MARICOPA ASSOCIATION of GOVERNMENTS

Strategic Transportation Safety Plan

MAG Contract No. 529 Project No. SP13-01

Technical Memorandum No. 8 – Monitoring and Reporting on Performance and Program Effectiveness

8.1 INTRODUCTION

The Maricopa Association of Governments is developing a comprehensive update of the 2005 Strategic Transportation Safety Plan (STSP) with oversight by the MAG Transportation Safety Committee and the Transportation Safety Stakeholders Group (TSSG). The new STSP will establish regional vision, goals, objectives, strategies, countermeasures, and performance measures for transportation safety. It is a data-driven, multi-year comprehensive plan that establishes goals, objectives, and key action areas and integrates the four E's of highway safety – engineering, education, enforcement and emergency medical services (EMS). The STSP allows MAG safety programs and member agencies to work together in an effort to align goals, leverage resources and collectively address the region's safety challenges. The STSP will also identify strategies for addressing new areas of transportation safety. The development of the STSP is closely coordinated with Arizona's 2014 Strategic Highway Safety Plan (SHSP)

This STSP will be a comprehensive and workable multi-modal plan that identifies needed system improvements and financial needs to institutionalize safety as a key consideration in the MAG transportation planning process. This Plan will provide guidance for future investment decisions that are reflected in the MAG Regional Transportation Plan (RTP) and the MAG Transportation Improvement Program (TIP) as shown in Figure 1. MAP-21 and the subsequent GROW AMERICA Act requires the FHWA to develop safety-related performance measures. The ADOT and MAG strategic plans will need to be consistent with federal directives and, correspondingly, with each other. The coordination between ADOT's and MAG's plans and programs will primarily occur at the TIP (short-range) level. The STSP will identify current effective programs and initiate new programs that will result in reducing the number and severity of traffic crashes within the MAG region.

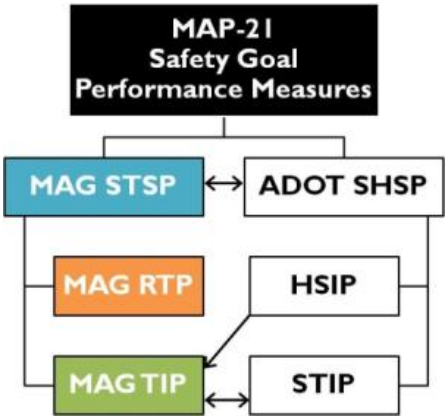

Figure 1 - Coordination of Federal, ADOT, and MAG Plans and Programs

This technical memorandum is the eighth in a series to document the effort on the Plan. Technical Memorandum No. 8 summarizes the work completed on Task 8: Monitoring and Reporting on System Performance and Program Effectiveness. This includes identifying enhancements to current MAG practices in documenting and reporting on road safety performance via the MAG website. Additionally, recommended approaches for monitoring the effectiveness of regional road safety programs and initiatives are provided.

8.2 Federal and State Influence of Safety Performance Measures

"Moving Ahead for Progress in the Twenty First Century" or as it is commonly referred to "MAP-21" was signed into law on July 6, 2012 and went into effect on October 1, 2012. It was a two-year transportation reauthorization bill that provided federal funding of transportation programs through September 2014. The most recent federal legislation to replace MAP-21 goes under the title: "Generating Renewal, Opportunity, and Work with Accelerated Mobility, Efficiency, and Rebuilding of Infrastructure and Communities throughout America Act" or "GROW AMERICA Act". It is a $302 billion, four-year transportation reauthorization proposal that provides increased and stable funding for our Nation's highways, bridges, transit, and rail systems. It builds on MAP-21 priorities and strengthens the commitment to safety, state-of-good-repair, efficiency, performance, and underserved populations. MAP-21 programs are not repealed or consolidated in the GROW AMERICA Act. The Act sets funding for the Highway Safety Improvement Program (HSIP) at $10.1 billion over four years.[1] The GROW AMERICA Act rewards effective MPOs with additional funding under the Surface Transportation Program (STP) and the Transportation Alternatives Program (TAP) and the new Fixing and Accelerating Surface Transportation (FAST) program. The GROW AMERICA Act defines high-performing MPOs as those that coordinate well with other MPOs in the region, consider performance goals as part of their planning, have equitable approaches to decision making, and demonstrate high technical capacity.[2]

Safety was especially prominent in the MAP-21 legislation and continues to be prominent in the GROW AMERICA Act. National performance goals for federal highway programs were set and the safety goal was at the top of the list:

> *"Safety – To achieve significant reduction in traffic fatalities and serious injuries on all public roads, including non-State-owned public roads and roads on tribal lands"*

The legislation supports an aggressive safety agenda by continuing the successful Highway Safety Improvement Program (HSIP), doubling funding for infrastructure safety, strengthening the linkage among modal safety programs, and creating a positive agenda to make significant progress in reducing highway fatalities. It also continues to build on other aggressive safety efforts, including the USDOT's fight against distracted driving and its push to improve transit and motor carrier safety.

The GROW AMERICA Act requires the adoption of performance-based decision-making for developing and implementing transportation improvement projects. Furthermore, there is a requirement for the MAG STSP to be consistent with federal safety goals and performance measures, and be coordinated with Arizona's SHSP.

In March 2014, proposed new rulemaking was published in the Federal Register that was devoted to National Performance Management Measures of the Highway Safety Improvement Program. It proposes to establish performance measures to carry out the HSIP, the process for State DOTs and MPOs to report safety targets, and the process that FHWA will use to assess progress State DOTs have made in achieving safety targets. MPOs could also be indirectly impacted by consequences to the State DOT for not achieving overall significant progress towards their safety targets.

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[1] http://www.dot.gov/grow-america/fact-sheets/overview accessed November 25, 2014
[2] http://www.dot.gov/sites/dot.gov/files/docs/Empowering%20Local%20Decision%20Makers.pdf accessed November 25, 2014

Federal rulemaking states that targets established by an MPO would be reported to their State DOTs on an annual basis in a manner that is agreed upon by both parties. The MPOs would report progress towards the achievement of their targets in their System Performance Report as part of their regional transportation plan. FHWA recommends, but would not require, that States prepare themselves so that no later than calendar year 2020, serious injuries data is collected through and reported by a hospital records injury outcome reporting system that links injury outcomes from hospital inpatient and emergency discharge databases to crash reports.

FHWA established the following measures to assess safety performance:

1. Serious injuries per one hundred million VMT
2. Fatalities per one hundred million VMT
3. Number of serious injuries
4. Number of fatalities

Each of the measures would be representative of a five-year rolling average, i.e., rolling average of five individual, consecutive annual points of data. Fatality-related measures would be derived from the Fatality Analysis Reporting System (FARS) and serious injury and fatality rates per one hundred million VMT as documented in the Highway Performance Monitoring System (HPMS).

The federal legislation does not establish a specific goal nor define “significant reduction”. This is intended to provide flexibility to the States to set appropriate performance targets relative to local conditions. In the proposed rule-making, States need to establish targets for the safety performance measures by April 2015. MPOs are required to establish targets for safety performance measures no later than 180 days after the State DOT establishes their safety targets. MPOs are required to report on progress toward achievement of their targets in their annual System Performance Report.

More than 11,350 comments were received from this notice of proposed rulemaking (NPRM), which were due by June 9, 2014. While this is not a final rule, the safety performance measures will in all probability be maintained.

The 2014 Arizona SHSP, published at www.azdot.gov/shsp on October 29, 2014, is an overarching safety plan for all public roads in Arizona with the new vision of ***Towards Zero Deaths by Reducing Crashes for a Safer Arizona***. Numerous stakeholders were involved while developing the plan, e.g. federal, state, regional, tribal, local agencies; private, non-profit organizations; other safety partners and advocates. The SHSP Goal is to *reduce fatalities and the occurrence and severity of serious injuries on all public roadways in Arizona* with a specific objective to *reduce the total number of fatalities and serious injuries in Arizona by three to seven percent during the next five years from the 2013 base year*.

Based on the traffic crash characteristics and input from statewide safety stakeholders, 12 emphasis areas have been established for Arizona:

- **Speeding and Aggressive Driving**
- **Impaired Driving**
- **Occupant Protection**
- **Motorcycles**
- **Distracted Driving**
- Roadway Infrastructure and Operations
- Age Related
- Heavy Vehicles/Buses/Transit
- Non-motorized Users
- Natural Risks
- Traffic Incident Management
- Inter-jurisdictional

The first five Emphasis Areas on the list were designated as “Top Focus Emphasis Areas”, which account for the greatest number of fatalities and serious injuries on public roads throughout the state or appear to have an upward trend of fatalities and serious injuries. The SHSP indicates that status as a Top Focus Emphasis Area will not affect project selection, prioritization or funding.

Two Emphasis Area Support Teams were established in Arizona to assist with the following needs:

- Data Improvements
- Policy Initiatives

Arizona will annually report four safety performance measures (serious injuries and fatalities per hundred million vehicle miles traveled, number of serious injuries and fatalities) as a five-year rolling average as proposed in the NPRM. Arizona will establish targets for these performance measures pending the final rule making legislation. The SHSP defines “incapacitating injuries” (“A” on the KABCO severity scale) on the Arizona Crash Report form as equivalent to serious injuries. Additionally, Arizona will report traffic fatality and serious injury crash statistics for rural roads, older drivers, and pedestrians.

8.3 Current Documenting and Reporting on Road Safety Performance

MAG currently documents and reports road safety performance measures for its planning area, which includes the Maricopa County region and portions of Pinal County, at the website http://www.azmag.gov/CrashData/. This resource provides member agencies and the transportation safety professional community a better understanding of the safety performance for the entire planning area as well as access to the various safety data and information sources that MAG collects and monitors. Major features of the MAG Crash Data website are crash trend analysis, crash characteristics for both freeway and arterial systems, distribution of drivers’ behavior attributes that influence crashes, as well as a comparison of crash statistics for the MAG Planning Area to the rest of Arizona. The characteristics of the major features are as follows:

- **Crash Trends in the MAG Region, 1999 – 2012:** shows crash trends for each crash type from 1999 to 2012, crash frequency by month of year, day of the week, and time of day for 2012. The page also provides injuries and fatalities per 100,000 population for each year by mid-block, signalized intersection, unsignalized intersection, and unknown location type. There is a tab called 'Show Data' which provides raw data for the graphs along with total number of fatalities and injuries in a tabular format.
- **Urban Freeway System:** shows number of crashes and crash rates for the year 1999 to 2012 for all crashes and crashes with injured, killed, and "injured or killed" that occurred on different freeway routes in the MAG planning area.
- **Arterial and Local Road Crashes:** shows crash trends from 1999 to 2012 by types of crashes. The table shows the number of crashes along with number of fatalities and all injuries. It does not show the statistics for serious injuries/serious injury crashes separately.
- **Traffic Violations and Seat Belt Usage:** shows fatalities and injuries related to traffic violations and seat belt usage for teen drivers and older drivers for 1999 to 2012.
- **Comparison of MAG Region to the Rest of Arizona:** shows crash frequency, total injuries and fatalities for MAG and the rest of Arizona. It does not show the statistics for serious injuries/serious injury crashes separately.
- **Crash Trends in the MAG Region – Notes:** shows MAG personnel notes for the users of the information.
- **Economic Losses due to Crashes in the MAG Region:** The table shows annual cost of crashes in the MAG planning area from 1999 to 2012, and the numbers have been updated to reflect changes in the MAG planning area through 2013.

8.4 Recommendations for Documenting and Reporting on Road Safety Performance

Federal, State, and local laws, rules, policies, and plans influence the ability of MAG and its member agencies to implement transportation safety projects. Federal legislation has provided significant support for transportation safety to be a more prominent part of MAG's planning process. Its performance-based provisions provide incentives to measure and track performance throughout the entire planning and programming process beginning with the RTP.

The 2014 Arizona SHSP is important to MAG as it relates to project programming and use of HSIP funding. Consistency of MAG's Action Areas with the State's SHSP Emphasis Areas will enhance the region's ability to obtain HSIP funds.

The MAG Crash Data website should be updated to align with the new federal legislation and the 2015 MAG STSP. The goal oriented and implementation progress measurements for the five 2015 MAG STSP Action Areas are currently documented in Technical Memorandum No. 3.

Consideration should also be given to align crash data with the 2014 Arizona SHSP and to provide crash data in a manner that would improve analysis for decision making. Prior to publication of the 2014 Arizona SHSP, efforts during Task 3 established goal oriented measurements as the % or # reduction (3-year moving average) in serious injury and fatal crashes. To align with federal legislation and the Arizona SHSP, MAG should consider revising these measurements to monitor serious traffic injuries and fatalities instead of "crashes", and report them as a 5-year moving average to facilitate a direct comparison with the state and nation. Table 1 shows the correlation between the Arizona SHSP Emphasis Areas and the MAG STSP Action Areas.

Table 1 – Comparison of Arizona Strategic Highway Safety Plan Update Emphasis Areas and MAG STSP Action Areas

Arizona SHSP Emphasis Areas	MAG STSP Action Areas
Age Related (Younger/Older Drivers)	**Eliminate Death and Injury Involving Young Roadway Users**
Distracted Driving	**Eliminate Death and Injury Involving Young Roadway Users**
Heavy Vehicles/Buses/Transit	Defer to State SHSP*
Impaired Driving (Alcohol, Illegal Drugs, Medication, Fatigued)	**Eliminate Impaired Driving**
Interjurisdictional Coordination	Defer to State SHSP*
Motorcycles	Defer to State SHSP*
Natural Risks (Weather, Animals)	Defer to State SHSP*
Non-Motorized Users (Pedestrians, Bicyclists, Transit Users, School Zone Users)	**Eliminate Death and Injury Involving Vulnerable Road Users – Bicyclist, Pedestrians, Persons with Disabilities**
Occupant Protection (Safety Belts, Child Safety Seats, Helmets)	Defer to State SHSP*
Roadway Infrastructure & Operations Improvement (Lane Departure, Intersections, Rural Roads, Rail Crossings	**Eliminate Death and Injury Related to Intersections**
Speeding & Aggressive Driving	**Eliminate Death and Injury from Speeding and Aggressive Driving Behavior**
Traffic Incident Management (Secondary Collisions, Work Zones)	Defer to State SHSP*
Arizona Emphasis Area Support	**MAG Action Area Support**
Data Analysis Improvements	**Improve Data Collection, Quality, Availability, Integration, and Analysis for Decision Making**
Policy Initiatives	Defer to State SHSP*

* The MAG planning area is largely urbanized and does not have associated Action Area(s) that align with those State SHSP Emphasis Areas that represent rural areas.

The following are recommendations for updating the MAG Crash Data website to improve crash data availability, integration, and analysis for decision making:

- Consider reporting serious injuries instead of all injuries to be consistent with the Arizona SHSP and federal performance measures. Serious injuries are defined as incapacitating injuries (“A” on the KABCO severity scale) on the Arizona Crash Report form.
- Consider reporting the number of serious injuries and fatalities as a five-year rolling average to be consistent with the Arizona SHSP and federal performance measures. Using a five-year rolling average shows long-term trend more clearly, as demonstrated in Figure 2.

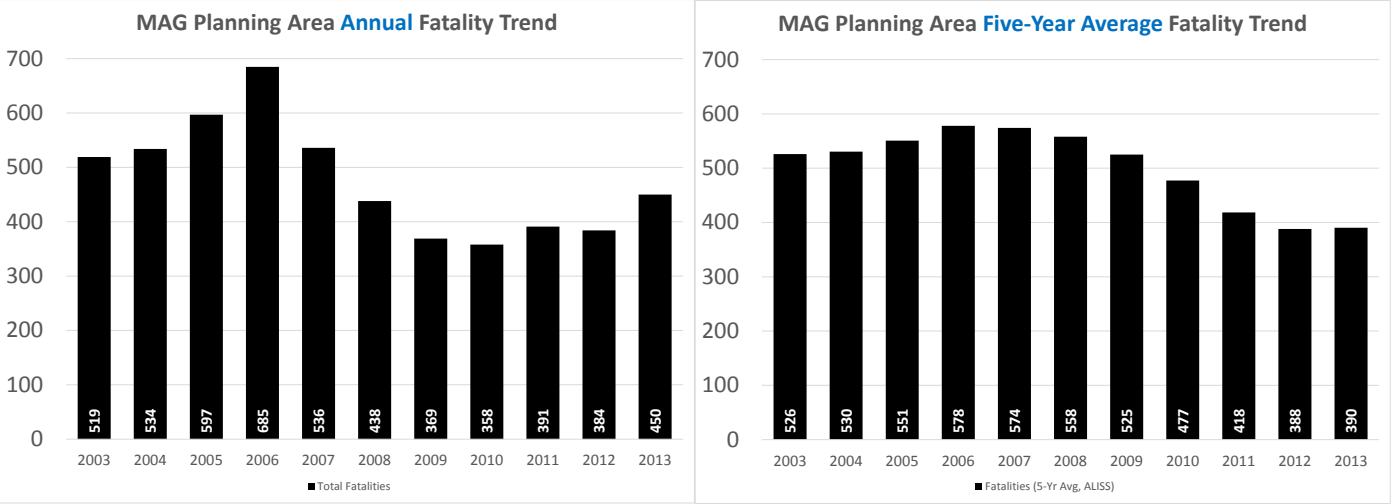

Figure 2 – MAG Annual Fatality Trend versus Five-Year Average Fatality Trend

- Consider reporting serious injury and fatality rates per one hundred million VMT, as documented in the Highway Performance Monitoring System (HPMS), as a five-year rolling average for the urban freeway system and arterial and local roads to be consistent with the Arizona SHSP and federal performance measures.
- Consider keeping the crash data updated to reflect most current year of data available (2013). The crash data is currently provided up to 2012. In July of each year, crash data for the previous year is available.
- Consider using 2013 as the baseline year crash data for comparison purposes to be consistent with the Arizona SHSP.
- Consider providing a pie chart or histogram of crashes by manner of crash impact, injury severity, violations/behavior, traffic unit maneuver/action, condition influencing driver/ped/cyclist, relation to junction, traffic control device, light condition, involving pedestrian, involving pedalcyclist, and time of day in three hour bins, day of week, month of year, and year. Graphical representation of crash data makes it easier for users to understand trends and identify factors that cause crashes.
- Review consistency with the naming convention for crash statistics and reporting. For example, instead of using both ‘killed’ and ‘fatalities’ for the same type, use ‘fatalities’ uniformly throughout.
- Coordinate with ADOT to report crash data for the urban freeway system by freeway segment in addition to the entire freeway route. For example, providing information for the Loop 101 - Agua Fria, Loop 101 - Pima, and Loop 101 - Price, in addition to the entire Loop 101 route, to identify safety issues on different portions of the freeways.
- Consider adding crash data tabs to report the goal-oriented measurements of the five 2015 MAG STSP Action Areas for the MAG planning area.
- Consider adding a crash data tab to report the goal-oriented measurements of the twelve 2014 Arizona SHSP Emphasis Areas for the MAG planning area because it relates to HSIP funding eligibility. Implementation of this may be selective based on resources available, applicability to the region, and is not intended to duplicate what the state is reporting.

- Explore the presentation of crash data in a user interactive map on the crash data website with filters for various crash data information.[3] At a minimum the crash data should include the goal-oriented measurements of the five 2015 MAG STSP Action Areas. Providing the detail statistics of implementation progress measurements of the five 2015 MAG STSP Action Areas is also desirable. Additionally, the user should be able to download the crash data and statistics in a tabular format. This would make monitoring and reporting crashes easier for member agencies.
- Explore the presentation of crash data in a user interactive map on the Regional Transportation Safety Information Management System (RTSIMS) website (https://rtsims.azmag.gov/) which would be strictly for authorized users at local member agencies to allow agencies to have improved crash information.
- Explore the presentation of the crash data on a separate tab with interactive map for each of the five 2015 MAG STSP Action Areas to allow each member agency to track their progress towards meeting the STSP and national goals of improving safety. There would be no cross jurisdictional comparison. Information for local member agencies could be obtained through RTSIMS secure login.
- Consider providing a "safety" link (stsp.azmag.gov) on the www.azmag.gov home page to allow member agencies to access this information easier.
- Consider providing a link to the crash data website (http://www.azmag.gov/CrashData/) on the transportation performance page (http://performance.azmag.gov/) for convenient navigation

8.5 Recommendations for Monitoring the Effectiveness of Regional Road Safety Programs and Initiatives

Regional transportation safety initiatives, projects and studies that are recommended in the STSP are carried out by MAG utilizing regional resources. Since the adoption of the 2005 STSP, MAG implemented several projects and programs which directly address the goals and visions of that initial plan including:

- Development of the Regional Transportation Safety Information Management System (RTSIMS)
- Establishment of the MAG Road Safety Assessment (RSA) Program
- Launch of the MAG Elderly Mobility Sign Project
- Enhancement of the MAG Safe Routes to School Program
- Other Studies (Effectiveness of Non-Engineering Road Safety Strategies, 2012)

Additionally, within the region, well developed, state-of-the-practice plans exist for planning and designing transit, pedestrian and bicyclist facilities, and for providing safe and comfortable connections between these modes. In particular, the Complete Streets Guide, designing transit accessible communities, the regional bikeway and pedestrian plans, and bus stop standards provide the tools to design safety into intermodal facilities. Many of these contain toolkits and checklists that MAG Member Agencies can use as a resource for their own agency. These plans and their relation to safety are summarized in Technical Memorandum No. 5 and listed below.

- MAG, Designing Transit Accessible Communities, 2013

[3] Alamo Area MPO Safety Program – Crash Data, http://www.alamoareampo.org/Safety/data/index.html
Corvallis Area MPO Area Transportation Safety Plan, http://www.corvallisareampo.org/Page.asp?NavID=37
Lake-Sumter MPO Crash Data History Maps, http://www.lakesumtermpo.com/maps/
Hagerstown/Eastern Panhandle MPO Area Traffic Count and Fatal Crash Web Map, http://bit.ly/1yQSRDL

- MAG, Complete Streets Guide, 2011
- MAG, Pedestrian Policies and Design Guidelines, April 2005
- MAG Regional Bikeway Master Plan, 2007
- RPTA Bus Stop Program and Standards Final Report, Findings and Recommendations, March 2008
- Valley Metro, Phase I Recommendations Regional Transit Standards and Performance Measures, November 2013

By virtue of the federal legislation there is increasing attention to performance management and its practical, continuous use in measuring overall transportation system performance. This increased attention fits right in with MAG's existing performance management program. The primary changes can be dealt with through increased emphasis on transportation safety. This increased emphasis can be developed through additional safety-related performance measures being tracked, and targets set that are measured and reported on each year. Then, depending on how well the targets are being achieved, changes to evaluation criteria (and corresponding weights) will be transferred to the RTP and TIP processes.

To monitor the effectiveness of regional road safety programs and initiatives, MAG should prepare an annual MAG Safety Performance Management Plan that includes: (1) safety-related measures covering all modes of transportation; (2) corresponding safety targets for each mode; and (3) based upon prior year performance, recommended actions (i.e., RTP, TIP, policies) going forward. In its 2013 Annual Report[4], The Regional Transportation Commission (RTC) of Washoe County, Nevada provides a status update on each performance measure and a comparison with the established target as shown in Table 2.

As part of work completed for Technical Memorandum No. 3 – Action Areas, Potential Strategies, and Performance Measures, TSSG members identified a realistic set of performance measures that could be used by MAG to report on progress. These performance measures are provided in the following sections. Each performance measure identified is a good measure of its Action Area and has data that is currently available or can be obtained for the MAG Planning Area.

Action Area 1.0 – Eliminate Death and Injury from Impaired Driving

Implementation progress measurement (output)

- % or # of MAG member agencies conducting high visibility patrols targeting impaired driving in the past year
- # or % of target population reached
- # of education tools identified

Goal-oriented measurement (outcome)

- % or # Reduction (5-year moving average) in Serious Injury and Fatal Crashes involving driver impairment where the physical description one or more drivers involved in the crash indicated alcohol, recreational drugs, medications, or fatigue as reported by the investigating officer.

[4] RTC, *2013 Annual Report*, 2013, p.20.

Table 2 – Example of Tracking Safety-Related Performance (Reno RTC)

National Performance Measure	RTP Goal	Annual Transit Performance Measures	Performance Target	2013 Performance Measure Status	2013 Performance Target Status
Safety Performance Measures	Improve Safety	Preventable transit accidents per 100,000 miles of service	• 0 (ongoing)	RTC RIDE 1.67 (Average of July 2013-December 2013) RTC ACCESS 1.01	Working toward goal Working toward goal
		Number of crashes and number of crashes per vehicle miles traveled (VMT)	• Reduce by 50% by 2020	951	Working toward goal
		Number of serious injuries per VMT —	• Reduce by 50% by 2020	551	Working toward goal
		Number of fatalities and fatalities per VMT	• 0; reduce by 50% by 2020	9	Working toward goal
		Miles of bicycle lanes added and percent of the Bicycle Pedestrian Master Plan	• 3-7% of plan implemented per year	The master plan identified 148 miles of existing bicycle lanes and proposed adding 89.3 miles of bike lanes in the Bicycle and Pedestrian Master Plan RTC added: 2012- 2.9 miles of bike lanes - 2% 2013 - 8.4 miles of bikes lanes added-9%	Exceed goal

Action Area 2.0 – Eliminate Death and Injury from Speeding and Aggressive Driving Behavior

Implementation progress measurement (output)

- # of automated enforcement cameras operating in MAG Planning Area
- # or % of MAG member agencies with automated enforcement cameras
- # of speeding violations recorded in the past year (note: # should be reduced if cameras are successful)

Goal-oriented measurement (outcome)

- % or # Reduction (5-year moving average) in Serious Injury and Fatal Crashes involving speeding or aggressive driving behavior including:
    - Crashes where data entered by the reporting officer as: “speed too fast for condition” or “exceeded lawful speed”.
    - Crashes where data entered by the reporting officer as: “speed too fast for condition” or “exceeded lawful speed” and improper or excessive lane changing: failing to signal intent, failing to see that movement can be made safely, or improper passing, per ARS 28-695.

Action Area 3.0 – Eliminate Death and Injury Related to Intersection Crashes

Implementation progress measurement (output)

- # of systemic improvement projects targeting intersections with high crash risk in the past year
- # of RSA's conducted at intersections with high crash risk in the past year
- # of proven design features implemented
- # of intersections equipped with automated enforcement systems
- % of representative population educated

Goal-oriented measurement (outcome)

- % or # Reduction (5-year moving average) in Serious Injury and Fatal Crashes at intersections including:
    - Crashes at all intersections
    - Crashes at signalized intersections
    - Crashes at STOP-controlled intersections
- # of Deaths and Injuries at Intersections per 100,000 population

Action Area 4.0 – Eliminate Death and Injury for Vulnerable Road Users

Implementation progress measurement (output)

- # of pedestrian crossing enhancements installed such as PHBs (HAWKs), pedestrian crossing islands, RRFB's, etc… (not marked crossings)
- # or % of MAG member agencies that combine safety with multimodal connectivity reviews in planning and design
- # or % of MAG member agencies with complete streets policies that rely on safety analysis and design
- # or % of actuated traffic signals with bicycle detection
- # or % of MAG member agencies with bicycle wrong-way riding prohibitions

Goal-oriented measurement (outcome)

- % or # Reduction (5-year moving average) in Serious Injury and Fatal Crashes involving a pedestrian
- # of Pedestrian Deaths and Serious Injuries
- % or # Reduction (5-year moving average) in Serious Injury and Fatal Crashes involving a bicyclist
- # of Bicyclist Deaths and Serious Injuries

Action Area 5.0 – Eliminate Death and Injury Involving Young Road Users

Implementation progress measurement (output)

- # of tools identified
- % of young road users with signed Safe Driving pledges
- # or % of target population reached

Goal-oriented measurement (outcome)

- % or # Reduction (5-year moving average) in Serious Injury and Fatal Crashes involving drivers younger than 25
- # of Deaths and Serious Injuries involving drivers younger than 25

8.6 Recommendations for Setting Safety Targets

The following measures to assess safety performance have been established by FHWA, and Arizona will comply with these requirements:

1. Serious injuries per one hundred million VMT
2. Fatalities per one hundred million VMT
3. Number of serious injuries
4. Number of fatalities

Each of the measures would be representative of a five-year rolling average, i.e., rolling average of five individual, consecutive annual points of data. Fatality-related measures would be derived from the Fatality Analysis Reporting System (FARS) and serious injury and fatality rates per one hundred million VMT as documented in the Highway Performance Monitoring System (HPMS).

The historic performance management measures (represented as five-year rolling averages) for Maricopa County are provided in Table 3.

Table 3 – Historic Maricopa County Performance Management Measures

Maricopa County Performance Management Measures; HSIP									
Dates for 5-year rolling average	2000-2004	2001-2005	2002-2006	2003-2007	2004-2008	2005-2009	2006-2010	2007-2011	2008-2012
Calendar year	2004	2005	2006	2007	2008	2009	2010	2011	2012
Number of Fatalities^	466	484	498	493	475	444	401	355	330
Fatalities per one hundred million VMT	-	-	-	-	1.67	-	1.40	1.25	1.15
Number of Serious Injuries*	3,846	3,645	3,443	3,865	3,622	3,329	3,032	2,835	2,664
Serious Injuries per one hundred million VMT	-	-	-	-	12.70	-	10.61	10.02	9.26
Daily VMT (000's)**	-	-	-	78,517	78,147	-	78,287	77,530	78,835

^ Data Source: FARS, Maricopa County
** Data Source: ALISS via RTSIMS, Maricopa County*
*** Data Source: HPMS, Phoenix-Mesa Urbanized Area*

The MAG Transportation Safety Committee (TAC) and Transportation Safety Stakeholder's Group (TSSG) set an aspirational target through the establishment of the Vision Statement *"Zero Deaths – Zero Injuries"*. MAG will also set evidence-based targets that are focused specifically on what can be achieved within the investments, policies, and strategies within the FY2016 – FY2026 Implementation Plan. These evidence-based targets promote accountability and encourage the consideration of investment tradeoffs.

A TSSG meeting was held on December 9, 2014 with a presentation by MAG and the consultant team. The following topics were presented:

- Overview of Federal and State performance measures
- Identified enhancements to current reporting on road safety performance via the MAG website

- Recommended approaches for monitoring the effectiveness of regional road safety programs
- Existing crash trends for the five MAG STSP Action Areas
- Brief review of recommended strategies from Technical Memorandum No. 6 and 7

The 2013 FHWA publication Safety Target Setting Final Report provides guidance on how to set evidence-based targets:

- Use trend analysis
- Consider exogenous factors, i.e. population, demographic distribution
- Forecast fatality reductions based on planned implementation of proven countermeasures

Figure 3 shows how these steps can be used to develop an evidence-based fatality target and what questions area being answered at each phase.

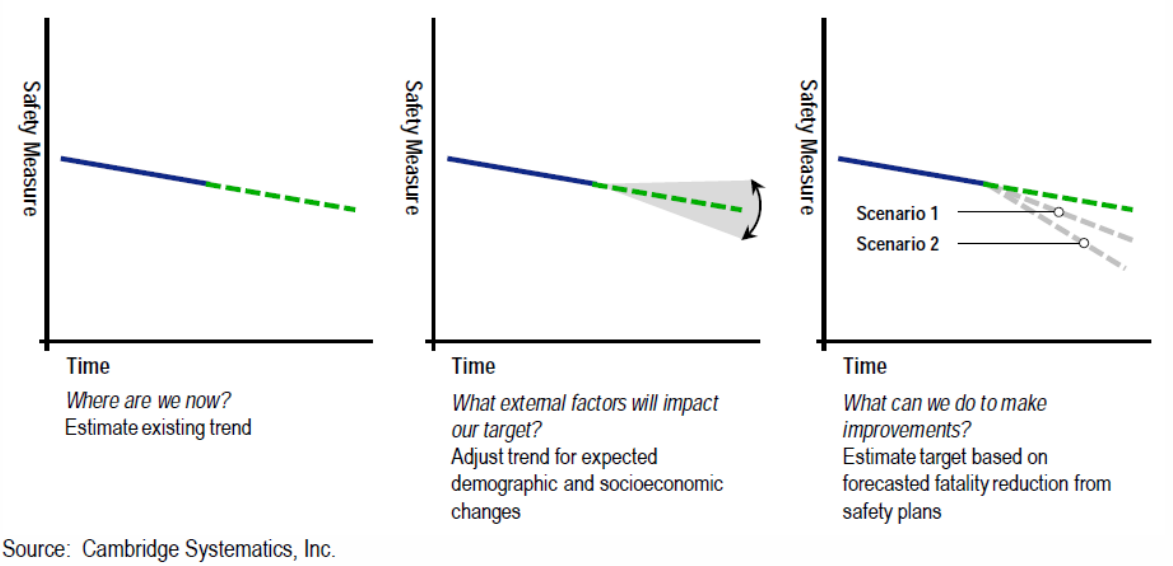

Figure 3 – Steps for Target Setting

Figure 4 depicts the existing linear fatality and serious injury trend based on the past five years for the MAG Planning Area. The slope of the trend line is essentially zero.

The following factors are expected to increase the fatality and serious injury trend in the MAG Planning Area:

- increase in older drivers due to an aging population
- increase in bicyclists and pedestrians
- increase in distracted road users

The following factors are expected to reduce the fatality and serious injury trend in the MAG Planning Area:

- decrease in younger drivers due to movement towards alternative transportation modes
- continual improvement of vehicle safety and technology, including crash avoidance systems

- continual roadway improvement, especially in developing areas and installation of additional lighting, traffic signals, etc…
- completion of the South Mountain Freeway

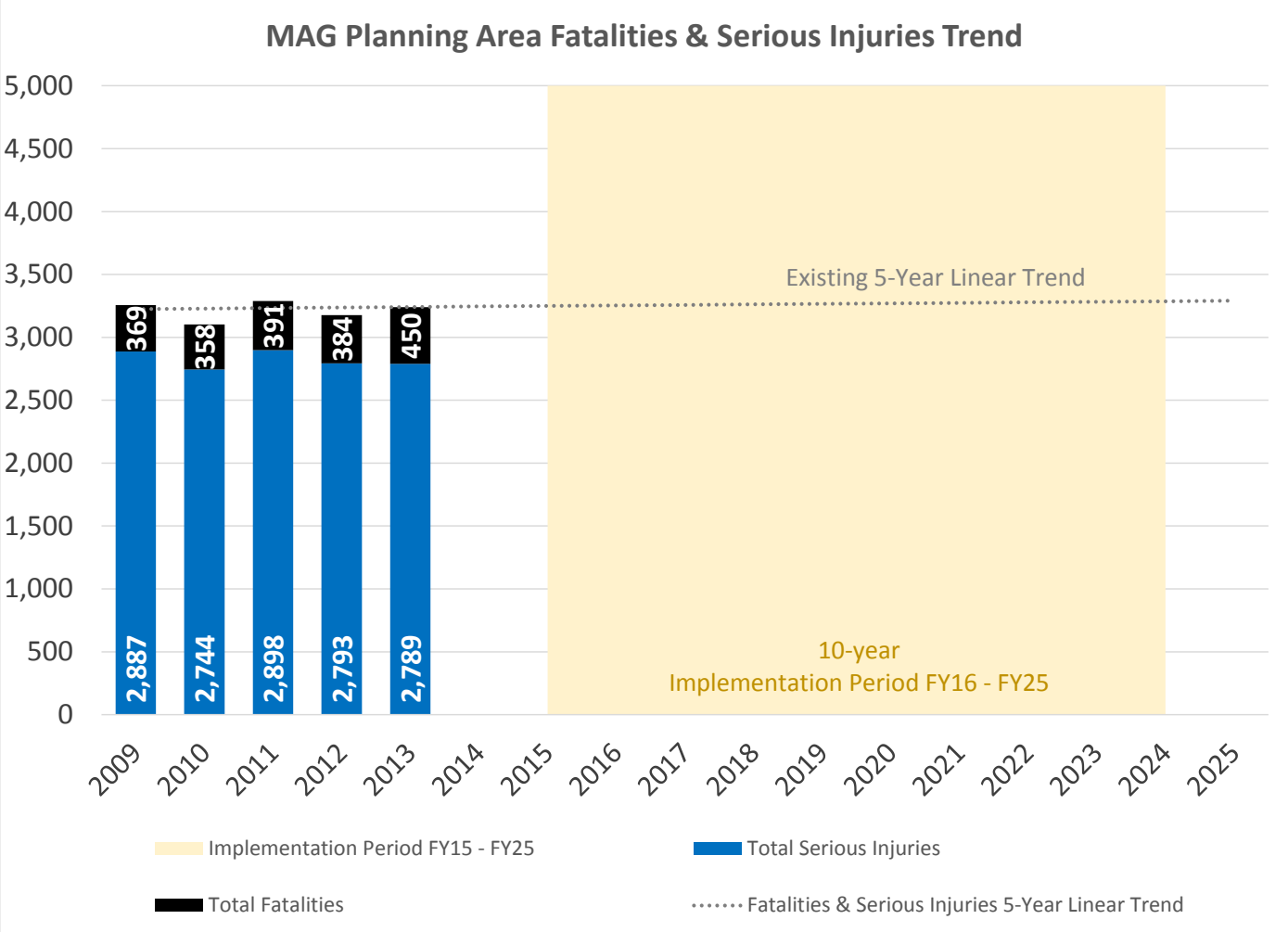

Figure 4 – Existing Fatality and Serious Injury Trend for the MAG Planning Area

Discussion of setting targets was conducted and consensus was reached to set a single target, in the form of a percent reduction, for the sum of fatalities and serious injuries that occur in the MAG planning area. A baseline year of 2013 and annual statistics (versus a five year rolling average) will be used to align with the objective set by Arizona.

The TSSG saw a need to view visual representations of targets prior to reaching consensus on the target that will be proposed for the MAG STSP. General comments from the TSSG indicate a desire to follow the State's objective. Two options are proposed in the following figures. Figure 5 illustrates the application of the Arizona objective to *reduce the total number of fatalities and serious injuries by 7% during the next five years from the 2013 base year* of the MAG planning area statistics.

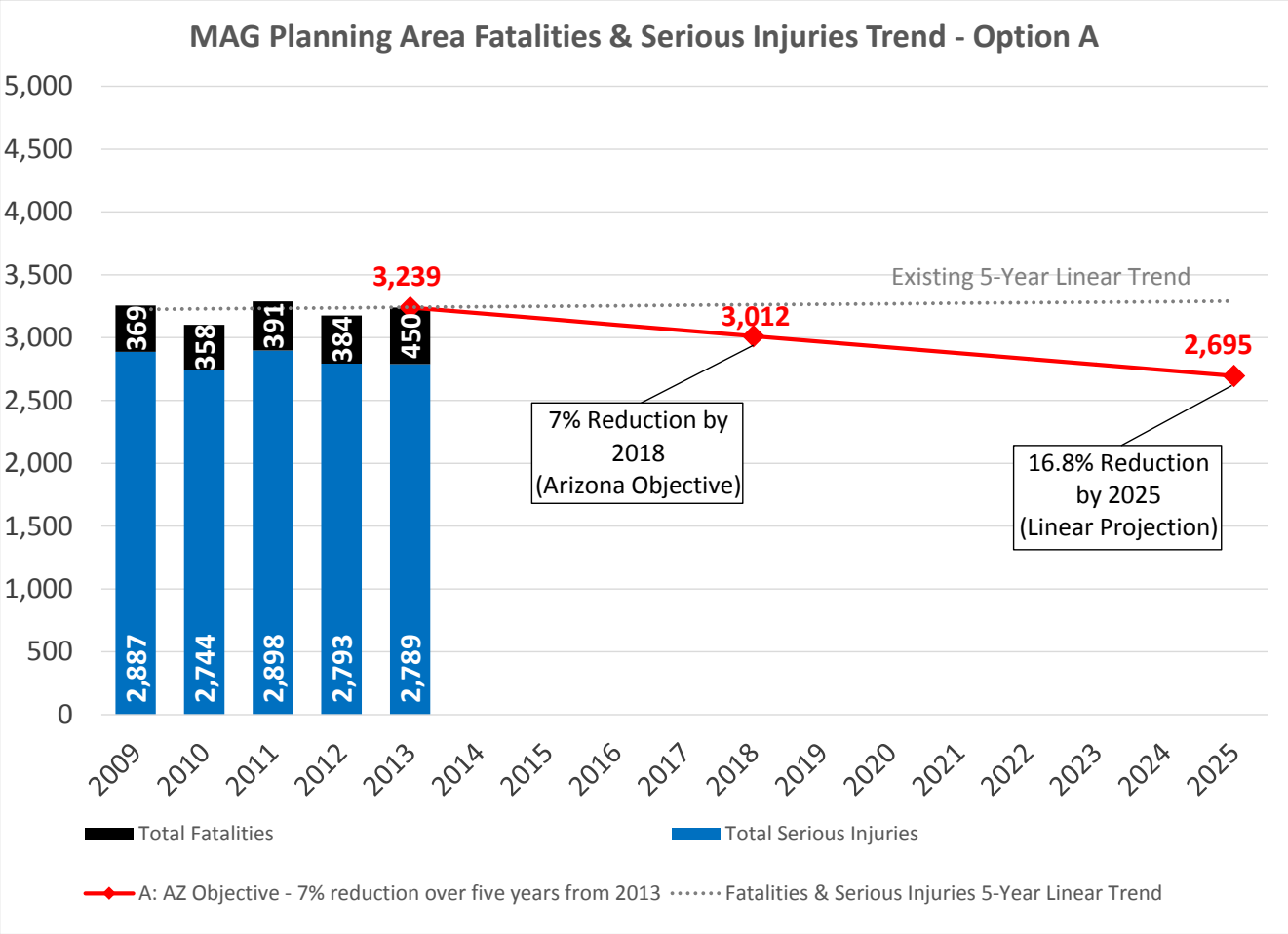

Figure 5 – Option A: 7% reduction over five years

Figure 6 illustrates a second option to *reduce the total number of fatalities and serious injuries by 30% by 2025 from the 2013 base year*. The TSSG, which includes the TSC and MAG staff, will view these visual representations of targets at a January 27, 2015 meeting and reach consensus on the target that will be proposed for the MAG STSP.

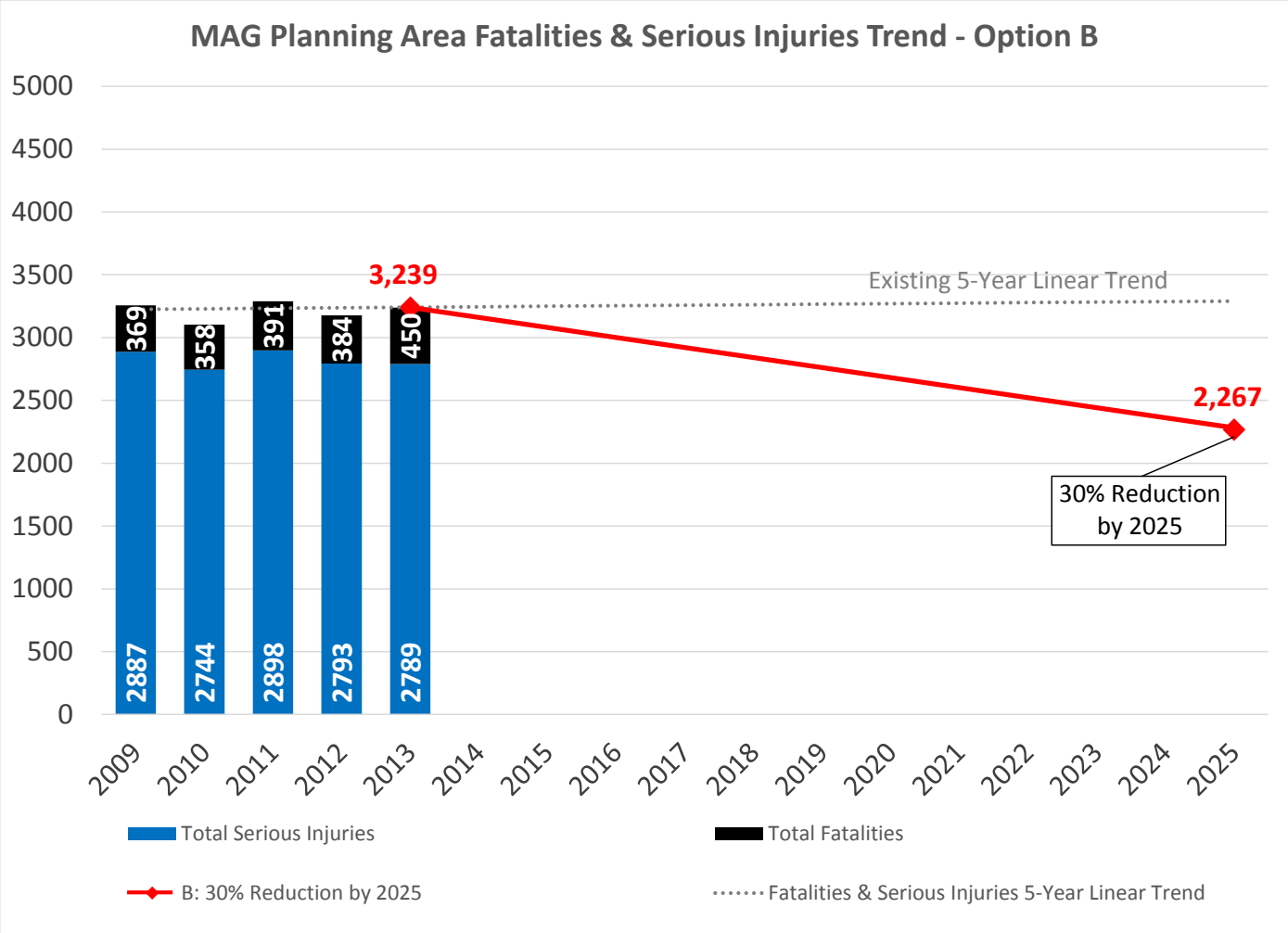

Figure 6 – Option B: 30% reduction by 2025

8.7 References

- 2010 Arizona's Crash Report Forms Instruction Manual, http://1.usa.gov/1yc0dAz
- 2014 Arizona SHSP, http://azdot.gov/shsp
- FHWA Safety Target Setting Final Report, http://www.camsys.com/pubs/safetyfinalrpt.pdf
- MAG STSP Technical Memorandum No. 3 – Action Areas, Potential Strategies and Performance Measures, http://bit.ly/1CgRnGP
- MAG STSP Technical Memorandum No. 5 – Incorporating Safety into the Regional Transportation Plan, http://bit.ly/15yqHTE
- National Performance Management Measures; Highway Safety Improvement Program, A Proposed Rule by the FHWA on 03/11/2014, http://1.usa.gov/1kaOScZ
- The GROW AMERICA Act, http://www.dot.gov/grow-america