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Development of Radar Speed Sign Warrants

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Environment**

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Presentation

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Development of Radar Speed Sign Warrants

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Overview

- Introduction
- Objectives
- Past work
- Existing direction
- Development of guidance
- Guidance
- Conclusion(s)

Introduction

- Radar speed signs have seen increased application in recent years
 - Mobile (trailer), permanent (pole) or portable (smaller pole mount)
- Used to reduce traffic speeds
 - Used in school and work zones, residential areas, high-to-low speed transition areas
- Deployment typically driven by subjective judgment rather than engineering studies

Examples



Image source: Veneziano



Image source: Turnbull



Image source: Veneziano

Objectives

- Establish criteria regarding when/how signage can be deployed and operated to address safety and speed issues
 - Establish applicable situations for radar speed sign use (ex. speeding issues)
 - Determine whether signs have been effective in similar applications
 - Provide guidance on where signs should be located (settings)
 - Develop physical and functional specifications for signage (not discussed here)

Past Work

- Past research/evaluations consulted in developing new guidance
 - Work focused on effectiveness on speeds, negligible safety evaluation
- Speed studies identified a number of specific applications of signage
 - Work zones
 - School zones
 - Other locations – residential, commercial, speed transition zones

Past Work

- Work zone effectiveness
 - Trailer: 2-9 mph reduction
 - CMS/Radar: 2-10 mph reduction
 - Post-mounted: 3 mph reduction
- School zone effectiveness
 - Trailer: 1-5 mph reduction
 - Permanent sign: 1-9 mph reduction
- Other location effectiveness
 - Trailer: 1-5 mph reduction
 - Permanent sign: 2-8 mph reduction

Existing Direction

- California MUTCD
 - Option
 - A Vehicle Speed Feedback sign that displays to approaching drivers the speed at which they are traveling may be installed in conjunction with a Speed Limit (R2-1) sign
 - When used, the Vehicle Speed Feedback sign may be mounted on either a separate support or on the same support as the Speed Limit (R2-1) sign
 - Standard
 - If a Vehicle Speed Feedback sign displaying approach speeds is installed, the legend shall be YOUR SPEED XX
 - Vehicle Speed Feedback signs shall not alternatively be operated as variable speed limit signs
 - Guidance
 - To the degree practical, numerals for displaying approach speeds should be similar font and size as numerals on the corresponding Speed Limit (R2-1) sign
 - Support:
 - Driver comprehension may improve when the Vehicle Speed Feedback Sign is mounted on the same support below the Speed Limit (R2-1) sign
 - Vehicle Speed Feedback Signs are appropriate for use with advisory speed signs and with temporary signs in temporary traffic control zones

Existing Direction

- Enterprise Program warrants transition zones, posted speed adherence and intelligent work zones
- Employed series of questions related to application of interest to determine use
- If responses to more than one question were yes, sign was justified
 - Of interest – specification of 5 miles between signs
- Limitation – no documentation on how guidance was developed

Development of Guidance

- Developed based on past results and existing CA MUTCD information
- Review of past evaluation identified different application types
 - Excessive mean and 85th% speeds
 - School and work zones
 - Safety concerns
 - Transition zones
 - Posed speed noncompliance
 - Pedestrian presence
 - Etc.

Development of Guidance

- Two levels of guidance developed: General and Location-specific
 - Based on past uses identified in literature and through survey of CA practitioners
- General guidance – direct use in addressing general concerns (ex. mean and 85th speeds, ADT, etc.)
- Location-Specific – direct use in addressing site concerns (ex. school and park zones, work zones, etc.)

General Guidance

- 85th percentile speed - A sign may be considered when the observed 85th percentile speeds at a site exceed the posted speed limit by 5 mph or more
- Mean speed – A sign may be considered when the observed mean speeds at a site exceed the posted speed limit by 5 mph or more
- Average daily traffic – A sign may be considered when ADT exceeds 500 vehicles
- Accidents – A sign may be considered at sites exhibiting a correctable speed-related accident history within a recent time period
- Pedestrians – A sign may be used at sites with a pedestrian-related accident history
- Posted speed limit – A sign may be considered in conjunction with other guidance when the posted speed limit at a site is 25 mph or greater

Location-Specific Guidance

- Schools and parks
 - A sign may be considered for use within one half mile of a school zone or park, and
 - A sign may be considered when the posted speed limit in a school zone or park area is 15 mph or greater, and
 - A sign may be considered when the 85th percentile speeds in a school zone or park area exceed the posted speed limit by 5 mph or more, or
 - A sign may be considered when the observed mean speeds in a school zone or park area exceed the posted speed limit by 5 mph or more, or
 - A sign may be considered when ADT exceeds 500 vehicles, or
 - A sign may be considered to supplement a conditional speed limit already in place (e.g., a sign stating: Speed Limit 25 when Children Present)

Location-Specific Guidance

- Work zones
 - A sign may be considered when the posted speed limit in a work zone is 35 mph or greater, and
 - A sign may be considered when the observed mean speeds in a work zone exceed the posted speed limit by 10 mph or more
 - A sign may be considered when the observed 85th percentile speeds in a work zone exceed the posted speed limit by 10 mph or more
 - A sign may be considered when there have been speed-related accidents in a work zone

Location-Specific Guidance

- Street conditions
 - Transition zones—A sign may be considered in conjunction with other guidance where a speed transition zone exists (high to low speed limits).
 - Curve warning – A sign may be considered in conjunction with other guidance where a curve speed warning advisory sign exists (high to low speed).
 - Signal approach – A sign may be considered in conjunction with other guidance for high-speed signalized intersection approaches where the speed limit exceeds 45 mph

Conclusions

- Primary purpose of work was to develop guidance for deployment in a systematic manner
- Past results indicated signs were used in a number of common applications
 - Achieved reductions in speeds
- Two levels of guidance developed:
General and Location-specific

Conclusions

- General guidance – direct use in addressing general concerns
- Location-Specific – direct use in addressing site concerns
- Systematic deployment based on guidance could lead to better compliance with posted speeds
 - More uniform application – avoidance of “sign saturation”



Disclaimer

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Questions