

Data-Driven Safety Training

Application Areas

Part 4 Safety Programming

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Outline

1 Design Exception

2 Traffic Impact Study

3 Design Build

4 Safety Programming

Introduction and goals

Economic analysis

Prioritization

Safety Programming

- “Safety programming” defined broadly
 - any systematic process to prioritize transportation funding to optimize safety
 - outline intended use of funding
- Safety programming examples
 - Missouri district safety plans
 - regional safety plan
 - city safety plan

Safety Programming

- Optimize use of limited funding, including safety funding
 - e.g. FHWA safety funds distributed to MoDOT districts
- Not limited to safety fund programming, many projects have safety aspects
- See MoDOT EPG 907.1 Safety Program Guidelines

Safety Programming

Safety planning

- Identify top safety needs
- Strategies to reduce fatalities and serious injuries
- List safety projects
 - location
 - describe safety improvement
 - expected benefits
 - benefit/cost ratio
 - number of crashes reduced (e.g. FI)

Safety Programming

Project analysis

- Expected safety benefit of safety treatment
 - crash reduction prediction using HSM
 - no-build estimation
 - safety treatment estimation
 - crash prediction using CMF
 - e.g. FHWA's CMF Clearinghouse
 - crash valuation in dollar amount
 - translation to dollars allows comparison among different treatment, sites, etc.

Safety Programming

- Comprehensive Crash Unit Cost (2016 dollars)
 - K \$11,295,400
 - A \$655,000
 - B \$198,500
 - C \$ 125,600
 - O \$11,900
- Crash Costs for Highway Safety Analysis (2018) – FHWA Safety Program

Safety Programming

- Adjusting to Missouri
- PCI (per capita income) ratio adjustment
 - Cost of living adjustment
- Multiply all crash unit costs (i.e. by severity and type) by the PCI ratio value
- Missouri PCI \$43,723 (2016), PCI ratio 0.88203

Safety Programming

- Comprehensive Crash Unit Cost (2016 dollars) adjusted for Missouri
 - K \$9,962,882
 - A \$577,730
 - B \$175,083
 - C \$ 110,783
 - O \$10,496

Safety Programming

- Prioritizing/ranking safety
 - locations
 - treatments
 - projects
- e.g. FHWA HSIP funds require annual programming, else it will lapse

Safety Programming

- Performance measures
 - crash frequency
 - e.g. focus on FI or total
 - crash rate
 - HSM expected safety performance
 - e.g. total number of expected fatal crashes/fatalities saved, total number of expected injuries reduced

Safety Programming

References

- MoDOT EPG 907.1 Safety Program Guidelines
- Highway Safety Manual (AASHTO 2014)
 - Chapter 7 – Economic Appraisal
- S-HAL: Safety Handbook for Locals (MoDOT 2014)
- Crash Costs for Highway Safety Analysis (FHWA 2018)