Road Safety Audits

Road Scholar Core Course
Annual County Commissioners Conference
Rick Drumm, P.E.
Safety Engineer
Federal Highway Administration
December 4, 2013
Course Plan

- Highway Safety – the Facts
- RSAs – the Basics
- RSAs – the Process
- RSA Examples – the Practice
“Highway Safety is a good thing.”

- Rick O. Drumm, P.E.
Indiana Highway Fatalities

Yearly vs 5-Year Ave.

Year


Fatalities

1100 1000 900 800 700 600 500 400

Yearly  5-Year Ave.
Highway Fatality Rate
National vs. Indiana
(fatalities per 100 MVMT)
Fatalities for 16-20 year-olds, 2008-2009
Motor Vehicle Crashes is the leading cause of death for the following age groups:

- 4-7
- 8-15
- 16-20
- 21-24
- 25-34
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- 4-7
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The Real Problem

Of every 100 children born this year in the U.S.
One will die violently
in a highway crash during his/her lifetime.

70 will be injured in a crash during their lifetimes…

We must reduce deaths and injuries.
Contributing Factors in Crashes

Road Environment Factors (28%)

Vehicle Factors (8%)

Human Factors (95%)
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Road Safety Audits

Road Safety Audit Reviews

The Basics
First, the Name
Audit? Review? Assessment?

"What's in a name? That which we call a rose
By any other word would smell as sweet."

--From Romeo and Juliet (II, ii, 1-2)
Name Game

- Road Safety Inquisition
- Road Safety Interrogation
- Road Safety Audit (RSA)
- Road Safety Review
- Road Safety Assessment
- Road Safety Audit Review
- Road Safety Audit/Review
"We have implemented RSAs on proposed resurfacing projects. We now see our staff consistently looking for and implementing numerous low cost safety improvements on Iowa’s roads."

Tom Welch
State Safety Engineer (retired)
Iowa DOT
“Road Safety Audits are a proven way to review just how safe our local roads are and can be a valuable tool for local government road professionals in making their roads safer.”

Tony Giancola
Executive Director
Nat’l Assoc. of County Engineers
Road Safety Audit

a formal safety performance examination of an existing or future road or intersection by an independent audit team.
An RSA is NOT….

… a simple standards check for adherence to design guidelines.

… an opportunity to redesign the project.
### Traditional Road Safety Review vs. RSA

<table>
<thead>
<tr>
<th>Traditional Road Safety Review</th>
<th>RSA</th>
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</thead>
<tbody>
<tr>
<td>- Reactive</td>
<td>- Proactive</td>
</tr>
<tr>
<td>- In-house team</td>
<td>- Independent team</td>
</tr>
<tr>
<td>- Field review (sometimes)</td>
<td>- Field reviews always</td>
</tr>
<tr>
<td>- Standards compliance</td>
<td>- Comprehensive, with human factors</td>
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</table>
Why do we need RSAs?

- Relatively few road-related safety issues are identified in collision reports.

- One perspective (owner, engineer, supervisor, etc.) is limiting.
Why do we need RSAs?

- Compromises and constraints are a normal part of transportation budgeting.
- RSAs demonstrate the safety implications of roadway elements.
- RSAs ensure that safety is an explicit consideration, and that safety does not “fall through the cracks”.
Legal Liability

Some Thoughts
Legal Liability

What if we identify issues/problems in the RSA but the agency doesn’t address them?

Do RSAs expose agencies to more legal liability?

- Agencies should seek legal advice.
- Agencies can be taken to court with or without a road safety assessment.
- RSAs can be part of a safety management system.
On January 14, 2003, the United States Supreme Court upheld the constitutionality of 23 USC 409. In section 409, Congress established an evidentiary privilege for information that States and other entities compile or collect for purposes of complying with certain highway safety programs.

i.e., safety information (like an RSA study) is protected from use in the courtroom.
RSA leaders must carefully complete the RSA to a reasonable standard of care and professionalism.

- Identify RSA scope
- Identify RSA materials
- Identify limitations
- Consult road owner during review
“[RSAs] demonstrate a proactive approach to identifying and mitigating safety concerns.”

“Our attorneys say that once safety issues are identified, and if we have financial limitations on how much and how fast we can correct the issues, then the audit will help us in defense of liability.”

RSA’s can be done...

- Planning
- Environment
- Design
- Construction
- Post-construction (existing)
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RSA’s: Basic Principles

- Formal Process
- Team Size
- Multidisciplinary Team
- Independent Team
- Agency support
Formal Process

- Inviting the right people
- Go through proper steps
- Formal Report
- Agreement to Action
Formal Process

Stay tuned: Next module of this morning’s training
Formal Report does (should) not need to be long
Agreement to Action

By Owner, Action brings about:

Countermeasures
Countermeasures

- Easy to implement/short time/low cost
  - Emphasis on these types
- More involved/longer time/higher cost
- Some countermeasures can be done by agency forces with no outside funds
- May be systemic – similar countermeasures at a number of locations
## Countermeasures - examples

<table>
<thead>
<tr>
<th>Category</th>
<th>Example</th>
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</thead>
<tbody>
<tr>
<td>Sight distance</td>
<td>Clear trees and brush</td>
</tr>
<tr>
<td>Wet weather</td>
<td>Skid-resistant surface</td>
</tr>
<tr>
<td>Driver didn’t see sign</td>
<td>Add signs, larger signs</td>
</tr>
<tr>
<td>ROR at curve</td>
<td>Signs, pavement markings, improve shoulder, extend clear zone, realignment</td>
</tr>
<tr>
<td>Left turns at intersections getting rear-ended</td>
<td>Add left turn lane, protected left</td>
</tr>
<tr>
<td>Night crashes</td>
<td>Lighting</td>
</tr>
</tbody>
</table>
Team Size

Too Few
Team Size

Too Many!
Team Size

- 3-5?
- 4-8?
- Limits:
  - minimum of 3
  - maximum of 9, maybe 7.
Multidisciplinary Team

- Road Supervisors
- Engineers
- Design
- Construction
- Law Enforcement
- Maintenance
- Educators
- EMS
- Planners
Independent Team

Preventing the Schultz effect...
Agency Support

- Formal presentation is made to the Agency/Owner.
- Formal report is written and sent.
- They have the decision on what action to take.
- Their support is essential.
Keys to Success

- Agency support and willingness to incorporate audit findings, resources permitting

- Small multidisciplinary audit team consisting of 3 to 7 people

- Conduct the audit at the earliest possible stage

- Willingness to investigate new ideas outside the traditional scope of work
RSAs in Indiana

- People available to conduct.
- LTAP HELPERS program can help.
- INDOT requires RSAs as part of the application for HSIP funds.
Action Photos
Road Safety Audit
Web Site

http://www.roadwaysafetyaudits.org/
What is a road safety audit?

A road safety audit is a formal safety performance examination of an existing or future road or intersection by an independent audit team.

Road safety audits can be used in any phase of project development from planning and preliminary engineering, design and construction. RSAs can also be used on any sized project from minor intersection and roadway retrofits to mega-projects.

The following executive summary provides additional background information on RSAs.*

*The executive summary and other supporting slides found throughout this site refer to road safety audits reviews (RSAs), which are road safety audits conducted on existing roadways. The current definition of road safety audits includes both existing and future roadways.

**Before**

This is a photo of an intersection in Grand Rapids, Michigan, before a road safety audit was conducted. The 2 traffic signal heads are hung on a diagonal span of wire and only one head is over the travel lanes. There are two lanes approaching the intersection separated by a dashed white pavement marking.

**After**

This is the same intersection after a road safety audit was conducted. The traffic signals are now hung on a lower span of wire and they are now able to be hung directly over the travel lane. Now there are three traffic signal heads, two for the through lane and one for the left turn lane. Pre-existing markings now show a separate left-turn lane at the intersection.

Photos courtesy of AAA Michigan.

Most state DOTs have established traditional safety review processes through their high hazard identification and correction programs. However, a road safety audit and a traditional safety review are different processes. It is important to understand the difference between the road safety reviews that are commonly performed and newer road safety audits. The main differences between the two are shown below.

<table>
<thead>
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<th>Road Safety Reviews</th>
<th>RSAs</th>
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<tr>
<td>* A safety review uses a small (1-2 person) team with design</td>
<td>* A safety audit uses a larger (3-5 person) interdisciplinary team</td>
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Teresa Wilson  
Director of Safety  
South Carolina  
Department of Transportation

*We view the RSAs as a proactive low-cost approach to improve safety. The RSAs helped our engineering team develop a number of solutions incorporating measures that were not originally included in the projects. The very first audit conducted saved SC DOT thousands of dollars by correcting a design problem.*

Ricky May  
District Engineer

*The road safety audit process looks at the roadway from a purely technical safety viewpoint without outside influences. It is a valuable process that gives an unbiased view of safety issues with support from safety experts. These recommendations are helpful when working with others, such as political leaders.*
Let me explain. No, there is too much. Let me sum up...

- “Safety is a good thing.”
- RSAs – the Basics
  - Don’t Fret over Name
  - Formal process
  - Team of right size and composition
  - Independent Team
  - Agency Support
And Now.......... 

RSAs – the Process
Course Plan

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