SPEED LIMITS SET LOWER THAN ENGINEERING RECOMMENDATIONS

Task Report #2: Survey of State Agency Practices

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Prepared for:
Montana Department of Transportation

December 2014
## SI* (MODERN METRIC) CONVERSION FACTORS
### APPROXIMATE CONVERSIONS TO SI UNITS

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*Si is the symbol for the International System of Units. Appropriate rounding should be made to comply with Section 4 of ASTM E380. (Revised March 2003)
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INTRODUCTION

The purpose of this research project is to determine the speed and safety effects of posted speed limits set lower than engineering recommendations, a common practice on Montana Department of Transportation (DOT) roadways. A previous deliverable (Task Report #1: Literature Review) provided a summary of the relevant research literature on this topic. Since current research regarding speed and safety performance on roadways with posted speed limits set lower than engineering recommendations is limited, the literature review broadly considered how speed limits are set, the relationship between posted speed limits and operating speeds, and the relationship between various speed measures and safety.

To supplement the information obtained from this review of the published literature, this task report documents the results of a survey administered to representatives from each state transportation agency on current practices with respect to setting speed limits lower than engineering recommendation. Feedback from this survey will help to assist in meeting the project objectives, which are to:

- Quantify mean vehicle speeds and the level of compliance with posted speed limits that are below engineering recommendations under various levels of law enforcement presence.
- Determine the minimum level of enforcement necessary to achieve a specific target posted speed limit compliance rate.
- Quantify the impacts of lower-than-engineering recommended posted speed limits on traffic safety, measured by the frequency and severity of crashes.
- Identify other potential safety or operation impacts of lower-than-engineering recommended posted speed limits.

This report describes the survey and its results. The following section describes the contents of the survey and the list of potential respondents that were contacted. Then, the results of the survey are summarized, including a review of state practices related to setting speed limits lower than engineering recommendations. Finally, conclusions from the survey are summarized.

SURVEY

The goal of the survey was to determine if other state transportation agencies have experience setting posted speed limits lower than engineering recommendations and, if so, to identify any guidance that might exist for this practice. The survey was hosted through Penn State and Qualtrics, an online survey software (Qualtrics 2014). Figure 1 depicts the structure of the survey as a flowchart. Each respondent was asked which agency he or she represents and if his or her agency sets posted speed limits lower than engineering recommendations. If the response to this question was yes, the respondent was asked if the representative’s state has evaluated the impacts of this practice if the agency has any documentation that may be helpful for the analysis, if the state has guidelines to determine the level of enforcement required to achieve a desired level of compliance on these roadways, and if there were any issues related to this practice. If the
respondent indicated that his or her agency did not practice setting speed limits lower than engineering recommendations, the respondent was asked if there were any conditions that the agency would consider such a practice, if the agency had experience quantifying speed limit compliance in the presence of enforcement and any documentation on speed limit compliance and enforcement. Documentation could either be uploaded through the survey platform or emailed directly to the research team. The full, text-based version of the survey can be found in Appendix A. Note that the series of questions asked of the participant was based on if the state sets posted speed limits lower than engineering recommendations.
Your agency *does post* speed limits lower than engineering recommendations

1. Does your agency have a policy or guidance document that describes the process that is used to identify sites for considering in setting speed limits lower than engineering recommendation?

2. Has your agency conducted any field or other evaluation(s) to determine driver compliance to the speed limits set lower than engineering recommendation?

3. Does your agency have any guidelines to determine the amount of enforcement required to achieve a desired level of compliance with speed limits set lower than engineering recommendations?

4. Has your agency conducted any field or other evaluation(s) to determine the safety effects of roads that have speed limits set lower than engineering recommendation?

5. Has your agency noticed any other issues with respect to speed limits set lower than engineering recommendations on your roadways?

6. Please provide any policy, guidance documents, or evaluations your state may have regarding posted speed limits lower than engineering recommendation.

Your agency *does not* post speed limits lower than engineering recommendations

1. Under what, if any, circumstance(s) would your agency consider setting a posted speed limit lower than engineering recommendation?

2. Has your agency conducted any field or other evaluation(s) to determine how driver compliance with the posted speed limit changes in the presence of speed enforcement?

3. Does your agency have any guidelines to determine the amount of enforcement required to achieve a desired level of speed limit compliance?

4. Please provide any relevant documentation related to speed limit compliance and enforcement.

**Figure 1 – Flowchart Depicting the Structure of the Survey**
State agency representatives selected as potential survey respondents were obtained through the AASHTO Subcommittee on Traffic Engineering (AASHTO 2014). All members that represented a state agency (including the District of Columbia and Puerto Rico, and excluding Montana) were included in the distribution list for the survey. A link to the survey was e-mailed to each contact. A total of 71 representatives from 51 states and territories were contacted to participate in the survey.

RESULTS

Of the 71 representatives contacted, representatives from 28 of 51 (55 percent) states and territories responded to the survey. Of these responding agencies, 22 (79 percent) indicated that their agency has posted speed limits set lower than the engineering recommended speed. Figure 2 shows the responses from the state transportation agencies.
As Figure 2 shows, few agencies indicated that setting speed limits lower than engineering recommendations is not practiced in their state. Of these agencies, only one has conducted an evaluation to determine compliance with posted speed limit changes in the presence of law enforcement. Also, no agencies indicated that they have guidelines to determine the amount of enforcement required to gain a desired level of speed limit compliance.

Of the agencies that indicated they do set posted speed limits lower than engineering recommendations, 50 percent indicated they have some sort of policy or guidance document that can be applied to these locations. About half of the agencies that practice setting speed limits lower than engineering recommendations (55 percent) stated that the agency has evaluated driver compliance with these speed limits. However, no reporting agencies have any guidance to determine the amount of enforcement required at these sites, and just 23 percent have conducted a study of the safety effects of these situations.

Survey respondents were also asked if any issues were noted at sites with posted speed limits set lower than engineering recommendations. Maryland State Highway Administration indicated that pedestrian safety issues have led to some posted speed limits being set lower than the 85th percentile operating speed. The Maine Department of Transportation indicates that speed limits do get set lower than the 85th percentile operating speed, but no more than seven mph lower. The Kentucky Transportation Cabinet indicated that speed limits set lower than engineering recommendations are rare in this state; however, political pressure does sometimes lead to these situations. Oklahoma Department of Transportation noted that this is a common situation that arises in school zones. Lastly, Oregon Department of Transportation noted that a posted speed limit must be within 10 mph of the measured 85th percentile operating speed following an engineering study.

The more notable responses are discussed in detail in the next section.

**NOTABLE PRACTICES**

A few state transportation agencies provided notable feedback regarding this practice. The Idaho Department of Transportation provided data regarding a city wide speed limit change indicating the change in safety and operating speeds. The New York State Department of Transportation explained their process of handling communities that desire lowered posted speed limits. The Missouri Department of Transportation mentioned their ability to override jurisdictions who use these situations for revenue. Feedback from these agencies is described in this section.

**IDAHO**

The Idaho Department of Transportation provided observational before-after speed data on roadways after a city-imposed speed limit change was implemented. Operating speed data were collected on 62 roadways within the city. Speeds were observed prior to the posted speed limit change, immediately after the change, and one year after the change. Throughout the city, there was an average reduction in posted speed limit of 11.7 mph. However, this only coincided with a
4.9 mph reduction in 85th percentile operating speeds immediately following the change, and a 6.4 mph reduction one year following the change. Prior to the change, the average difference between 85th percentile operating speeds and posted speed limit was 1.7 mph. Immediately following the change (i.e., lowering the posted speed limit citywide), this difference was 8.4 mph, and, after one year, the difference was 7.2 mph. This is consistent with the findings noted in the literature review, in which reductions in posted speed limit often do not result in the desired reduction in operating speeds. Changes in collision rates were monitored, and results were mixed. Some sites experienced increases in crash rates, some experienced decreases, and some had no change. However, the analysis performed was a naïve before-after analysis using simple crash rates, so the results are not reliable (Gross, Persaud, and Lyon 2010).

**NEW YORK STATE**
New York State Department of Transportation reported an interesting practice. The DOT is willing to provide communities with speed limits as low as the 50th percentile operating speed, provided the community agrees to strict enforcement. However, if after one year the new 85th percentile operating speed is not equal to or less than the old 50th percentile operating speed, the roadway posted speed limit is returned to the original posted speed. This practice has been applied at several sites within the state; however, in general, communities typically do not agree to this practice. As a compromise, the DOT and communities use the 67th percentile operating speed as the posted speed limit.

**MISSOURI**
The Missouri Department of Transportation noted their authority to override local speed limit jurisdiction. Specifically, Missouri law allows the Missouri DOT to change posted speed limits if local jurisdictions use these sites to generate significant revenue through speeding citations. Anecdotally, locations with these conditions are considered “speed traps” by the public if heavily enforced, while the posted speed limit is widely violated under light or no enforcement.

**MINNESOTA**
The Minnesota Department of Transportation has received numerous requests from local officials to lower posted speed limits because they disagree with those recommended by the agency. Speed studies performed following these speed limit change requests have revealed no changes in operating speeds. This has led the Minnesota DOT to maintain the use of 85th percentile speeds as the method to establish posted speed limits, unless a safety issue has arisen.

**CONCLUSION**
Based on the responses to the state transportation agency survey, it is clear that posting speed limits lower than engineering recommendations is a common practice. The motivations for this practice vary; however, the most common theme was political pressure. Few states have
evaluated the safety and operational effects of setting posted speed limits lower than engineering recommendations. Only half of the responding agencies indicated they have guidance concerning a process for setting posted speed limits lower than engineering recommendations. Approximately half of the responding agencies indicated that they have evaluated driver compliance with posted speed limits set lower than engineering recommendations – these agencies indicated poor driver compliance with these speed limits. No state has guidance concerning speed enforcement at locations with posted speed limits set lower than engineering recommendations. The feedback provided in this survey underscores the need to understand the impacts of posting speed limits lower than engineering recommendations.
REFERENCES


APPENDIX A – SURVEY

Default Question Block

Instructions:

As part of a Montana Department of Transportation (MDT) study titled "Speed Limits Set Lower than Engineering Recommendations," our research team is interested in your feedback to a short survey. The survey will help us to meet the project objectives, which are to:

- Quantify mean vehicle speeds and the level of compliance with posted speed limits that are below engineering recommendations under various levels of law enforcement presence.
- Determine the minimum level of enforcement necessary to achieve a specific target posted speed limit compliance rate.

Quantify the impacts of lower-than-engineering recommended posted speed limits on traffic safety, measured by the frequency and severity of crashes.

Identify other potential safety or operational impacts of lower-than-engineering recommended posted speed limits.

The survey is organized into two parts based on the objectives listed above. The survey should take approximately 5 minutes to complete. Thank you for your time and thoughtful consideration.
What agency do you represent?

Does your agency set posted speed limits lower than engineering recommendations (i.e., 85th percentile operating speed of free-flow traffic) on any road types?

Yes  No

Questions asked if no:

Under what, if any, circumstance(s) would your agency consider setting a posted speed limit lower than engineering recommendation?

Has your agency conducted any field or other evaluation(s) to determine how driver compliance with the posted speed limit changes in the presence of speed enforcement?

Yes  No

Does your agency have any guidelines to determine the amount of enforcement (i.e., frequency and intensity of police presence) required to achieve a desired level of speed limit compliance?

Yes  No
If your agency has any documentation or unpublished evaluations related to speed limit compliance and enforcement, would you upload a digital copy below. If there is no digital copy available, please forward the documentation to the following:

Eric Donnell  
The Pennsylvania State University  
Department of Civil and Environmental Engineering  
212 Sackett Building  
University Park, PA 16802  
E-mail: edonnell@engr.psu.edu

Questions asked if yes:

Does your agency have a policy or guidance document that describes the process that is used to identify sites for consideration in setting speed limits lower than engineering recommendation?

Yes  
  
No

Has your agency conducted any field or other evaluation(s) to determine driver compliance to the speed limits set lower than engineering recommendation?

Yes  
  
No
Does your agency have any guidelines to determine the amount of enforcement (i.e., frequency and intensity of police presence) required to achieve a desired level of compliance with speed limits set lower than engineering recommendations?

Yes ☐
No ☐

Has your agency conducted any field or other evaluation(s) to determine the safety effects of roads that have speed limits set lower than engineering recommendations?

Yes ☐
No ☐

Has your agency noticed any other issues with respect to speed limits set lower than engineering recommendations on your roadways?

If your agency has a policy, guidance documentation, or any unpublished evaluations of roads that contain posted speed limits set lower than engineering recommendation, please upload a digital copy below. If a digital copy is unavailable, please forward a paper copy to the following:

Eric Donnell
The Pennsylvania State University
Department of Civil and Environmental Engineering
212 Sackett Building
University Park, PA 16802
E-mail: edonnell@engr.psu.edu