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TRB Webinar: Displaying Good Traffic Safety Messages on Variable Message Signs

September 9, 2025

1:00 – 2:00 PM

PDH Certification Information

1 Professional Development Hour (PDH) – see follow-up email

You must attend the entire webinar.

Questions? Contact Andie Pitchford at TRBwebinar@nas.edu

The Transportation Research Board has met the standards and requirements of the Registered Continuing Education Program. Credit earned on completion of this program will be reported to RCEP at RCEP.net. A certificate of completion will be issued to each participant. As such, it does not include content that may be deemed or construed to be an approval or endorsement by the RCEP.



AICP Credit Information

1 American Institute of Certified Planners Certification Maintenance Credit

You must attend the entire webinar

Log into the American Planning Association website to claim your credits

Contact AICP, not TRB, with questions

Purpose Statement

This webinar will explore how behavioral science, and human factors shape the effectiveness of safety messaging on variable message signs. Presenters will share findings from human factors studies that assess how quickly and accurately drivers comprehend messages when displayed for limited viewing times.

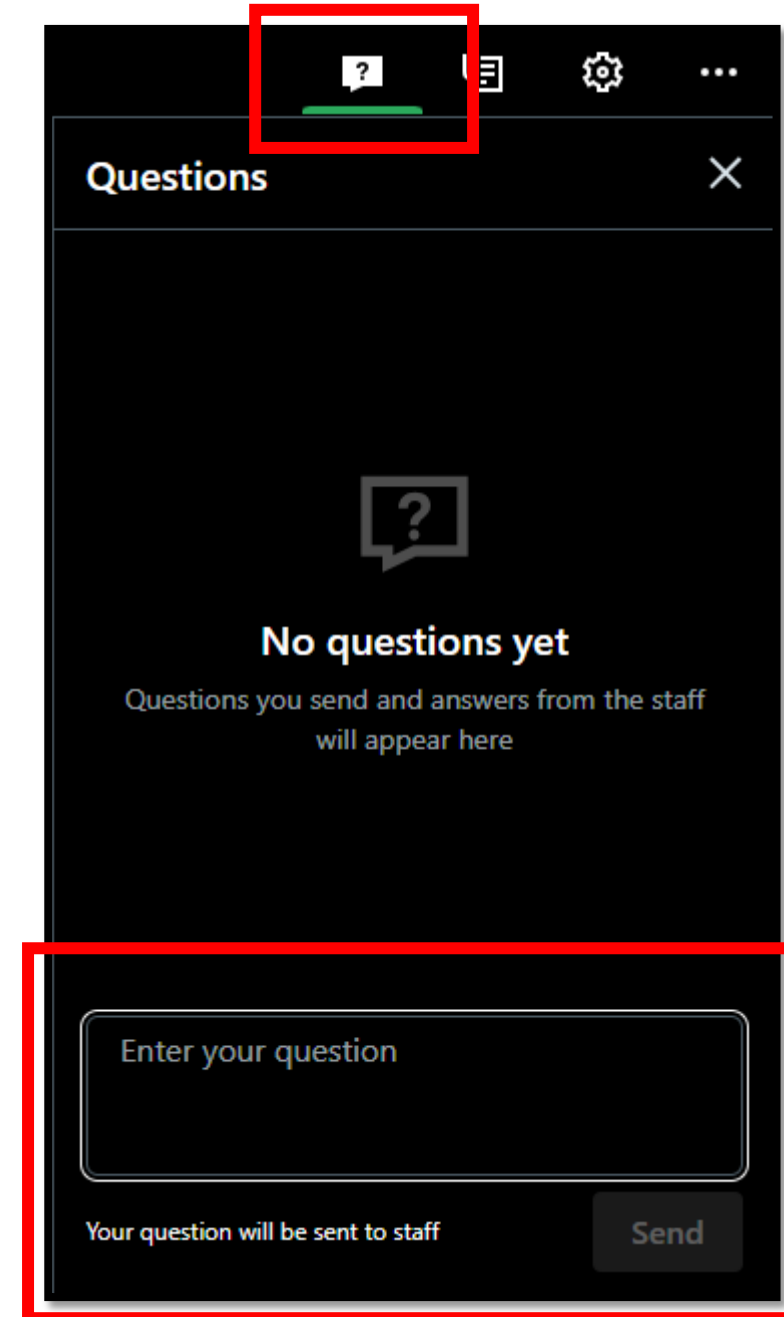
Learning Objectives

At the end of this webinar, participants will be able to:

- Apply effective content and display strategies that enhance the effectiveness of traffic safety messaging;
- Evaluate the impact of humor, wit, and pop culture references in safety messages and recognize when such approaches may reduce message effectiveness; and
- Develop clear, effective traffic safety messages that promote good driving behaviors.

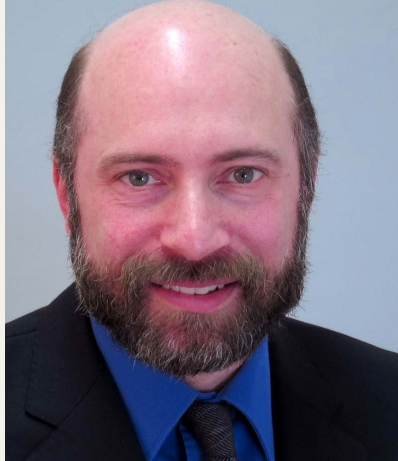
Questions and Answers

- Please type your questions into your webinar control panel
- We will read your questions out loud, and answer as many as time allows



The screenshot shows a dark-themed mobile application interface for a webinar Q&A session. At the top, a navigation bar contains several icons: a question mark icon (highlighted with a red box), a list icon, a settings gear icon, and a three-dot menu icon. Below the navigation bar is a header section with the title "Questions" and a close button (X). The main content area displays a large question mark icon and the text "No questions yet" followed by "Questions you send and answers from the staff will appear here". At the bottom, there is a text input field with the placeholder "Enter your question" (highlighted with a red box). Below the input field, the text "Your question will be sent to staff" is displayed, and a "Send" button is located to the right.

Today's Presenters



Richard Retting

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**YOU TALK
YOU TEXT
YOU CRASH**

**DRIVE SOBER
OR
GET PULLED OVER**

**NO
HANDHELD PHONES
IN WORK ZONES**

**BUCKLE UP
IT IS THE LAW**

**DRIVING DROWSY?
REST AREA
3 MILES AHEAD**

Displaying Good Traffic Safety Messages on Variable Message Signs



Variable (Changeable, Dynamic) Message Signs

- Highly versatile traffic control devices
- Information should:
 - Fulfill a need
 - Command attention
 - Convey a clear, simple meaning
 - Command respect from road users
 - Give adequate time for proper response
- Only legible for a limited time
- Visible to all drivers

**ACCIDENT
1 MILE
RIGHT LANE CLOSED**

**ROADWORK
NEXT 2 MILES
WATCH FOR WORKERS**

**EVENT PARKING
USE EXIT 5
TURN RIGHT**

**LOOK TWICE
FOR
MOTORCYCLES**

Behavioral Traffic Safety (BTS) Messaging Concepts and Effectiveness

Emotional appeal message more effective than objective, factual messages

Males are less influenced by negative, fear-appeal messages

Some drivers may not “catch” the safety issue or topic of excessively humorous BTS messages

Messages that shame or mock not effective

Most Common BTS Topics Displayed on VMS

- Encouraging Seat Belt Use
 - Discouraging Distracted Driving
 - Encouraging Safer Driving
 - Encouraging Safe Driving During Adverse Weather Conditions
 - Encouraging Proper Lane and Shoulder Use
- Discouraging Drinking and Driving
 - Discouraging Speeding
 - Encouraging Safe Driving in Work Zones
 - Encouraging Motorcycle or Bicycle Awareness
 - Encouraging Proper Response Around Emergency Vehicles

Human Factors Study of BTS Message Characteristics

- How many words can be displayed?
- Can multiple safety topics be displayed in a BTS message?
- Should humor be used in a BTS message?
- BTS messages should not be any more difficult to read and process while simultaneously operating a vehicle than traffic management messages

Study Methodology

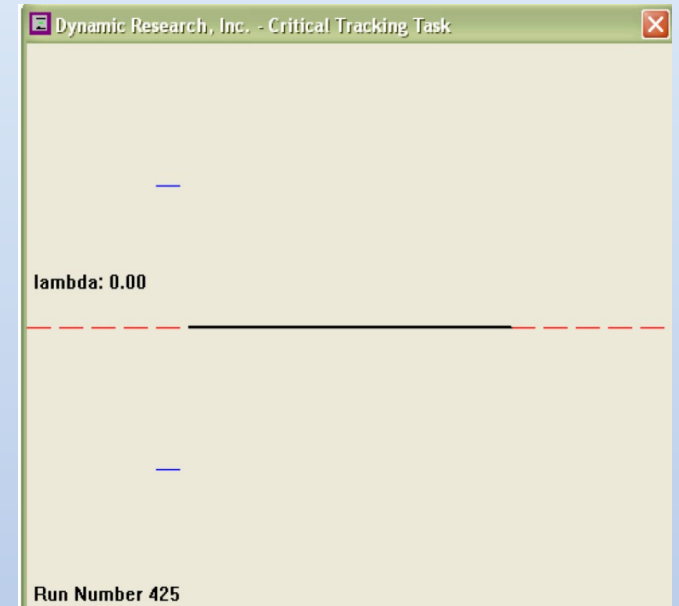
Two-phase BTS messages presented on a computer screen for a limited viewing time

Participants viewed message while simultaneously performing a secondary (critical tracking) task on an adjacent computer screen

Measured critical tracking task performance, subject comprehension of messages

Critical Tracking Task (CTT)

- Horizontal cursor line moved randomly up and down on the screen
- Joystick used to keep horizontal cursor line close to dashed centerline
- The closer to the centerline the cursor is kept, the lower the score
- Random cursor movements adjusted in software to create low and high levels of CTT difficulty



BTS Message Test Levels

Number of Words Contained in Message

9-11 Words, e.g.,

**SHARE THE ROAD
WITH
MOTORCYCLES**

**WATCH FOR
MOTORCYCLES
DRIVE SAFELY**

15-16 Words, e.g.,

**STATE LAW
BUCKLE UP
EVERYONE EVERY TIME**

**BUCKLE UP
IT COULD MEAN
LIFE OR DEATH**

18-21 Words, e.g.,

**SLOW DOWN
IN WORK ZONES
GIVE 'EM A BRAKE**

**WORK ZONES –
WE DON'T SPEED
THROUGH YOUR OFFICE**

BTS Message Test Levels

Number of Safety Topics in the Message		
Same Safety Topic on Both Phases, e.g.,	Different Safety Topic on Each Phase, e.g.,	Safety Topic on One Phase and a General Statement on the Other Phase, e.g.,
SHARE THE ROAD WITH MOTORCYCLES	DRIVE SMART TEXT LATER IT CAN WAIT	SLOW DOWN ENJOY THE RIDE
WATCH FOR MOTORCYCLES DRIVE SAFELY	MOVE OVER FOR RED, BLUE, OR AMBER LIGHTS	1200 TRAFFIC DEATHS THIS YEAR

BTS Message Test Levels

Use of Humor in the Message	
Humor Not Used, e.g.,	Humor Used, e.g.,
DRIVE HIGH GET A DUI	NOBODY RELISHES A PICKLED DRIVER
SLOW DOWN AND SAVE A LIFE	DON'T BE A TURKEY DRIVE SOBER

Baseline Traffic Management Messages

Each Message Contains Four Units of Information

Incident Message		Special Event Message		Roadwork Message
MAJOR ACCIDENT 3 MILES		STADIUM TRAFFIC USE BROAD STREET		ROADWORK 1 MILE
USE ALTERNATE ROUTES AVOID DELAYS		THROUGH TRAFFIC USE LEFT LANE		LEFT LANE CLOSED EXPECT DELAYS

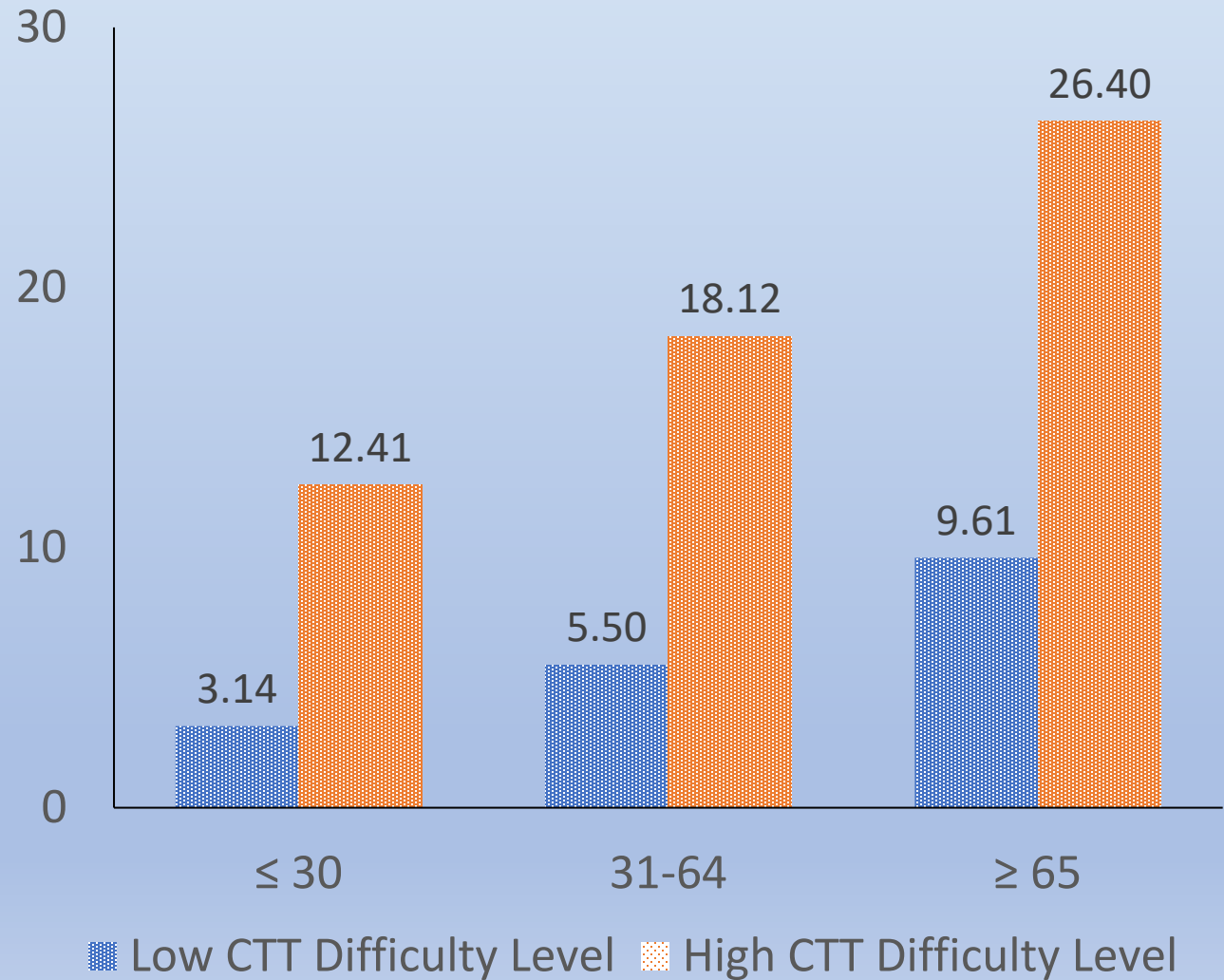
Study Participant Demographics

- 120 participants
 - 60 from Texas
 - 60 from Pennsylvania
- Evenly split by gender
- 3 age groups
 - ≤ 30
 - 31-64
 - ≥ 65
- One-half assigned to a low CTT difficulty level, the other assigned to a high CTT difficulty level

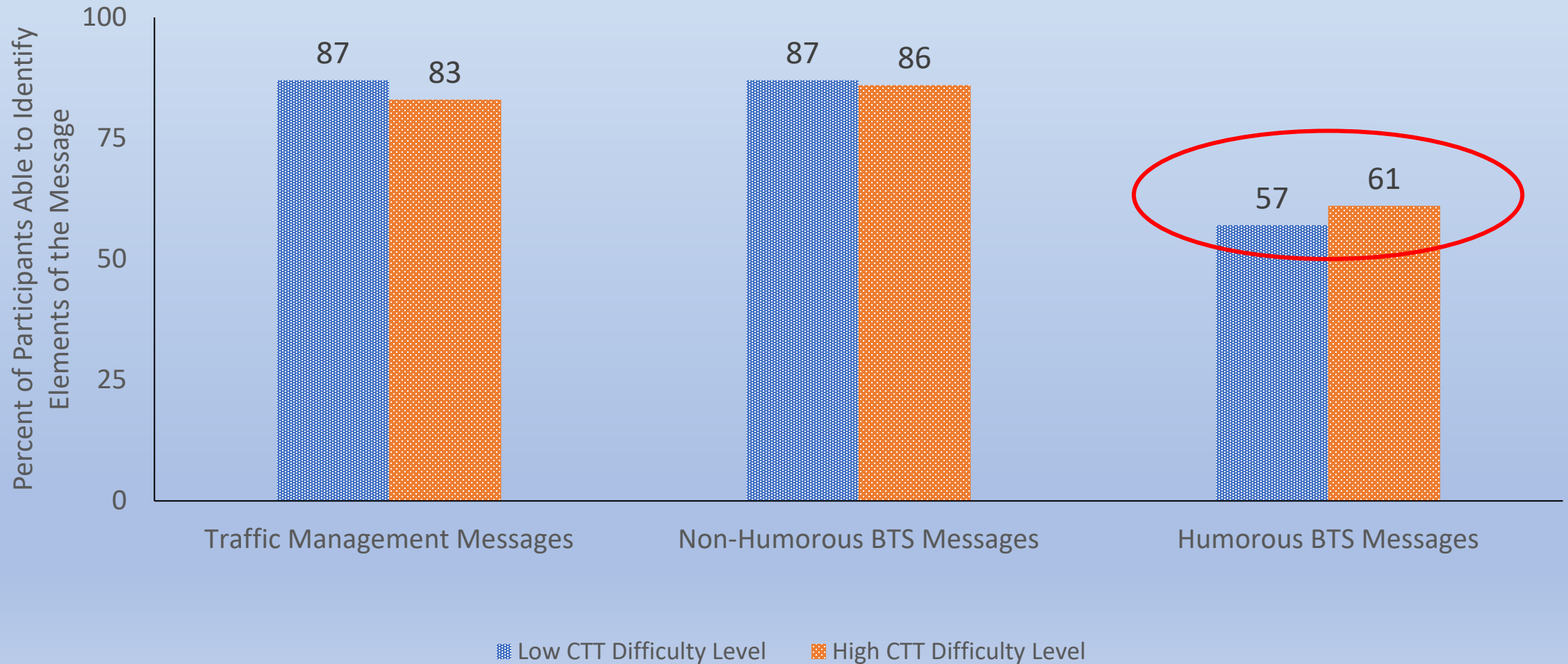
Study Results

- No differences between TX and PA study participants
- No consistent differences between male and female participants
- As expected, CTT scores increased as age of participant and CTT difficulty level increased

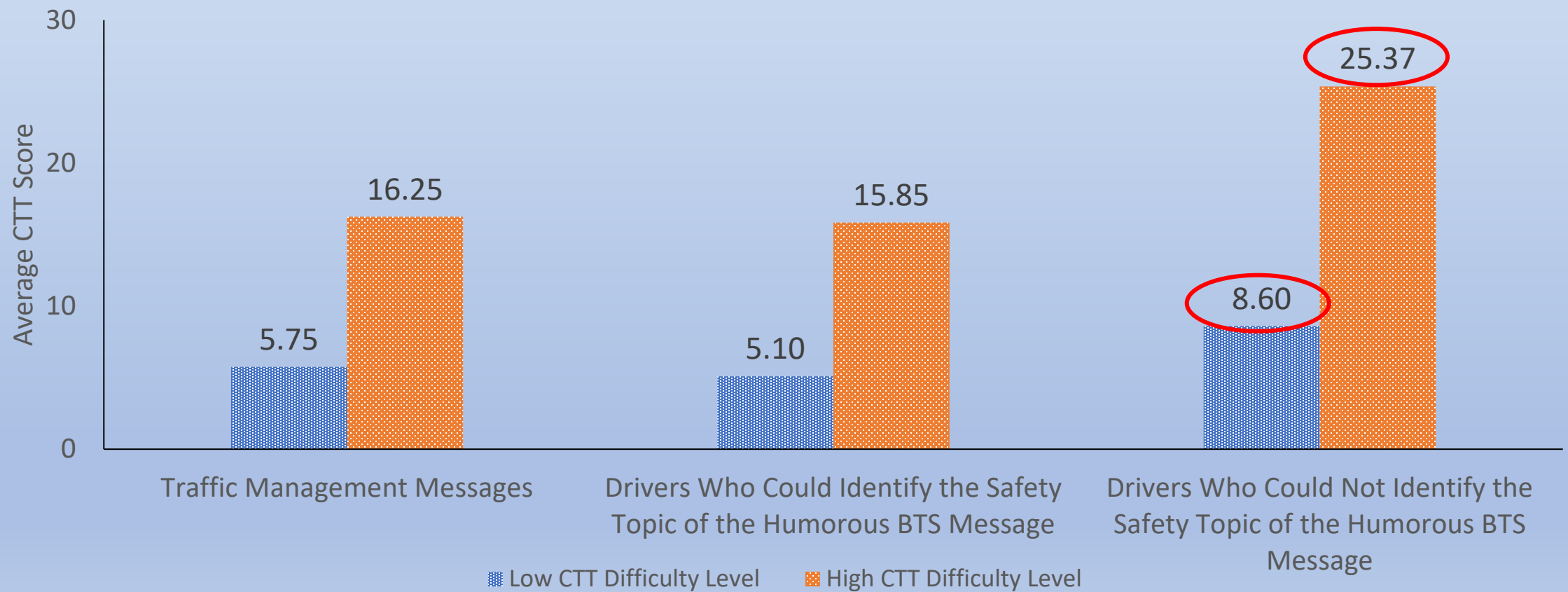
Effect of Age on Average CTT Score for BTS Messages



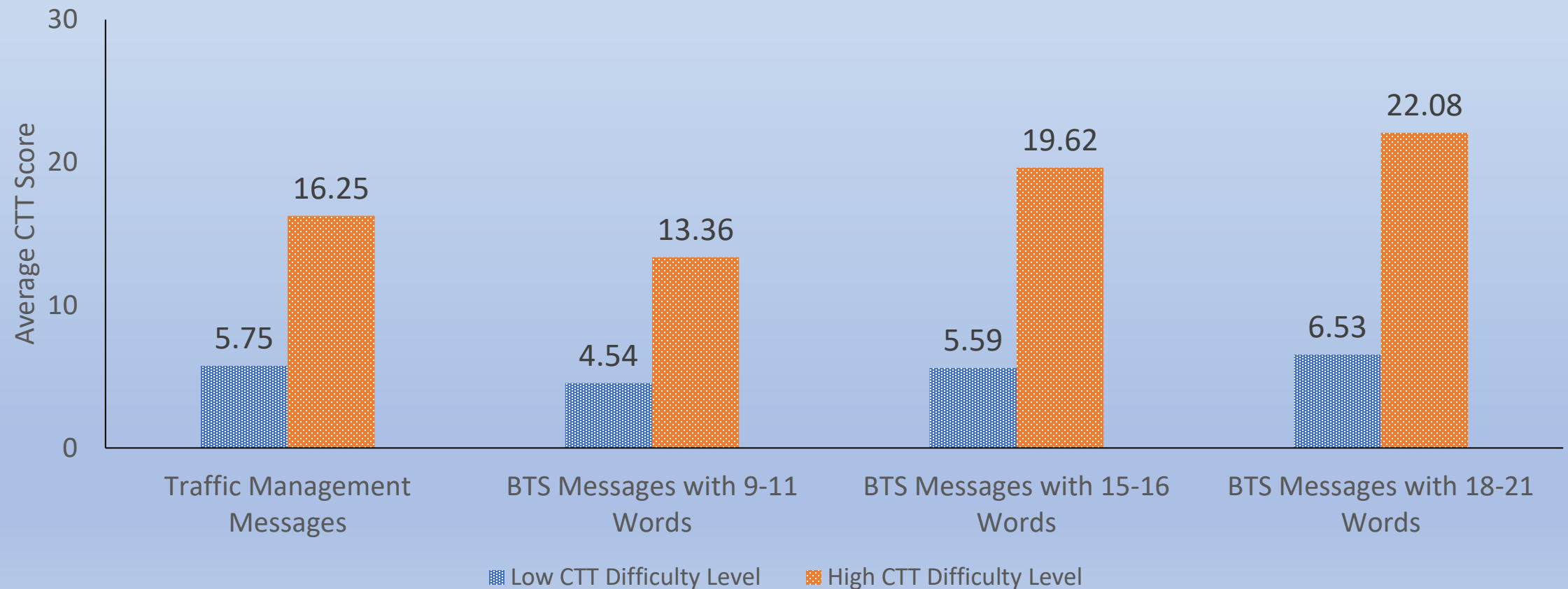
Humorous BTS Messages May Not Be Well Understood



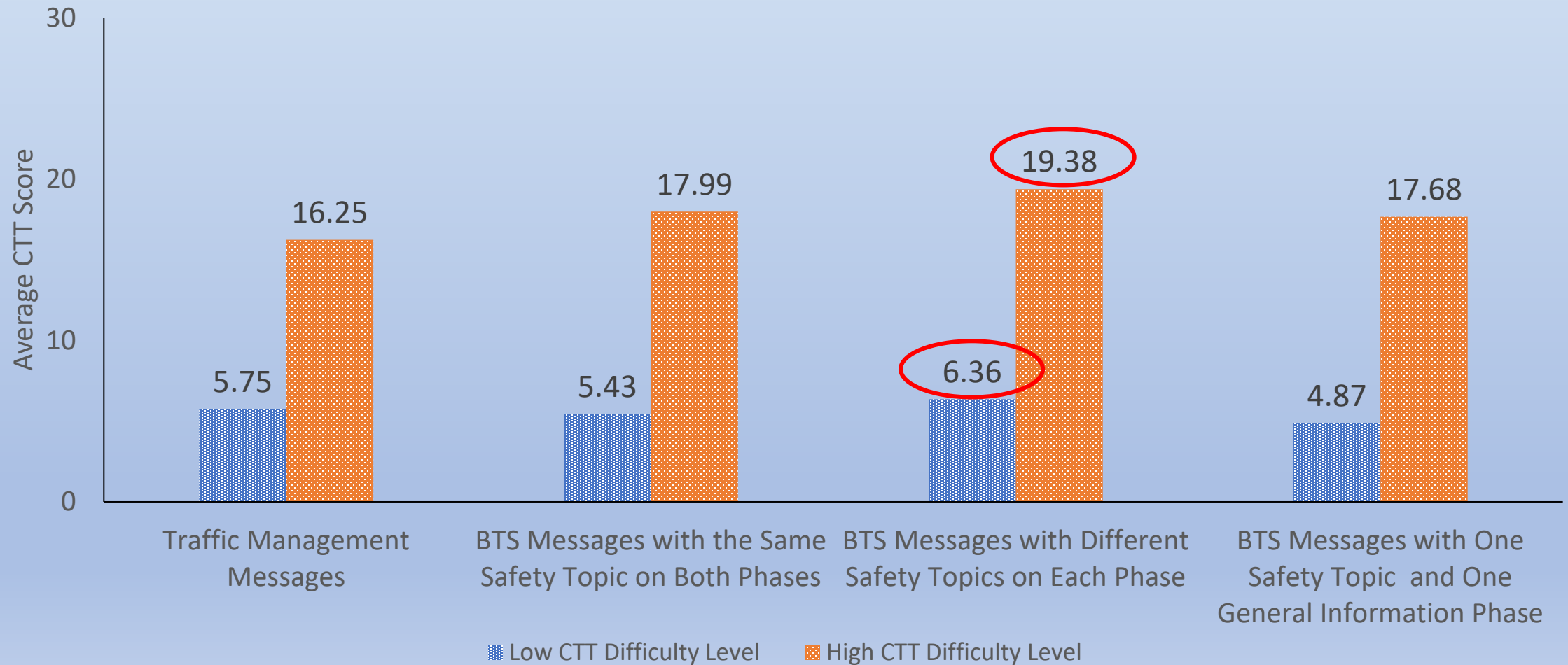
Effect of Poor Understanding of Humorous BTS Messages

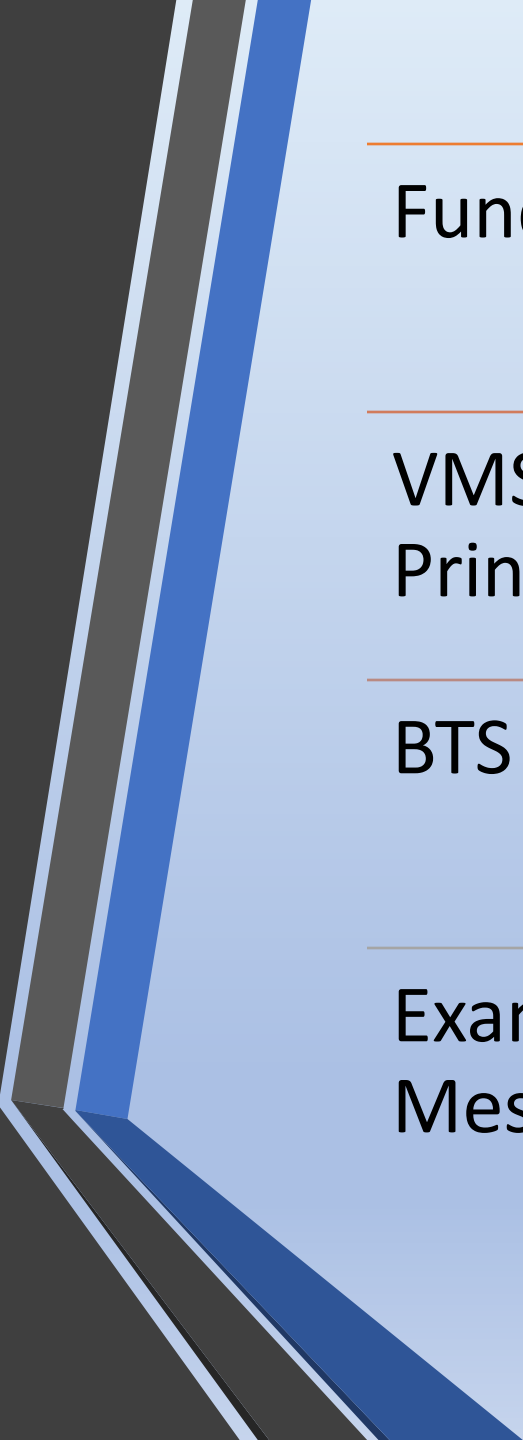


Effect of Message Length on Non-Humorous BTS Messages



Effect of Multiple Safety Topics on Non-Humorous BTS Messages





Guide for BTS Messaging on VMS

Fundamentals of BTS Messaging

VMS Message Design and Operating
Principles for BTS Messages

BTS Message Display Guidelines

Examples of VMS-Formatted BTS
Message Phases by Traffic Safety Topic

Seven Characteristics of an Effective BTS Message



Process for Developing a BTS Message

Identify Target Audience

Identify Problem Behavior

Select Message Objective

Define Benefits of Safer Behavior or
Costs of Continuing Problem Behavior

Develop Message

MUTCD Guidance Regarding BTS Messages on VMS

- Support an overall safety campaign
- Coordinate with enforcement
- Target adverse safety behaviors prevalent on the roadway where the message is displayed
- Avoid use of humor, wit, colloquialisms, and pop culture references
- Avoid use of statistics
- Avoid general PSAs
- Avoid telephone numbers, websites, domain names, hashtags, or app names
- No scrolling lines, animation, flashing displays, and non-approved symbols

Maximum BTS Message Lengths on VMS

Low driver workload conditions: No more than 16 words or numbers

High driver workload conditions: No more than 11 words or numbers

Address only one traffic safety topic in the message

Start Each New Thought on a New Line



**WATCH YOUR
SPEED NOT
YOUR PHONE**

Incorrect



**YOU TALK YOU
TEXT YOU CRASH**

Incorrect

**WATCH YOUR
SPEED
NOT YOUR PHONE**

Correct

**YOU TALK
YOU TEXT
YOU CRASH**

Correct

Each Phase Should Be Understood by Itself

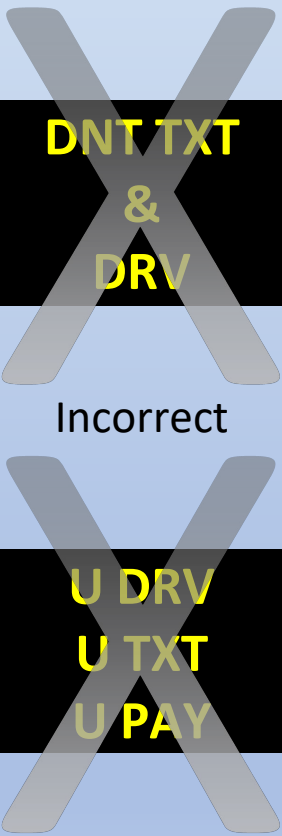


Incorrect



Correct

Texting Abbreviations Should Not Be Used



**DNT TXT
&
DRV**

Incorrect

**U DRV
U TXT
U PAY**

Incorrect

**DONT TEXT
AND
DRIVE**

Correct

**YOU DRIVE
YOU TEXT
YOU PAY**

Correct

Other Decisions to Make About Displaying BTS Messages on VMS

Which campaigns to support (national, state, local)?

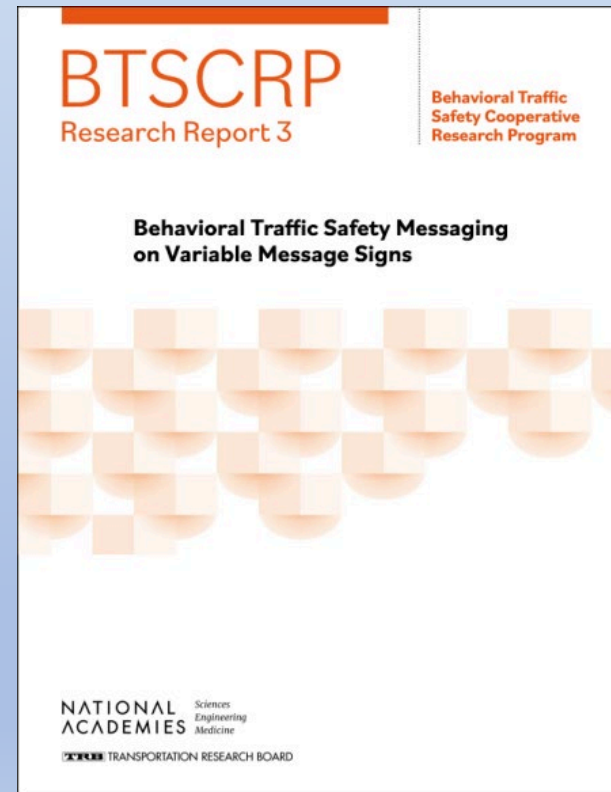
What BTS message topics will be allowed?

Which VMS will be used to display BTS messages?

When will BTS messages be displayed, and for how long?

For More Information....

BTSCR P Research Report 3,
*Guide for Behavioral Traffic
Safety Messaging on Variable
Message Signs*



Thank You!

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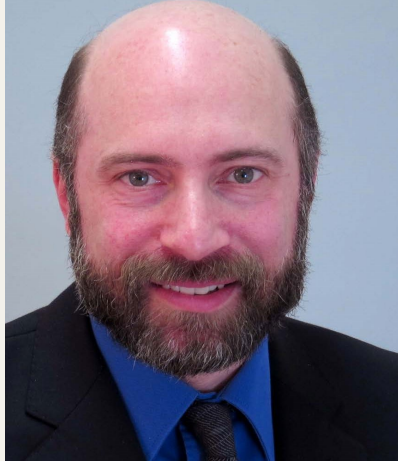
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Upcoming events for you

January 11-15, 2026

2026 TRB Annual Meeting

<https://trb-annual-meeting.nationalacademies.org/>

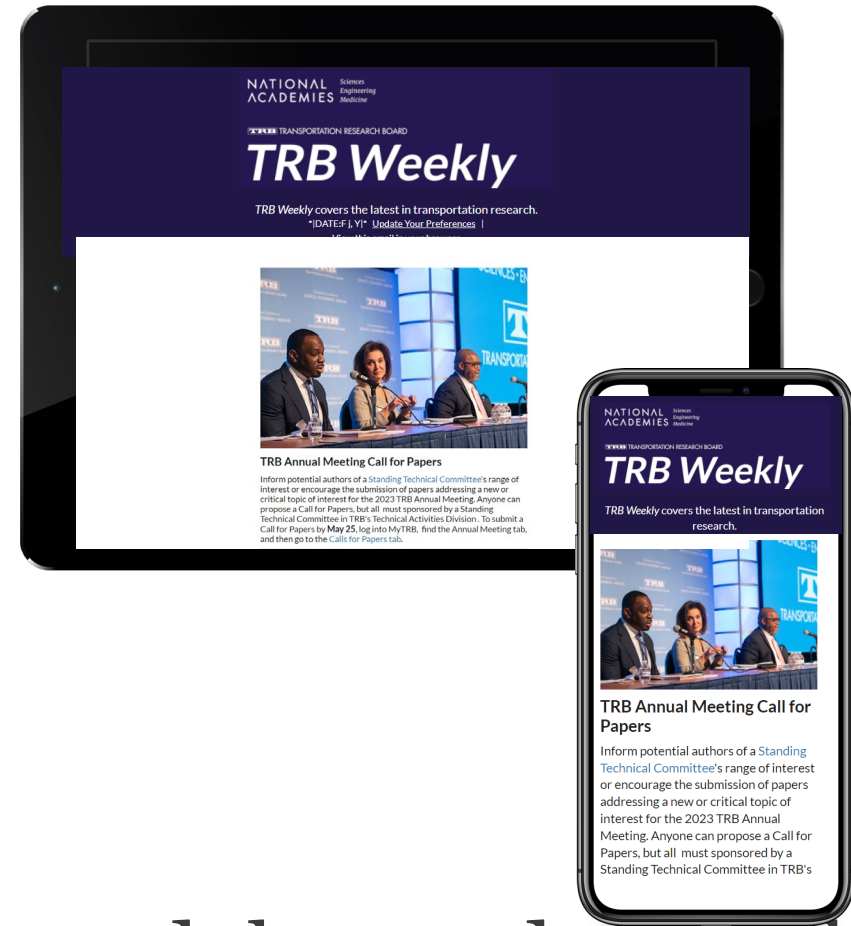


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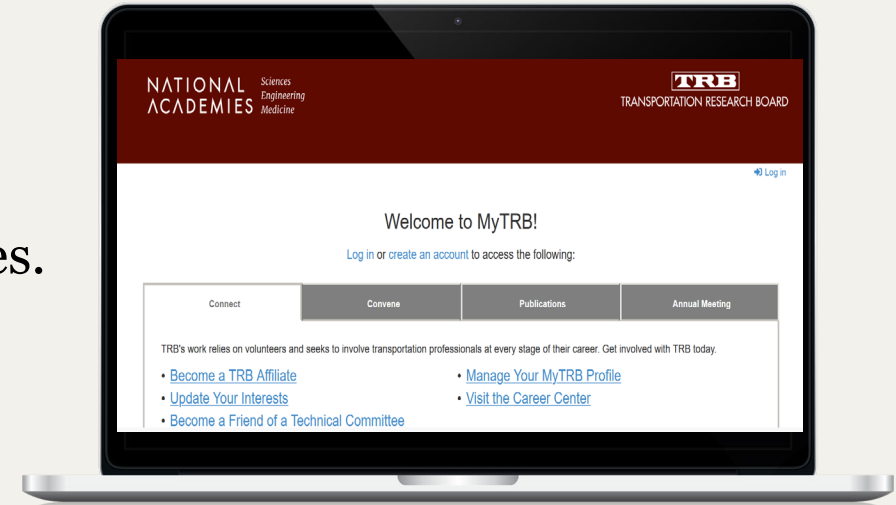


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