Chapter 321 Sustainable Safety Analysis

321.01 Sustainable Safety Related Policy

The Washington State Strategic Highway Safety Plan, "Target Zero" has a vision to reduce traffic fatalities and serious injuries to zero by 2030. WSDOT is pursuing this goal along with partners such as Washington State Patrol (WSP) and Washington Traffic Safety Commission (WTSC). WSDOT recognizes that risk exists in all modes of transportation. The universal objective is to reduce the number of fatal and serious injury crashes within the limits of available resources, science, technology, and legislatively mandated priorities.

The *Secretary's Executive Order E 1085*, Sustainable Highway Safety Program, sets the policy for the Washington State Department of Transportation (WSDOT) to embark on a targeted and scientifically-based Engineering approach for identifying and addressing crash risks that is multimodal and coordinated with the other three "E"s, Education, Enforcement, and Emergency Services. Sustainable Safety employs a "5th E", Evaluation, this is the analysis and diagnosis of crashes and to target their contributing factors in addressing highway safety performance. Evaluation relies on quantifying safety performance using scientific tools and assessment techniques to determine appropriate safety countermeasures.

Practical Solutions is an approach to making project decisions that focus on resolving the project need for the least cost without adversely impacting safety performance. Sustainable Safety is the approach for resolving safety performance within WSDOT's Practical Solutions as directed in *Secretary's Executive Order E 1090*, Moving Washington Forward: Practical Solutions.

E 1085 directs engineers to base project-level decisions on safety analysis of specific locations and corridors and focus on proven lower-cost targeted countermeasures at specific locations that optimize the return on investment of safety dollars. These lower-cost investments allow for additional identified locations to be addressed. Sustainable Safety is therefore an essential part of successful Practical Design implementation. It provides the process and methods to incorporate safety performance assessment and peer-review into Performance-Based Practical Design. Sustainable Safety allows the planner, engineer, and decision maker, to identify and quantify the safety performance of alternatives during project development.

Implementing Sustainable Safety improves WSDOT's effectiveness in reducing the risk of fatal and serious injury crashes statewide. It focuses on the contributing factors and types of crashes through the use of state-of-the-art principles and analytical methods to diagnose, quantify, and predict safety performance.

The Sustainable Highway Safety Policy directs WSDOT to use effective and efficient resources, like the AASHTO Highway Safety Manual (HSM) to achieve the goals of the Washington State Strategic Highway Safety Plan: Target Zero. This approach:

- Optimizes the reduction in fatal and serious injury crash potential on Washington's highways.
- Provides quantifiable assessment of crash potential.
- Identifies locations that have a higher potential for crash reduction.
- Provides reliable and accurate assessment of potential crash reduction benefits.
- Identifies and deploys solutions with optimal benefit/cost within the WSDOT safety priority programming process or through low cost operational improvements.

- Reduces waste by focusing on design elements that provide a reduction in crash potential.
- Addresses locations that will result in a higher crash risk reduction potential for a given investment level.
- Provides an accurate assessment of project and program performance.
- Provides scientific and engineering tools to continually improve and refine safety analyses.

Sustainable Safety is a critical, integral part of Practical Solutions that supports Washington in reaching its Target Zero goal.

321.02 HQ Safety Technical Group

The HQ Safety Technical Group is comprised of experts in safety analysis. The team has several duties including maintaining the Safety Analysis Guide, safety analysis training, review of complex safety analysis, review of Crash Analysis Reports, and approve the use of crash modification factors. The team can also provide assistance to a project office as they conduct safety analysis.

321.03 Project Related Safety Analysis

All projects are required to have a safety analysis for Design Approval (see Chapter 300). The safety analysis is intended to be scalable. The Safety Analysis Guide provides direction on the scope and scale of safety analysis for each funding subprogram (i.e. I-1, I-2, P-3) and each document needing a safety analysis (i.e. Design Analyses, Access Revision Reports (ARRs), Intersection Control Evaluations (ICEs)). Contact the HQ Safety Technical Group if your project is not covered by the Safety Analysis Guide or if you have questions regarding how to use the guide.

321.04 Safety Analysis

The *Safety Analysis Guide* contains guidance on the content of stand-alone safety analyses for Design Analyses, Crash Analysis Reports (CAR), ICE, Transportation Management Plans, Road Safety Audits, Environmental Impact Statements, and ARRs. Use the procedures described in the WSDOT Safety Analysis Guide when performing a safety analysis. Contact the HQ Safety Technical Group if you have any questions or need to develop a stand-alone safety analysis that is not covered in the Safety Analysis Guide.

321.05 Reports and Documentation

The CAR, ICE, and Basis of Design (BOD) utilize safety analysis. They are described in the following subsections. For approval requirements, refer to Chapter 300.

321.05(1) Crash Analysis Report

A Crash Analysis Report (CAR) is developed during the scoping phase for I-2 Crash Reduction projects and is required for funding to be released. Contact Headquarters Traffic for a copy of the latest version of the CAR template.

Projects with an approved CAR may, in some cases, be exempted from the requirement to prepare a Basis of Design (see Chapter 1100.)

321.05(2) Intersection Control Evaluation

Projects that require an Intersection Control Evaluation (ICE) need to do a safety analysis on the alternatives. If a project has a completed CAR, the ICE may reference this CAR. If not, the safety analysis for the ICE should have a scale and scope associated with its funding source as noted in the Safety Analysis Guide.

321.05(3) Basis of Design

The Basis of Design (BOD) utilizes metrics and targets in the baseline and contextual needs. If the chosen metric is safety related utilize a safety analysis to determine the potential for crash reduction for various alternatives. The safety analysis may also be used as a component in the Alternative Comparison Table (ACT) to allow easier comparison across alternatives. The scale and scope of a safety analysis for a BOD is associated with its program type and is explained in the Safety Analysis Guide.

321.06 References

321.06(1) Federal/State Directives, Laws, and Codes

23 United States Code (USC) 148 – Federal requirements for the Highway Safety Improvement Program (HSIP)

Revised Code of Washington (RCW) 47.05.010 – The statement of purpose for priority programming of transportation projects

Secretary's Executive Order 1085 – Sustainable Highway Safety Program

Secretary's Executive Order 1090 – Moving Washington Forward: Practical Solutions

321.06(2) Design Guidance

Safety Analysis Guide, WSDOT; See Sustainable Highway Safety Tools here:

Safety Analysis Guide (wa.gov) (PDF)

Highway Safety Manual (HSM), AASHTO, 2010

A Policy on Geometric Design of Highways and Streets (Green Book), AASHTO, 2011

321.06(3) Supporting Information

Strategic Highway Safety Plan: Target Zero – Washington State´s strategic traffic safety plan developed by the Washington Traffic Safety Commission: www.targetzero.com/

Sustainable Highway Safety Internal Web Page – Contains all of the procedures and tools to implement highway safety: Design - Support | WSDOT (wa.gov)

Washington Transportation Plan – Washington State Transportation Commission´s recommended strategic transportation plan; includes a highway safety element: Safety | Policy, Vision & Recommendations (wtp2040andbeyond.com)