

Data-Driven Safety Training

Application Areas

Part 3 Safety Design Build

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Outline

1 Design Exception

2 Traffic Impact Study

3 Design Build

Project delivery methods and goals

St. Louis Safety DB example

4 Safety Programming

Safety Design Build

- Project delivery compared
- Traditional design-bid-build issues
 - constructability – builder not involved with design
 - flexibility – builder limited to specific design, even way of building
 - timing – non-overlapping design then construction
 - risk allocation – builder bears no risk for design
 - innovation – unable to use technology, efficiencies, creativity to accomplish same goals with different design

Safety Design Build

- Project delivery compared
- Design build potential
 - contracting – single point of responsibility
 - schedule - overlap design and construction
 - cost – minimize cost to leverage synergies in simultaneous design and construction
 - risk – design and construction allocated to contractor
 - innovation – contractor can exploit own strengths in terms of skills, labor, equipment

Safety Design Build

Goal

- best overall value
- reach project goals without restricting the pathway

See MoDOT EPG 139 Design-Build

Safety Design Build

Candidate characteristics

- multiple possible solutions
- benefit from innovations
- high public impact
- unique or unusual conditions

Safety Design Build

Legislative authority and history

- Notable examples
 - I-64 reconstruction 2005
 - kcICON bridge 2007
 - Safe and Sound Bridge Improvement Program 2008
- 2% of annual number of projects allowed as DB

Safety Design Build

St. Louis Safety Design Build Example 2017

- \$24.11M budget
- Funding from Highway Safety Improvement Program (HSIP)
- Open container funds

Safety Design Build

Goals

- Maximize safety benefits
 - reduce fatal and serious injury crashes
- Reasonable service life, low maintenance cost
- Maximize public impacts
- Meet schedule

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Scope

- Data-driven selection
 - top 31 locations
- St. Charles County 15 locations
- Franklin County 16 locations

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- Areas of analysis
 - horizontal curves
 - wet crashes
 - shoulder
 - crossed centerline
 - expressway intersection
 - high severity

Safety Design Build

- Data-driven safety analysis
- Modified HSM spreadsheets
- ISATe spreadsheets

Safety Design Build

- MoDOT oversight
- safety analysis verified by MoDOT and consultant

Safety Design Build

St. Louis safety DB scoring criteria example

- safety improvements 45%
- maintenance and durability of improvements 30%
- maintenance of traffic 15%
- completion schedule 10%