Innovative Devices for Implementing Short Term Work Zone Speed Limits (WZSLs)

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WZSL Issues in Texas

- Unrealistic reductions for conditions
- Posted 24/7 vs. when conditions warrant
- Posted for entire work zone vs. in vicinity of work

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Potential Consequences

- Disregard for WZSLs
- Disregard for other work zone signing
- Greater difference among vehicle speeds
- Angry or aggressive drivers
- Negative public opinion of work zones

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Texas House Bill 1925

"remove or cover…a sign that restricts the speed limit in a…work zone…during any period when no hazard exists that dictates the need for a restricted speed limit."

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What Are Short Term WZSLs?

- Reduced regulatory speed limits
- Work activity only hazard present
- Posted only when work is active
- Cover/remove signs when work not active

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Implementation Issues

- Daily set-up/removal of signs
  - Additional task for contractor
  - Cumbersome & time consuming
  - Reduces overall work productivity
  - Forget or choose not to do

- Failure to cover/remove signs turns short term speed reductions into long term reductions

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TxDOT Project 0-5561


TTI: 0-5561

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Studies to Improve the Management of Regulatory Speed Limits in Texas Work Zones

Technical Report 0-5561-1

Cooperative Research Program

TEXAS TRANSPORTATION INSTITUTE
THE TEXAS A&M UNIVERSITY SYSTEM
COLLEGE STATION, TEXAS

TEXAS DEPARTMENT OF TRANSPORTATION

in cooperation with the
Federal Highway Administration and the
Texas Department of Transportation
http://tti.tamu.edu/documents/0-5561-1.pdf

- 2 year effort
- Completed in August 2008
- Objectives
  - Improve existing procedures on establishing & maintaining WZSLs
  - Evaluate new technologies that can be used to better manage WZSLs

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Innovative Devices

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Devices Evaluated

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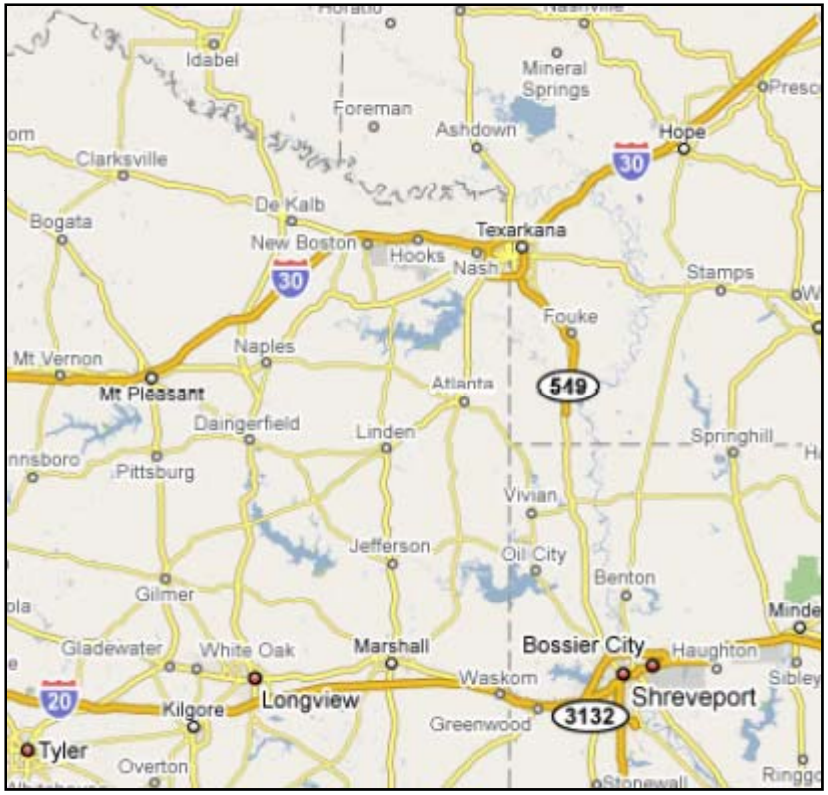
Long Term Evaluation

- Devices
  - Static SL signs
  - ESL signs
- Evaluations
  - Field study
  - Motorist surveys
  - Police discussions



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Field Study Description

- 9 mile widening project
- 70 mph reduced to 60 mph
- Timeline
  - May – “before” data
  - July – installed ESL signs
  - August – 1st “after” data
  - December – 2nd “after” data
- Free flow vehicle speeds

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Field Study Results

- No practical difference in
  - Mean speeds
  - % exceeding the speed limit
  - Speed variance

- ESL signs did not negatively impact operations
- ESL signs allowed inspector to more easily change speed limit for conditions

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Motorist Surveys

- 100 participants
- 84% had seen ESL signs
- 98% thought SL changes
  - 56% workers present
  - 20% work conditions change
- 88% thought effective
- 100% thought could get speeding ticket

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Police Discussions

- ESL Advantages
  - More visible
  - Easy to read
  - Log book
  - Auto day/night

- ESL Concerns
  - Numerals orange
  - Changing too often
  - Not same in both directions
  - Malfunctioning
  - Obtaining log book
  - Vandalism

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Short Term Evaluation

- Devices
  - Static SL signs
  - ESL sign trailers
  - Roll-up SL signs
- Field study
  - 2 seal coat projects
  - 70 mph reduced to 60 mph
  - Free flow vehicle speeds

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Short Term Field Study Results

Location	Treatment	Mean Speed (mph)			% Exceeding the Speed Limit Downstream of Treatment
		Free Flow (SL=70)	Downstream of Treatment (SL=60)	Δ	
I30	Standard	70.0	65.7	-4.3	81%
	Roll-up	70.2	63.8	-6.4	71%
	ESL	69.9	62.8	-7.1	64%
US59	Roll-up	68.4	60.3	-8.1	46%
	ESL	69.1	59.7	-9.4	36%

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Motorist Comprehension Surveys

- 792 Texas drivers
- 4 Texas cities
- 11 treatments

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Comprehension Results

- > 95% understood WZSL
- 99% thought could get speeding ticket
- < 1% confused ESL signs with driver speed feedback signs

Color Comparison Results

- 89% signs have <u>same</u> meaning
- 10% signs have <u>different</u> meaning
  - 2% regulatory vs. advisory
  - 3% normal vs. work zone
  - 1% speed limit vs. driver's speed

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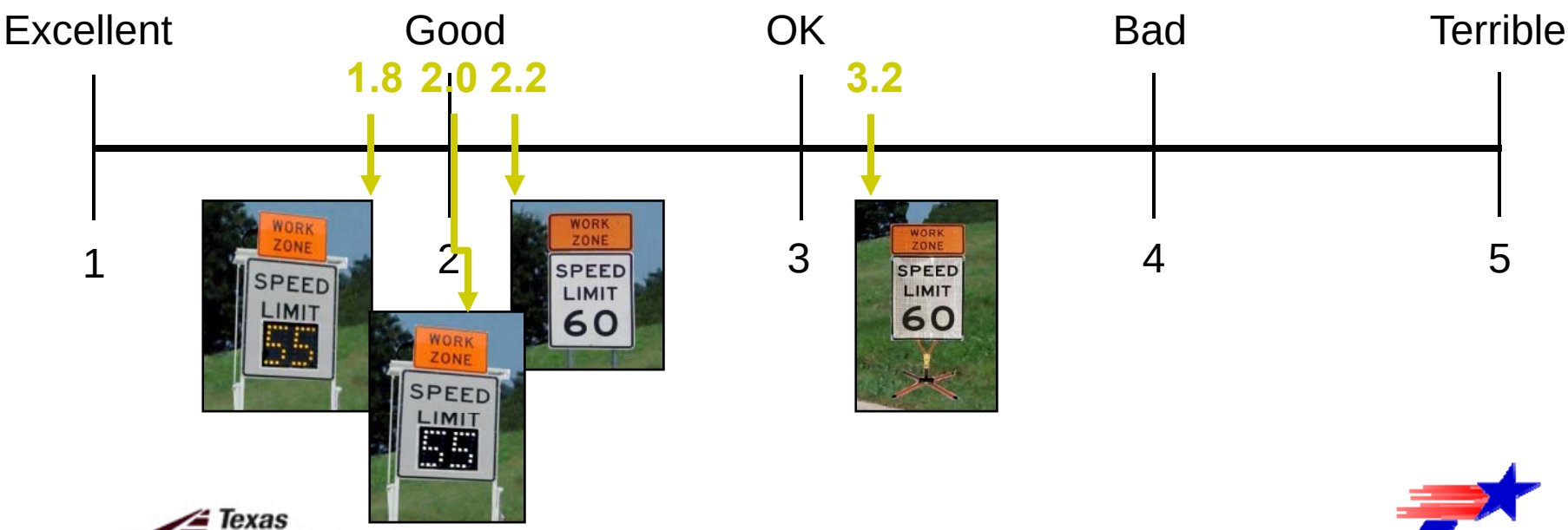
Sign Ratings

How well do you think the sign tells drivers that they are in a <u>work zone</u> & there is a <u>reduced speed limit</u>?



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Recommendations

- Use of ESL & roll-up signs
- ESL signs should use white LEDs
- Need to develop standards
  - Meet state specifications
  - Meet NCHRP 350 criteria

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Questions

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