Data Driven Safety Analysis

Application in Design

Goals

- Analyze crash and roadway data to predict the safety impacts
- Improve safety
- Promote informed decision-making
- Target investments wisely

Maintenance and Operations

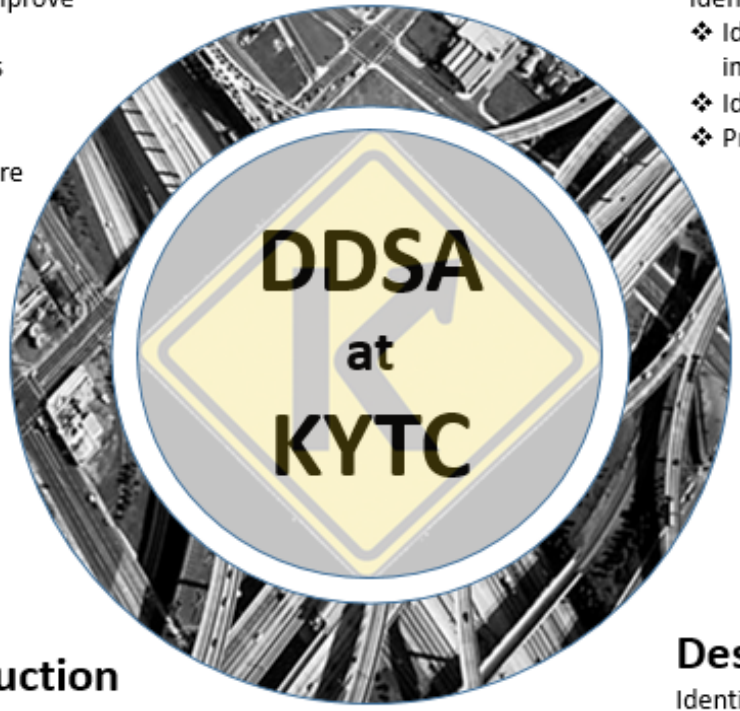
Modify existing conditions to maintain and improve safety and efficient operations

- Identify crash patterns at existing locations
- Evaluate safety effectiveness of potential countermeasures
- Modify policies and design criteria for future planning and design

Planning

Identify needs and program projects

- Identify sites most likely to benefit from safety improvements
- Identify targeted crash patterns for the network
- Prioritize expenditures for efficiency



Construction

Build projects

- Evaluate how performance measures are impacted by design changes and construction
- Assess potential change in crash frequency during design exception evaluation

Design

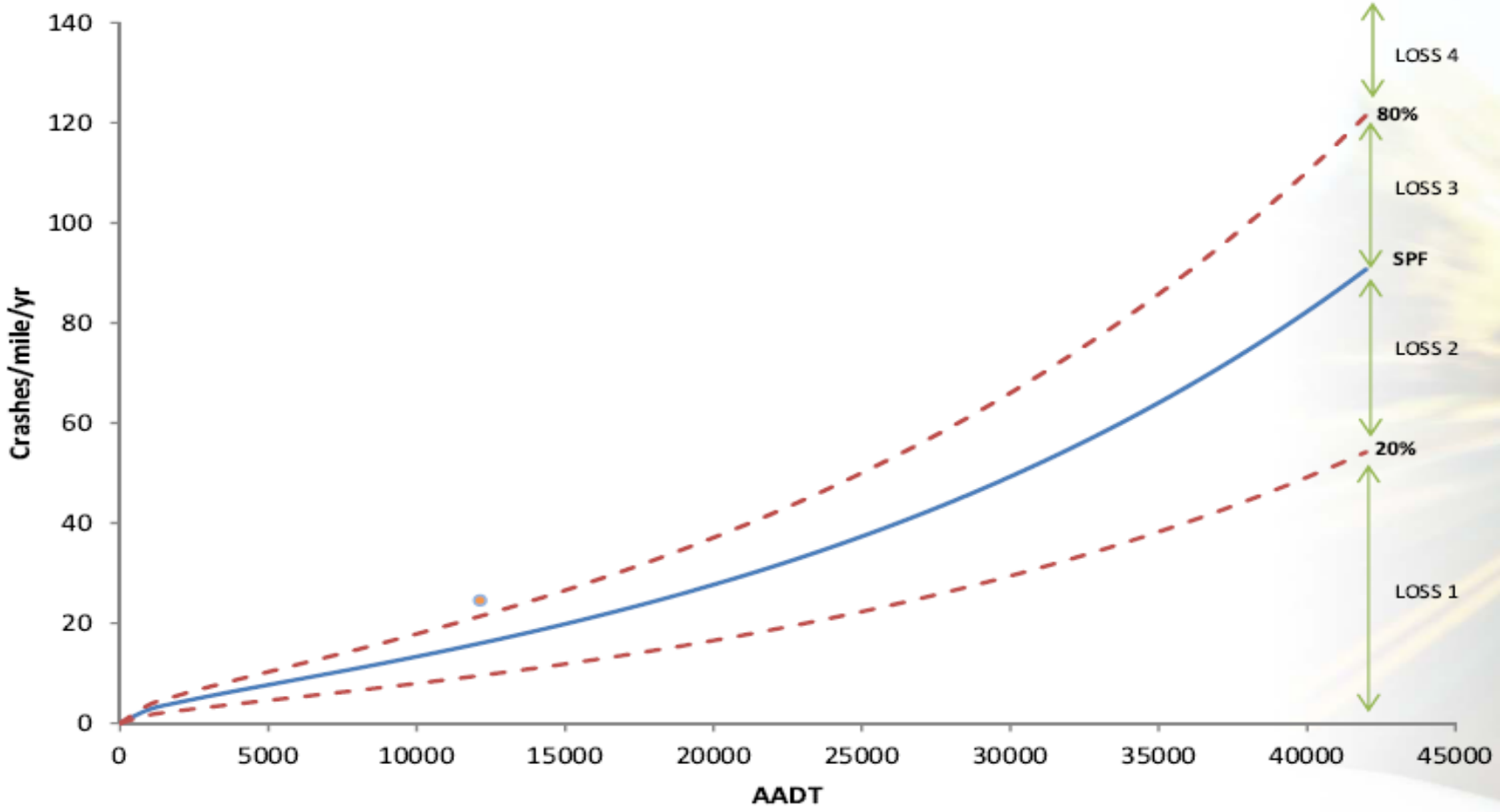
Identify alternatives, choose and design preferred solutions

- Identify targeted crash patterns for projects
- Evaluate countermeasures' costs and effectiveness
- Compare change in crash frequency to predict safety effect of alternatives

Terminology

Historical Level of Service of Safety (LOSS)

- LOSS 1 indicates a substantially better safety performance and a low potential for crash reduction
- LOSS 2 indicates better than expected safety performance and a low to moderate potential for crash reduction
- LOSS 3 indicates less than expected safety performance and a moderate to high potential for crash reduction
- LOSS 4 indicates a substantially worse than expected safety performance and a high potential for crash reduction


140
120
100
80
60
40
20
0
Crashes/mile/yr
0
5000
10000
15000
20000
25000
30000
35000
40000
45000
AADT
LOSS 4
80%
LOSS 3
SPF
LOSS 2
20%
LOSS 1

Crash Data Analysis Tool (CDAT)

- Integrates crash with road data
- Includes advanced crash flags
- Includes HSM-based analysis
- Compare to similar roads/regions
- Updated once a year
- Maps… coming soon!

Functionality

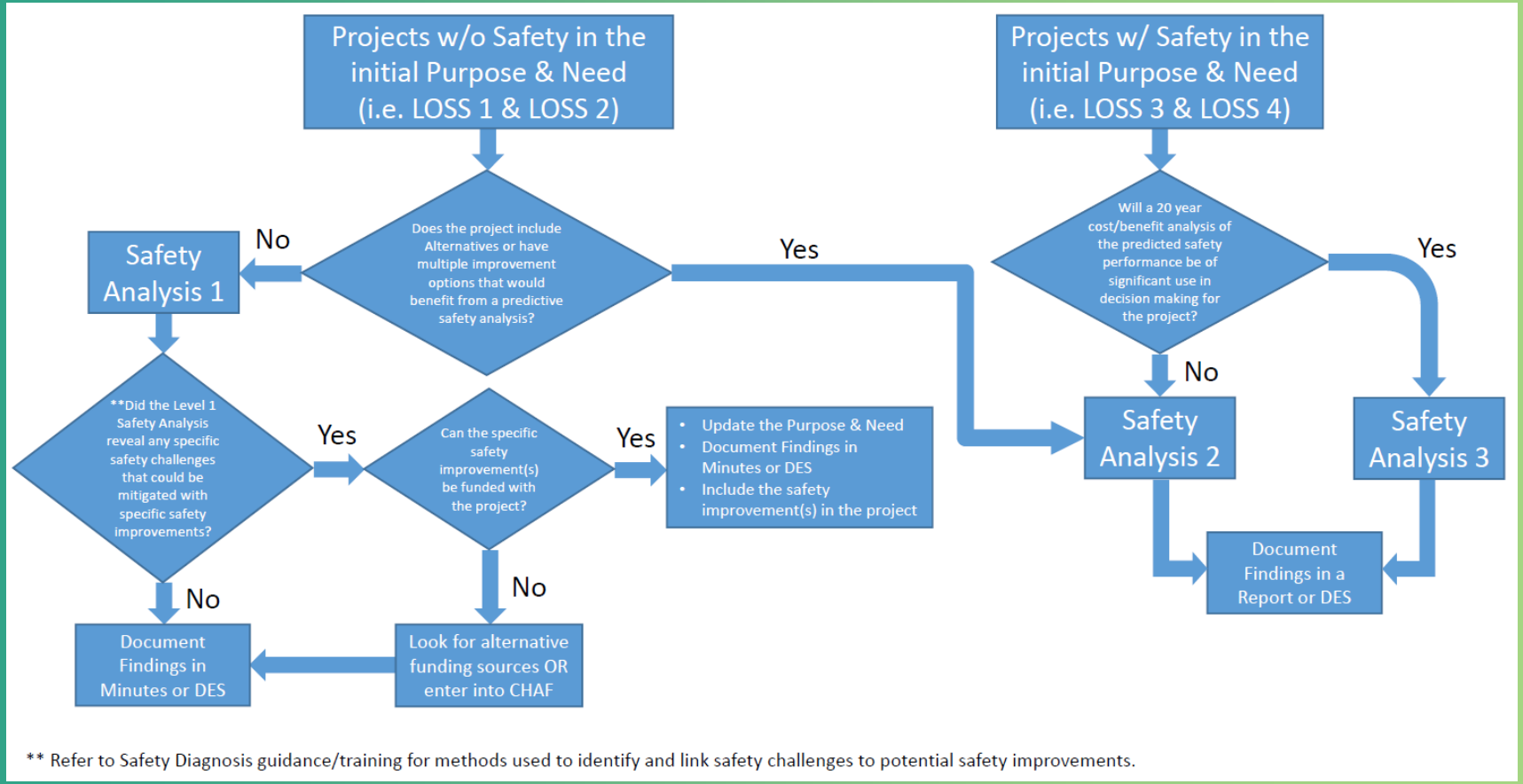
- Query mode:
  - County, route and milepoint range
- Import mode:
  - Upload your own file

Access

- Current and signed MOU on file with KYTC and has access to information as outlined in that agreement

Process

- Project Scoping
  - Diagnosis
- Design Exceptions or Variances
  - Justification
- Alternative Comparison
  - Quantitative Safety Performance



** Refer to Safety Diagnosis guidance/training for methods used to identify and link safety challenges to potential safety improvements.

Safety Analysis 1 (SA1)

Safety is not included in purpose and need (i.e. LOSS 1 or 2) and does not include multiple alternatives or multiple improvement options.

Examples:

- bridge replacements
- maintenance and operations projects
- pavement rehabilitation projects

Safety Analysis 1 (SA1)

- Minimum, should include a review of information from CDAT.
- determine if there may be a specific safety challenge within the project limits that could be mitigated by a specific safety improvement

Safety Analysis 2 (SA2)

Includes alternative analysis or has multiple improvement options.

Examples:

- safety improvement projects
- capacity/mobility projects
- corridor reconstruction projects
- intersection/interchange improvement projects

Safety Analysis 2 (SA2)

- CDAT review as well as some level of predictive safety analysis.
  - simpler projects may only be a comparison of predicted crashes of the competing improvement options
  - more complex projects may need more thorough analysis to quantify the predicted safety performance of the most practical alternatives

Safety Analysis 3 (SA3)

LOSS 4

Examples:

- Any project with a high number of excessive crashes

Safety Analysis 3 (SA3)

- Very thorough CDAT review and in-depth predictive analysis.
- A predictive analysis, as well as a 20 year cost/benefit analysis should be performed for the most feasible alternatives/improvement options, as well as for the no-build