

Chapter 8

Fresno County, California *Sunset Sky*

Transportation Performance Management *Investment Accountability and Efficiency*

*Transportation Performance Management establishes
quantifiable targets for the transportation system performance*

8.1 Performance Management

Federal transportation bills Moving Ahead for Progress-21st Century (MAP-21) and Fixing America's Surface Transportation (FAST Act) require Metropolitan Planning Organizations (MPOs) to conduct performance based planning and focus on achieving performance outcomes. The Federal Highway Administration (FHWA) defines Transportation Performance Management (TPM) as a strategic approach that uses system information to make investment and policy decisions to achieve national performance goals. TPM's key characteristics can be summarized as follows:

- Is systematically applied; a regular, ongoing process
- Provides key information to help decision makers, allowing them to understand the consequences of investment decisions across transportation assets or modes
- Improving communications among decision makers, stakeholders and the traveling public.
- Ensuring targets and measures are developed in cooperative partnerships and based on data and objective information

The national transportation performance goals established by MAP-21 are as follows:

- **Safety:** achieve a significant reduction in traffic fatalities and serious injuries on all public roads
- **Infrastructure Condition:** maintain the highway infrastructure asset system in a state of good repair
- **Congestion Reduction:** achieve a significant reduction in congestion on the National Highway System
- **System Reliability:** improve the efficiency of the surface transportation system
- **Freight Movement and Economic Vitality:** improve the national freight network, strengthen the ability of rural communities to access national and international trade markets, and support regional economic development
- **Environmental Sustainability:** enhance the performance of the transportation system while protecting and enhancing the natural environment
- **Reduced Project Delivery Delays:** reduce project costs, promote jobs and the economy, and expedite the movement of people and goods by accelerating project completion through eliminating delays in the

project development and delivery process, including reducing regulatory burdens and improving agencies' work practices

To achieve the above national goals, transportation performances are managed through different metrics, including safety, bridge and pavement conditions, congestion/system performance and transit asset management, as shown in [Figure 8-1](#).

The Statewide and Nonmetropolitan Transportation Planning and Metropolitan Planning Final Rule establishes that States and MPOs must coordinate their respective targets with each other to ensure consistency to the maximum extent practical. The State Department of Transportation (DOTs) and MPOs are expected to use information and data generated as a result of the regulations to inform their transportation planning and programming decisions. The transportation performance management (TPM) will provide a means to achieve the national transportation goals as identified above and increase the accountability and transparency of Federal-aid programs and improve project decision making through performance-based planning and programming.

States and MPOs must integrate performance-based planning and programming into the long range transportation plans. The Regional Transportation Plans shall include the performance measures and targets as well as a description of progress made towards the targets. In addition, the Transportation Improvement Program shall provide a description on how investment in the TIP will contribute towards achieving the transportation performance targets set in the RTP.

State DOTs and MPOs must also establish written agreements for a metropolitan area describing roles and responsibilities for performance-based planning and programming including:

- Coordination on target setting
- Data collection
- Data analysis
- Reporting on progress toward target achievement
- Data collection for the NHS asset management plan

[Table 8-1](#) provides the timeline for the three major groups of Performance Measures.

Figure 8-1: Transportation Performance Management Areas

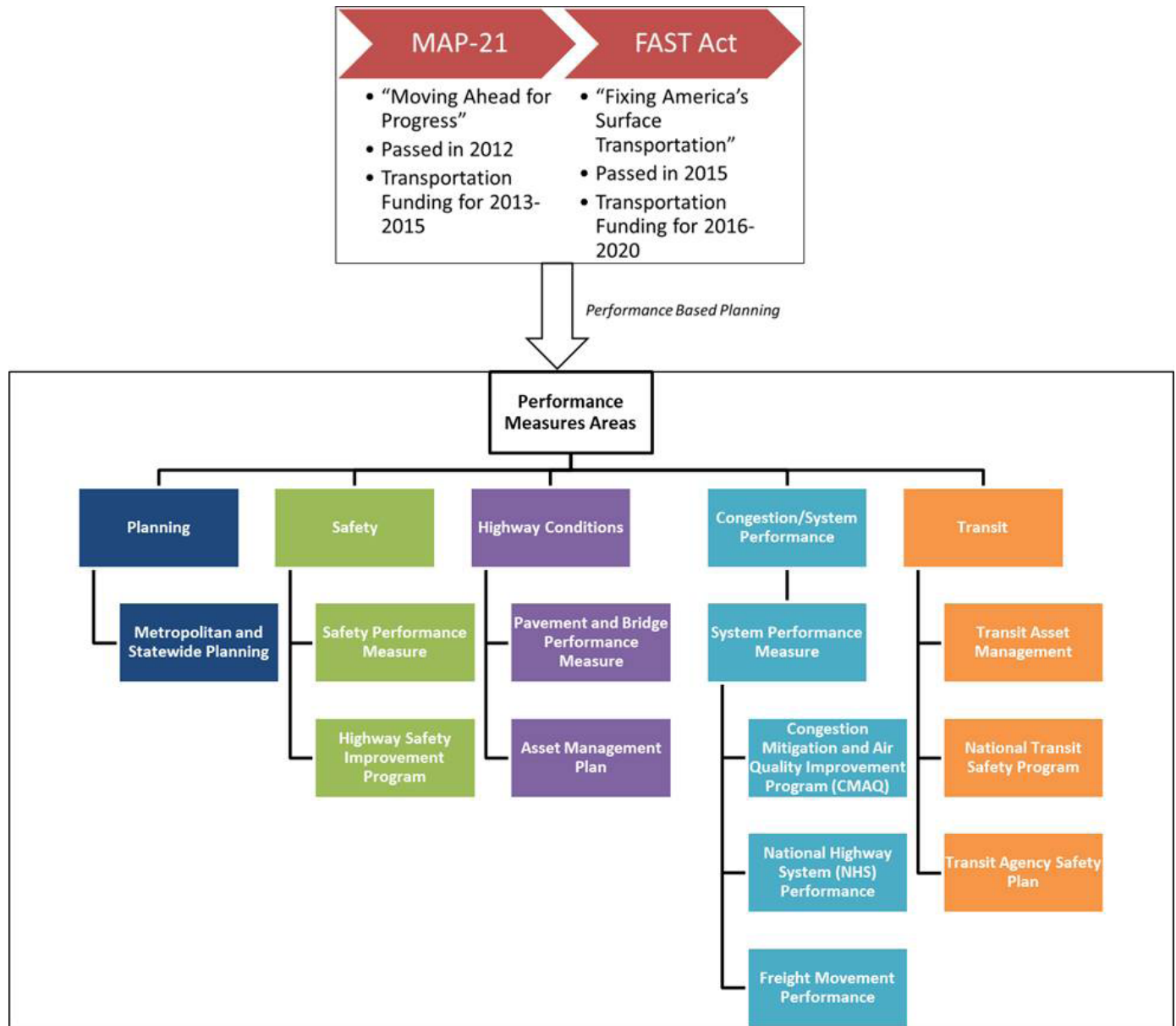


Table 8-1: Performance Based Planning and Programming Implementation Timeline

Final Rule	Effective Date	States Set Targets By	MPOs Set Targets By	LRSTP, MTP, STIP, and TIP Inclusion
Safety Performance Measures (PM1)	April 14, 2016	August 31, 2017	Up to 180 days after the State sets targets, but not later than Feb. 27, 2018	Updates or amendments on or after May 27, 2018
Pavement/Bridge Performance Measures (PM2)	May 20, 2017	May 20, 2018	No later than 180 days after the State(s) sets targets	Updates or amendments on or after May 20, 2019
System Performance Measures (PM3)	May 20, 2017	May 20, 2018	No later than 180 days after the State(s) sets targets	Updates or amendments on or after May 20, 2019

Based on the timeline provided in [Table 8-1](#), the 2018 RTP, which is to be adopted in the summer of 2018, includes PM1 targets and a description of the baseline system performance. PM2 and PM3 targets will be established after the adoption of the 2018 RTP and will be documented in the 2022 RTP.

Performance Management 1 (PM1)

Performance Measures:

- Number of Fatalities
- Rate of Fatalities per 100 million VMT
- Number of Serious Injuries
- Rate of Serious Injuries per 100 million VMT
- Number of Non-motorized Fatalities and Non-motorized Serious Injuries

Performance Management 2 (PM2)

Performance Measures:

- Pavement
- 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
- Percentage of NHS bridges in Good condition
- Percentage of NHS bridges in Poor condition

Performance Management 3 (PM3)

Performance Measures:

- 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 for reliable truck travel time (Truck Travel Time Reliability Index)
- Total emissions reductions by applicable pollutants under the CMAQ program
- Annual hours of peak hour excessive delay per capita
- Percent of non-single occupancy vehicle travel which includes travel avoided by telecommuting
- Percent change in tailpipe CO₂ (GHG measure) compared to 2017

8.2 Safety Performance Measures

Safety performance is the first performance measure area that is included in this Fresno COG 2018 Regional Transportation Plan (RTP). It is an effort to reduce fatalities and serious injuries on the road, and achieve a safer transportation system. Achieving a safe transportation system for all motorized and non-motorized users on all public roads in Fresno County is also an objective reflected in the document's policy chapter.

Specifically, to manage the safety performance, future year targets need to be set for each of the following five performance measures:

1. **Number of Fatalities:** Number of persons suffering fatal injuries in a motor vehicle crash during a calendar year
2. **Rate of Fatalities:** The ratio of number of fatalities to vehicle miles traveled (VMT, in 100 million VMT) in a calendar year
3. **Number of Serious Injuries:** Number of persons suffering at least one serious injury in a motor vehicle crash during a calendar year
4. **Rate of Serious Injuries:** The ratio of number of serious injuries to VMT (in 100 million VMT) in a calendar year
5. **Number of Non-motorized Fatalities and Non-motorized Serious Injuries:** The combined number of non-motorized fatalities and non-motorized serious injuries involving a motor vehicle during a calendar year

Table 8-2: Timeline of Safety Performance Measures

Timeline	Event
May 2016	Safety Performance Rule Effective
August 2017	States Set 2018 Safety Performance Targets
February 2018 (180 days after)	MPOs Set 2018 Safety Performance Targets
July 2018	Fresno COG Regional Transportation Plan Approval
August 2018	State Sets 2019 Safety Performance Targets
February 2019 (180 days after)	MPOs Set 2019 Safety Performance Targets

The timeline of safety performance measures is shown in [Table 8-2](#). The final rule for safety performance measures was published in May 2016. Caltrans set the state target in August 2017, which indicates that Fresno COG need to set regional targets by February 2018. The cycle then repeats every year thereafter for setting future year targets.

The safety performance measures help support the implementation of State of California Highway Safety Improvement Program (HSIP) and Strategic Highway Safety Plan (SHSP). The vision, mission and goal of the California SHSP are as follows:

- **Vision:** California will have a safe transportation system for all users
- **Mission:** The mission is to ensure a safe and sustainable transportation system for all motorized and non-motorized users on all public roads in California. The plan will achieve this mission by utilizing a data-driven 4E approach of engineering, enforcement, education, and emergency medical services to improve infrastructure and assist with behavior change and by focusing efforts in those areas where the greatest opportunity for reductions in traffic-related fatalities and severe injuries exist. This will enhance California's economy and livability
- **Goal:** The goal of California's Strategic Highway Safety Plan is Toward Zero Deaths

Fresno COG has the option of following the State of California overall target, or setting separate regional targets for one or more of the five safety performance measures.



8.3 Historical Safety Performance in Fresno County

Prior to setting the safety performance targets, it is important to obtain information on current and historical safety performances in Fresno County. Historical crash data was collected for Fresno County from various sources and trend analysis for each of the performance measures was conducted.

Official data sources for crashes and traffic volume have been used to gather historical safety performance in Fresno County, and are listed as follows:

- Fatality Analysis and Reporting System (FARS) is used to obtain the number of fatalities each year
- Statewide Integrated Traffic Records System (SWITRS) is used to obtain the number of serious injuries each year
- Highway Performance Monitoring System (HPMS) is used to obtain Vehicle Miles Traveled (VMT) information in order to compute the rate of fatalities and serious injuries

Trends derived from annual crash data from 2004 to 2016 (or the latest available year) are presented in a series of charts.

[Figure 8-2](#) shows a comparison of Fresno County's population, VMT and number of fatalities as a percentage of California's total. As shown in the chart, Fresno County's population accounts for approximately 2.5% of California's population over the years. The same pattern can be observed for the percentage of VMT. However, the number of fatalities in Fresno County accounts for approximately 4% of the statewide fatalities. This indicates that Fresno County has a disproportionately large number of fatalities compared with California overall.

The recent year trends for the five safety performance measures are presented in [Figure 8-3](#). Each colored bar in the charts represent the yearly value for each performance measure from 2004 to 2016. Each point on the line represents five-year rolling averages. The rolling averages show a smoother trend by aggregating the year by year variations.

Each year, on average, more than 100 people are killed on the roadways and more than 300 that are seriously injured. Among them, around 60 are either pedestrians or bicyclists. The rate of fatalities in Fresno County is significantly higher than California overall, as shown in the comparison between the red and green bars in the charts in [Figure 8-3](#). On the other hand, the rate of serious injuries in Fresno County is slightly lower than the State average.

A general trend that is shared among the number of fatalities, rate of fatalities, number of serious injuries, rate of serious injuries is that they all show a generally decreasing trend from 2004 to 2013. This trend is also consistent with statewide and national trend of decreasing fatalities and serious injuries. However, since 2013, the numbers are increasing again, which indicates that still more needs to be done to reverse the increasing trend. The number of pedestrians and bicyclists fatally and seriously injured has been fluctuating year by year due to its smaller number causing higher uncertainty.

Staff conducted a more detailed analysis of characteristics such as location, types of crashes and contributing factors using all fatal- and serious-injury crash data during a five-year period (2009 – 2013) to better understand the nature of the region's traffic accidents and identify countermeasures to reduce fatalities and serious injuries.

[Figure 8-4](#) specifies the location of every fatal and serious injury crash in Fresno County from 2009 to 2013. Each point's shape and color represent the different crash types. Fatal and serious-injury crash concentrations generally follow population densities. The Fresno-Clovis metropolitan area has the largest crash concentrations -- including most of the pedestrian and bicycle crashes -- with the southeastern cities having the next highest concentration. Crashes are scarce in the County's mountain and western regions. The crashes in the County's western areas are concentrated on the I-5 corridor, while crashes in mountain areas are concentrated on CA-168 and CA-180.

Figure 8-2: Comparison of Population, VMT, and Fatalities between Fresno County and California

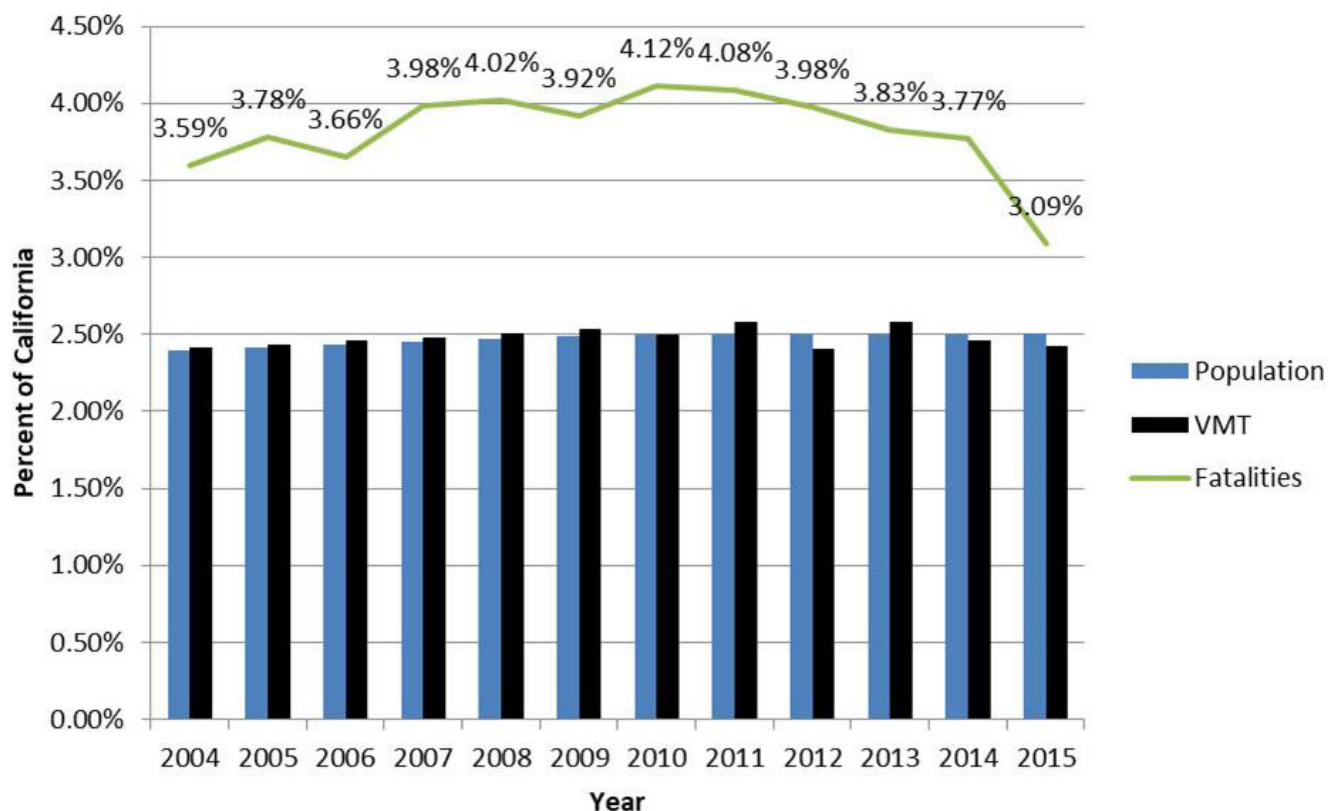
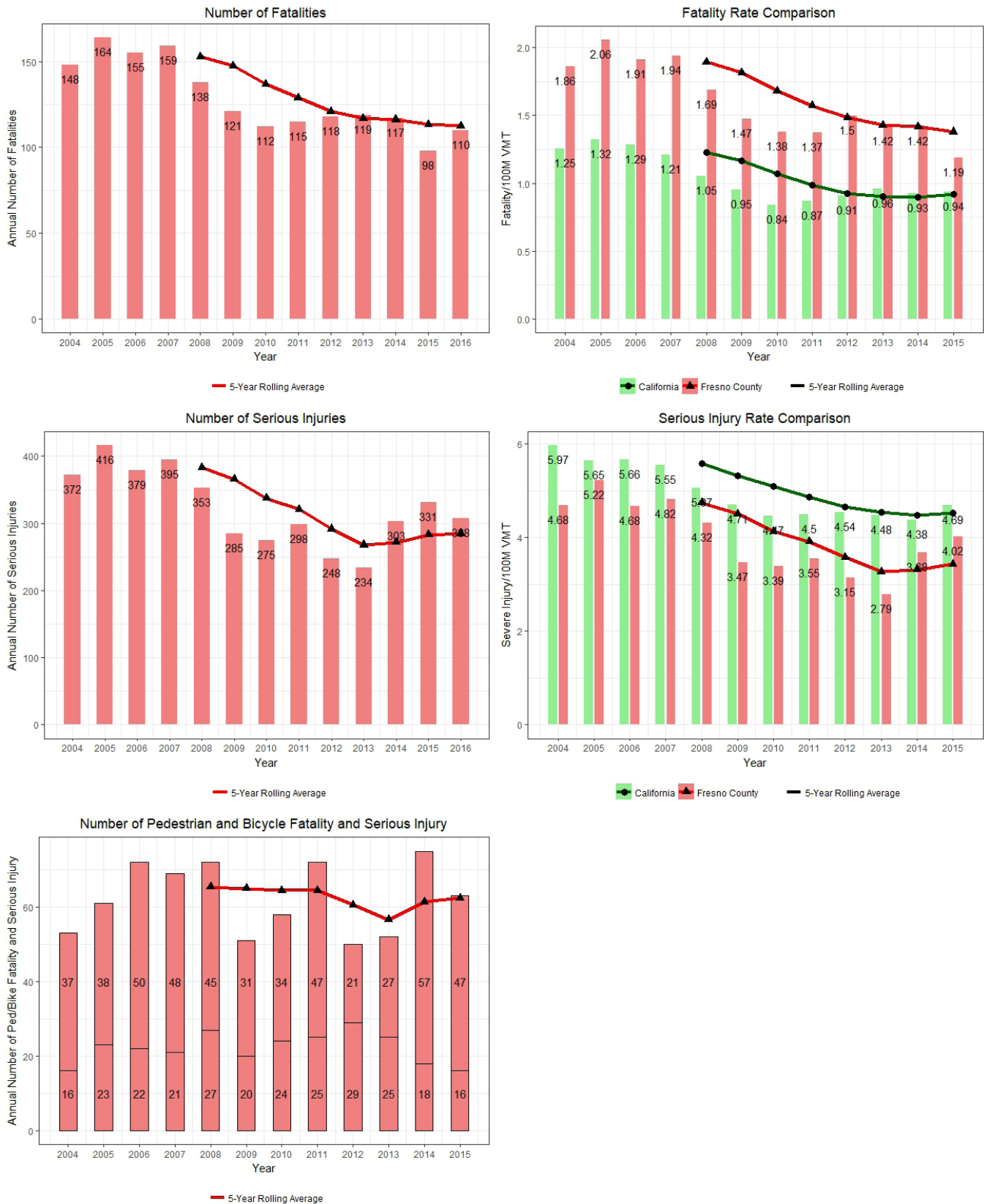


Figure 8-3: Recent Year Trends for Each Safety Performance Measure in Fresno County



2018 Regional Transportation Plan and Sustainable Communities Strategy



Jurisdiction	Fatalities	Fatalities/ 100,000 Pop	Serious Injuries	Serious Injuries/ 100,000 Pop
Clovis	21	20.9	20	19.9
Coalinga	2	11.8	4	23.6
Firebaugh			1	12.3
Fowler	3	49.9	5	83.2
Fresno	157	30.7	332	65.0
Huron	1	14.7	1	14.7
Kerman	1	7.0	3	21.0
Kingsburg	1	8.5	5	42.8
Mendota	1	8.7	3	26.3
Orange Cove			1	10.4
Parlier	3	20.1	3	20.1
Reedley			10	39.8
Sanger	2	8.1	12	48.5
Selma	8	33.3	18	74.9
County only	392	232.7	917	544.4

Table 8-5 summarizes the percentages of fatal and serious injury crashes by crash types. Broadside crashes (T-bone) are most common among fatal crashes, while hit-fixed-object is the most common among serious injury crashes. Rear-end crashes are usually the most common traffic accidents. However, it is not ranked in the top four crash types. This indicates that although rear-end crashes are common, the injury severity is not as high compared to other types of crashes that top the list.

Table 8-4: Top Contributing Factors for Fatal and Serious Injury Crashes (2009-2013)

Top Contributing Factor	Fatal Crashes	Percent of Fatal Crashes	Serious Injury Crashes	Percent of Serious Injury Crashes
Alcohol and Drug Impaired	135	26.4%	246	24.0%
Improper Turning	103	20.2%	239	23.3%
Pedestrian Violation	64	12.5%	66	6.4%
Failure to Yield Right-Of-Way	56	11.0%	116	11.3%
Unsafe Speed	52	10.2%	160	15.6%
Disregard Signal or Sign	46	9.0%	72	7.0%

Table 8-5: Top Crash Type for Fatal and Serious Injury Crashes (2009-2013)

Collision Type	Fatal Crashes	Percent of Fatal Crashes	Serious Injury Crashes	Percent of Serious Injury Crashes
Broadside (T-Bone)	121	23.5%	209	19.9%
Hit Fixed Object	108	21.0%	273	26.0%
Pedestrian	102	19.8%	112	10.7%
Overtaken	62	12.0%	176	16.7%
Head On	50	9.7%	83	7.9%
Rear End	35	6.8%	101	9.6%
Other	29	5.6%	43	4.1%
Sideswipe	8	1.6%	54	5.1%

8.4 Setting Safety Performance Targets

Fresno COG convened a safety target committee to provide guidance on the safety target setting process. The committee was composed of planners and engineers of the member agencies and the other stakeholders. The sub-committee had an in-depth discussion about the safety performance targets, safety data analysis, target setting options, strategies to reach the targets and resources to implement the strategies. The committee made a recommendation on the safety targets for the Fresno region.

Target-setting methods can generally be classified into two categories: evidence-based and vision-based. Evidence-based methods rely completely on historical trend to predict future year performances, while vision based methods set a goal to achieve regardless of the

existing trend. In this target setting process, staff presented the committee with the following three targets options:

- Evidence-based: based on the historical trends, fit trendline that best represents historical conditions and use it to predict future-year number of fatalities and serious injuries
- Vision-based, State Target: California Department of Transportation (Caltrans) announced its 2018 safety performance targets on June 2017. The State targets an annual reduction of 7.69% for number of fatalities, 1.5% for number of serious injuries (identical to the State SHSP target) and 10 percent for the number of non-motorized fatalities and serious injuries
- Vision-based, State SHSP: The 2015 California Strategic Highway Safety Plan (SHSP) also identifies objectives to reduce roadway fatalities and serious injuries. This document targets a 3% annual fatality reduction and 1.5% annual reduction in serious injuries

In all cases, the rate of fatalities and the rate of serious injuries are calculated using the number of projected fatalities and serious injuries.

Figure 8-5 shows the target options for each of the five safety performance measures and provides a visual comparison of the three target options. The red bars and lines in each chart represent the historical and evidence-based projections; the blue bars and lines represent the State SHSP targets and; the green bars and lines represent State targets. Again, all the bars represent yearly values and the lines represent five-year rolling averages. Only two options for the number of serious injury and rate of serious injury charts are displayed since the State target and State SHSP are identical and thus combined. Table 8-6 lists the 2018 projected numbers for all target options as a comparison. Clearly, the numbers do not differ much among the three 2018 target options.

Upon discussion and consideration of different factors, the committee decided to choose evidence based targets for 2018. This decision takes into consideration of the increasing number of fatalities and serious injuries in the past 2-3 years, and the project planning and implementation cycle. During the next target setting cycle, the committee will reassess the trends and conditions then and decide on 2019 safety performance targets.

The recommended targets were then presented to and approved by a series of committees, including the RTP Roundtable, Transportation Technical Committee, Policy Advisory Committee and the Fresno COG Policy Board. The final 2018 safety performance targets for the Fresno region are summarized as follows.

- Number of fatalities: 130 (2014-2018 average: 116.0)
- Rate of fatalities per 100 million VMT: 1.521 (2014-2018 average: 1.388)
- Number of serious injuries: 320 (2014-2018 average: 315.4)
- Rate of serious injuries per 100 million VMT: 3.743 (2014-2018 average: 3.779)
- Number of non-motorized fatalities and serious injuries: 69 (2014-2018 average: 67.8)

8.5 Regional Efforts to Improve Safety and Achieve the Targets

Fresno COG is dedicated to improving the safety in the region and plans to take the following steps towards the safety goal:

- Provide assistance to member agencies in safety data analysis and other technical matters so that safety issues can be addressed both locally and regionally
- Develop regional implementation mechanism through COG's funding process to advance safety projects and achieve the safety targets
- Encourage and support member agencies to prioritize transportation projects that address safety issues
- Work with law enforcement and emergency medical service on developing strategies and programs to reduce accidents and casualties
- Support and work with responsible agencies in educating the public about safe driving practice; support the development of an education program/plan to increase awareness of the risky driving behaviors

Table 8-6: Comparison of 2018 Numbers for All Target Options

Performance Measure	Evidence Based		State SHSP		State Target	
	2018	2014-2018 Avg.	2018	2014-2018 Avg.	2018	2014-2018 Avg.
Number of Fatalities	130	116	119	113.9	114	112.7
Rate of Fatalities	1.521	1.388	1.396	1.363	1.328	1.350
Number of Serious Injuries	320	315.4	310	313.5	310	313.5
Rate of Serious Injuries	3.743	3.779	3.629	3.756	3.629	3.756
Number of Non-Motorized Fatalities and Serious Injuries	69	67.7	61	65	57	64.1

Figure 8-5: Target Options Comparisons for Each Safety Performance Measure in Fresno County



- Actively participate in the State's Strategic Highway Safety Plan and encourage and support implementation of countermeasures identified in the plan that are feasible in Fresno County
- Coordinate and cooperate with relevant agencies on implementing the 4E's of safety countermeasures (Engineering, Education, Enforcement, and Emergency Medical Services)

- Revenue Vehicle: percentage of revenue vehicles (by type) that exceed the useful life benchmark (ULB)
- Non-Revenue Vehicle: percentage of non-revenue service vehicles (by type) that exceed the ULB
- Facilities: percentage of facilities (by group) that are rated less than 3.0 on the Transit Economic Requirements Model (TERM) Scale
- Infrastructure: percentage of track segments (by mode) that have performance restrictions.

8.6 Transit Asset Management Targets

As part of the performance-based planning requirement by the Moving Ahead for Progress in the 21st Century Act (MAP-21) and the subsequent Fixing America's Surface Transportation (FAST) Act the Transit Assets Management (TAM) rules were developed by the Federal Transit Administration (FTA) and became effective Oct 1st 2016. This is completed by establishing a strategic and systematic process of operating, maintaining, and improving public capital assets effectively through their entire life cycle. Four performance measures were established:

MPOs are required to establish annual TAM targets specific to the MPO planning area for the same performance measures for all public transit providers in the MPO planning area within 180 days after the transit providers establish their targets. Fresno COG developed the 2018 regional TAM targets by weighting the targets set by the local transit providers, which are Fresno Area Express (FAX) and Fresno County Rural Transit Agency (FCRTA). TAM target does not apply to Clovis Transit because Clovis Transit does not receive federal dollars. The infrastructure performance measure does not apply to the Fresno region since there is no rail transit in Fresno County. The final 2018 transit asset management targets are listed in [Table 8-7](#).

Table 8-7: Transit Asset Management Targets for 2018

A. Percentage of Revenue Vehicles (by Type) that Exceed ULB			
Revenue Vehicle	FAX	FCRTA	Regional
Automobile	0%	N/A	0%
Bus	3%	47%	8%
Cutaway Bus	0%	18%	10%

B. Percentage of Non-Revenue Vehicles (by Type) that Exceed ULB			
Revenue Vehicle	FAX	FCRTA	Regional
Non-Revenue / Service Automobile	3%	N/A	3%
Trucks and other Rubber Tire Vehicles	17%	0%	13%

C. Percentage of Facilities (by Group) that are Rated Less Than 3.0 on the TERM Scale			
Revenue Vehicle	FAX	FCRTA	Regional
Administration	30%	N/A	30%
Maintenance	30%	N/A	30%
Passenger Facilities	0%	N/A	0%