

Low Volume Roads Safety Topics Recap

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Various Topics Covered

- Technology
- Event Management
- Alternative users
- Legal lessons
- Safety plans
- One-lane workzone operations
- Crash reduction in Iowa
- Contributing factors in crashes

Technology

- Demonstration of automated driving system performance on rural roadways - U of I
- Rural challenges identified
 - Navigation of unmarked gravel and low-signage roads
 - Passing vulnerable road users - Bikes and peds, horse and buggy, farm equipment
 - Weather concerns - snow accumulation on road/roadside, iced over sensors



Photo: University of Iowa

Event Management

- RAGBRAI - Traffic management on low volume roads
- Challenges - safety, access, communication, coordination, responsiveness
- Lessons learned
 - Involve partners early
 - Good communication is essential
 - You can't plan for everything



Photo: Dan Malsom presentation

Alternative Users

- Engineering for horse-drawn vehicles
- Maintenance issues - horse troughs
 - Increased pavement wear
 - Drainage issues
 - Operational effects on vehicles and buggies
- Solutions
 - Horse trough paving
 - Dedicated lanes
 - Increased gap acceptance times for Intersection design and sight distance
- December LTAP webinar:



Photo: Grossman, McKenzie and Veloz presentation

Lawsuits

- Safety lessons from lawsuits against local road agencies
- Takeaways:
 - Surface condition very important, especially for 2-wheeled users
 - Driveways deserve attention
 - Enhanced signing/markings important on extreme alignments and downstream of transitions
 - Safety training critical for maintainers so they can conduct knowledgeable inspections
 - Investigate crashes
 - Document! (Especially variations from agency guidelines)
- October LTAP webinar:

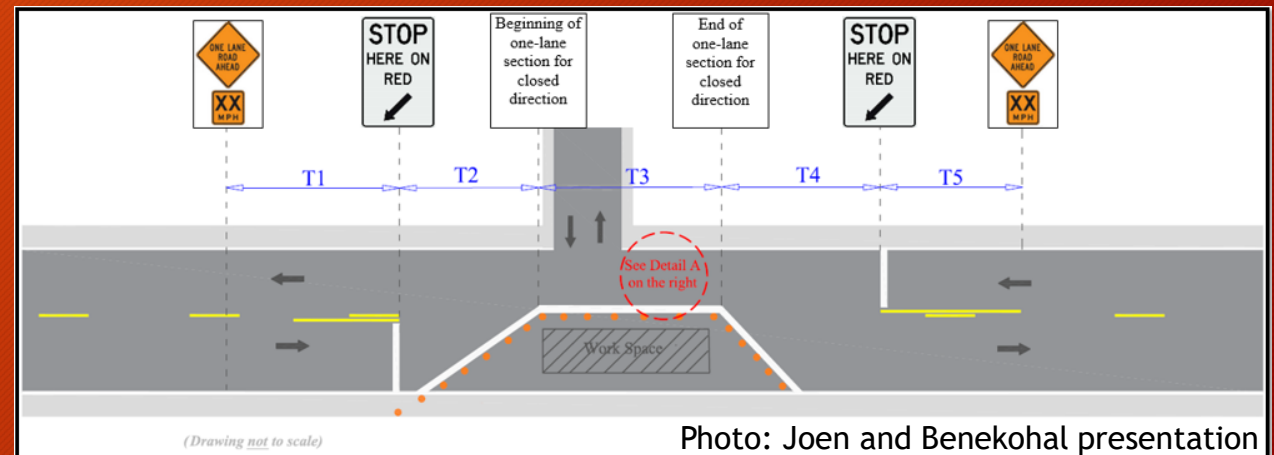


Safety Plans

- Empowering local road safety decision-makers to save lives
- Survey of North Dakota agencies on safety plans and investments
- Increase in application of basic safety treatments between 2010-2020
 - Delineators or chevrons on curves, rumble strips or stripes, guardrail ends
- Interval between restriping - 3 years
- Use of stop ahead and curve warning signs widely used

Operations

- Several factors affect operating speed and clearance times in workzones
 - Speed limit, lane/shoulder width, workzone length, traffic mix, work intensity, speed control strategies in place, vehicle acceleration
- WorkZoneQ-Pro software used to consider start-up lost time, work zone length, acceleration capability of vehicles, and adjusted free flow speed
- Software computed and produced reasonable estimates of road clearance times compared to Highway Capacity Manual method (that only analyzes one hour)



Safety Performance Functions

- SPFs developed for Iowa's paved, high speed secondary roads - ISU/InTrans
- Six SPFs developed for roadway segments
 - Segments with <25% of its length made up of curves, AADT \leq 400
 - Segments with <25% of its length made up of curves, AADT >400
 - Segments with greater than 25% of its length made up of curves, AADT \leq 400
 - Segments with greater than 25% of its length made up of curves, AADT >400
 - Tangents with speed limit equal to 45 or 50 mph
 - Tangents with speed limit equal to 55 mph
- Apply SPFs to paved secondary roads to identify roads with highest potential for crash reduction

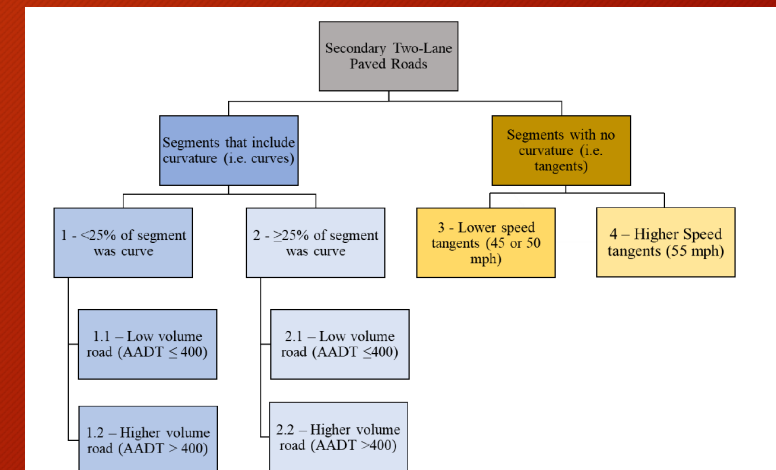


Photo: Hans, Oneyear and Naraghi presentation

Crash Factors

- Contributing factors for crashes on low-volume unpaved roads
 - Driver characteristics - speeding
 - Roadway characteristics - dry surface, clear weather, roadway departure, single vehicle, collision with fixed object
- Factors that increase odds of crash
 - Presence of farm equipment, trains, speeding, teen driver, travel at dusk



Photo: Mojumder presentation

Questions?

