National Center for Rural Road Safety

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Rural Intelligent Transportation System (ITS) Toolkit – *Example Scenario*

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Example Scenario #1

- A county engineer has noted that there are a significant number of roadway departure crashes within his/her jurisdiction. They have deployed proven Everyday Counts initiatives already (e.g. rumblestrips, static curve warning signs); however, the issue persists. The county engineer wants to try to employ the Rural ITS Toolbox to identify potential options to address the crashes, yet funding is tight. What tools might the county engineer consider?

What tools might we consider to address the problem?

Crash Countermeasures (CC) tools; are there some that we can eliminate that would likely not address run-off-the-road crashes?

Crash Countermeasure Tools

- CC1: Animal Warning System
- CC2: Automated Visibility Warning Systems
- ~~CC3: Bicycle Safety Systems~~
- CC4: Connected Vehicles
- CC5: Wrong Way Driver Detection & Warning System
- ~~CC6: Highway-Rail Crossing Safety Systems~~
- ~~CC7: Intersection Collision Warning System (ICWS)~~
- ~~CC8: Pedestrian Safety Systems~~
- CC9: Road Geometry Warning System
- ~~CC10: Smart Trucks~~
- CC11: Speed Warning Systems
- ~~CC12: Work Zone Safety Systems~~

What about the other categories?

Example – Traffic Management (TM)

- TM1: Access Control Gates
- TM2: Variable Speed Limit (VSL)
- ~~TM3: Geographic Information Systems (GIS)~~
- TM4: Interconnected Signal Systems
- ~~TM5: Vehicle Detection~~
- TM6: Monitoring Travel Times and Speeds
- ~~TM7: Parking Management Systems~~
- ~~TM8: Planned Special Event Management Systems~~
- TM9: Rural TMC/TOC
- TM10: Adaptive Signal Control Technologies (ASCT)

Knowing that we're fiscally constrained, can we further reduce the possible tools for consideration from the CC and TM categories?

Low Cost CC & TM Tool Candidates

Tool	Cost Category
1) CC1: Animal Warning System	1) CC1: Low to High
~~2) CC2: Automated Visibility Warning Systems~~	~~2) CC2: Medium to High~~
3) CC4: Connected Vehicles	3) CC4: Low to Medium
4) CC5: Wrong Way Driver Detection & Warning System	4) CC5: Low
5) CC9: Road Geometry Warning System	5) CC9: Low to Higher
6) CC11: Speed Warning Systems	6) CC11: Low
7) TM1: Access Control Gates	7) TM1: Low
8) TM2: Variable Speed Limit (VSL)	8) TM2: Low to Higher
9) TM4: Interconnected Signal Systems	9) TM4: Low to Medium
10) TM6: Monitoring Travel Times and Speeds	10) TM6: Low to Medium
~~11) TM9: Rural TMC/TOC~~	~~11) TM9: Higher~~
12) TM10: Adaptive Signal Control Technologies (ASCT)	12) TM10: Low to Higher

Road Geometry Warning System

Rural Intelligent Transportation Systems (ITS) Toolkit

Road Geometry Warning Systems

CC 9

Photo: Courtesy of Jaime Sullivan, WTI

Description: Road Geometry Warning Systems are typically focused on addressing heavy vehicle rollovers. However, Road Geometry Warning Systems can benefit all users. The following are Road Geometry Warning Systems:

- Ramp Rollover Warning – notifies heavy vehicles of a ramp that might require a lower speed to ensure that they do not rollover,
- Dynamic Curve Warning – notifications about curvature, typically horizontal, that requires a slower operating speed for safe travel,
- Downhill Speed Warning – helps to reduce the risk of running out-of-control, typically focused at heavy vehicles, when traveling downhill over steep terrain, and
- Overheight/Overwidth Warning – identifies tunnels, bridges or other obstacles that may limit the size of the vehicle that can pass.

Consult Examples Within Fact Sheet

Examples of Implementation

- **Dynamic Curve Warning System**

A dynamic curve warning system was evaluated on rural roadways in Iowa, Missouri, Texas, Washington, and Wisconsin. For more information about this project, click here and here.

- **Truck Tip-Over Warning System**

A truck tip-over warning system was installed on I-70 in Colorado, just outside of Idaho Springs in the eastbound direction. The intent of the system was to address rollover crashes.

- **Overheight Warning System**

A collision in 2010 between an intercity passenger bus service and a low-height railroad bridge prompted the New York State Department of Transportation to develop an overheight warning system in 2011. However, collisions between vehicles and the bridge are still occurring. There is still an on-going discussion as discussed in the Syracuse Metropolitan Transportation Council's 2050 Long Range Transportation Plan as to whether to restrict access to this roadway by oversized vehicles or to retrofit the bridge. For more information about this project, click here, here, and here.

- **Narrows Oversize Vehicle Identification System**

This project compared oversized vehicle detection systems, assessed their effectiveness, and provided recommendations for an integrated detection and traveler information system to improve safety in the Narrows Corridor of northern California.

Additional Resources

- *Warning Systems Evaluation for Overhead Clearance Detection,* found here: https://ntl.bts.gov/lib/61000/61000/61065/15-21.pdf
- Alaska Department of Transportation, *Evaluation of Overheight Vehicle Warning Devices,* found here: http://www.dot.state.ak.us/stwddes/research/assets/pdf/fhwa_ak_rd_03_02.pdf
- New York State Department of Transportation, *Bridge Vehicle Impact Assessment,* found here: https://www.dot.ny.gov/divisions/engineering/technical-services/trans-r-and-d-repository/C_07_10_final%20report.pdf

Questions?

https://ruralsafetycenter.org/resources/rural-its-toolkit/

Example Scenario #2

- The local police officer for a very small community (less than 10,000 people) has brought to the Town Administrator's attention that several intersections seem to be experiencing high frequency and severity of crashes. While the Town Administrator has contacted the LTAP for assistance, the Town Administrator would like to better understand potential ITS tools that may assist with addressing the problem. However, as a result of a decreasing population, the Town Administrator has limited resources with which to address the concerns. What tool(s) might you recommend?

Thank you!

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