

SP-6

Safety Planning

Goal

Agency integrates quantitative measures of safety into the transportation planning process, across all modes and jurisdictions.

Sustainability Linkage

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



Crashes are also a major source of nonrecurring congestion, which, in some places, is estimated to account for half of all congestion.¹ Thus reducing crashes also tends to improve mobility with benefits across the Triple Bottom Line (TBL). The process of reducing crashes starts with systematic, collaborative, data-driven planning.

Potential TBL Cost Savings*



\$\$ - DOTs can save on the cost of emergency response, property damage, administrative, legal, and liability costs of crashes.



\$\$\$ - Highway users can save millions of dollars in crash (property damage), travel delay, and workplace productivity costs.



\$\$\$ - Reducing crashes can prevent adverse environmental impact costs (added fuel usage and air quality emissions caused by congestion).



\$\$\$\$ - Safety planning can save people's lives and enhance quality of life.

*Order of magnitude dollar equivalent potential savings for planning and implementation of highway safety measures: \$~1M, \$\$~10M, \$\$\$~100M, \$\$\$\$~1B

Basis for Savings

The U.S. Department of Transportation (USDOT) National Highway Traffic Safety Administration (NHTSA) reported 33,561 fatalities, 2.36 million injuries, and 9.9 million vehicles were involved in motor vehicle crashes in the United States in 2012² with total TBL costs approaching \$1 trillion.³ Additional information is available from the FHWA Operations Benefit/Cost Analysis Desk Reference.⁴

Comprehensive, collaborative, data-driven safety planning is essential, not only to reduce the economic and social costs associated with these motor vehicle crashes, but most importantly to help save people's lives.



Safety planning to reduce crashes is the first step to prevent property damage, emergency response, litigation, and liability costs associated with crashes.⁵ Capacity needs may also be reduced through reduction of crash induced delays.⁶



Crash reduction improves system reliability resulting in increased productivity and efficiency for users.⁷ NHTSA estimated that the total pure economic cost of motor vehicle crashes in the U.S. in 2010 was about \$277 billion.⁸



Crash reduction lowers vehicle emissions released by idling traffic⁹ as a result of congestion, and avoids petroleum and toxic spills from commercial vehicle crashes.¹⁰ NHTSA estimates that adverse environmental impact costs of crashes in 2010 were \$28 billion.¹¹



According to NHTSA the societal costs of motor vehicle crashes in the U.S. reflected as impacts to quality of life factors exceeded \$590 billion in 2010.¹²

Agency Experience

Washington State Department of Transportation (WSDOT) conducted an INVEST pilot study that evaluated three corridor studies and found that the SP-6 criteria could be used to effectively integrate quantitative safety planning and considerations into these projects.¹³ California DOT's Highway Safety Improvement Program (HSIP)¹⁴ helped reduce the number of fatal collisions (19.6 percent) and number of persons injured (18.8 percent) at 95 highway locations.¹⁵

Transportation Safety Planning (TSP)

The mission of TSP is to reduce transportation fatalities and serious injuries by supporting comprehensive, system-wide, multimodal, data-driven, and proactive regional and statewide transportation planning processes that integrate safety into surface transportation decision-making. TSP involves processes that yield the following products: Strategic Highway Safety Plans (SHSP), safety provisions in the Statewide Transportation Improvement Programs (STIP) and Transportation Improvement Programs (TIP), and long-range transportation (20-year) plans.

Comprehensive and Collaborative

Starting with Federal law that requires state and metropolitan transportation planning processes to be consistent with the SHSPs, TSP supports comprehensive, system-wide, multimodal proactive planning processes to protect motorized and non-motorized users including pedestrians, vehicle occupants, bicyclists, motorcyclists, older users, and children.

State Departments of Transportation (DOTs) and Metropolitan Planning Organizations (MPOs) play the leading roles in TSP. However, to make the greatest impact a broad range of other stakeholders should be engaged and involved,¹⁶ including:

- ✓ State, Local, and Tribal Transportation Agencies
- ✓ Emergency Medical Services
- ✓ Local Law Enforcement
- ✓ Transit Agencies
- ✓ State Agencies
- ✓ Federal Agencies
- ✓ Trade Associations
- ✓ Highway Safety Advocates
- ✓ Private sector entities

Data Driven

TSP work is based on a scientific approach that includes collection and maintenance of safety data, data analysis, project development, and monitoring.

Analysis tools¹⁷ include:

- ✓ The Highway Safety Manual (HSM)
- ✓ Crash Modification Factors (CMF)
- ✓ Interactive Highway Safety Design Model (IHSDM)
- ✓ Safety Analyst to identify safety improvement needs and cost-effectiveness
- ✓ Systemic Safety Project Selection Tool to consider risk as well as crash history.
- ✓ Highway Performance Monitoring System (HPMS) Viewer and Geographic Information System (GIS) Tools
- ✓ PlanSafe to incorporate sociodemographic data
- ✓ U.S. Road Assessment Program (usRAP) benchmarking safety performance
- ✓ Pedestrian and Bicycle Crash Analysis Tool (PBCAT)
- ✓ Bicycle Countermeasure Selection System – BIKESAFE
- ✓ Pedestrian Safety Guide and Countermeasure Selection System – PEDSAFE
- ✓ Interchange Safety Analysis Tool (ISAT).
- ✓ Surrogate Safety Assessment Model (SSAM) to assess design alternatives using traffic simulation models

Notes on Valuation

The range in agency cost savings realized through TSP implementation can be expected to vary across states due to:

- ✓ Current crash rates
- ✓ Highway congestion
- ✓ Stakeholder collaboration
- ✓ Degree of system maturity

Individual Assessments

States are encouraged to review the following references, and to consult the FHWA INVEST Subject Matter Expert, Robert.Ritter@dot.gov for additional working materials in assessing their own unique situations and/or if they have information that could assist others on this topic.

References

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- 15 AASHTO Subcommittee on Safety Management. "Caltrans Accomplishments and Issues" (n.d.). Accessed June 10, 2014, <http://scohts-sm.transportation.org/Documents/CaliforniaReport.pdf>.
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