The plan must also describe how the PTASP is appropriately scaled to the size, scope and complexity of your transit agency.

Transit Safety Target Setting

PTASPs must include Safety Performance Targets (SPTs). At a minimum, targets must be set for each mode of transit and based on the four safety performance measures established by FTA in the National Public Transportation Safety Plan (NSP):

- Fatalities: Total amount and rate of fatalities per total vehicle revenue miles, by mode
- Injuries: Total amount and rate of injuries per total vehicle revenue miles, by mode
- Safety Events: Total amount and rate of safety events per total vehicle revenue miles, by mode
- System Reliability: Mean distance between major mechanical failures, by mode

Federal regulations require transit agencies to identify appropriate performance targets and regularly monitor the performance of their systems to ensure that they are making progress

towards improving safety outcomes. The safety performance targets and performance-based plans should inform a transit agency's investment priorities, and those investment priorities should be carried forward within the MPO's and State DOT's planning processes. Regulations give each transit agency the discretion to choose their own methodology and approach to setting targets.

Conditions Triggering a PTASP Update

FTA expects transit agencies to evaluate their safety performance and determine whether they should change their safety performance targets at least annually. Each transit agency must establish a process and timeline for conducting an annual review and update of its PTASP. Given the diversity of transit systems, FTA is deferring to each transit agency to determine how its safety plan review and updates are completed each year.

The PTASP should be updated earlier than annually if a transit agency determines its approach to mitigating safety deficiencies is ineffective, makes significant changes to service delivery, introduces new processes or procedures that may impact safety, changes or re-prioritizes resources available to support SMS and/or significantly changes its organizational structure.

Safety Plan Approval

The PTASP must be signed by the agency's Accountable Executive. It must also be approved by agency's Board of Directors or an equivalent authority. The time required for putting the PTASP through a board approval process must be taken into consideration to assure it is approved by the board by the initial July 20, 2020 deadline.

Performance Evaluation

PTASP compliance is overseen directly by the FTA. PTASPs do not need to be submitted to the FTA but must be made available upon request. Transit agencies must indicate they have complied with PTASP rules in the annual Certifications and Assurances process. Grantees that cannot self-certify may be unable to obligate new grants. This is a potentially serious repercussion which could impact a transit agency's funding. Triennial and State Management Reviews will begin to include PTASP compliance. Findings of non-compliance may result in negative impacts to transit agency funding. Transit agencies must maintain records related to their safety plan and implementation for three years.

Transit Safety Measures in the Rural Context

While most transit agencies operating within non-MPO rural RTPAs are exempt from the PTASP rule, the requirements of this rule are particularly challenging. Implementation

requires the development of a number of new complex policies and processes, and a complicated set of measures and targets. Fatalities, injuries and safety events must be tracked by rate, absolute number and mode. Measures must be tracked constantly and the PTASP must be updated annually. The associated workload could easily be expected to take a quarter or more of a full time equivalent (FTE) position. While the compliance burden may not be as concerning for an urban provider, resource limitations in small systems may necessitate additional staffing for compliance which could divert resources away from transit service.

While the PTASP policies and performance measures may make sense in large transit systems with long organizational charts, a more efficient and compact system of safety oversight is typically employed in smaller transit agencies. These smaller transit agencies often rely on a few staff members and/or a contractor to run the transit service. For small urban transit systems, this report recommends that they seek advice from Caltrans and the FTA on how to most efficiently complete their PTASP plan.

One challenge with the federal PTASP rule is that no guidance is offered on how to implement various PTASP policies. For example, the PTASP requires ongoing safety training. However, it does not provide best practices or direct agencies to appropriate resources. The report “Safety Guidelines for Rural and Small Urban Transit Agencies” indicates the Community Transportation Association of America recommends 120 hours of training for new bus operators covering 14 safety related categories, while the Citibus system in Lubbock, Texas, requires 56 hours in only seven safety categories (Turnbull, Katherine F; Higgins, Laura L; Weatherby Gilliland, Cynthia A. Texas Transportation Institute, 2003). This variety of training standards highlights the need for a best practices guide on urban and rural transit safety training. Similarly, guidance is needed on PTASP areas such as implementing drug and alcohol testing programs, procedures following accidents, incident reporting, data collection procedures, and best practices in implementing an employee safety reporting system.

Another challenge with the federal PTASP rule is that the federal measures focus on injuries and fatalities by mode and revenue miles, indicating that these measures focus on safety incidents which happen on the road. However, these measures ignore critical safety such as maintenance and equipment operator safety within transit maintenance yards. Similarly, non-revenue vehicle related fatalities and injuries are not required to be tracked under this rule. If the goal of the federal PTASP rule is to improve the transit safety culture, it should also provide guidelines for these other critical areas of safety. Without these elements, the resulting safety plan and improvements to safety culture may be incomplete.

Chapter 7: Integrating Performance Based Planning into Regional Planning

Introduction

Each MPO may be required to comply with all or part of each TPM rule regarding safety, bridge and pavement condition, system performance and air quality, TAM, and PTASP. For all performance management areas that an MPO is required to comply with, MPOs must include related goals, objectives, measures, and targets in their RTP and MTIP. This is to help assure that MPOs are partners in achieving federally required targets. While RTPAs are not required to integrate the targets into their planning and programming processes, this report recommends that RTPAs do so where feasible. The following discusses the key requirements for MPOs and provides recommendations for RTPAs.

For each TPM category, the state and/or transit agencies within MPOs are required to adopt targets. Within 180 days, each MPO must either adopt those targets or set their own regional targets. For targets related to roadway safety, pavement and bridge condition, and highway system performance and air quality, the MPO will choose to either adopt the statewide targets or set their own regional targets. For TAM and PTASP rules, the MPO must either adopt the targets of their local transit agencies or set their own regional targets.

This report recommends that the MPO coordinate with relevant local, regional, and state transportation partners before adopting targets. For statewide targets, Caltrans will provide MPOs with a form to certify target adoption. For transit agency targets, the MPO will need to document adoption of targets through an internal memo, an informational item to the board or a similar official process.

Regional Transportation Plans (RTP) and Performance Based Planning

RTPs must also include a description of progress made toward target achievement since the plan's last update. This must include a system performance report for each set of targets, excluding the transit targets for TAM and PTASPs (see Appendix H for an example). With subsequent adoptions of RTPs, MPOs must describe progress in meeting the performance targets in comparison with system performance recorded in previous years. An MPO's RTP cycle does not need to change to accommodate new regional targets. If the RTP was updated before the targets were set, the RTP does not need to be updated until the regularly scheduled update cycle.

RTPAs are exempt from requirements to this coordinated planning rule. If RTPAs choose to include TPM performance measures in their RTP as a voluntary effort, a detailed system analysis related to the measures would not be required. Rather, the RTPA should determine

how best to include this information, and what level of analysis to provide, if any. This should be determined by the agency's planning needs and capacity.

Regional Transportation Improvement Programs (RTIP) and Performance Based Planning

There are two primary requirements for incorporating performance management into an MPO's regional TIP: For all federally required targets, MPOs must show that (1) the TIP makes progress towards achieving the performance targets and that (2) the TIP includes, to the maximum extent practicable, a description of the anticipated effect of the TIP towards achieving the performance targets (Title 23 CFR§ 450.326).

MPOs must show they are making progress towards targets based on the package of investments included in the TIP and must also describe how much of an effect the TIP investments are expected to have on target achievement. See Appendix I for an example of TIP language used to address this requirement.

While RTPAs are exempt from most performance based requirements, their local transit agencies may be required to comply with TAM planning rules. RTPAs should coordinate with their transit agencies to make sure key transit projects identified through the TAM plan are included in their TIPs, RTPs and other relevant regional plans as feasible.

Appendix A: Example Caltrans Pavement and Bridge Condition Target Setting and Reporting Certification

TARGET REPORTING FORM

Performance Management (PM2)

National Highway System Pavement & Bridge Targets

Agency Information	
MPO/RTPA	
Contact Name	
Title	
Phone	
Email	

MAP-21 and subsequent federal rulemaking established federal regulation that requires the development of a Transportation Asset Management Plan (TAMP) and the implementation of Performance Management. These regulations require all states to utilize nationally defined performance measures for pavements and bridges on the National Highway System (NHS). The Bridge and Pavement Performance Management (PM2) Final Federal Rule established six performance measures related to the performance of the Interstate and non-Interstate NHS for the purpose of carrying out the National Highway Performance Program (NHPP); to assess pavement and bridge condition. The specific performance measures are:

Pavement Performance of the NHS

- Percentage of Interstate Pavements in Good Condition
- Percentage of Interstate Pavements in Poor Condition
- Percentage of Non-Interstate NHS Pavements in Good Condition
- Percentage of Non-Interstate NHS Pavements in Poor Condition

Bridge Performance of the NHS

- Percentage of NHS Bridges in Good Condition
- Percentage of NHS Bridges in Poor Condition

Federal regulations require Caltrans to set 2 and 4-year pavement and bridge targets by May 20, 2018. These statewide targets were transmitted to all Metropolitan Planning Organizations (MPOs) on May 21, 2018. MPO's were notified they have 180 days after Caltrans sets their targets to either support Caltrans targets or establish their own.

Please use this form to designate which method your agency elects to utilize for the establishment of 4-year NHS pavement and bridge targets to comply with federal regulation (23 U.S.C 150). If your Agency elects to establish their own targets, please complete the entire form. A signature from your Agency is necessary regardless of adopting Caltrans targets or establishing your own.

Target Options	Target Description
☐ Adopt statewide pavement and bridge targets	Agency elects to adopt the "statewide" targets which is the statewide weighted aggregate of the NHS asset targets from Caltrans and all MPO/RTPAs in California that own NHS pavement and bridges.
☐ Adopt statewide pavement targets and establish regional bridge targets	Agency elects to adopt the "statewide" pavement targets which is the statewide weighted aggregate of the NHS pavement only asset targets from Caltrans and all MPO/RTPAs in California that own NHS pavement. Agency elects to establish their own NHS bridge targets. By selecting this option, agency methodology for bridge target setting is required and must include inventory, planned funding, target condition, performance gap, deterioration rates and unit prices.
☐ Adopt statewide bridge targets and establish regional pavement targets	Agency plans to adopt the "statewide" bridge targets which is the statewide weighted aggregate of the NHS bridge asset targets from Caltrans and all MPO/RTPAs in California that own NHS bridges. Agency elected to establish their own NHS pavement targets. By selecting this option, agency methodology for pavement target setting is required and must include inventory, planned funding, target condition, performance gap, deterioration rates and unit prices.
☐ Establish regional pavement and bridge targets	Agency elects to establish their own regional condition targets for NHS pavement and bridges. By selecting this option, agency methodology for target setting is required and must include inventory, funding, target condition, performance gap, deterioration rates and unit prices.

If your Agency elects to adopt statewide targets, no other information is required in this form other than signature and submittal to Caltrans.

If your Agency elects to submit one or more of their own targets, the following information is required. Explain below the methodology your Agency used for establishing 4-year targets. How will your Agency plan and program projects so they contribute toward the Statewide or Regional NHS pavement and bridge targets?

Methodology Used for Establishing Targets (Attach a separate document to describe methodology in detail)	
Pavement	
Bridges	

PLANNED FUNDING (1/1/2018 - 12/31/2021)		
FY	**Pavement (NHS only) ($ millions)**	**Bridges (NHS only) ($ millions)**
2018/19		
2019/20		
2020/21		
2021/22		

Provide the expected annual deterioration rate used that changes condition of pavement and bridge assets from good to fair and fair to poor condition in the following table. Also, provide the unit price used in your analysis that is based on a "fully loaded" cost for construction and the engineering and administration costs associated with planning, design, and construction.

DETERIORATION RATE		
Asset Inventory (All)	**Good to Fair (%)**	**Fair to Poor (%)**
Pavement (lane miles)		
Bridge (square feet)		

UNIT PRICE (capital plus support)		
Asset Inventory (All)	**Fair ($ 1,000)**	**Poor ($ 1,000)**
Pavement (lane miles)		
Bridge (square feet)		

Identify your 4-years planned condition information on NHS pavement and bridges at the point in times defined in the table below. Was this an estimate based on the proportion of NHS to your total or the actual expenditures on NHS? Please specify.

PLANNED CONDITION		
	Pavement (lane miles)	**Bridges (square feet)**
December 31, 2018		
December 31, 2019		
December 31, 2020		
December 31, 2021		

Report in the table below MPO expected 4-year NHS pavement and bridge targets at the point in times shown in the table below.

EXPECTED 4-YEAR NHS PAVEMENT AND BRIDGE TARGETS			
NHS Assets	**Good**	**Fair**	**Poor**
Pavement (December 31, 2021)	%	%	%
Bridge (December 31, 2021)	%	%	%

Please complete the target reporting form and submit via email to CT-TAM@dot.ca.gov. Please provide name and signature of the MPO official certifying this information.

Appendix B: Example Caltrans Form for Reporting MPO Pavement and Bridge Condition

Performance Management 2 (PM2) Reporting

Assessing Pavement and Bridge Condition on the National Highway System (NHS)

The code of federal regulations (23 CFR Part 515) (MAP-21) requires each state to develop a Transportation Asset Management Plan (TAMP) and implement Performance Management. These regulations require all states to utilize nationally defined performance measures for pavements and bridges on the National Highway System (NHS). The Bridge and Pavement Performance Management (PM2) Final Federal Rule established performance measures related to the performance of non-Interstate NHS for the purpose of carrying out the National Highway Performance Program (NHPP); to assess pavement and bridge condition. The specific performance measures are:

Pavement Performance of the NHS

- Percentage of Non-Interstate NHS Pavements in Good Condition
- Percentage of Non-Interstate NHS Pavements in Poor Condition

Bridge Performance of the NHS

- Percentage of NHS Bridges in Good Condition
- Percentage of NHS Bridges in Poor Condition

Federal regulations require each state Department of Transportation to establish 2 and 4 year pavement and bridge targets. Federal regulations allow Metropolitan Planning Organizations (MPO's) to adopt the states target or adopt their own within 180 days after the establishment of the statewide target.

To assist our local partners with the target setting process, your regions NHS pavement and bridge inventory and condition is attached. NHS routes and maps, the definition of good and poor, as well as the California Transportation Asset Management Plan (TAMP) can be found at the following link: http://www.dot.ca.gov/assetmgmt/

Please review your regions data, and identify what condition you expect your NHS pavement and bridges to be in 2 and 4 years, given your available funding and planned projects.

Please provide MPO contact information, 2 and 4 year expected condition data, and the signature of the MPO official certifying the information.

Agency Information	
MPO/RTPA	
Contact Name	
Title	
Phone	
Email	

Expected 2-Year NHS Pavement and Bridge Map-21 Based Condition
(Quantity weighted average)

Two Year Performance Targets	Inventory	Good	Fair	Poor
Pavement Lane Miles (Miles)				
Bridge Deck Area (Square Feet)				

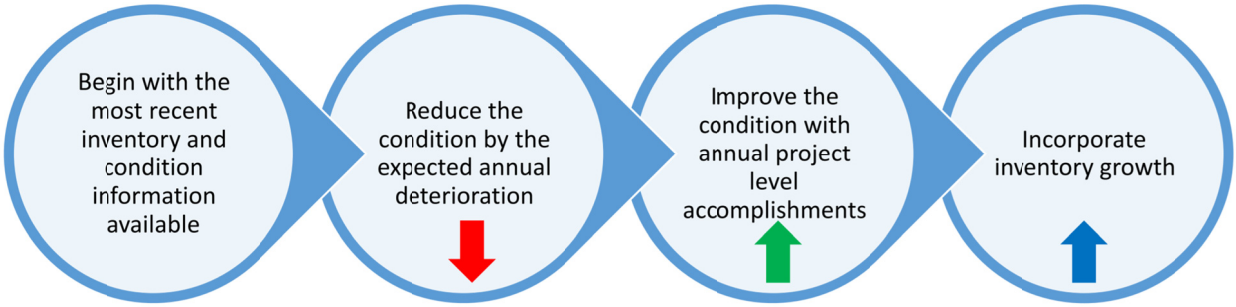
Expected 4-Year NHS Pavement and Bridge Map-21 Based Condition
(Quantity weighted average)

Four Year Performance Targets	Inventory	Good	Fair	Poor
Pavement Lane Miles (Miles)				
Bridge Deck Area (Square Feet)				

Appendix C: MPO/RTPA Guide for Estimating Condition and Inventory for Interstate, non-Interstate NHS and NHS Bridges

Caltrans may ask MPOs to estimate their bridge and pavement condition for the two year and four year reporting periods. The following provides a procedural guide to estimate future conditions for these metrics.

Figure 1: Overview of Process for Estimating Future Condition of Pavement and Bridge Infrastructure



Estimating Interstate and Non-Interstate NHS Pavement Condition

1. Caltrans provides Bridge Condition and Pavement Condition Target Calculator tools for the purpose of identifying each MPOs relevant lane mile inventory and the split of that inventory into poor and good categories based on national infrastructure condition standards. Using this tool, identify your MPO's baseline pavement inventory and condition (see Table 1 below).
2. Identify highways that are part of the Interstate and non-Interstate NHS in the MPO area. This information can be obtained from Caltrans.
3. Review the TIP, MTP, and/or RTPs for the MPO area in question and determine if there are any projects in within the four-year performance period that may improve or add to any Interstate or non-Interstate NHS highway sections. Note the length of lane-miles affected, the highway type, length of segment, expected condition improvement, and whether it falls into the two year or four year target period. For example, if a two mile section of highway in poor condition is expected to be replaced within the four-year performance period, that segment would then be in good condition. The corresponding two lane miles would be removed from poor condition lane miles total and added to good condition total.

Table 1: Example California Pavement Condition Calculator Tool Provided by Caltrans

Example: Pavement Conditions (NHS) Target Calculator Tool

Jurisdiction	2016 Lane Miles (LM)	2016 Pavement Condition (%) Good(G)	Poor(P)	2 Year Pavement Condition Targets Good (LM)	% Target (G)	Poor (LM)	% Target (P)	4 Year Pavement Condition Targets Good (LM)	% Target (G)	Poor (LM)	% Target (P)	% Impact to Statewide Lane Miles
State Interstate - NHS	14,159	47.9%	3.1%	6,353	44.9%	240	1.7%	6,353	44.9%	283	2.0%	25.2%
Non Interstate - NHS	22,544	45.9%	2.5%	9,796	43.5%	653	2.9%	9,796	43.5%	518	2.3%	40.2%
Butte (BCAG)	69	20.3%	12.6%	5	7.3%	9	12.6%	5	7.3%	9	12.6%	0.1%
Fresno (FCOG)	479	17.5%	4.2%	64	13.4%	20	4.2%	64	13.4%	20	4.2%	0.9%
Glenn CTC	6	10.1%	0.0%	1	9.7%		0.0%	1	9.7%	-	0.0%	0.0%
Humbolt CAG	35	100.0%	0.0%	35	98.8%		0.0%	35	98.8%	-	0.0%	0.1%
Kern (KCOG)	586	23.3%	4.1%	113	19.3%	24	4.1%	113	19.3%	24	4.1%	1.0%
Kings (KCAG)	35	16.2%	0.0%	6	16.2%		0.0%	6	16.2%	-	0.0%	0.1%
Lassen CTC	8	100.0%	0.0%	6	79.6%		0.0%	6	79.6%	-	0.0%	0.0%
Madera (MCTC)	3	0.0%	0.0%		0.0%		0.0%		0.0%	-	0.0%	0.0%
Merced (MCAG)	87	17.7%	15.2%	2	2.1%	13	15.2%	2	2.1%	13	15.2%	0.2%
Metropolitan (MTC)	2,995	12.7%	11.1%	50	1.7%	333	11.1%	50	1.7%	333	11.1%	5.3%
Alameda County	593	21.0%	16.1%	6	1.0%	95	16.1%	6	1.0%	95	16.1%	1.1%
Contra Costa County	619	11.4%	7.0%	16	2.5%	43	7.0%	16	2.5%	43	7.0%	1.1%
Marin County	72	15.0%	11.0%	1	2.0%	8	11.0%	1	2.0%	8	11.0%	0.1%
Napa County	29		23.9%	-	0.0%	7	23.9%	-	0.0%	7	23.9%	0.1%
San Francisco County	318	6.6%	3.3%	0	0.1%	10	3.3%	0	0.1%	10	3.3%	0.6%
San Mateo County	54	8.7%	7.0%	1	1.1%	4	7.0%	1	1.1%	4	7.0%	0.1%
Santa Clara County	985	14.0%	10.0%	21	2.2%	99	10.0%	21	2.2%	99	10.0%	1.8%
Solano County	285	20.2%	17.7%	2	0.8%	50	17.7%	2	0.8%	50	17.7%	0.5%
Sonoma County	61	19.2%	16.1%	2	2.6%	10	16.1%	2	2.6%	10	16.1%	0.1%
Monterey (AMBAG)	218	16.0%	8.1%	17	7.6%	18	8.1%	17	7.6%	18	8.1%	0.4%
Monterey County	142	19.7%	7.6%	14	9.6%	11	7.6%	14	9.6%	11	7.6%	0.3%
San Benito County	17	13.5%	1.2%	2	12.3%	0	1.2%	2	12.3%	0	1.2%	0.0%
Santa Cruz County	61	16.5%	10.9%	1	1.4%	7	10.9%	1	1.4%	7	10.9%	0.1%
Sacramento (SACOG)	1,149	17.5%	14.4%	37	3.2%	166	14.4%	37	3.2%	166	14.4%	2.0%
El Dorado County	2		77.3%	-	0.0%	1	77.3%	-	0.0%	1	77.3%	0.0%
Placer County	115	14.4%	3.4%	12	10.4%	4	3.4%	12	10.4%	4	3.4%	0.2%
Sacramento County	952	18.7%	15.9%	20	2.1%	152	15.9%	20	2.1%	152	15.9%	1.7%
Yolo County	86	15.6%	10.1%	5	5.3%	9	10.1%	5	5.3%	9	10.1%	0.2%
San Diego (SANDAG)	991	10.8%	8.8%	21	2.1%	87	8.8%	21	2.1%	87	8.8%	1.8%
San Joaquin (SJCOG)	545	13.9%	6.8%	39	7.1%	37	6.8%	39	7.1%	37	6.8%	1.0%
San Luis Obispo (SLOCOG)	43	22.0%	11.5%	4	10.4%	5	11.5%	4	10.4%	5	11.5%	0.1%
Santa Barbara (SBCAG)	131	11.8%	7.9%	5	3.8%	10	7.9%	5	3.8%	10	7.9%	0.2%
Southern California (SCAG)	11,658	17.9%	14.4%	427	3.7%	1,676	14.4%	427	3.7%	1,399	12.0%	20.8%
Imperial County	288	42.0%	24.3%	48	16.8%	70	24.3%	48	16.8%	70	24.3%	0.5%
Los Angeles County	6,355	20.7%	18.2%	108	1.7%	1,159	18.2%	108	1.7%	1,159	18.2%	11.3%
Orange County	2,793	15.2%	7.5%	128	4.6%	208	7.5%	128	4.6%	208	7.5%	5.0%
Riverside County	662	17.1%	8.6%	42	6.3%	57	8.6%	42	6.3%	57	8.6%	1.2%
San Bernardino County	1,047	24.9%	10.0%	54	5.2%	105	10.0%	54	5.2%	105	10.0%	1.9%
Ventura	514	15.3%	8.4%	34	6.5%	43	8.4%	34	6.5%	43	8.4%	0.9%
Shasta (SRTA)	9	28.3%	15.5%	1	13.3%	1	15.5%	1	13.3%	1	15.5%	0.0%
Stanislaus (StanCOG)	219	26.4%	13.2%	29	13.2%	29	13.2%	29	13.2%	29	13.2%	0.4%
Tahoe (TMPO)	5	100.0%	0.0%	5	97.1%		0.0%	5	97.1%	-	0.0%	0.0%
Tulare (TCAG)	102	16.9%	2.0%	15	14.2%	2	2.0%	15	14.2%	2	2.0%	0.2%
Grand Total	56,076	30.4%	6.1%	17,029	30.4%	3,323	5.9%	17,029	30.4%	2,954	5.3%	100%

4. Review your MPO area and identify any events which may degrade highway condition including declines resulting from regular use over the four-year performance period. Include any events which may have significantly reduced roadway conditions since the baseline data was collected such as disasters, accidents, storms or other events. Record the degradation. For example, if expected degradation results in a highway segment going from good to fair, it would be removed from the good condition total. If

degradation would result in infrastructure with a fair condition becoming poor, add that to the poor condition total (See Table 2 below for an example of the calculations). Note, while fair condition may be tracked by the MPO when performing these calculations, the fair category is not included in reporting. Only the good and poor categories are used to report and track this metric.

Table 2: Example of Pavement Condition Change Calculation

	Good	Fair	Poor
Condition at beginning of year	1500	400	100
	75%	20%	5%
Changes to inventory condition:			
(1) Project Accomplishments	450	-200	-250
(2) Deterioration			
Good to Fair	-150	150	0
Fair to Poor	0	-200	200
(3) New Inventory	100	0	0
Net change in condition	400	-250	-50
Condition at end of year	1900	150	50
	90%	7%	2%

5. Provide Caltrans with updated data on inventory, and how many miles of that inventory are split into good and poor condition.

Estimating Interstate and Non-Interstate NHS Bridge Condition

1. Caltrans provides Bridge Condition and Pavement Condition Target Calculator tools which identify and MPOs relevant lane mile inventory and the distribution of that inventory into poor and good categories based on national infrastructure condition standards. Using this tool, identify your MPO's baseline bridge inventory and condition (See Table 3 below).

2. Identify NHS bridges in the MPO area. This information can be obtained from Caltrans.

3. Review the TIP, MTP, and RTPs for the MPO area in question and determine if there are any projects in within the four-year performance period that may improve or add to any NHS Bridges. Note the deck area, expected condition improvement, and whether it falls into the two year or four year target period. For example, if a 3,000 square foot deck

area bridge in poor condition is expected to be replaced within the four-year performance period, that bridge would then be in good condition. The corresponding 3,000 square foot deck area would be removed from poor condition deck area total for the region and added to the good condition deck area total.

4. Review your MPO area and identify any events which may degrade bridge or highway condition including declines resulting from regular use over the four-year performance period. Include any events which may have significantly reduced bridge conditions since the baseline data was collected such as disasters, washouts, culvert failures, storms or other events. Record the degradation by adding or subtracting bridge deck area into the appropriate good or poor columns.

5. Provide Caltrans with updated data on inventory, and how many miles of that inventory are split into good and poor condition.

Table 3: Example California National Bridge Inventory Calculator Tool Provided by Caltrans

Example: National Bridge Inventory (NBI) Bridge Conditions Target Calculator Tool

Jurisdiction	Number of Bridges	Deck Area (SF)	2017 Bridge Health (%)		2 Year Bridge Condition Targets				4 Year Bridge Condition Targets				% Impact to Statewide Deck Area
			Good(G)	Poor(P)	Good (SF)	% Target (G)	Poor (SF)	% Target (P)	Good (SF)	% Target (G)	Poor (SF)	% Target (P)	
State	9,196	210,774,774	69.4%	3.7%	146,271,637	69.4%	7,743,040	3.7%	146,271,637	69.4%	7,743,040	3.7%	90.0%
Butte (BCAG)	7	40,085	23.3%	0.0%	9,322	23.3%	-	0.0%	9,322	23.3%	-	0.0%	0.0%
Fresno (FCOG)	33	389,427	31.2%	0.8%	121,320	31.2%	3,272	0.8%	121,320	31.2%	3,272	0.8%	0.2%
Humbolt CAG	2	5,113	0.0%	0.0%	-	0.0%	-	0.0%	-	0.0%	-	0.0%	0.0%
Kern (KCOG)	70	859,612	63.2%	4.9%	543,455	63.2%	42,130	4.9%	543,455	63.2%	42,130	4.9%	0.4%
Merced (MCAG)	10	52,958	33.3%	1.7%	17,653	33.3%	893	1.7%	17,653	33.3%	893	1.7%	0.0%
Metropolitan (MTC)	288	4,641,759	45.6%	20.9%	2,117,924	45.6%	971,639	20.9%	2,117,924	45.6%	971,639	20.9%	2.0%
	48	975,403	45.8%	2.4%	446,368	45.8%	23,013	2.4%	446,368	45.8%	23,013	2.4%	0.4%
	63	677,427	31.3%	30.7%	211,724	31.3%	207,714	30.7%	211,724	31.3%	207,714	30.7%	0.3%
	1	4,101	100.0%	0.0%	4,101	100.0%	-	0.0%	4,101	100.0%	-	0.0%	0.0%
	8	138,827	8.3%	66.6%	11,544	8.3%	92,440	66.6%	11,544	8.3%	92,440	66.6%	0.1%
	13	274,264	45.9%	0.0%	125,884	45.9%	-	0.0%	125,884	45.9%	-	0.0%	0.1%
	29	854,083	40.4%	42.1%	345,338	40.4%	359,977	42.1%	345,338	40.4%	359,977	42.1%	0.4%
	104	1,545,883	56.5%	17.3%	873,032	56.5%	267,526	17.3%	873,032	56.5%	267,526	17.3%	0.7%
	14	116,218	59.7%	18.0%	69,384	59.7%	20,968	18.0%	69,384	59.7%	20,968	18.0%	0.0%
	8	55,552	55.0%	0.0%	30,548	55.0%	-	0.0%	30,548	55.0%	-	0.0%	0.0%
Monterey (AMBAG)	11	121,969	11.1%	0.0%	13,577	11.1%	-	0.0%	13,577	11.1%	-	0.0%	0.1%
	8	102,670	10.1%	0.0%	10,380	10.1%	-	0.0%	10,380	10.1%	-	0.0%	0.0%
	3	19,300	16.6%	0.0%	3,197	16.6%	-	0.0%	3,197	16.6%	-	0.0%	0.0%
Sacramento (SACOG)	97	1,272,986	51.9%	3.5%	660,340	51.9%	44,767	3.5%	660,340	51.9%	44,767	3.5%	0.5%
	13	196,624	42.6%	0.0%	83,851	42.6%	-	0.0%	83,851	42.6%	-	0.0%	0.1%
	78	1,002,553	55.5%	3.8%	556,425	55.5%	38,190	3.8%	556,425	55.5%	38,190	3.8%	0.4%
	6	73,808	27.2%	8.9%	20,064	27.2%	6,577	8.9%	20,064	27.2%	6,577	8.9%	0.0%
San Diego (SANDAG)	68	1,265,363	33.7%	20.6%	425,940	33.7%	260,766	20.6%	425,940	33.7%	260,766	20.6%	0.5%
San Joaquin (SJCOG)	33	539,939	77.8%	9.8%	420,169	77.8%	53,044	9.8%	420,169	77.8%	53,044	9.8%	0.2%
San Luis Obispo (SLOCOG)	5	33,497	0.0%	0.0%	-	0.0%	-	0.0%	-	0.0%	-	0.0%	0.0%
Santa Barbara (SBCAG)	27	167,659	48.1%	18.2%	80,680	48.1%	30,537	18.2%	80,680	48.1%	30,537	18.2%	0.1%
Southern California (SCAG)	928	13,229,785	36.4%	14.4%	4,810,698	36.4%	1,900,818	14.4%	4,810,698	36.4%	1,900,818	14.4%	5.7%
	4	14,628	0.0%	0.0%	-	0.0%	-	0.0%	-	0.0%	-	0.0%	0.0%
	588	8,491,870	28.1%	15.8%	2,385,954	28.1%	1,338,423	15.8%	2,385,954	28.1%	1,338,423	15.8%	3.6%
	187	2,802,020	57.3%	5.0%	1,605,783	57.3%	140,372	5.0%	1,605,783	57.3%	140,372	5.0%	1.2%
	75	1,025,563	57.2%	9.6%	586,654	57.2%	98,888	9.6%	586,654	57.2%	98,888	9.6%	0.4%
	74	895,704	25.9%	36.1%	232,306	25.9%	323,134	36.1%	232,306	25.9%	323,134	36.1%	0.4%
	35	536,393	30.0%	26.1%	160,905	30.0%	139,802	26.1%	160,905	30.0%	139,802	26.1%	0.2%
Shasta (SRTA)	3	133,860	94.1%	0.0%	125,970	94.1%	-	0.0%	125,970	94.1%	-	0.0%	0.1%
Stanislaus (StanCOG)	9	188,185	24.6%	14.7%	46,263	24.6%	27,631	14.7%	46,263	24.6%	27,631	14.7%	0.1%
Tulare (TCAG)	3	32,518	100.0%	0.0%	32,518	100.0%	-	0.0%	32,518	100.0%	-	0.0%	0.0%
Grand Total**	**10,790**	**233,749,490**	**66.7%**	**4.8%**	**155,697,465**	**66.6%**	**11,078,537**	**4.7%**	**155,697,465**	**66.6%**	**11,078,537**	**4.7%**	**100.0%**

Appendix D: Example Caltrans System Performance and Air Quality Target Setting and Reporting Certification

TARGET REPORTING FORM

Agency Information	
MPO/RTPA	
Contact Name	
Title	
Phone	
Email	

Performance Management (PM3) System Performance/Freight/CMAQ Targets

On May 20, 2017, a Federal Highway Administration (FHWA) final rule took effect, with the exception of certain portions of the rule. The rule, published in the Federal Register (82 FR 5970) on January 18, 2017, establishes performance measures that State Departments of Transportation (State DOT) and Metropolitan Planning Organizations (MPOs) will use to report on the performance of the Interstate and Non-Interstate National Highway System (NHS) to carry out the National Highway Performance Program (NHPP); freight movement on the Interstate system to carry out the National Highway Freight Program (NHFP); and traffic congestion and on-road mobile source emissions for the purpose of carrying out the Congestion Mitigation and Air Quality Improvement (CMAQ) Program. The rule addresses requirements established by the Moving Ahead for Progress in the 21st Century Act (MAP-21), and reflects passage of the Fixing America's Surface Transportation (FAST) Act.

Federal regulations require State DOTs to establish and report annual targets related to each of the six performance measures by May 20 of each year. MPO's shall establish a target six-months after State DOTs establish targets (November 16th) by either: 1) Agreeing to plan and program projects so that they contribute toward the accomplishment of the State DOT system performance target for each respective performance measure; or 2) Committing to a quantifiable target for each respective performance measure for their metropolitan planning area. State DOTs and MPOs with NHS mileage in applicable urbanized areas must agree to single, unified targets for two of the performance measures.

In preparation for the 2018 Performance Management 3 (PM3) target setting effort, coordination between the California Department of Transportation (Caltrans) and MPOs occurred via guidance from PM3 Technical Advisory Group (TAG) meetings, which consisted of members from MPOs and Caltrans, and in-person/webcast workshops in 2017 and 2018. The

information provided during these engagements was used to collaboratively establish targets for six of the performance measures, and individual discussions were held with each MPO with urbanized areas over one million to establish single, unified targets for two of the performance measures, as noted in the chart below.

Performance Measure	2017 Baseline Data	2-year Target	4-year Target
Percent of Reliable Person-Miles Traveled on the Interstate	64.6%	65.1% (+0.5%)	65.6% (+1%)
Percent of Reliable Person-Miles Traveled on the Non-Interstate NHS	73.0%	N/A	74.0% (+1%)
Percentage of Interstate System Mileage Providing Reliable Truck Travel Time (Travel Time Reliability Index)	1.69	1.68 (-0.01)	1.67 (-0.02)
Total Emissions Reductions by Applicable Pollutants under the CMAQ Program			
VOC (kg/day)	951.83	961.35 (+1%)	970.87 (+2%)
CO (kg/day)	6,863.26	6,931.90 (+1%)	7,000.54 (+2%)
NOx (kg/day)	1,753.36	1,770.89 (+1%)	1,788.43 (+2%)
PM10 (kg/day)	2,431.21	2,455.52 (+1%)	2,479.83 (+2%)
PM2.5 (kg/day)	904.25	913.29 (+1%)	922.34 (+2%)
*Annual Hours of Peak-Hour Excessive Delay Per Capita	State and MPO must coordinate on a single, unified 4-year target.		
Sacramento UA	14.9 Hours	N/A	14.7 (-1.0%)
San Francisco-Oakland UA	31.3 Hours	N/A	30.0 (-4.0%)
San Jose UA	27.5 Hours	N/A	26.4 (-4.0%)
Los Angeles-Long Beach-Anaheim UA	51.7 Hours	N/A	51.2 (-1.0%)
Riverside-San Bernardino UA	16.3 Hours	N/A	16.1 (-1.0%)
San Diego UA	18.4 Hours	N/A	18.0 (-2.0%)
*Percent of Non-Single Occupancy Vehicle (SOV) Travel	State and MPO must coordinate on a single, unified 2-year and 4-year target.		
Sacramento UA	22.8%	23.3% (+0.5%)	23.8% (+1%)
San Francisco-Oakland UA	44.3%	45.3% (+1%)	46.3% (+2%)
San Jose UA	24.5%	25.5% (+1%)	26.5% (+2%)
Los Angeles-Long Beach-Anaheim UA	25.6%	26.1% (+0.5%)	26.6% (+1%)
Riverside-San Bernardino UA	22.7%	23.2% (+0.5%)	23.7% (+1%)
San Diego UA	23.8%	24.8% (+1%)	25.2 (+1.4%)

Source data: NPMRDS Analytics Tool (https://npmrds.ritis.org/analytics/), CMAQ Public Access System (https://fhwaapps.fhwa.dot.gov/cmaq_pub/), and U.S. Census Bureau, 2012-2016 American Community Survey 5-Year Estimates.

In addition, on May 31, 2018, the FHWA published a final rule in the Federal Register repealing the performance management measure in 23 CFR 490.507(b) that assessed the percent change

in tailpipe carbon dioxide (CO2) emissions, from the reference year 2017, on the NHS (also referred to as the Greenhouse Gas (GHG) measure).

By repealing the GHG measure, FHWA no longer requires State DOTs and MPOs to undertake administrative activities to establish targets, calculate their progress toward their selected targets, report to FHWA, and determine a plan of action to make progress toward their selected targets if they failed to make significant progress during a performance period.

Although this mandate has been rescinded, respectfully, Caltrans will voluntarily submit the GHG baseline numbers in the table below for California's NHS, using the methodology FHWA proposed in its original rule. The information, represented in the table below, will also be uploaded to the FHWA's User Profile and Access Control System (UPACS) by October 1, 2018. Additionally, California is firmly committed to setting GHG performance targets for the NHS in the near future.

GHG Measure:

Fuel Type	**2012 Emissions (Metric Tons)**	**2013 Emissions (Metric Tons)**	**2014 Emissions (Metric Tons)**	**2015 Emissions (Metric Tons)**	**2016 Emissions (Metric Tons)**
Gasoline	125,599,006	125,624,932	126,829,188	130,694,456	134,172,599
Diesel Fuel	26,557,575	27,931,906	28,292,065	28,752,265	30,540,741
Total GHG Emissions	152,156,581	153,556,838	155,121,253	159,446,721	164,713,340
Total On-NHS	**103,016,599**	**102,522,799**	**103,166,921**	**105,111,424**	**110,264,455**
Year	**2012**	**2013**	**2014**	**2015**	**2016**
NHS VMT (M)	216,017	215,228	213,290	215,739	222,370
Total VMT (M)	326,272	329,534	332,857	335,593	340,115
Gasoline (k)	14,525,691	14,553,305	14,943,098	15,119,963	15,507,693
Diesel (k)	2,748,351	2,859,342	2,918,733	3,012,037	3,182,368

Please use this form to designate which method your agency elects to utilize for the establishment of two year and four year targets to comply with federal regulation (23 U.S.C 150). If your Agency elects to establish agency specific targets, please complete the entire form. A signature from your Agency is necessary regardless of adopting Caltrans' targets or establishing your own.

Target Options	Target Description
☐ **Adopt statewide system performance/freight/CMAQ targets**	Agency elects to adopt the "statewide" targets, and will plan and program projects so that they contribute toward the accomplishment of the State DOT system performance target for each performance measure.
☐ **Establish regional system performance/freight/CMAQ targets**	Agency elects to establish their own region-specific targets. By selecting this option, agency methodology for target setting is required.

If your Agency elects to adopt statewide targets, no other information is required in this form other than signature and submittal to Caltrans.

If your Agency elects to submit their own targets, the following information is required. Specify your two year and four year targets below, and explain below the methodology your Agency used for establishing your targets.

Performance Measure	2017 Baseline Data	2-year Target	4-year Target
Percent of Reliable Person-Miles Traveled on the Interstate	64.6%		
Percent of Reliable Person-Miles Traveled on the Non-Interstate NHS	73.0%		
Percentage of Interstate System Mileage Providing Reliable Truck Travel Time (Truck Travel Time Reliability Index)	1.69		
Total Emissions Reductions by Applicable Pollutants under the CMAQ Program			
VOC (kg/day)	951.83		
CO (kg/day)	6,863.26		
NOx (kg/day)	1,753.36		
PM10 (kg/day)	2,431.21		
PM2.5 (kg/day)	904.25		

Methodology Used for Establishing Targets (Attach a separate document to describe methodology, if necessary.)	
Percent of Reliable Person-Miles Traveled on the Interstate	
Percent of Reliable Person-Miles Traveled on the Non-Interstate NHS	
Percentage of Interstate System Mileage Providing Reliable Truck Travel Time (Truck Travel Time Reliability Index)	
Total Emissions Reductions by Applicable Pollutants under the CMAQ Program	

Please provide name and signature of the MPO official certifying this information.

MPO Official's Name: _____

MPO Official's Signature: _____ **Date:** _____

Appendix E: Accessing Performance Measure Data Sets

National Performance Management Research Data Set (NPMRDS)

MPOs and State DOTs are granted free access to NPMRDS data through the Regional Integrated Transportation Information System (RITIS) database in order to review and download data for the four performance measures and associated metrics listed in Table 1.

Table 1: System Performance/Air Quality Measures and Metrics Accessible

Performance Measure	Metric
Percent of Reliable Person-Miles Traveled on the Interstate	Level of travel time reliability (LOTTR), 15 minute intervals
Percent of Reliable Person-Miles Traveled on the Non-Interstate NHS	Level of travel time reliability (LOTTR), 15 minute intervals
Percent of Interstate System Mileage Proving Reliable Truck Travel Time (Truck Travel Time Reliability Index)	Truck Travel Time Reliability (TTTR) Index, 15 minute intervals
Annual Hours of Peak-Hour Excessive Delay Per Capita	Total peak-hour excessive delay (PHED) person-hours, 15 minute intervals

Registering and Accessing Your NPMRDS Account

To register for an account, visit https://www.ritis.org/register/. After registering for an account, it may take up to two business days for your account to be created. Once your account has been created, you will be notified by email. Once you have created your account, go to https://npmrds.ritis.org/ and log in.

Tutorials and Accessing NPMRDS Data

RITIS has produced a number of video tutorials to assist in using the database. After logging in, go to https://npmrds.ritis.org/analytics/tutorials/ and watch the tutorials regarding "MAP-21 PM3". To access and download the relevant data for your region, follow the tutorial directions. Note, data for Annual Hours of Peak-Hour Excessive Delay Per Capita is not available for download unless your region meets the population size threshold criteria for required reporting. This means your region must include an urban area with a population of 1,000,000 or more before January 1, 2022. On or after January 1, 2022, data will be available for this measure from Urban Areas with a population of 200,000 or more.

Congestion Mitigation and Air Quality (CMAQ) Public Access System

The public has access to the CMAQ Public Access System which is used to determine the Total Emissions Reductions by Applicable Pollutants under the CMAQ Program measure (see Table 2). Large MPOs in non-attainment or maintenance status for applicable pollutants and precursors can access this data at https://fhwaapps.fhwa.dot.gov/cmaq_pub/. RTPAs and small urban MPOs are not required to report on this measure.

Table 2: Congestion Mitigation and Air Quality (CMAQ) Measure and Metric

Performance Measure	Metrics	
Total Emissions Reductions by Applicable Pollutants under the CMAQ Program	Sum of 2-and 4-year totals of emissions reductions of the following pollutants	VOC (kg/day) CO (kg/day) NOx (kg/day) PM10 (kg/day) PM2.5 (kg/day)

Identifying Percent of non-Single Occupancy Vehicle (SOV) Travel

Three options are available to MPOs and State DOTs for measuring modal share to calculate Percent of non-SOV Travel (see Table 3): (1) American Community Survey (ACS) Commuting data from the U.S. Census Bureau, (2) local travel surveys gathered within two years of the start of the performance period, or (3) system use measurement of volume/usage counts for each mode. The measure includes all surface modes of transportation that are not SOV and may include travel avoided by teleworking. RTPAs and small urban MPOs are not required to report on this measure.

Table 3: Non-Single Occupancy Vehicle (SOV) Travel Measure and Metric

Performance Measure	Metric
Percent of non-Single Occupancy Vehicle (SOV) Travel	Census, local survey, or local counts including bike/pedestrian counts

Appendix F: Methodology for Quantifying System Performance and Air Quality Metrics

Federal regulations specify the metrics that must be used to measure most performance measures in the system performance and air quality category. The purpose of this is to assure that all State DOTs are reporting using standardized metrics and to assure progress is consistently being tracked by each state over time. The quantitative methodology for measuring performance metrics is complex and often involves complex measurements and mathematical calculations. The purpose of this appendix is to give the reader a high-level understanding of how each metric is measured or calculated. This includes a review of all system performance and air quality measures and metrics (see Table 1). Note, only the Percent of non-Single Occupancy Vehicle (SOV) Travel metric may need to be calculated by the reporting jurisdiction. All other reporting metrics can be generated using the NPMRDS RITIS or CMAQ Public Access systems.

Table 1: System Performance and Air Quality Measures and Metrics

Performance Measure	Metric	
Percent of Reliable Person-Miles Traveled on the Interstate	Level of travel time reliability (LOTTR), 15 minute intervals	
Percent of Reliable Person-Miles Traveled on the Non-Interstate NHS	Level of travel time reliability (LOTTR), 15 minute intervals	
Percent of Interstate System Mileage Proving Reliable Truck Travel Time (Truck Travel Time Reliability Index)	Truck Travel Time Reliability (TTTR) Index, 15 minute intervals	
Total Emissions Reductions by Applicable Pollutants under the CMAQ Program	Sum of 2-and 4-year totals of emissions reductions of the following pollutants	VOC (kg/day) CO (kg/day) NOx (kg/day) PM10 (kg/day) PM2.5 (kg/day)
Annual Hours of Peak-Hour Excessive Delay Per Capita	Total peak-hour excessive delay person-hours, 15 minute intervals	
Percent of non-Single Occupancy Vehicle (SOV) Travel	Census, local survey, or local counts (including bike/pedestrian counts)	

Percent of Reliable Person-Miles Traveled on the Interstate and Non-Interstate: Level of Travel Time Reliability (LOTTR), 15 minute Intervals

The first two performance measures use *Level of Travel Time Reliability (LOTTR)* as their metric. LOTTR is defined as the ratio of the 80th percentile travel time of a reporting segment to a

"normal" travel time (50th percentile), using data from FHWA's free National Performance Management Research Data Set (NPMRDS) or equivalent. Data are collected in 15-minute segments during all time periods other than 8 p.m.-6 a.m. local time. The metric accounts for the percent of person-miles traveled on the relevant NHS areas that are reliable (23 CFR 490.511). If the LOTTR for any given highway reporting segment is below 1.50, the segment is considered reliable. For more information on how this measure and associated metric is calculated, see the FHWA's TPM Implementation Recordings at https://www.fhwa.dot.gov/tpm/resources/presentations.cfm.

State DOTs and MPOs will find the data they need for evaluating this metric is available in FHWA's National Performance Management Research Data Set (NPMRDS), as the data set includes travel times for the full Interstate System. To access this database, please visit npmrds.ritis.org.

Percent of Interstate System Mileage Proving Reliable Truck Travel Time: Truck Travel Time Reliability (TTTR) Index, 15 minute intervals

The freight movement performance measure is assessed by a *Truck Travel Time Reliability (TTTR) Index* metric. The data for this metric is divided into five periods: morning peak (6-10 a.m.), midday (10 a.m.-4 p.m.) and afternoon peak (4-8 p.m.) Mondays through Fridays; weekends (6 a.m.-8 p.m.); and overnights for all days (8 p.m.-6 a.m.). The TTTR ratio is generated by dividing the 95th percentile time by the normal time (50th percentile) for each segment. Then, the TTTR Index is generated by multiplying each segment's largest ratio of the five periods by its length, then dividing the sum of all length-weighted segments by the total length of Interstate. [23 CFR 490.511 and 490.513] For more information on how this measure and associated metric is calculated, see the FHWA's TPM Implementation Recordings at https://www.fhwa.dot.gov/tpm/resources/presentations.cfm.

State DOTs and MPOs will find the data they need for target setting and reporting on this metric in FHWA's NPMRDS which includes truck travel times for the full Interstate System.

Total Emissions Reductions by Applicable Pollutant in CMAQ

Total emissions reductions by applicable pollutant are quantified by using the *sum of two and four year totals of emissions reductions of applicable criteria pollutant and precursor, in kilograms per day*, for all projects funded with CMAQ funds. Depending on what pollutants or precursors an area is in non-attainment or maintenance for, this may include some or all of the following: volatile organic compounds (VOCs, kg/day), carbon monoxide (CO, kg/day), nitrogen oxides (NOx, kg/day), particulate matter measuring 10 microns or less (PM10, kg/day), and particulate matter measuring 2.5 microns or less (PM2.5, kg/day). For more information on how

this measure and associated metric is calculated, see the FHWA's TPM Implementation Recordings at https://www.fhwa.dot.gov/tpm/resources/presentations.cfm.

Annual Hours of Peak Hour Excessive Delay per Capita: Total Peak-Hour Excessive Delay (PHED) Person-Hours, 15 Minute Intervals

Traffic congestion will be measured by the *total annual hours of peak hour excessive delay (PHED) per capita on the NHS*. Excessive delay refers to the time spent in congested conditions, defined by speed thresholds that are lower than normal congestion delays. The speed at which excessive delay is considered present is set at a 20 miles per hour travel time or 60 percent of the posted speed limit travel time, whichever is greater, during in 15-minute intervals per vehicle. Peak hours are defined as a morning and afternoon peak. The morning peak period is 6-10 a.m. local time on weekdays and the afternoon peak period is 3-7 p.m. or 4-8 p.m. local time, providing flexibility to State DOTs and MPOs. The total excessive delay metric is weighted by vehicle volumes and occupancy. For more information on how this measure and associated metric is calculated, see the FHWA's TPM Implementation Recordings at https://www.fhwa.dot.gov/tpm/resources/presentations.cfm.

Percent of Non-Single Occupancy Vehicle (SOV) Travel: Census, Local Survey or Local Counts

Unlike other performance measures, Federal regulations do not strictly specify the metric that must be used to measure this performance measure. A minimum option for measurement will be use of the American Community Survey (ACS) Commuting (Journey to Work) data from the U.S. Census Bureau. State DOTs and MPOs also may use localized survey or measurements. Finally, State DOTs and MPOs may use volume counts for each mode to determine the percent non-SOV travel, and will be encouraged to report any data not available in national sources today (such as bike counts) to FHWA. [23 CFR 490.709] The measure includes all surface modes of transportation that are not SOV, and may include travel avoided by teleworking. For more information on how this measure and associated metric is calculated, see the FHWA's TPM Implementation Recordings at https://www.fhwa.dot.gov/tpm/resources/presentations.cfm.

Appendix G: FTA Default Useful Life Benchmarks (ULBs)

FTA
FEDERAL TRANSIT ADMINISTRATION

Default Useful Life Benchmark (ULB) Cheat Sheet

Source: 2017 Asset Inventory Module Reporting Manual, Page 53

Transit Agencies will report the age of all vehicles to the National Transit Database. FTA will track the performance of revenue vehicles (Rolling Stock) and service vehicles (Equipment), by asset class, by calculating the percentage of vehicles that have met or exceeded the useful life benchmark (ULB).

FTA has set a default ULB as the expected service years for each vehicle class in the table below. ULB is the average age-based equivalent of a 2.5 rating on the FTA Transit Economic Requirements Model (TERM) scale. Transit agencies can adjust their Useful Life Benchmarks with approval from FTA.

Vehicle Type		Default ULB (in years)
AB	Articulated bus	14
AG	Automated guideway vehicle	31
AO	Automobile	8
BR	Over-the-road bus	14
BU	Bus	14
CC	Cable car	112
CU	Cutaway bus	10
DB	Double decked bus	14
FB	Ferryboat	42
HR	Heavy rail passenger car	31
IP	Inclined plane vehicle	56
LR	Light rail vehicle	31
MB	Minibus	10
MO	Monorail vehicle	31
MV	Minivan	8
	Other rubber tire vehicles	14
RL	Commuter rail locomotive	39
RP	Commuter rail passenger coach	39
RS	Commuter rail self-propelled passenger car	39
RT	Rubber-tired vintage trolley	14
SB	School bus	14
	Steel wheel vehicles	25
SR	Streetcar	31
SV	Sport utility vehicle	8
TB	Trolleybus	13
TR	Aerial tramway	12
VN	Van	8
VT	Vintage trolley	58

Appendix H: Example of System Performance Report in a Regional Transportation Plan

Performance Management Rule 1 (PM 1): Safety System Performance Measures Report

The Fixing America's Surface Transportation Act (FAST Act) requires that MPOs provide a system performance report in the Metropolitan Transportation Plan evaluating the condition and performance of the transportation system with respect to established state performance targets. The following provides a report on the five-year rolling averages for safety Performance Management (PM 1) Targets: (1) number of fatalities, (2) rate of fatalities per 100 million vehicle miles traveled (VMT), (3) number of serious injuries, (4) rate of serious injuries per 100 million VMT and (5) number of non-motorized fatalities and non-motorized serious injuries.

Number of Fatalities

Number of fatalities accounts for the number of motorized collision fatality victims in the AMBAG region. Multiple fatalities can result from each collision and this measure does not represent the number collisions throughout the region. Between 2014 and 2016 there were between 49 and 90 vehicular collision related fatalities in the region (see Figure G-1). In this same period the number of fatalities has increased between 3% and 12% per year. During an average year regional transportation projects have not contributed toward the statewide collision fatality reduction targets.

Rate of Fatalities per 100M VMT

Rate of fatalities per 100M VMT accounts for the number of motorized collision fatality victims per 100 million vehicle miles travelled (VMT) in the AMBAG region. Multiple fatalities can result from each collision, this measure does not represent the rate of collisions in the area. Between 2014 and 2016 the rate of fatalities per 100 million VMT over the annual 5-year rolling average increased between 3.1% and 11.6% per year (see Figure G-2). This indicates that during an average year regional transportation projects have not contributed toward statewide collision fatality reduction targets.

Table G-2: PM1 Safety System Performance Measures

PM 1 Safety System Performance Measures	2012	2013	2014	2015	2016
Number of Fatalities					
AMBAG Region	49	52	61	79	90
Monterey	28	32	31	50	55
San Benito	10	7	9	9	13
Santa Cruz	11	13	21	20	22
5 Year Average	70	64	57	56	61
Rate of Fatalities per 100M VMT					
AMBAG Region	291	310	362	464	529
Monterey	276	316	307	497	530
San Benito	712	491	660	594	839
Santa Cruz	210	248	390	365	433
5 Year Average	415	378	339	333	365
Number of Serious Injuries					
AMBAG Region	311	274	298	335	329
Monterey	140	127	148	136	171
San Benito	41	34	36	38	38
Santa Cruz	130	113	114	161	120
5 Year Average	320	306	296	292	302
Rate of Serious Injuries per 100M VMT					
AMBAG Region	1,850	1,631	1,770	1,966	1,935
Monterey	1,378	1,255	1,466	1,353	1,649
San Benito	2,919	2,382	2,640	2,508	2,453
Santa Cruz	2,477	2,152	2,119	2,939	2,362
5 Year Average	1,897	1,812	1,749	1,720	1,798
Number of Non-Motorized Fatalities and Non-Motorized Severe Injuries					
AMBAG Region	52	72	75	58	84
Monterey	27	37	41	27	41
San Benito	4	6	4	5	10
Santa Cruz	21	29	30	26	33
5 Year Average	26	36	38	29	42

Number of Serious Injuries

Number of serious injuries accounts for the number of victims which were seriously injured as the result of motorized collisions in the AMBAG region. Multiple victims with serious injuries may result from each collision and this measure does not represent the number of collisions in the region. Between 2013 and 2016 the annual 5-year rolling average has increased or decreased between -5.9% and 3.5% with an average change of -1.2% year-to-year (see Figure G-3). This indicates that historically the region has seen declining or flat vehicular related serious injury rates due to regional projects. Moving forward, regional transportation projects may contribute towards statewide serious injury reduction targets.

Rate of Serious Injuries per 100M VMT

This measure accounts for the number of vehicular related serious injuries per 100 million vehicle miles travelled in the AMBAG region. Multiple serious

injuries can result from each collision and this measure does not represent the number of collisions in the area. Between 2013 and 2016 the annual 5-year rolling average increased or decreased between -5.9% and 3.1% with an average change of -1.2% year-to-year (see Figure G-4). This indicates that historically the region has seen declining or flat vehicular related serious injury rates due to regional projects. Moving forward, regional transportation projects may contribute towards statewide serious injury reduction targets moving forward.

Number of Non-Motorized Fatalities and Severe Injuries

This measure accounts for the number of non-motorized vehicle related fatalities or injuries as the result of collisions in the AMBAG region, specifically bicyclists and pedestrians. Multiple victims may result from each collision and this measure does not represent the number of collisions in the region. Between 2013 and 2016 the annual 5-year rolling average has increased or decreased between -13% to 19.2% with an average increase of 2.5% year-to-year (see figure G-5). This indicates that during an average year regional transportation projects have not contributed toward statewide targets to reduce non-motorized fatalities and severe injuries.

Figure G-1: Fatalities

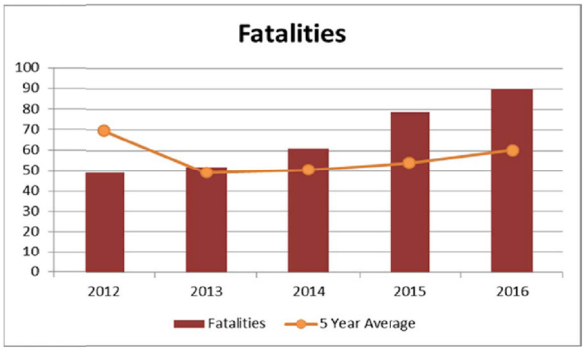


Figure G-2: Fatalities per (100 m) VMT

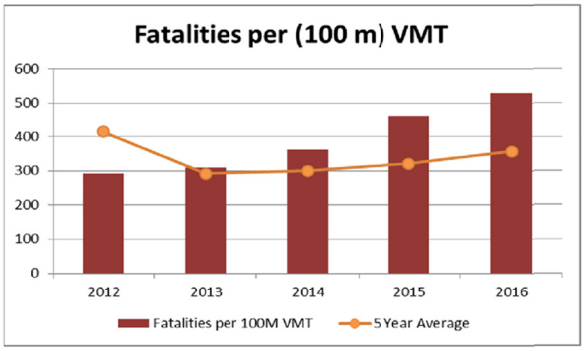


Figure G-3: Serious Injuries

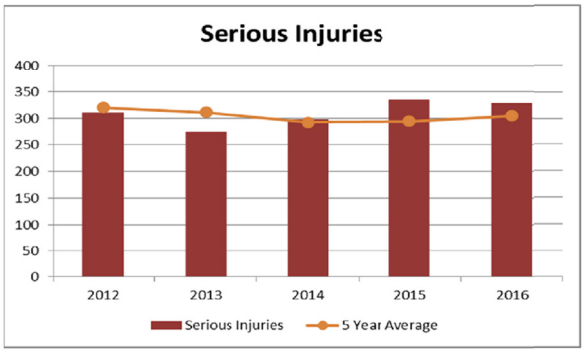


Figure G-4: Serious Injuries per (100 m) VMT

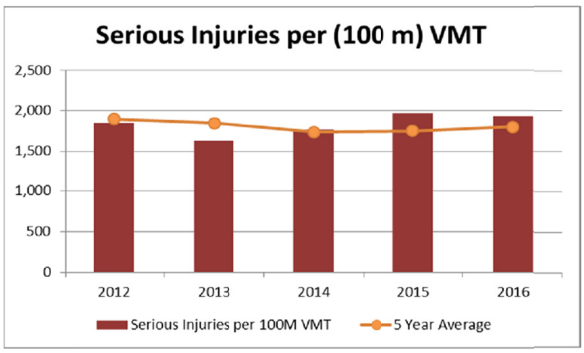
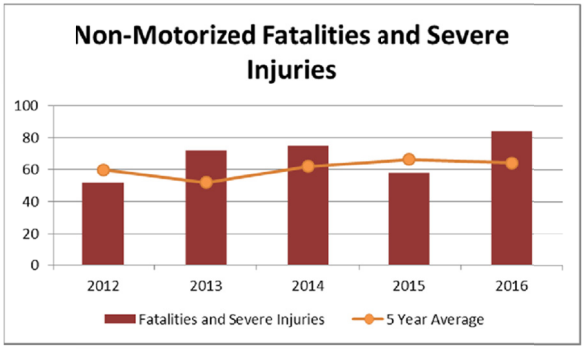


Figure G-5: Non-Motorized Fatalities and Severe Injuries



Chapter VI: Performance-Based Planning and Programming

Performance-Based Planning and Programming

MAP-21 and the FAST Act established several performance management requirements for state departments of transportation (DOTs), metropolitan planning organizations (MPOs), and transit agencies. A performance-based approach to transportation planning and programming aims to ensure the most efficient investment of transportation funds, support improved decision-making and increase accountability and transparency. MAP-21 and subsequent federal legislation requires DOTs, MPOs and transit agencies to establish performance targets for each of the following national goal areas:

- Safety
- Infrastructure Condition
- Transportation Asset Management
- System Reliability
- Freight Movement and Economic Vitality
- Congestion Reduction
- Environmental Sustainability

The national goal areas fall into three categories of performance management (PM) rules:

PM 1: Safety
PM 2: Infrastructure Condition;
Transportation Asset Management
PM 3: System Reliability;
Freight Movement and Economic Vitality;
Congestion Reduction; and
Environmental Sustainability

According to regulations and the current 2040 Metropolitan Transportation Plan/Sustainable Communities Strategy (MTP/SCS), AMBAG's must collect data on project contributions to safety performance targets for the MTIP. MTIP projects should indicate expected contributions to safety. Moving forward, AMBAG will be required to collect additional data for other performance target areas for the MTIP such as system performance and transportation asset management in order to meet new federal and state reporting requirements.

AMBAG's Role

Under the federal performance management rules, AMBAG is responsible for setting regional transportation performance targets. AMBAG has adopted Caltrans' Statewide safety, infrastructure condition, system performance and air quality targets as our regional targets, consistent with the MPO-State coordination requirements of federal performance management regulations. AMBAG is responsible for setting regional transit asset management targets in association with the transit agencies operating within our MPO area. AMBAG must incorporate these statewide and local transit targets into our planning processes, including in the MTIP and MTP. Caltrans' performance targets are set and achieved at the state level. As of the writing of this document the State has not set binding region specific targets.

MTIP Requirements

There are two primary requirements for incorporating performance management into the MTIP. For all federally-required targets, AMBAG must show that the MTIP "makes progress towards achieving the performance targets" and that the MTIP includes, "to the maximum extent practicable, a description of the anticipated effect of the MTIP towards achieving the performance targets" (Title 23 CFR§ 450.326). AMBAG must show that it is moving in the right direction based on the package of investments included in the MTIP and must also describe how much of an effect the MTIP investments are expected to have on the target achievement.

MTP Requirements

Currently AMBAG is required to report on the safety, condition and performance of the transportation system in relation to its adopted performance targets (Title 23 CFR§ 450.324). AMBAG will also have to comply with other new federal requirements related to long-range planning including any potential scenario planning.

Reporting

In addition to quantifying progress made towards performance targets in the context of its MTIP and MTP, AMBAG is required to report regional targets to Caltrans. To meet this requirement, AMBAG coordinates with Caltrans and RTPAs to collect transportation performance data.

Overall Goals

The overall goal of a performance-based approach to transportation planning and programming intends to ensure the most efficient investment of transportation funds, support improved decision-making, and increase accountability and transparency.

Road Safety

Goal: Reduce traffic fatalities and serious injuries on all public roads.

Performance Measures-Road Safety

Five performance measures were established to identify trends and assess progress towards reducing traffic-related fatalities and serious injuries on public roads.

Table 1 – Performance Measures - Road Safety

Performance Measure
Number of fatalities
Rate of fatalities per 100 million vehicle miles traveled
Number of serious injuries
Rate of serious injuries per 100 million vehicle miles traveled
Number of non-motorized fatalities and non-motorized serious injuries
For all measures: 5-year rolling average; all public roads

Performance Targets-Road Safety

State DOTs are required to set numerical targets each year for each safety measure to comply with the regulation. MPOs have the option of supporting State targets or setting their own region-specific numerical targets on a target-by-target basis.

Caltrans established ambitious statewide targets to align with the State's Towards Zero Deaths goal for zero traffic fatalities by 2030 and the State Highway Safety Plan. AMBAG chose to support the State's targets through ongoing planning and programming efforts. The targets for each measure are detailed in the table below.

Table 2 –Statewide Road Safety Targets (2019)

Performance Measure	Percent Reduction Target (2019)
Fatalities – total	3% reduction
Fatalities – per 100 million VMT	3% reduction
Serious Injuries – total	1.5% reduction
Serious Injuries – per 100 million VMT	1.5% reduction
Non-motorized fatalities + serious injuries – total	3% reduction in fatalities 1.5% reduction in serious injuries

Transit Safety

Goal: Improve the safety of all public transportation systems, specifically in the areas of fatalities, injuries, safety events and system reliability.

Performance Measures-Transit Safety

Seven performance measures were established to improve safety on transit systems.

Table 3 – Performance Measures - Transit Safety

Performance Measure
Number of fatalities, by mode
Rate of fatalities per vehicle revenue miles, by mode
Number of injuries, by mode
Rate of injuries per vehicle revenue miles, by mode
Number of transit safety events, by mode
Rate of transit safety events per vehicle revenue miles, by mode
Mean distance between major mechanical failures, by mode

Performance Targets-Transit Safety

The seven transit safety performance measures are already collected through the National Transit Database (NTD) and have been selected through rulemaking on national reporting. AMBAG coordinates on transit safety performance measures with the region's three transit operators, Monterey-Salinas Transit (MST), Santa Cruz Metropolitan Transit District (METRO), San Benito County Local Transportation Authority (LTA). Transit agencies are required to set numerical targets each year for each transit safety measure to comply with performance management regulations. Once transit operators in the region set their targets through their Public Transportation Agency Safety Plan (PTASP), AMBAG will adopt the targets by reference and coordinate to assure the MTIP helps to implement their transit

safety plans and achieve the targets found therein.

Infrastructure Condition

The maintenance and preservation of the existing transportation infrastructure is critical for supporting a safe and efficient transportation system. The primary goal of the infrastructure condition performance area is to improve the condition of existing pavement and bridge assets.

Pavement Condition

Goal: Maintain the condition of highway infrastructure assets in a state of good repair.

Performance Measures - Pavement Condition

Four performance measures were established to identify trends and assess progress towards maintaining a state of good repair on the Interstate and Non-Interstate National Highway System (NHS).

Table 4 – Performance Measures - Pavement Condition

Performance Measure
Percentage of pavements on the Interstate in good condition (lane miles)
Percentage of pavements on the Interstate in poor condition (lane miles)
Percentage of pavements on the non-Interstate NHS in good condition (lane miles)
Percentage of pavements on the non-Interstate NHS in poor condition (lane miles)

Performance Targets – Pavement Conditions

State DOTs are required to develop a Transportation Asset Management Plan to develop long-range investment strategies for assets on the National Highway System, including pavement and bridge condition. The plan establishes 10-year performance goals and interim two- and four-year performance targets to monitor progress. MPOs are required to set four-year targets and may choose to adopt the statewide target or adopt quantifiable performance targets for the region.

Caltrans finalized the statewide targets for pavement condition in May 2018 and AMBAG adopted these regional targets.

Table 5 –Statewide Pavement Condition Targets (2018)

Performance Measure	Statewide 2-Year Targets	Statewide 4-Year Targets
Interstate in good condition – %	45.10%	44.50%
Interstate in poor condition – %	3.50%	3.80%
Non-Interstate NHS in gocd condition – %	28.20%	29.90%
Non-Interstate NHS in poor condition – %	7.30%	7.20%

Bridge Condition

Goal: Maintain the condition of bridge assets in a state of good repair

Performance Measures- Bridge Condition

Two performance measures were established to identify trends and assess progress towards maintaining a state of good repair of bridges on the National Highway System (NHS).

Source: Caltrans

Table 6 – Performance Measure- Bridge Condition

Performance Measure
Percentage of NHS bridges classified in good condition (deck area square miles)
Percentage of NHS bridges classified in poor condition (deck area square miles)

Performance Targets – Bridge Condition

State DOTs are required to develop a Transportation Asset Management Plan to develop long-range investment strategies for assets on the National Highway System, including bridge condition. The plan establishes 10-year performance targets as well as targets for years 2 and 4 to monitor progress. MPOs are required to set four-year targets, and may choose to adopt the statewide target or adopt quantifiable performance targets for the region.

Caltrans finalized the statewide bridge condition targets in May 2018 and AMBAG has adopted these regional targets.

Table 7 –Statewide Bridge Condition Targets (2018)

Performance Measure	Statewide 2-Year Targets	Statewide 4-Year Targets
NHS bridges in good condition – %	69.1%	70.5%
NHS bridges in poor condition – %	4.6%	4.4%

Transit Asset Management (TAM)

Goal: Maintain the condition of public transit assets in a state of good repair.

Performance Measures - Transit Asset Management

Four asset performance measure categories were established to improve transit asset management for rolling stock, equipment, infrastructure and facilities.

Table 8 – Performance Measures – Transit Asset Management

Performance Measure
Percentage of revenue vehicles that have met or exceeded their useful life benchmark (by asset class)
Percentage of facilities with a condition rating below fair (by asset class)
Percentage of rail fixed-guideway with performance restrictions (not applicable in AMBAG region)
Percentage of non-revenue vehicles that have met or exceeded their useful life benchmark

Performance Targets – Transit Asset Management

Metropolitan transportation planning is performed in coordination with the region's three transit operators, MST in Monterey County, METRO in Santa Cruz County and LTA in San Benito County. AMBAG coordinates with these transit operators to assure the MTIP facilitates implementation of their transit asset management plans. The MTIP prioritizes funding based on the condition of transit assets in order to maintain local and regional transit system in a state of good repair. AMBAG's planning process aims to address the goals, objectives, performance measures and targets described in each transit operator's Transit Asset Management Plan (TAMP). AMBAG's MTIP is consistent with the FHWA-FTA Final Rule on planning and the Transit Asset Management Final Rule.

Source: SCMTD

System Performance and Air Quality

Goals: Reduce congestion on the National Highway System; improve the efficiency of the surface transportation system; improve the national freight network, strengthen the ability of rural communities to access national and international trade markets, support regional economic development; enhance the performance of the transportation system while protecting and enhancing the natural environment.

Performance Measures- Congestion Reduction; System Reliability; Freight Movement and Economic Viability; Congestion Reduction; And Environmental Sustainability

These performance measures were established to identify trends and assess progress towards improving reliability, freight movement and economic vitality, and environmental sustainability of the Interstate system and non-Interstate National Highway System (NHS).

Source: MST

Table 9 – Performance Measures - Congestion Reduction, System Reliability, Freight Movement and Economic Vitality, Congestion Reduction, and Environmental Sustainability

Performance Measure
Annual hours of peak-hour excessive delay per capita by urbanized area
Percent of non-single occupancy vehicle (non-SOV) travel by urbanized area
Percentage of person-miles traveled on the Interstate highway system that are reliable
Percentage of person-miles traveled on the non-Interstate NHS that are reliable
Percentage of Interstate highway system mileage providing reliable truck travel times (Truck Travel Time Reliability Index)
Total emissions reduction from CMAQ-funded projects, by pollutant (PM 2.5, PM 10, CO2, VOCs, NOx)

Performance Targets - Congestion Reduction, System Reliability, Freight Movement And Economic Viability, Congestion Reduction And Environmental Sustainability

State DOTs and MPOs are required to set two- and four-year targets every four years for each reliability measure. MPOs have the option of supporting State targets or setting their own region-specific numerical targets on a target-by-target basis. For environmental and congestion reduction performance targets, the AMBAG region is not subject to these targets as a small urban MPO that is in air quality attainment status.

Caltrans set their targets for these measures in May 2018 and AMBAG adopted these targets. AMBAG's will support state targets for system performance and air quality on the interstate system. 8) Measures and targets not applicable to the AMBAG region include annual hours of peak-hour excessive delay and percent of non-single occupancy vehicle travel.

Table 10 – Statewide Congestion Reduction, System Reliability, Freight Movement and Economic Vitality, Congestion Reduction and Environmental Sustainability Targets Continued (2018)

Performance Measure	2017 Baseline	Statewide 2-year Targets	Statewide 4-year Targets
Annual Hours of Peak-Hour Excessive Delay Per Capita	N/A	N/A	N/A
Percent of Non-Single Occupancy Vehicle (SOV) Travel	N/A	N/A	N/A

Table 10- continued

Performance Measure	2017 Baseline	Statewide 2-year Targets	Statewide 4-year Targets
Reliable person-miles traveled on Interstate system – %	64.6%	65.1% (+0.5%)	65.6% (+1.0%)
Reliable person-miles traveled on non-Interstate NHS – %	73.0%	N/A	74.0% (+1.0%)
Reliable Interstate miles of truck travel – Truck Travel Reliability Index	1.69	1.68 (-0.01)	1.67 (-0.02)
Fine particulate matter – PM2.5 (kg/day)	904.25	913.29 (+1%)	922.34 (+2%)
Particulate matter – PM10 (kg/day)	2,431.21	2,455.52 (+1 %)	2,479.83 (+2%)
Carbon monoxide – CO2 (kg/day)	6,683.26	6,931.90 (+1%)	7,000.54 (+2%)
Volatile organic compounds – VOCs (kg/day)	951.83	961.35 (+1%)	970.87 (+2%)
Nitrogen oxide – NOx (kg/day)	1,753.36	1,770.89 (+1%)	1,788.43 (+2%)

Summary of Projects Moving Transportation Performance Metrics

The Draft 2018-19 MTIP includes a number of projects which contribute to improvement of one or more transportation performance measures. These are summarized below. Each project may contribute to multiple performance measure goals.

Table 11- Projects Contributing to Performance Measure Improvement in Draft 2018-19 MTIP

AMBAG Draft 2018-2019	# of Projects Contributing to PM*
Safety	49
Roadway & Bridge Condition	73
System Performance	18
Transit Operation & State of Good Repair	13

*Note: Each project may have multiple PM benefits