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16. Abstract

Posted speed limits (PSLs) are a highly complex issue involving engineering, human factors, and political and societal concerns. On a national level, recent research along with calls to change how speed limit are set, especially for city streets, have generated extensive discussion on future speed limit setting procedures. Recent Texas Department of Transportation (TxDOT) research involved conducting dialogues with TxDOT districts to learn about the practices and procedures being used, developing products designed to increase the understanding of operating speed and of PSLs, and performing new research into operating speed relationships with roadway characteristics. The developed communication products include videos (one for engineers and one for the public), a pamphlet for public distribution, answers to common questions about speed and speed limits, and a workshop on state and national speed limit setting practices.

TxDOT's *Procedures for Establishing Speed Zones* manual contains guidelines for conducting speed zone studies and setting regulatory speed limits based on the study results. The NCHRP 17-76 Speed Limit Setting Tool spreadsheet is available to assist practitioners in the application of nationally developed guidelines by automating calculations based on well-defined input data describing the speed distribution, site characteristics, and crash data. In this implementation project, the researchers presented workshops at three venues (two in-person and one virtual) to facilitate implementation of these tools.

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IMPROVING AND COMMUNICATING SPEED MANAGEMENT PRACTICES: WORKSHOP DEVELOPMENT

by

Kay Fitzpatrick, Ph.D., P.E., PMP
Senior Research Engineer

Steven P. Venglar, P.E.
Research Engineer

Michael P. Pratt, P.E., P.T.O.E.
Associate Research Engineer

Texas A&M Transportation Institute

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College Station, Texas 77843-3135

DISCLAIMER

The contents of this report reflect the views of the authors, who are responsible for the facts and the accuracy of the data published herein. The contents do not necessarily reflect the official view or policies of the Federal Highway Administration (FHWA) and/or the Texas Department of Transportation (TxDOT). This report does not constitute a standard, specification, or regulation. It is not intended for construction, bidding, or permitting purposes. The engineers in charge of the project were Kay Fitzpatrick, P.E. (TX #86762) and Steven P. Venglar, P.E. (TX #84027)

NOTICE

The United States Government and the State of Texas do not endorse products or manufacturers. Trade or manufacturers' names appear herein solely because they are considered essential to the object of this report.

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INTRODUCTION

Speed limits are among the most visible and routinely enforced traffic control devices motorists encounter in their everyday driving. Given this high degree of exposure and scrutiny, speed limits—and the practices and procedures used to develop them, inform drivers, and help enforce them—must be appropriate for their environment, defensible from an engineering and legal perspective, and comprehensible to the full range of mobility and safety stakeholders. In summary, posted speed limits (PSLs) are a highly complex issue involving engineering, human factors, and political and societal concerns.

The Texas Department of Transportation (TxDOT) Research Project 0-7049 (*1*) was designed to increase the profession's understanding of the fundamental relationships between posted and operating speed, identify procedures for the establishment of PSLs, identify technologies that increase driver awareness and comprehension, and provide content to support external and internal TxDOT dialogue about speed limits and their development for all roadway environments. The research team produced several products including the following:

- Video. Two videos were developed to address two very different audiences. The video oriented to the public focused on the steps used to study speed and roadway data and implement a new PSL. A second video was created to communicate the process for performing a speed study for public agency stakeholders and engineering staff.
- Pamphlet. The researchers designed the speed management pamphlet to clearly communicate how speed limits are set based on collected data and context-sensitive roadway and driving environment factors. The document is intended to replace the existing TxDOT informational pamphlet entitled "Setting Speed Limits."
- Talking Points. The talking points took the form of answers to questions to increase awareness among TxDOT staff regarding speed limit setting procedures and means for promoting speed limit compliance.
- Workshop. Materials were developed that can be used to train traffic engineers and staff on speed studies.
- Summary of TxDOT Speed Management Techniques.
- Suggested Revisions to TxDOT's *Procedures for Establishing Speed Zones* manual.

The researchers developed the workshop to inform participants about the guidance resources and demonstrate how to apply the resources through the conduct of sample problems. The first four sample problems involve identifying a suggested regulatory speed limit for a freeway segment and a suburban arterial segment using the guidance from TxDOT's *Procedures for Establishing Speed Zones* manual (*2*) and again using the National Cooperative Highway Research Program (NCHRP) 17-76 Speed Limit Setting Tool (N17-76 SLS-Tool) spreadsheet. A fifth sample problem revisits the suburban arterial segment and provides an opportunity for the workshop participants to discuss speed management techniques that may be used based on typical TxDOT practice.

This report consists of two parts. The first part describes the workshop that was developed and conducted. The second part recommends additional steps that can be taken to further facilitate implementation of the guidelines that are described in the workshop.

WORKSHOP DESCRIPTION

This section provides a description of the workshop content and a review of the workshop presentations at three venues (two in-person and one virtual) in Texas. The first subsection to follow provides an overview of the workshop. It is followed by a review of the learning objectives. Then, the workshop format and venues are outlined. The final subsection summarizes the participant evaluations.

WORKSHOP OVERVIEW

The workshop was four hours in length and covered practices for conducting speed zone studies and setting regulatory speed limits, methodologies for analyzing site data, operating speed trends on several types of roadways, resources for communicating speed limit setting practices, and availability of speed management treatments. The format of the workshop consisted primarily of a presentation using PowerPoint slides. Interactive sample problems were also conducted using an Excel-based spreadsheet program, the N17-76 SLS-Tool. The purpose of the N17-76 SLS-Tool was to facilitate the complex calculations needed to implement the guidance from NCHRP Report 966 (*3*). Each participant was given a copy of the N17-76 SLS-Tool and instructed on its use during the sample problems.

WORKSHOP OBJECTIVES

The first workshop objective was to review and discuss practices for conducting speed zone studies and setting regulatory speed limits. This material focused first on TxDOT's current practices as described in the *Procedures for Establishing Speed Zones* manual, and then on new directions described in national research and policy-making activities, including NCHRP Research Report 966 (*Posted Speed Limit Setting Procedure and Tool: User Guide*). Participants had an opportunity to analyze two sample roadway speed zones twice: first using the *Procedures for Establishing Speed Zones* methodology, and then using the N17-76 SLS-Tool. These sample problems provided an opportunity for the participants to discuss the issues and challenges with analyzing speed zones and setting regulatory speed limits.

The second workshop objective was to inform the participants about the availability of resources that can help them communicate speed limit setting practices and treatments that can help them manage speed on roadways. The communication resources included informational videos developed for engineers and citizens, an informational pamphlet, and talking points and frequently asked questions material. These resources were developed in TxDOT Research Project 0-7049.

After attending the workshop, participants should be able to apply the two discussed methodologies for setting regulatory speed limits (*Procedures for Establishing Speed Zones* and the N17-76 SLS-Tool) and explain the methodologies to interested practitioners or citizens.

WORKSHOP FORMAT

The workshop presentations consisted of approximately four hours of instruction, which included a presentation, a demonstration of the N17-76 SLS-Tool, and five interactive sample problems. The visual aids used in the course consist primarily of 76 PowerPoint slides.

The workshop agenda is provided in Table 1. As shown, there are four hours of instruction, so the workshop can be presented with a morning agenda or an afternoon agenda. The sample problems in each lesson are designed such that participants can analyze the same site multiple times using different sets of guidance. Sample problems 1 and 2 involve applying the *Procedures for Establishing Speed Zones* methodology to a rural freeway segment and a suburban arterial segment, respectively. Sample problems 3 and 4 involve applying the NCHRP Report 966 methodology to the same two segments using the N17-76 SLS-Tool and comparing the results obtained using the two methodologies. Sample problem 5 involves an open discussion of speed management treatments on the same suburban arterial segment that was analyzed in sample problems 2 and 4.

Table 1. Workshop Agenda with Typical Start Times.

Start Time (Morning)	Start Time (Afternoon)	Lesson	Material Covered
8:00	1:00	Introduction and Scope	Overview of workshop agenda and scope.
8:15	1:15	Lesson 1: Speed Study Approach within Texas	A viewing of the engineer video. TxDOT guidance for setting regulatory speed limits, focusing on the *Procedures for Establishing Speed Zones* manual and the use of the 85th percentile speed. Two sample problems to apply the TxDOT guidance.
9:00	2:00	Lesson 2: Recent National Activities	Directions discussed and researched in other states and at the federal level. The context-based speed limit framework synthesized in NCHRP Research Project 17-76. Two sample problems to apply the NCHRP 17-76 framework.
9:50	2:50	Break	Break.
10:00	3:00	Lesson 2 (continued)	Continuation of Lesson 2.
10:35	3:35	Lesson 3: Operating Speed Research	Findings from the analysis of operating speed relationships for rural highways, urban/suburban streets, and freeways.
11:20	4:20	Lesson 4: Helpful Resources for Communicating Practices	A viewing of the citizen video. The two-page informational pamphlet and the Frequently Asked Questions document. Speed management treatment availability and implementation order. One sample problem to apply speed management treatments.
11:50	4:50	Closure	Final questions about workshop material.
12:00	5:00	Adjourn	Adjourn.

WORKSHOP VENUES

The researchers conducted three workshops. Table 2 summarizes the locations, dates, and attendance numbers for each workshop presentation. Practitioners from 12 of the 25 TxDOT districts were able to attend, as well as TxDOT divisions, cities, counties, and consultants. The first workshop presentation occurred at the venue for the TxDOT Short Course immediately after the official Short Course activities ended. The second workshop presentation occurred virtually.

The third workshop presentation was included on the agenda for the 2024 Texas Institute of Transportation Engineers (TexITE) Spring Meeting.

Table 2. Workshop Venues and Attendance.

Venue	Date	TxDOT Participants	Other Participants
College Station (post-Short Course)	10/11/2023	20 (ABL, ATL, AUS, BRY, CRP, PHR, WAC, WFS)	0
Virtual	1/31/2024	25 (AUS, BRY, CRP, DAL, LFK, ODA, TYL, WAC, unspecified)	0
College Station (TexITE)	4/3/2024	0	26 (8 city, 1 county, 1 unspecified public agency, 14 consultant, 2 unspecified)
All venues	All dates	45	26

WORKSHOP EVALUATION

Participants were given evaluation forms near the end of each workshop presentation and asked to comment on the workshop content and format. The evaluation form contained four questions about the workshop content and four questions about the participants' general observations about the strengths and weaknesses of the workshop format.

The four questions that inquired about workshop content were the following:

1. Did the workshop meet your expectations?
2. Was the material presented at the correct level of difficulty?
3. Was the topic of the workshop covered adequately (nothing left out, no one topic overemphasized)?
4. Was the software easy to use?

Participants were instructed to respond to each question using a scale of 1 to 5, with 1 = Yes/Strongly Agree, 2 = Somewhat Agree, 3 = Maybe/Neutral, 4 = Somewhat Disagree, and 5 = No/Strongly Disagree. The responses to the first four questions are summarized in Table 3.

Table 3. Participant Evaluation of Workshop Content.

Workshop Venue	Number of Responses	Response[1] to Question 1	Response[1] to Question 2	Response[1] to Question 3	Response[1] to Question 4
College Station (post-Short Course)	4	1.0	1.0	1.0	1.5
Virtual	4	1.5	1.8	1.0	1.3
College Station (TexITE)	26	1.5	1.5	1.6	1.5
Average or total:	34	1.4	1.5	1.4	1.4

Note:
[1] Average participant response for the question. Scores of 1 to 5 were possible, with 1 = Yes/Strongly Agree, 2 = Somewhat Agree, 3 = Maybe/Neutral, 4 = Somewhat Disagree, 5 = No/Strongly Disagree.

The second set of four questions inquired about the participants' general observations of workshop strengths and weaknesses. Unlike the first four questions, each of the questions in the second set was open-ended. The specific questions posed to the participants include:

1. What did you like most about the course?
2. What did you like the least about the course?
3. What can we do to improve this workshop?
4. Other comments.

Of the 71 workshop participants, 33 provided responses to questions 5–8. When asked what portion of the workshop the participant liked best, the most common responses were the spreadsheet tool and other communication tools (13 participants) and the interactive discussions (6 participants). Five participants suggested adding another break period or additional sample problems to address more roadway types, and four participants suggested enforcement, variable speed limits, optical speed bars, and intersection speed management as additional topics to include in the workshop. Six participants gave positive feedback on the spreadsheet tool, describing it as "self-explanatory" or "intuitive but not black box."

Regarding the coverage of topics, a split is apparent in both the answers to question 3 (see Table 3) and the free-form responses provided to several survey questions. Four participants at the third workshop expressed that the material seemed TxDOT or rural centric or stated that they would have liked to see more sample problems and discussion of urban streets and variables that are more relevant to urban areas, such as the variables addressing pedestrian and bicycle facilities. This feedback likely reflects the differences in audience between the first two workshops (TxDOT practitioners) and the third workshop (city practitioners and consultants who conduct the bulk of their analyses for cities). The latter group's efforts more often focus on speed zones in developed areas where more variables are needed to account for the presence and needs of pedestrians and bicyclists.

SUMMARY AND RECOMMENDATIONS

The positive responses to the workshop material suggest that the content is effective and its format is well-organized. Now that workshops have been offered at several venues to cover the material and introduce the N17-76 SLS-Tool, a future follow-up survey of past participants may yield insight into the long-term value of the material, as well as identify improvements that could be made to the spreadsheet or additional topics and variables to add into guidance materials.

Feedback on the speed limit practice communication materials was also generally positive. As with the spreadsheet, a follow-up survey could be conducted to assess the long-term benefits of the communication materials and identify additional topics or stakeholder groups that need to be addressed in the materials.

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