

# OM-05: Safety Management

1-15 points

**Goal:** Maximize the safety of the existing roadway network through a systematic and comprehensive review of safety data and the allocation of resources in planning and programming to support safety in operations and maintenance.

## Sustainability Linkage

Reducing fatal and serious injuries contributes to the social and economic principles by reducing the impacts associated with personal and public property damage, injury, and loss of life.



## Background and Scoring Requirements

### Scoring Requirements

#### **Requirement OM-05.1**

#### **2 or 4 points. Assess Current Safety Performance**

Assess the current safety performance of the state or region, identify prevailing trends in fatal and serious injuries based on a variety of metrics, and identify safety performance metrics most appropriate to assess progress in improvement of the safety performance of the state or region.

Prevailing trends reflect the characteristics of the safety performance of the state or region that would most benefit from improvement, that measure performance of the system for vulnerable user groups, and that reflect the reliability of the system (for example, as it relates to incidents and crashes on major through routes). Once the agency identified a set of safety performance metrics that define safety performance for the region (measures that reflect areas associated with the largest amount of fatal and serious injuries and those associated with vulnerable users and system reliability), the agency quantifies the current or base safety performance of the system.

Safety performance metrics typically account for fatal and serious injuries related to, for example, collision types, user groups involved, behavioral characteristics, vehicle types involved, or other crash-related circumstances. Safety performance metrics may also account for, for example, particular fatal and serious crash characteristics showing increasing trends.

Scoring for this requirement is based on the following, cumulative requirements:

- **Requirement OM-05.1a**

#### **2 points. Evaluate Safety Performance**

For state agencies (for metropolitan or regional agencies see below):

One of the following scores applies:

- **0 points.** Quantify the safety performance of the state in terms of a rate or solely with the use of one metric: the overall number of fatalities or fatal and serious injuries in the state or region.
- **2 points.** Identify safety performance measures for the state and evaluate the safety performance of the state through a quantitative evaluation of the safety performance of the state in terms of:

- The number of fatal and serious injuries across collision types, and user groups; and where particular user behaviors are present that would increase the risk of fatal and serious injury crashes (for example, unbelted vehicle occupants), and
- Fatal and serious crash characteristics that reflect the status of safety culture among road users (for example, drinking and driving).

In most cases, such quantitative assessments are included as part of the development of the SHSP (refer to the FHWA's *Strategic Highway Safety Plans: A Champion's Guide to Saving Lives*<sup>1</sup> and other SHSP-related resources) and those reflecting safety culture.

For metropolitan or regional agencies (for state agencies see above):

One of the following scores applies:

- **0 points.** Quantify the safety performance of the region in terms of a rate or solely with the use of the overall number of fatalities or fatal and serious injuries in the region.
- **2 points.** Conduct a safety performance evaluation that includes:
  - Evaluation of the safety performance of the region across the emphasis areas in the SHSP or agency if this is regional.
  - Evaluation of regional safety performance related databases (crash, roadway, and other databases mentioned in the FHWA's *Strategic Highway Safety Plans: A Champion's Guide to Saving Lives*<sup>1</sup>) to identify any additional emphasis areas that may be unique to the region or different from state priorities. These additional emphasis areas reflect regional differences in the nature of these crashes, road network characteristics, and community priorities.

The product of this activity is a list of emphasis areas along with the number of fatal and serious injuries associated with each emphasis area where feasible. The list of emphasis areas would also include those for which the number of associated fatal and serious injuries would be difficult to quantify; for example, EMS, data and analysis, and workforce development.

Metropolitan or regional agencies safety performance evaluations can be conducted as part of metropolitan or regional agency participation in the development of the state SHSP (refer to the FHWA's *Strategic Highway Safety Plans: A Champion's Guide to Saving Lives*<sup>1</sup> and other SHSP-related resources).

- **Requirement OM-05.1b**

**2 points. Identify Safety Performance Metrics**

Identify safety performance metrics for the reduction of fatal and serious injuries in the state or region.

One of the following scores applies:

- **0 points.** Use the rate or total number of fatal and serious injuries as the sole safety performance metric for the state or region.
- **2 points.** Identify safety performance metrics for each of the emphasis areas identified during the evaluation of the safety performance of the state or region:
  - For emphasis areas related to particular collision types or users, each of the metrics measures the change in the number of fatal and serious injuries for the particular collision type or user group.
  - For user behavior-related metrics the associated metrics reflect the change in the number of fatal and serious injuries in crashes where these behaviors are present; and the change in the portion of overall fatal and serious injuries where the behavior is reported. For example, if an emphasis area is identified

as: *Reduce the fatal and serious injuries involving drinking and driving*, then the metrics include at least the following: (a) the number of fatal and serious injuries sustained in crashes where one or more drivers were drinking and driving; and (b) the portion of drivers that were drinking and driving in fatal and serious injury crashes.

- For emphasis areas that cannot be readily measured in terms of fatal and serious injuries, metrics would identify improvement in these areas based on other criteria. For example, for EMS, the metrics may include the number of drivers that die on the scene and the number of drivers that die on their way to a hospital or trauma center.

NOTE: Metropolitan or regional agencies. Evaluate the incidence of fatal and serious injury crashes in the jurisdiction and identify emphasis areas based on the evaluation. For a metropolitan area, not all the emphasis areas in the SHSP may be applicable due to the urban nature of the area, and for rural counties, some of the more urban emphasis areas may not be relevant.

### **Requirement OM-05.2**

#### **3 points. Set Goals and Targets**

Set goals and targets for each of the safety performance metrics identified for the reduction in fatal and serious injuries.

For state agencies (for metropolitan or regional agencies see below):

Set safety performance metrics that are consistent with the emphasis areas in the state

SHSP. For metropolitan or regional agencies (for state agencies see above):

Set safety performance metrics for each of the emphasis areas identified during the evaluation process described earlier. Where applicable, these should be consistent with the metrics in the SHSP that also reflects prevailing trends in the region.

Scoring is based on the following, cumulative requirements. The first requirement must be accomplished to earn the second.

- **Requirement OM-05.2a**

#### **1-2 points. Set Safety Goals and Targets**

One of the following scores applies:

- **0 points.** Set no safety performance goals, or performance goals are expressed solely as a rate (for example, crash rate, and fatal and serious injury crash rate).
- **1 point.** Set safety performance goals that can be readily achieved under current program and agency activity priorities.
- **2 points.** Set long-term goals and intermediate targets for improvements in the safety performance metrics in addition to the State’s fatality reduction goal (which is set under an agreement reached between NHTSA and GHSA). Goals and targets set by the agency should reflect meaningful reductions on an ongoing basis; acceleration in reductions that would require a concerted effort to achieve. These goals should measure the numeric change in fatalities and serious injuries across emphasis areas, and the incidence of behaviors that increases the risk of fatal and serious injury crashes.

For example, for the emphasis area “Reduce drinking and driving,” the safety performance metrics would include: (a) change in the outcome of crashes where one or more drivers were drinking (change in the number of fatal and serious injuries sustained in crashes where one or more drivers were drinking); and b) change in the portion of fatal and serious injury crashes where one or more drivers were drinking. In other words, the

metrics should direct, for example, changes in user behavior in addition to overall reductions within an emphasis area.

- **Requirement OM-05.2b**

Two points must be earned on OM-05.2a to accomplish this requirement.

**1 additional point. Integrate Safety Goals with Maintenance & Operations**

Integrate these goals to make resource decisions for maintenance, repair, and operations activity.

**Requirement OM-05.3**

**1-2 points. Develop a Plan**

Develop a plan to support the reduction in fatal and serious injuries in the state or region. Depending on the structure and needs of the agency, this could be one plan or a set of consolidated plans from differing geographies or levels of governance (headquarters, district, etc.); however to achieve points for this scoring requirement, all geographies of the agency must be included.

Scoring is based on the following, cumulative requirements. The first requirement must be accomplished to earn the second.

- **Requirement OM-05.3a**

**1 point. Develop Statewide or Regional Safety Plan**

One of the following scores applies:

- **0 points.** No plan exists, or the plan does not (a) incorporate all the emphasis areas; (b) identify strategies and lead agencies; and (c) present a system-wide approach to identify expenditure on programs, projects, and activities targeting a reduction in fatal and serious injuries in the region.
- **1 point.** Develop a statewide or regional safety plan as part of a collaborative effort across all levels of government (federal, state, and local level). The plan:
  - Presents a system-wide approach to reduce the risk of fatal and serious injuries that rely on systematic and scientific methods and approaches that (i) are aimed at reducing the overall severity of crashes rather than the frequency of crashes; and (ii) incorporate performance thresholds (base performance).
  - Includes specific strategies and lead agencies for each the emphasis areas in the plan.
  - Supports integrated and multidisciplinary approaches to reduce the number of fatal and serious injuries on the entire public highway system.
  - Demonstrates a commitment to prioritize safety improvements through their programming decisions for safety projects and the use of safety funding.

The plan could be a single statewide plan or a combination of SOPs at headquarters and district/regional levels; or a plan for a county, metropolitan area, or regional council area.

- **Requirement OM-05.3b**

At least one point must be earned on OM-05.2a to accomplish this requirement.

**1 additional point. Include Strategies and Activities to Support Improvement of Data and Analysis**

Include, as part of the plan, specific strategies and activities to support improvement of data and analysis capabilities across the public highway system. For example, improvement of the quality and accuracy of crash location information within a geographic framework (GIS), improved traffic record systems, improved analysis

tools, linkage across databases (for example, medical, asset management, incident management). These activities should be part of the larger state traffic records program coordinated and supported by the state Traffic Records Coordinating Committee (TRCC). The benefits of such a process include, but are not limited to: improved data quality, improved safety performance metrics, improved reliability of analysis results, improved the ability to identify appropriate emphasis area needs, improved implementation by targeting funding where it is needed most, improved reliability of economic evaluations, and improved ability to evaluate and monitor the safety performance of the public highway system.

#### **Requirement OM-05.4**

##### **1 or 3 points. Implement the Plan**

For state agencies (for metropolitan or regional agencies see below):

One of the following scores applies:

- **0 points.** No plan exists, or implementation of projects, activities, and programs occur within agencies without integration or collaboration across state and regional agencies in support of the common goal to reduce fatal and serious injuries on the public highway system.
- **3 points.** Implement the plan in an integrated and multidisciplinary manner. Implementation needs to incorporate proactive and reactive approaches to fatal and serious injury reduction:
  - Programming and implementation of projects, activities, and programs reflects priorities of the plan.
  - Implementation of strategies within the plan occurs in an integrated, coordinated, and multidisciplinary way, involving different technical areas (planning and engineering), other disciplines such as EMS and public health.
  - Specified implementation actions require the involvement of different state, federal, and local agencies across multiple disciplines.
  - Implementation includes strategies that are proactive as well as reactive.
  - Implementation reflects an approach that incorporates consideration of the reduction of the risk that a crash occurs, reduction of the risk of fatal and serious injury during the crash, and reduction of the crash outcome. For example, drinking and driving increases the risk of a crash occurring; installation of cable median barrier reduces the risk of fatal and serious injury during a crash; and short response times by qualified and skilled EMS improves the likelihood that injured victims will survive the crash.
  - Consider implementation of systemic approaches to reduce fatal and serious injury risk on the public highway system.

For metropolitan or regional agencies (for state agencies see above):

One of the following scores applies:

- **0 points.** No plan exists, or implementation of projects, activities, and programs occur within agencies without integration or collaboration across state and regional agencies in support of the common goal to reduce fatal and serious injuries on the public highway system.
- **1 point.** Implement the plan in close cooperation with local agencies. Facilitate and support allocation of funding that reflects the priorities of the plan to the extent possible.
- **3 points.** Adopt PlanSafe or a similar program as an integral part of the agency's technical process for conducting transportation planning.

PlanSafe is an advanced quantitative tool that uses macro-level predictive models to assess the impact of long-range planning (20-year horizon) on safety performance. The results provide a quantitative and statistically reliable forecast of crashes for a given future travel demand (using output from travel demand models) and socio-demographics if no particular improvements in safety culture, infrastructure, EMS, and other areas occur other than what exists at the base year of the analysis. Future forecast assists in identifying actual improvements in safety performance needed over longer period (20 years) to meet long-term safety performance goals. See the TRB's [Report on PlanSafe](#)<sup>2</sup>.

### **Requirement OM-05.5**

#### **1-3 points. Measure Progress and Monitor Performance**

Advanced methods set a baseline for performance without change brought about by the plan, accounts for the unique nature of crash data, and account for volume and socio-demographic changes. Agencies can use tools such as PlanSafe to estimate anticipated performance of the system without intervention and compare results with actual performance with implementation.

Statistically sound approaches account for crash data as count data that are heavily skewed. Agencies can use the advanced evaluation methods in Chapter 9 of the *Highway Safety Manual*<sup>3</sup> (HSM) for project and program evaluation (these advanced methods account for regression to the mean (RTM) effects that are common to safety studies and applications). While treatments at sites require monitoring over the first year to identify any unintended effects, it is necessary to extend the evaluation period to a three to five year before and after period to support statistically valid evaluation.

One of the following scores applies:

- **0 points.** Measure progress and change in the system safety performance solely based on the overall crash rate, crash rates for typical facilities, the rate of fatal and serious injuries, or the total number of fatal and serious injuries.
- **1 point.** Measure progress using some of the safety performance metrics previously identified. The evaluation is limited to an overall summary of the number of fatal and serious injuries across the state or region.
- **2 points.** Measure the performance of the public highway system in the region using advanced and statistically sound methods to perform evaluations of the safety performance of the system.
- **3 points.** Measure the performance of the public highway system in the region using advanced and statistically sound methods to perform evaluations of the safety performance of the system AND incorporate project and program evaluations into the monitoring process. Use statistically sound evaluation approaches.

### **Resources**

The following resources are referenced in this criterion and consolidated here:

1. FHWA, *Strategic Highway Safety Plans: A Champion's Guide to Saving Lives*, <http://safety.fhwa.dot.gov/safetealu/guides/guideshsp040506/guideshsp040506.pdf>
2. TRB, Report on PlanSafe, <http://www.trb.org/Main/Blurbs/163790.aspx>
3. AASHTO, Highway Safety Manual, [https://bookstore.transportation.org/collection\\_detail.aspx?ID=135](https://bookstore.transportation.org/collection_detail.aspx?ID=135)

### **Scoring Sources**

The program is considered to have met this criterion if the requirements above can be reasonably substantiated through the existence of one or more of the following documentation sources (or equal where not available):

1. The agency's plan for safety improvements.

2. The state SHSP, Highway Safety Plans, and Annual Report submitted annually for the Highway Safety Program for NHTSA.
3. Annual review of safety performance of the system, data, trends, and 3- or 5-year averages.
4. Annually collected documentation that measures safety performance of the road network, including fatalities and serious injuries for all facilities within their jurisdiction. The report would outline changes in aggregate safety performance across the safety performance metrics, identify the actions taken through projects, activities and programs to reduce the fatal and serious injury crashes, and results from evaluations of the safety performance of implemented projects, activities, and programs.
5. Maintenance project reports, technical memos, or other supporting documentation that demonstrate application of evaluation methods such as those described in the HSM; and report on the existing system safety performance (frequency, crash type, severity) and comparisons with appropriate benchmarks.
6. Memoranda or calculations documenting the effectiveness over the life of the solution, treatment, or countermeasure in reducing crashes. Using processes outlined in the AASHTO HSM determine the benefit-cost ratio (reduction in total crash cost anticipated for the project investment), or net present value (difference between the anticipated reduction in total crash cost and the project investment) for the project.
7. Research report that documents a post-implementation effectiveness evaluation of projects. Such a report shall include collection of actual crash data before and after implementation, and shall follow the Empirical Bayes process or advanced methods that account for RTM where feasible. Feasible refers to the availability to perform the evaluation using predictive methods; for example, availability of calibrated HSM SPFs or state-specific SPFs available for appropriate application of the EB method.
8. A report that documents system safety performance evaluation and performance across various performance measures identified as part of the state or regional safety plan.
9. A capital improvement program description that documents how the agency specifically prioritizes ongoing safety improvements through allocation of funds to safety-based programs. For example, documentation of the projects funded in safety-based programs and their relative anticipated impact on fatal and serious injury crashes.