Graphic: FHWA

Road Safety Audits

Overview and Design Stage Tips

September 22, 2025

Michael Baker INTERNATIONAL | *We Make a Difference*

Overview

- What is a RSA?
- How to conduct a RSA?
- Why conduct a RSA?
- Tips and recommendations for design stage RSAs

What's your RSA experience?

Michael Baker INTERNATIONAL

I can spell RSA…

I've been trained on RSAs

I've participated in RSAs

I've led RSAs

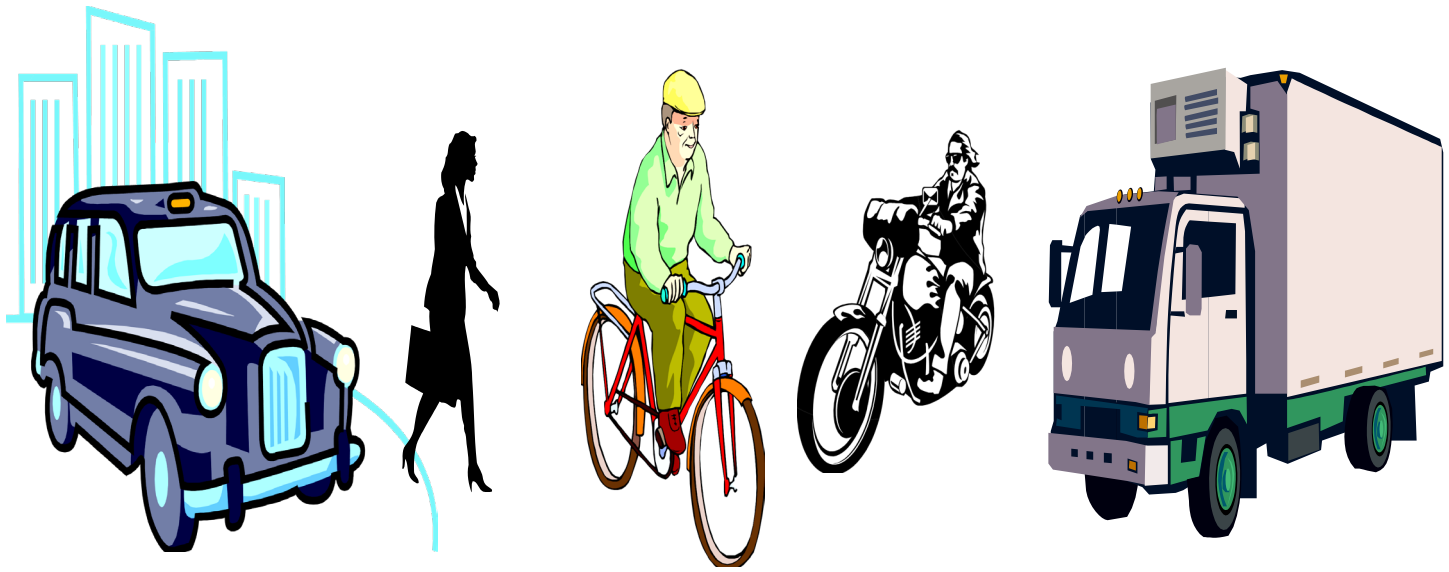
I should be presenting

What is a Road Safety Audit (RSA)

- Formal safety performance examination
- Existing or future road segment or intersection
- Independent multidisciplinary team

A road safety audit also…

- Considers the safety of all road users
- May proactively consider mitigation measures



A road safety audit is NOT…

- A quality control review
- A compliance with standards review
- A redesign of a project
- A judgement on the quality of the design
- A traffic engineering study
- A public involvement process

Why do we need RSAs?

Michael Baker INTERNATIONAL

The Haddon Matrix

Period	Human Factors	Vehicle Factors	Roadway Factors
Pre-Crash	Human factors before the crash	Vehicle factors before the crash	Roadway factors before the crash
Crash	Human factors during the crash	Vehicle factors during the crash	Roadway factors during the crash
Post-Crash	Human factors after the crash	Vehicle factors after the crash	Roadway factors after the crash

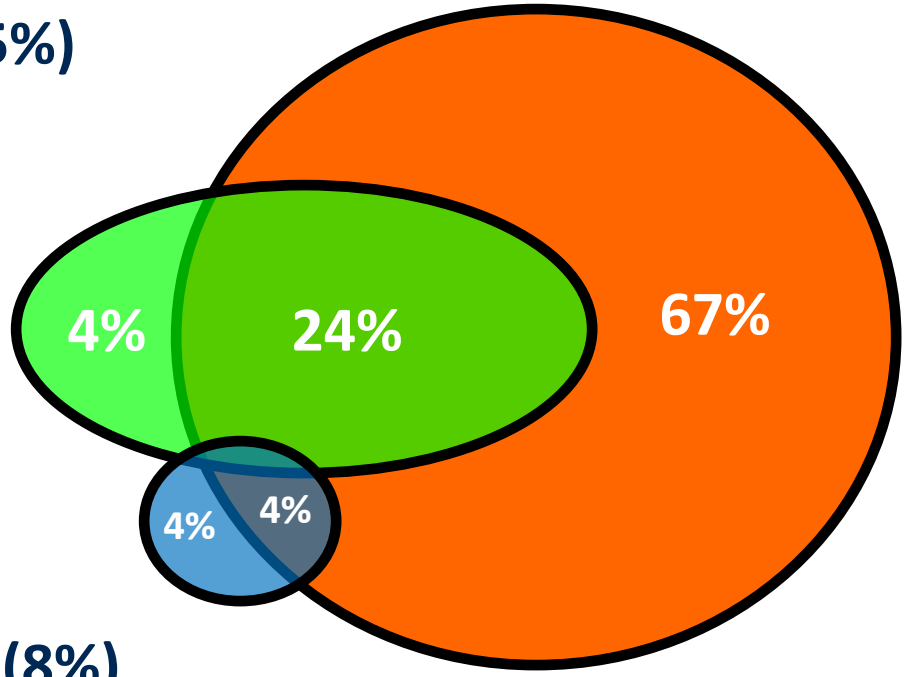
Why do we need RSAs?

Michael Baker INTERNATIONAL

Human factors (95%)

Road environment factors (28%)

Vehicle factors (8%)



Typical reported crash causes

Graphic: FHWA

RSA and the Safe System Approach

Michael Baker INTERNATIONAL

Aims to eliminate fatal and serious injuries for all road users by:

Accommodating human mistakes

Keeping impacts on the human body at tolerable levels

Graphic: FHWA

What are the Benefits?

"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

NACE

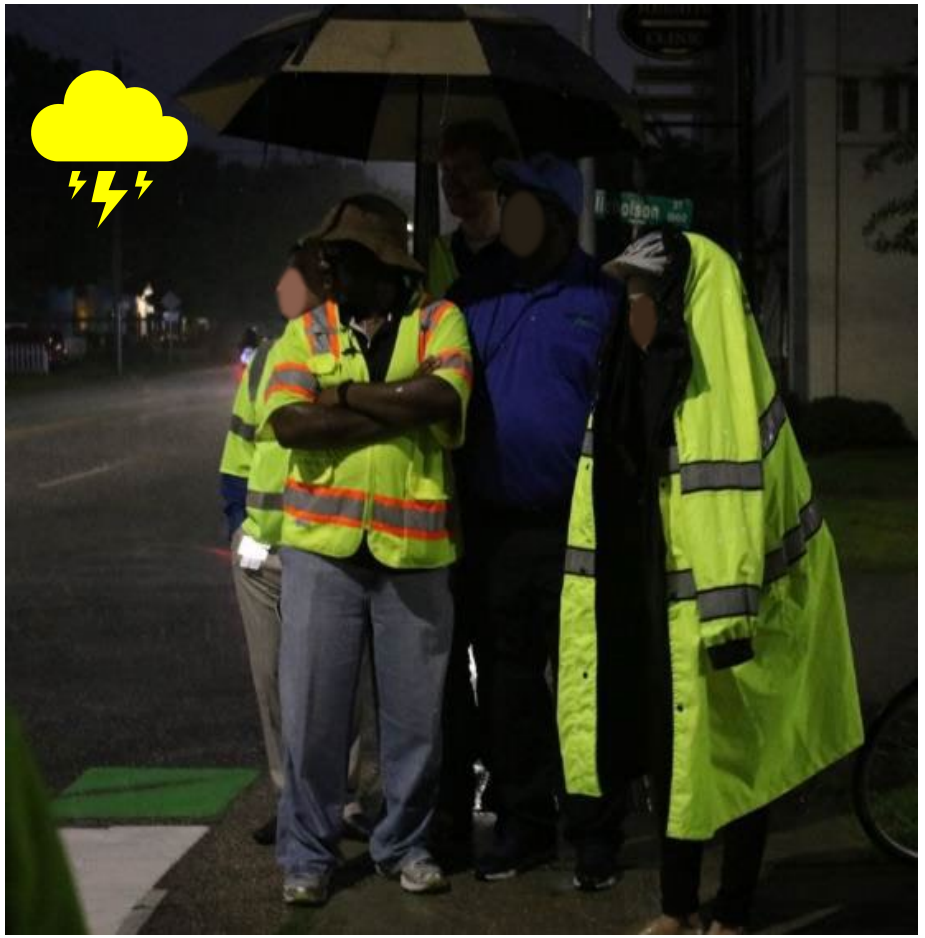
How to conduct a RSA?

Graphic: FHWA

Start-Up Meetings

- Introduce the RSA team
- Meet with stakeholders
- Finalize assessment approach

Field Reviews



Analysis and Report Draft

- Crash trends
- On site observations
- Collision diagrams
- Geometrics
- Pavement condition
- Signs and markings
- Human factors

Report Out

- Present preliminary findings to road owner
- Refine recommendations
- Team finalizes report
- Road owner completes a response

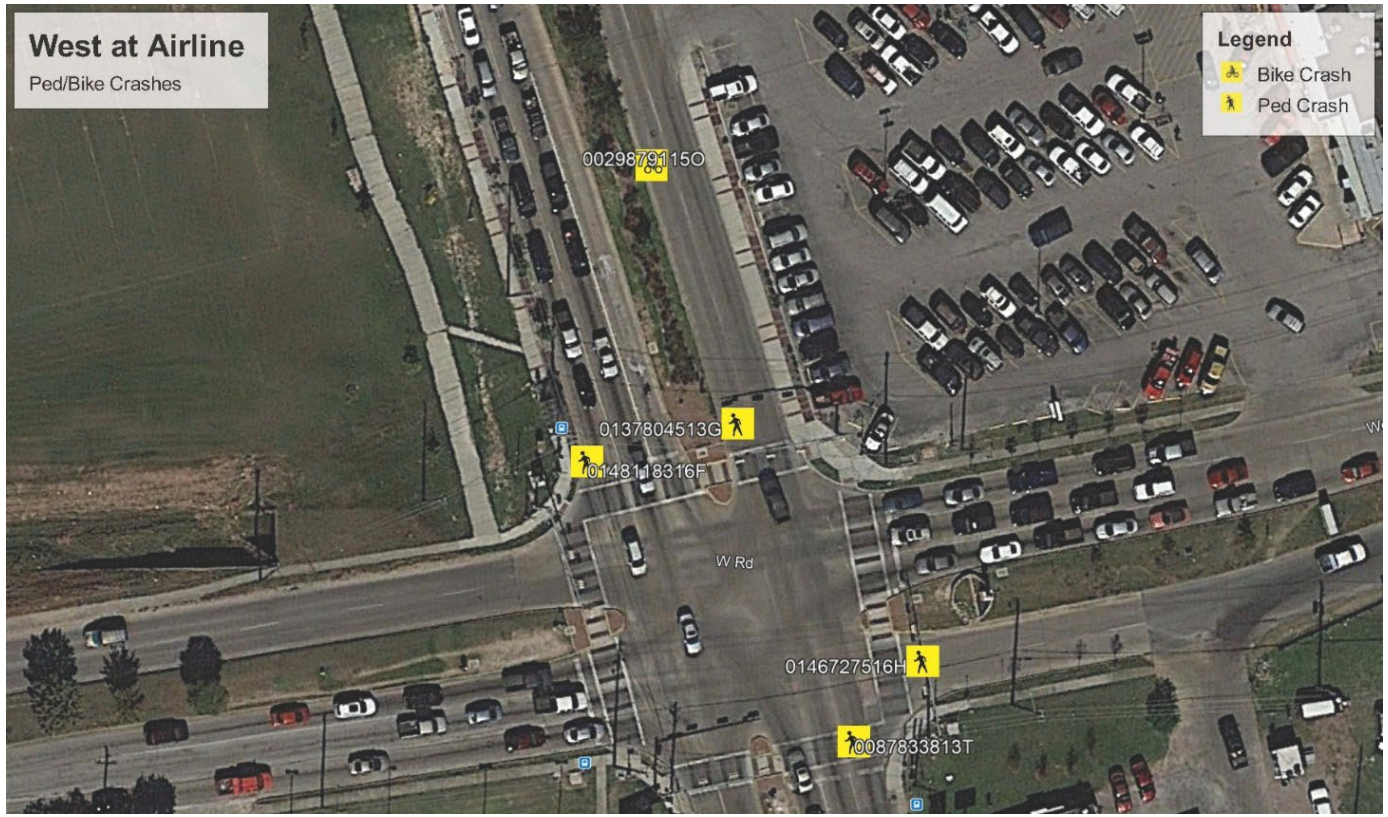
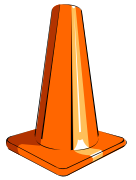


Image: City of Houston

When do we Conduct RSAs?

- Pre-construction
  - planning / feasibility
  - preliminary (draft) design
  - detailed design
- Construction
  - work zones
  - pre-opening
- Post-construction/Operational
  - existing roads



Why Conduct a RSA?

- To gain consensus for solutions
- To provide formal recommendations
- To provide independent review
- To address public scrutiny

Graphic: FHWA

Questions?

Design Stage RSAs and Other Thoughts

The Audit Team

- Have the right experts
- Keep the group small
- What do we mean by “independent”?

When to conduct the RSA?

- At what stage of project development should the RSA be done?

- How to coordinate with other activities

Scale and Scope of Safety Analysis

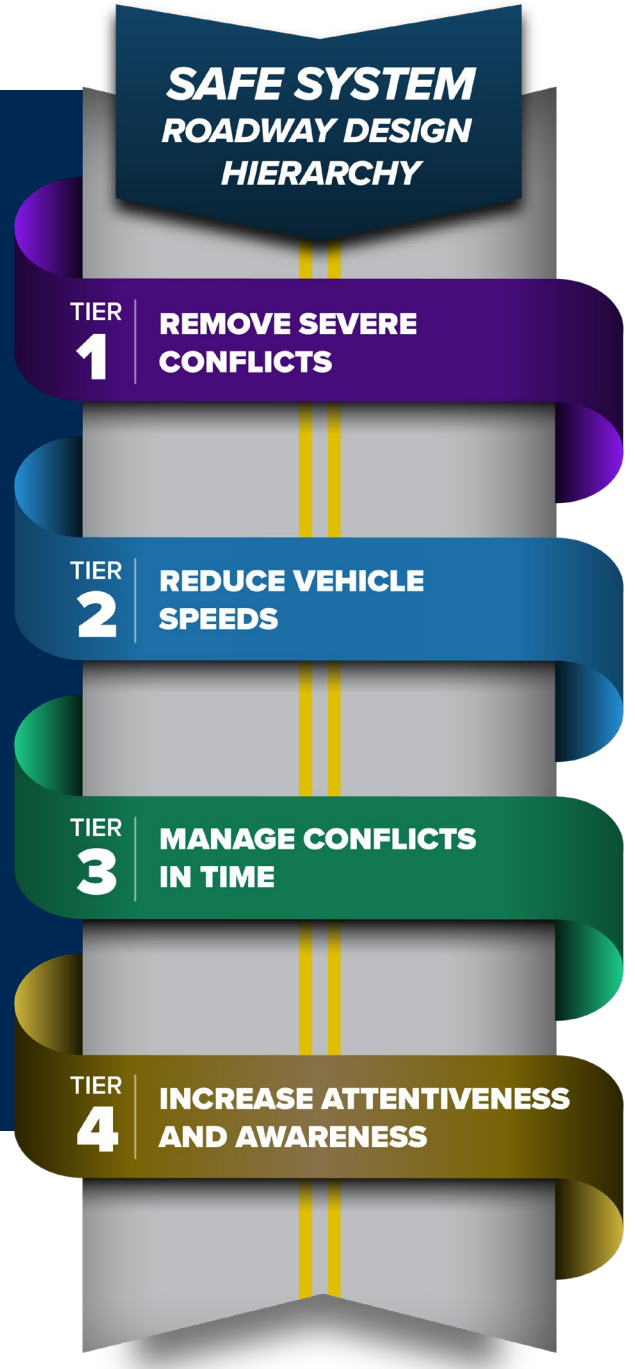
- Identifies methods for quantitative safety analysis in project development
- Describes data needs and considerations for various levels of safety analysis
- Presents safety assessment methods that may be suitable for many projects, including road safety audits
- Illustrates concepts and provides examples

Graphic: FHWA

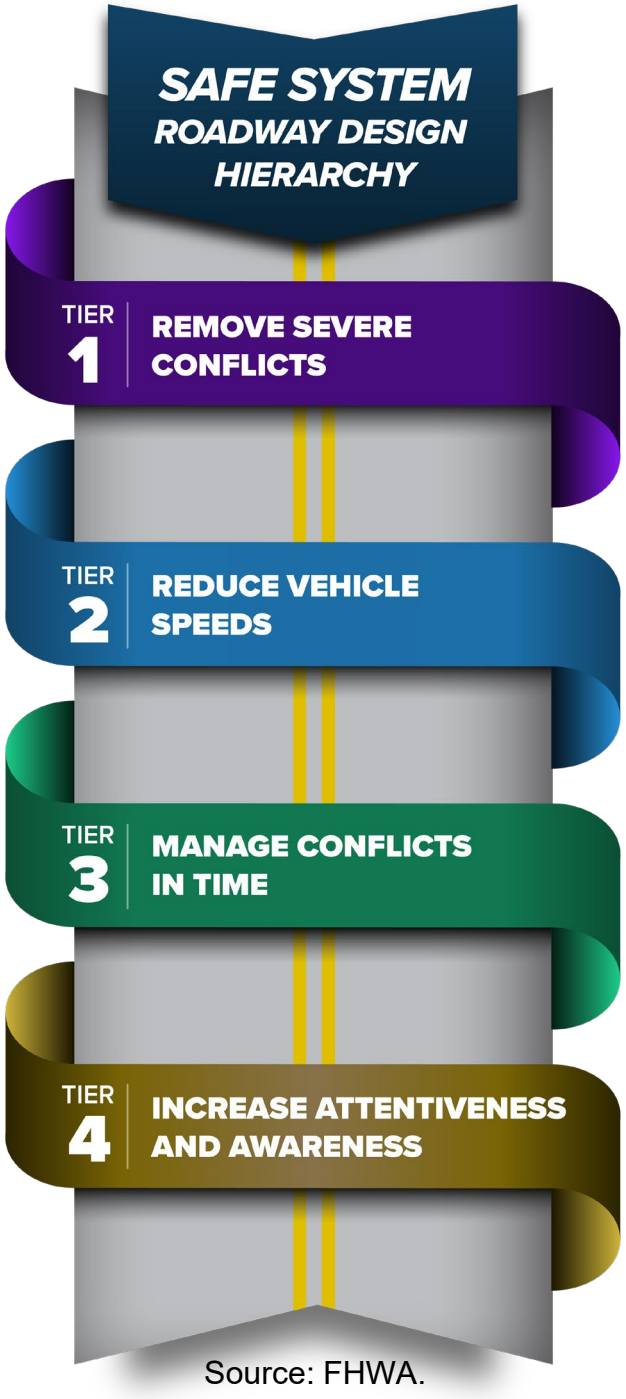
https://highways.dot.gov/safety/data-analysis-tools/hsm/scale-and-scope-safety-assessment-methods-project-development

Safe system Roadway Design hierarchy

https://highways.dot.gov/sites/fhwa.dot.gov/files/2024-01/Safe_System_Roadway_Design_Hierarchy.pdf



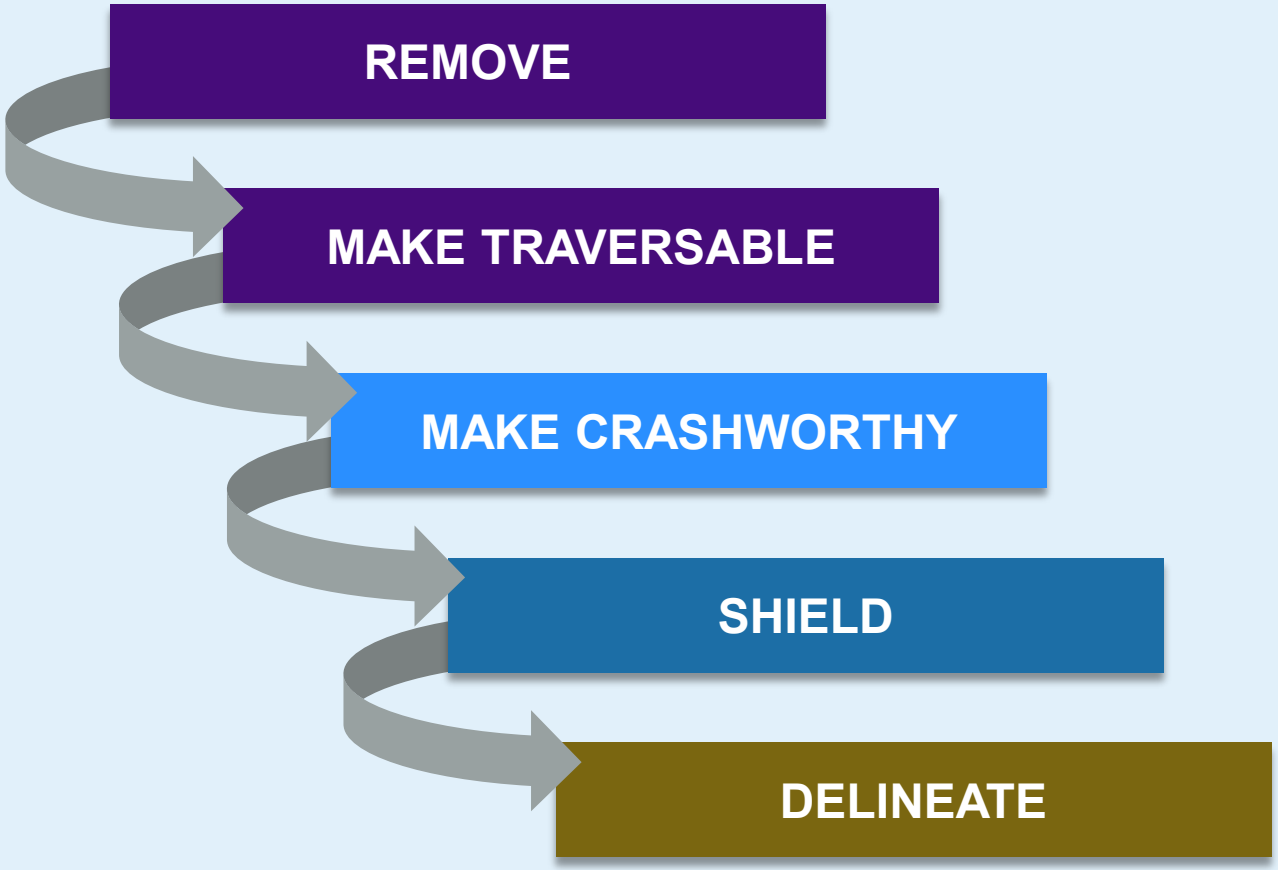
Source: FHWA.



Source: FHWA.

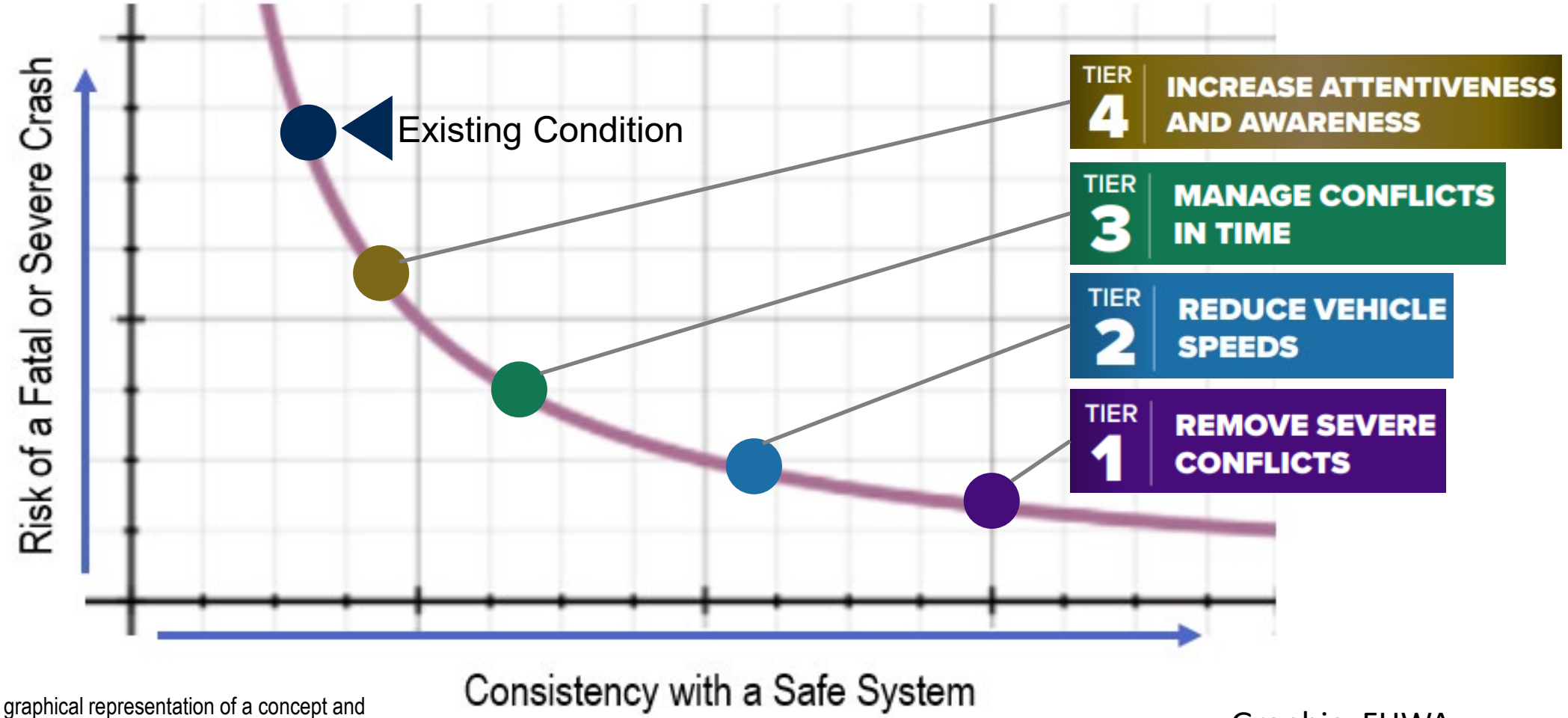
What's Old is New

Hierarchy to address hazards within the roadside clear zone



Derived from AASHTO Roadside Design Guide.

“Safe Roads” is a continuum – not an absolute



Note: This figure is a simplified graphical representation of a concept and is not intended to imply a precise numerical relationship. The lack of units on this graph is intentional.

Graphic: FHWA

Return

Preparing the Report

- Be diplomatic
- Don’t create unnecessary risk for the owner
- Create and use templates

Report out and Feedback

- Understand red flags and deal breakers
- Maintain independence
- Not all recommendations have to be accepted

Managing Expectations

- All parties need to be:
  - diplomatic
  - cooperative
  - constructive.

Image: FHWA

Independence and objectivity

Owner concerns

Return

Formal Response

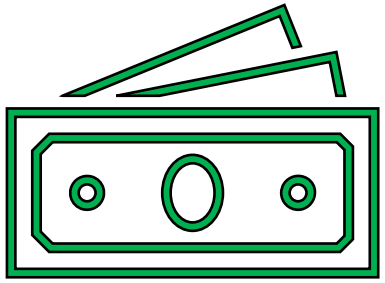
- Don’t skip this step
- Keep with the project files
- Follow up through construction and into service

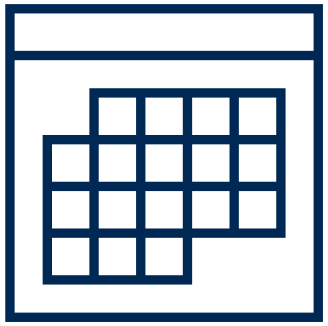
Evaluation and Assessment

- Monitor RSA sites after work completed 1, 3, 5 years
- Compile inventories of results
  - Per treatment or modification
  - successful and otherwise
  - Build proven safety countermeasures for future RSAs, guidance, policies
  - Identify lack-luster safety performers

Common Concerns and Challenges

- Time
- Cost
- Risk

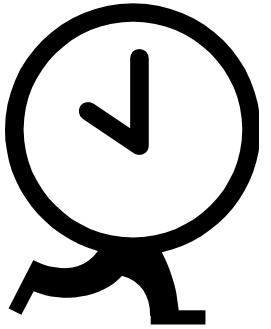




Pre-construction audits:

Michael Baker INTERNATIONAL

Will an RSA delay the project?



- RSAs require a relatively short time.
- Pre-construction RSAs can occur concurrently with the agency's review of the design drawings.
- RSAs can be simultaneously performed with other project tasks
- RSAs require very little time or disruption when an in-service road is reviewed.

Conducting RSAs: Time Commitments

- Prep Time for host and RSA leader: 1 day
- Group work and site visits: 2 to 5 days
- Lead time: 4 to 6 weeks
- Report preparation time: 2 to 6 weeks with draft reviews and gathering input
  - Actual writing time: 1 to 4 working days

*small projects will require less time, while larger or more complex scenarios will require more.

Pre- and post-construction audits:

Michael Baker INTERNATIONAL

Will an RSA drive up costs?

The audit team provides suggestions only. The road agency or designer remains responsible for design decisions.

The road agency will implement in accordance with priorities, scope, and budget.

Do RSAs expose agencies to more Risk?

Michael Baker INTERNATIONAL

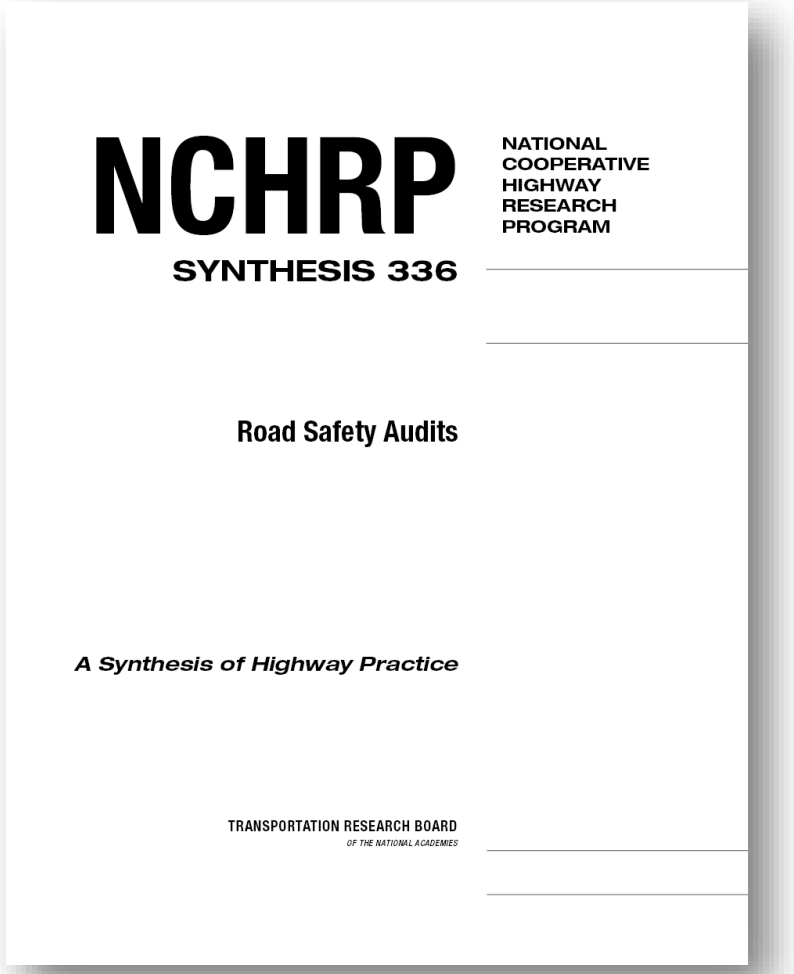
- RSAs can be a part of managing risk
  - RSA documents can help explain phasing and scheduling of safety improvements
- Agencies can be taken to court with or without a road safety audit.
- Agencies should seek legal advice.

Do RSAs expose agencies to more risk?

Michael Baker INTERNATIONAL

"[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 managing risk."



Issues and Challenges: Risk

- Do RSAs expose agencies to more Risk?

“We did not know” is not a defense and does not relieve an agency’s liability.

The question is, “should you have known, in your position?”

FHWA RSA Publications

- Road Safety Audit Guidelines
- Road Safety Audit Case Studies
- An Evaluation of RSA Programs and Projects
- **Pedestrian and Bicyclist RSA Guide and Prompt List**
- And more…

Graphic: FHWA

https://highways.dot.gov/safety/data-analysis-tools/systemic/road-safety-audits-rsa

ITE RSA Activities

Michael Baker INTERNATIONAL

A Community of Transportation Professionals

ITE Transportation Safety Roadmap and Action Plan | 2025-2027

Our Vision

Through collaborative and collective action to achieve zero road fatalities, ITE will leverage our volunteer member resources and staff capabilities to lead the development and dissemination of resources, services, and tools to foster a cultural shift to better plan, design, and operate transportation systems.

Our Beliefs

This vision is founded upon the belief that:

1. Zero is Achievable.
2. Safety is Not a Luxury, but a Fundamental Right.
3. Data-driven, Evidence-based Approaches are Essential.
4. Collaboration and Partnerships are Crucial.
5. Technological Advancements are Critical to create safer transportation systems.

Student Engagement

Work with educators and students at schools, colleges, and universities to raise awareness and build a culture of transportation safety in all aspects of transportation programs and classes.

Professional Development

Enhance and expand professional development and training opportunities to equip ITE members with the latest transportation safety knowledge and skills.

ITE Initiatives

Advance initiatives that ensure ITE Councils, Committees, and staff consider transportation safety in all aspects of the work they do.

Technical Resources

Engage in the development of technical resources and publications to advance safety technologies and solutions.

Partnerships

Collaborate and work with partners and stakeholders across all levels of government, the private sector, and community organizations to achieve shared safety goals.

- Highlights:
  - RSA Great Idea Group
  - Develop and deliver RSA training

https://www.ite.org/about-ite/safety-roadmap/

Michael Baker INTERNATIONAL | *We Make a Difference*

Final Questions and Discussion

Stephen Ratke, PE(NV), RSP2i
Senior Project Manager – Transportation Safety
Michael Baker International
Stephen.Ratke@mbakerintl.com