



**Procedures
for
Roadway Safety Audit Reviews
by**

**Indiana LTAP
HELPERS Project**



Federal Highway
Administration



Indiana Department
Of Transportation



Purdue
University



\$ HES Funds \$



- ◆ **Avenues to HES funds**
 - FA-3 form
 - Via an MPO
 - Indiana LTAP *HELPERS* Project
 - Accelerated process
 - Must meet certain criteria



Indiana LTAP – *HELPERS* Project

- ◆ Hazard
- ◆ ELimination
- ◆ Project
- ◆ Existing
- ◆ Roads
- ◆ Streets



LTAP *HELPERS* Project

- ◆ Typical *HELPERS* Projects are:
 - Low to medium cost
 - Minor engineering required
 - Little if any right of way required
 - Possibly using local forces or annual work contract
 - NEPA categorical exclusion
 - www.fhwa.dot.gov/indiv/ceeaproc.htm



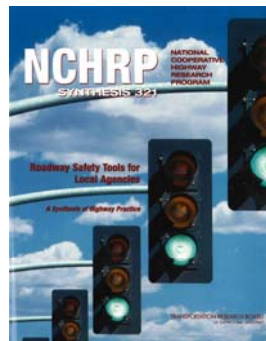
Resources and Guiding Documents

- ◆ Roadway Safety Tools for Local Agencies
- ◆ Hazard Elimination Program – Manual for Improving Safety of Indiana Road Sections and Intersections
- ◆ SAFER Manual – Safety Evaluation for Roadways
- ◆ Low Cost Safety Improvements Notebook
- ◆ Manual for Transportation Engineering



Resources and Guiding Documents

Roadway Safety Tools for Local Agencies



- ◆ NCHRP Synthesis 321
- ◆ By Eugene Wilson
- ◆ Published 2003



Resources and Guiding Documents

Manual for Improving the Safety of Indiana Road Sections and Intersections

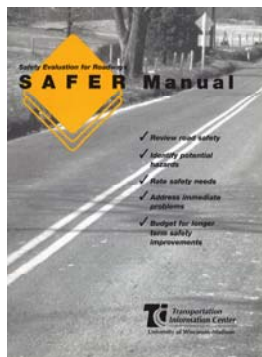


- ◆ JTRP Research Report
 - Volume 1 - Research Report
 - Volume 2 - Guidelines
- ◆ By Andrew Tarko
- ◆ Published 2004
- ◆ Specifically for Indiana



Resources and Guiding Documents

SAFER – Safety Evaluation for Roadways

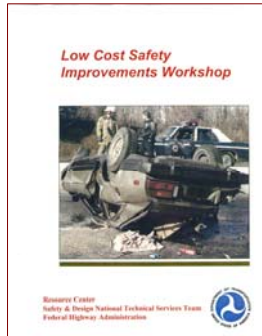


- ◆ By Don Walker
- ◆ Univ of Wisconsin TIC
- ◆ Published 1996
- ◆ Same format as PASER Manuals
- ◆ Contain criteria for establishing a safety rating



Resources and Guiding Documents

Low Cost Safety Improvements Workshop

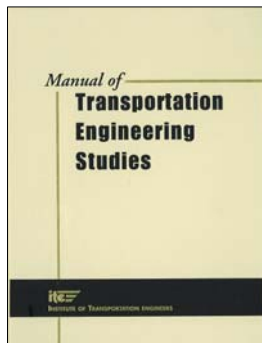


- ◆ FHWA Workshop Handout
- ◆ From MRC, March 2004



Resources and Guiding Documents

Manual of Transportation Engineering Studies



- ◆ Published by ITE
- ◆ C: 2000
- ◆ “How to” guide for all types of traffic studies
 - Volume
 - Speed
 - Many more



Types of Projects

- ◆ Programmatic
 - System Wide
 - RSAR not required
- ◆ High Crash Locations (HCL's)
 - Site Studies
 - Route Studies



Key Players

- ◆ Local public agency (LPA)
- ◆ Indiana LTAP (Project Manager)
- ◆ Volunteer Reviewers
- ◆ Highway Safety Improvement Committee (HSIC)



Responsibilities of Key Players

- ◆ Local public agency (LPA)
 - Identify projects and submit Request Form
 - Provide LTAP with traffic and crash data
 - Provide cost information to construct or install the recommended countermeasures



Responsibilities of Key Players

- ◆ Indiana LTAP
 - Assist LPA with Request Form if req'd
 - Coordinate site meeting and field investigation
 - Document discussions and recommendations
 - Discuss above with reviewers and LPA
 - Assist LPA in requesting HES funds



Responsibilities of Key Players

- ◆ Volunteer Reviewers
 - Become familiar with RSAR concepts and procedures
 - Participate and contribute to site meeting and field investigation
 - Review and comment on conclusions and recommendations prepared by LTAP



Responsibilities of Key Players

- ◆ Highway Safety Improvement Committee (HSIC)
 - Participate as reviewers when possible
 - Review and submit funding requests to Governors Council with recommendations



RSAR Procedure

- ◆ Four step process
 - Identification
 - Evaluation
 - Recommendations
 - Action



RSAR Procedure

- ◆ Step 1 – Identification
 - Consider HCL's
 - Contact Indiana LTAP
 - Complete Request Form
 - Prioritize by crash frequency



RSAR Procedure

- ◆ Step 2 – Evaluation
 - Coordinate site meeting and field investigation
 - Data collection
 - Using [Field Data Collection Forms](#)
 - Calculate index of crash frequency (I_{cf})
 - I_{cf} is measure of the difference between expected and reported crashed
 - Function of type of route/site, volume of traffic, length
 - $I_{cf} = 2$ means actual exceeds expected by 2 standard deviations



RSAR Procedure

- ◆ Step 3 – Recommendations
 - Recommend countermeasures
 - Based on field investigation
 - Input from reviewers and LPA
 - Discuss with the LPA



RSAR Procedure

- ◆ Step 4 – Action
 - Action taken will be up to the LPA
 - If HES is desired, LPA will estimate costs
 - LTAP assists LPA in requesting federal aid
 - Crash reduction factors
 - Cost/benefit ratio
 - HSIC will review and make recommendation for funding to Governor's Council



What are we looking for? Pavement Markings

- ◆ MUTCD standard for c/l pavement markings



- ◆ Required for:
 - Urban
 - 20+ ft width
 - ≥ 4000 aadt
- ◆ Encouraged for:
 - Rural
 - 18+ ft width
 - ≥ 3000 aadt



What are we looking for? Warning Signs



Roadway Safety Audit Reviews

23



What are we looking for?



- ◆ Steep slope and edge drop-offs



Roadway Safety Audit Reviews

24



What are we looking for?



- ◆ Bad guardrail



What are we looking for?



- ◆ Bridges and culvert headwalls





What are we looking for?



- ◆ Trees
 - Larger than 4"
 - Outside of curves
 - Intersections
 - Previous strikes



What are we looking for?



- ◆ Urban trees
 - Protected by curb
 - Landowner sensitivity
 - Reduced speeds reduce the hazard



What are we looking for?



What are we looking for?



- ◆ Does not meet MUTCD Standards



What are we looking for?



- ◆ Utility poles
 - Object in the clear zone
 - Reduces visibility for vehicles entering from the side
 - Consider relocation further off the shoulder



What are we looking for?



- ◆ Urban utility poles
 - Often protected by parked cars, curbs, or even railing
 - May be used for sign supports to reduce "clutter"



What are we looking for?



What are we looking for?



- ◆ Mailboxes





What are we looking for? Pavement Condition



What are can we do? Potential Countermeasures

- ◆ Signs
- ◆ Pavement markings
- ◆ Lighting
- ◆ Removal of objects in the clear zone
- ◆ Guardrail and crash cushions
- ◆ Traffic calming



What are can we do? Potential Countermeasures

- ◆ Correct alignment
 - Horizontal
 - Vertical
- ◆ Pavement surface improvements
- ◆ Pavement widening
- ◆ Construct shoulders
- ◆ Structure widening and/or removal



What are can we do? Potential Countermeasures

- ◆ Signalize intersections





Questions ???

