

SAFE SYSTEM PILOT APPLICATION SUMMARY

ALIGNING MARICOPA ASSOCIATION OF GOVERNMENTS' STRATEGIC TRANSPORTATION SAFETY PLAN WITH THE SAFE SYSTEM APPROACH

CASE STUDY | AUGUST 2024

To advance implementation of the Safe System Approach (SSA), Federal Highway Administration (FHWA) developed three (3) resources for measuring SSA alignment—Safe System Project-Based Alignment Framework, Safe System Policy-Based Alignment Framework, and Safe System Roadway Design Hierarchy. These resources were introduced, applied, and refined through a series of eight (8) pilot workshops. The Safe System Pilot Application Summaries provide an overview of each pilot application, the approach used to assess Safe System alignment, and outcomes from the pilot effort.

The [Safe System Policy-Based Alignment Framework](#) offers a series of questions and considerations to help agencies assess policy and program alignment with the SSA. The Framework is based on seven criteria. These criteria include the SSA principles: 1) death and serious injury are unacceptable; 2) humans make mistakes; 3) humans are vulnerable; 4) responsibility is shared; 5) safety is proactive; and 6) redundancy is crucial, as well as equity. A series of prompts guide the user to evaluate the level to which the policy or program is aligned with each criterion. Similar to the [Highway Safety Improvement](#)

[Program Self Assessment Tool](#), there are five levels of alignment—Initiation (an agency has started to address the initiative), Development (an agency has developed a plan or approach to address the initiative), Execution (an agency has executed a plan or approach to address the initiative), Evaluation (an agency has assessed performance of the initiative), and Integration (an agency has integrated the initiative into agency culture). The user assigns a score within the appropriate level.

The Policy-Based Alignment Framework can be used to:

- ✓ **BENCHMARK PROGRESS** toward improving the SSA alignment of agency policies.
- ✓ **RAISE THE LEVEL OF AWARENESS** and promote adoption of SSA-related practices and strategies.
- ✓ **IDENTIFY GAPS** in existing policy and program efforts.
- ✓ **GENERATE STRATEGIES** to improve SSA alignment in agency policies and programs.
- ✓ **TRACK PROGRESS** of SSA alignment.
- ✓ **INFLUENCE A CHANGE** in agency business practices.





MARICOPA ASSOCIATION OF GOVERNMENTS (MAG) PILOT BACKGROUND

The Maricopa Association of Governments (MAG) serves as the Metropolitan Planning Organization (MPO) for the Phoenix, Arizona region. Member agencies include 27 cities and towns, 3 Native nations, Maricopa County, portions of Pinal County, and the Arizona Department of Transportation. MAG developed a Strategic Transportation Safety Plan (STSP) in 2021 to help promote a traffic safety culture to improve multimodal road safety throughout the region. The plan identified a vision for the region: “Everyone Stays Safe Traveling Place to Place.” The plan promotes traffic safety culture to improve multimodal road safety by adopting SSA, identifying locations and areas of opportunity, promoting use of high-value safety countermeasures, and communicating safety as a shared language.

The purpose of this pilot was to understand how MAG could improve future iterations of the STSP to better align the content, strategies, and programs with the SSA. As part of this review, MAG considered the following

- ▶ Incorporating human behavior and vulnerability in countermeasure selection.
- ▶ Scaling different levels of pedestrian and bicycle improvements (i.e., bike lane protection versus separation) using the Project-Based Alignment Framework.
- ▶ Considering context in risk and solution identification.
- ▶ Collaborating with partners.
- ▶ Integrating Equity and SSA principles throughout the agency (beyond safety) and to its partners.



THE APPROACH

MAG convened several of its member agencies including representatives from the Arizona Department of Transportation, City of Phoenix, City of Glendale, City of Tempe, City of Scottsdale, City of Mesa, City of Queen Creek, City of Gilbert, and Pinal County. Representatives from these agencies encompassed a wide range of experience in traffic safety and the SSA. MAG also invited a human factors specialist who is often consulted on Road Safety Assessments in the region. During the one-day workshop, participants provided opportunities to better align the STSP with the SSA using the Safe System Policy-Based Alignment Framework. **Organized by the Framework criteria, and building upon participants feedback, the following describes FHWA's best practice ideas to enhance alignment of MAG's STSP update with the SSA.**

Death and Serious Injury are Unacceptable

The plan could focus on eliminating fatal and serious injury crashes versus all crashes. The Goal of MAG's STSP is to “reduce the severity and number of people impacted by crashes.” The use of the word “reduce” implies that some deaths are still acceptable, which they are not within a Safe System; thus, the workshop participants recommended to use the word “eliminate” in place of “reduce” to better align the STSP with the SSA. Furthermore, while severity of crashes is a component of the STSP and prioritization process, all injury crashes are considered in the scoring criteria. MAG may consider continuing to prioritize safety solutions focused only on serious and fatal injury crashes while using all other crashes to guide crash contributing factor analysis and countermeasure selection.

Humans Make Mistakes

The plan could acknowledge that humans make mistakes and that systems could be built to make sure that when they occur, the crashes do not yield fatal and serious injuries. Additionally, human factors and behavior generally play a significant role in crashes; thus, developing strategies and policies to accommodate human behavior is critical to creating a Safe System. The MAG STSP addresses human errors related to roadway departure countermeasures and via the “Pedestrian Safety Performance” section. Additionally, the “See Me AZ” campaign was implemented by MAG to minimize the mistakes by drivers and vulnerable road users when interacting on the region's transportation network. The goal of this campaign is to promote awareness of pedestrian, bicycle, and motorist laws and to change behaviors that can lead to vulnerable road user crashes. MAG could consider updating other sections of the STSP to explicitly identify the human mistakes and corresponding countermeasures for other emphasis areas of the plan. Expanding the use of the “See Me AZ” campaign to other agencies and promoting the campaign to consider human factors in other departments within MAG can help further align this work with the SSA.

Humans are Vulnerable

The plan could recognize that the human body can only withstand a certain amount of kinetic energy which is directly affected by speed and angle of collision. It may identify strategies to promote vulnerable road users (e.g., pedestrians, bicyclists), speed management (e.g., policy improvements, design improvements, etc.), and angle of collision. MAG's STSP has a "focus on people" and includes vulnerable road users as an identified focus area. Furthermore, the STSP details some "Proven Safety Countermeasures" that include roundabouts (i.e., change in angle of collision) and improvements that provide reductions in speed. The STSP could be more aligned with the SSA if the human vulnerability element was explicitly stated. Specific discussion about how the "angle of impact" increases the likelihood of severe crashes and other information or infographics about the relationship between speed, severity, and human vulnerability could also be included. While speed management strategies are included in the STSP, specific infrastructure improvements that slow speeds are not included. Aligning countermeasures with the [Safe System Roadway Design Hierarchy](#) could better align the STSP update with the SSA.

Responsibility is Shared

The plan could address how the responsibility of eliminating fatalities and serious injuries can be shared among all roadway users. MAG understands the importance of sharing responsibility for roadway safety in the region. The STSP identifies participants and responsibilities, specifically in the Transportation Safety Stakeholders Group (TSSG), to assist and guide development of the STSP update to the region's Transportation Safety Committee. The STSP demonstrates a shared responsibility for traffic safety in the MAG region by highlighting the convening of this stakeholder group, as well as the inclusion of several strategies beyond engineering and infrastructure such as education, enforcement, and behavioral changes. However, the STSP update could be expanded to include details on how education, enforcement, and behavioral strategies complement engineering countermeasures. The "See Me AZ" campaign includes education, enforcement, and behavioral elements, but collaboration with representatives from law enforcement, emergency services, public information, and community groups to implement the identified strategies could continue to promote a shared responsibility for traffic safety in the region.

Safety is Proactive

The plan could proactively account for risks and behaviors that could lead to fatal and serious injury crashes. MAG proactively supports treatments that are Safe System aligned despite some not having crash modification factors (CMF) or sufficient studies and locations, including those that are believed to be "dynamic, flexible and responsive, particularly in areas of future development and growth." They also proactively identify funding sources for specific improvement types in the STSP, and they use Highway Safety Manual predictive analyses in funding applications through their Road Safety Program (RSP). The STSP includes strategies for eliminating specific risk factors that contribute to fatal or serious injuries. However, the content could be expanded to state that certain risks, or elimination of those risks, are more likely to yield a reduction in serious and fatal injury crashes.

Redundancy is Crucial

The plan language could highlight how various infrastructure elements provide layers of protection and how behavioral, education, and enforcement strategies provide another layer of protection if the infrastructure fails. In the Roadway Departure section, MAG's STSP documents improvements that support redundancy such as longitudinal [rumble strips](#) and stripes and [SafetyEdgeSM](#). However, additional explanations as to how these specific countermeasures or strategies provide redundancy could be added to strengthen the alignment to the SSA. Also, these strategies are primarily focused on infrastructure and engineering improvements and not on innovative education, enforcement, and vehicle technology. Explicit discussion on how education, enforcement, and emerging technologies can be implemented to proactively supplement infrastructure and engineering solutions could be included in the STSP update. Overall, adding a precursor in the STSP update when discussing the SSA that highlights the importance of the layers of protection and the role they play in providing redundancy on the system could be included such as a graphic illustrating the redundancy (i.e., the Swiss Cheese Model) to explain the concept.

Equity

The plan could prioritize communities and users of the transportation network that are disproportionately impacted by safety challenges and include solicitation of input from those communities and users. Additionally, plan language may include considerations and strategies for addressing inequities in transportation safety investments for all users. MAG's priority throughout the STSP is the prioritization of people, starting with the most vulnerable users of the system.

Furthermore, equity is explicitly mentioned in the goals of the plan, specifically relating to bicycle and pedestrian concerns. MAG carries out these goals through their RSP, which requires project justification in how the equity was measured and used to prioritize safety projects. One strategy included in the STSP includes conducting a network screening and including demographic and land

use data for incorporating equity elements. One consideration for better alignment with the SSA in the STSP update is to promote or discuss how environmental justice measures will integrate into the safety project prioritization methods and MAG processes and policies outside of safety.



OUTCOMES

As a result of the Safe System pilot and related efforts, MAG is doing the following:

Spreading SSA awareness

After completing the pilot workshop, MAG led a presentation to their member agencies to explain how the framework tools could be used and how policies could be better updated to align with the SSA. Disseminating this information to safety and non-safety professionals to regionally align practices and procedures with the SSA is an important step in progressing toward a goal of zero fatalities and serious injuries.

Considering SSA in STSP updates

The STSP is due for an update before 2025. MAG will consider the feedback from this workshop in the upcoming STSP update process. Specific modifications can be made to better align the STSP with the SSA. Through this update, text can be added to serve as overarching adoption of the SSA which can be a guiding document for other policies and practices within the MAG region.



APPLYING THE SAFE SYSTEM POLICY-BASED ALIGNMENT FRAMEWORK IN YOUR AGENCY

The [Safe System Policy-Based Alignment Framework](#) can be used to assess Safe System alignment of any policy, procedure, program, or plan. The following is a summary of the lessons learned from the MAG pilot that may benefit other agencies applying the Policy-Based Framework.

- ▶ **PROVIDE GUIDANCE AND RESOURCES**—MAG's STSP includes a strategy to develop a Regional Priority Safety Implementation Toolkit (RP-SIT). The toolkit will catalog over 8,500 safety recommendations, location characteristics, and available sociodemographic data into a queryable database to assess applicable project safety elements. The toolkit will also provide guidance, case studies, and communication materials to better inform local agencies during the project planning process. As more agencies begin to adopt the SSA into their policies, plans, and programs, it may be helpful to develop resources to support integration and redundancy across the system.

For more information about the Safe System Policy-Based Framework and other FHWA Safe System related tools and resources, please visit:
<https://highways.dot.gov/safety/zero-deaths>.

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ZERO IS OUR GOAL
A SAFE SYSTEM IS HOW WE GET THERE