Systematic Approach to Road Safety II – usRAP Pilot Program

Rural Road Safety Webinar Series
Thursday, June 23, 2011

NACo is pleased to present this webinar in cooperation with the Federal Highway Administration and the National Association of County Engineers.
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This webinar will be recorded and made available on line to NACo members to view later or review.

Within the next few days you will receive an email notice with the link to the recording with your webinar evaluation survey.

Thank you in advance for completing the webinar evaluation survey. Your feedback is important to us.
Question and Answer Session Instructions

Type your question into the chat window, and the moderator will read the question on your behalf.
Peer Exchange Program kicked off at:

Developing County Solutions to Improve Rural Road Safety
NACE 2009 Annual Meeting - Management & Technical Conference
April 23
Peoria, IL

Workshop Objectives: Develop a system for sharing rural road safety best practices among counties
Systematic Approach to Road Safety II – usRAP Pilot Program

April 7, 2001 – 2:00 to 3:15 p.m. EDT

The AAA Foundation for Traffic Safety (AAAFTS) is completing a (usRAP) pilot program to examine the key technological and political initiatives necessary to institute a safety assessment of all our nation’s roads, including rural. In this webinar, hear from representative(s) from Midwest Research Institute and Iowa State University who will provide background information on the results of the multi phase Pilot project being implemented in various states across the country and a representative from Kane County, IL will describe the results from its (usRAP) pilot program.

This NACo webinar is being offered in cooperation with the Federal Highway Administration/Office of Safety and our NACo affiliate, the National Association of County Engineers.
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Type your question into the chat window, and the moderator will read the question on your behalf.
Thank you for participating in NACo’s webinar.
For more information about NACo membership, contact

Andrew Goldschmidt at agoldschmidt@naco.org or
Ilene Manster at imanster@naco.org
Thank you for attending today’s webinar.

Please register to attend NACo’s 2011 Annual Conference and Exposition at www.naco.org/meetings
Thank you for participating in NACo’s webinar.

To learn about future webinars, please visit on www.naco.org/webinars

For more information on NACo’s Rural Road Safety Resource Center please visit http://www.naco.org/programs/csd/Pages/RuralRoadResourceCenter.aspx
AAA Foundation

- Established in 1947
- 501(c)(3) Not-For-Profit
- Research affiliate of AAA/CAA
- North American Focus
- Identify traffic safety problems
- Foster research that seeks solutions
- Disseminate information and educational resources
usRAP Objectives

- Benchmark safety of road segments
- Allocate resources based on risks
  - Infrastructure
  - Enforcement
- Inform and provide guidance to motorists
- Foster collaboration
usRAP Protocols

- Risk Mapping
- Performance Tracking
- Star Ratings
- Safer Roads Investment Plans

NOTE: All based on fatal and serious injury crashes
usRAP

Phase I
Phase II
Phase III

RPS Validation – Washington, Iowa
Public Awareness Campaigns – Utah, Michigan
usRAP Kane County Objectives

• Demonstrate the application of usRAP protocols to a county agency
• Assist Kane County and Illinois DOT in development of a strategic highway safety plan for Kane County
• Identify site-specific safety improvements that Kane County may consider implementing as part of the strategic highway safety plan
Elements of the usRAP Kane County Study

- Included all county roads in Kane County

RISK MAPPING
- Risk mapping based on crash data and traffic volume data

SAFER ROADS INVESTMENT PLAN
- Inventory of roadway characteristics based on roadway videos
- Star ratings for county roads based on presence or absence of safety-related design and traffic control features
- Safer roads investment plans developed from star rating data
Risk Maps

• Began in usRAP in 2004
• Risk mapping has been conducted for:
  – state highway network in 8 states
  – county roads in 3 counties
  – over 65,000 road miles mapped
• Emphasis on rural roads
• Urban roads considered in some states
Risk Maps

- Focus on fatal and serious injury crashes
- Homogeneous road segments
- Segment length sufficient to provide meaningful results
Types of Risk Maps

• Map 1 – crash density (fatal and serious injury crashes/mi)

• Map 2 – crash rate (fatal and serious injury crashes per 100 million veh-mi)

• Map 3 – crash rate ratio – ratio of crash rate for a specific road to average crash rate for similar roads

• Map 4 – potential savings – reduction in fatal and serious injury crashes per mile if crash rate were reduced to average crash rate for similar roads
Risk Levels

LOWEST RISK
- Dark green (40% of roadway length)
- Green (25% of roadway length)
- Yellow (20% of roadway length)
- Red (10% of roadway length)
- Black (5% of roadway length)

HIGHEST RISK
Map 2 – Crash Rate
Map 3 – Crash Rate Ratio
Map 4 – Potential Savings
Star Ratings

• Star ratings have been used since the inception of RAP programs
• Star ratings are assigned based on presence or absence of road design features related to safety
• 1 to 5 scale
Safer Roads Investment Plans

• Safer roads investment plans were first developed based on star ratings by iRAP
• Applied in many low- and middle-income countries
• Now being tested in the U.S.
• Enables development of safety improvement plans based on road attributes without the need for detailed site-specific crash data
iRAP Star Rating Overview

Road Inspection Data → Road Protection Scores → Star Rating → Road Safety Investment Plan
Typical Inspection Vehicle
Road Inspection Videos
Coding Safety-Related Road Attributes
Road Protection Scores

Road users

Vehicle occupants

Crash types

Run off road

Head on

Intersection

Road attributes

Speed
Roadside severity – left
Roadside severity – right
Lane width
Paved shoulder
Curvature
Curvature quality
Delineation
Shoulder rumble
Road condition

Speed
Median type
Number of lanes
Lane width
Curvature
Curvature quality
Overtaking demand
Road condition

Speed
Intersection type
Intersecting road volume
Intersection quality
Minor access density
Road Protection Scores

Road users:
- Pedestrians

Crash types:
- Along
- Across

Road attributes:
- Speed
- Sidewalk provision – left
- Sidewalk provision – right
- Side friction
- Number of lanes
- Median type
- Crossing facilities
- Crossing facilities quality
Road Protection Scores

- Road users
  - Bicyclists

- Crash types
  - Along
  - Across
  - Intersection

- Road attributes
  - Speed
  - Roadside severity – left
  - Roadside severity – right
  - Lane width
  - Paved shoulder
  - Curvature
  - Curve quality
  - Delineation
  - Road condition
  - Facilitates for bikes
  - Side friction
  - Speed
  - Crossing facilities
  - Number of lanes
  - Median type
  - Crossing facilities
  - Crossing facilities quality
  - Speed
  - Intersection type
  - Intersecting road volume
  - Intersection quality
  - Minor access density
Example Roads for Each Star Rating: Car Occupants
Example Roads for Each Star Rating: Bicyclists
Example Roads for Each Star Rating: Pedestrians
Star Rating/Crash Relationships

All F&S Injury Crashes/100 MVMT for All 2U Roadways
Star Rating Based on Individual Locations

All area types; groups with 10+ mi only

All F&S Injury Crashes/100 MVMT

Car Star Rating for Individual Locations

1 2 3 4 5

17.8 8.4 5.7 4.8
Safer Roads Investment Plan

RPS \times \text{traffic volume} \times \text{calibration factor}

Deaths and serious injuries (before)

Apply countermeasures $\rightarrow$ new RPS

Deaths and serious injuries (after)

Reduction in deaths and serious injuries and economic benefit
Safer Roads Investment Plans
Safer Roads Investment Plans

- **usRAP analysis software** provides a unique tool for developing infrastructure-based safety improvement programs without the need for detailed site-specific crash data.
- **Potential applications:**
  - agencies without crash data
  - agencies with poorly located crashes, not suitable for site-specific assessment
  - any agency with good road inventory data and/or with video coverage of its road system
Demonstration of usRAP Analysis Software
Questions?
Q: How are weather fluctuations taken into consideration while doing these multi-faceted inspections?
Q: How does this related to a county of 4,000 people with all gravel/dirt roads?
Q: I did not see or hear much about painted roadway markers related to the usRAP system?
Q: What was the name of the company that provided the road video data? Is the cost data table able to be edited based on local costs? Does it include soft costs (i.e., cost of life)?