New England Transportation Consortium

NEW ENGLAND TRANSPORTATION CONSORTIUM
RESEARCH PROBLEM STATEMENT FORMAT

Due to netc@ctcandassociates.com **by January 22, 2021**

I. PROBLEM TITLE

A suggested title in as few words as possible.

Evaluation of Dynamic Message Signs in New England.

II. RESEARCH PROBLEM STATEMENT

Clearly define the problem and provide sufficient evidence to support its importance to the New England region. The statement should discuss the gaps in current knowledge, literature, and studies that demonstrate the research need.

Dynamic Message Signs (DMS) can provide travelers with critical road incidents, adverse weather and road conditions, work zones, congestion, travel time, and other relevant traffic and traveler information. DMS messaging is widely used by state DOTs in the New England region. State DOTs are very interested in quantifying how exactly New England drivers respond to these messages in general and based on where and when messages are sent, so that they can fully understand the benefits of investing in DMS or design more effective messages. For example, it is important to determine how drivers respond to travel time and incident messaging. It is also important to quantify the effectiveness of DMS messaging under different weather conditions (e.g., slippery roads during snowstorms) and in different location types (urban vs. rural, arterial vs. interstate, parallel routes vs. no parallel routes). New and emerging data sources provide potential ways to more effectively and accurately analyze the effectiveness of DMS under different scenarios. It is interesting to explore these data together with data from other sources (e.g., loop detectors) to analyze the effectiveness and benefits of DMS. Given the complexity of the data and their volume, variety, and veracity, it is interesting to use advanced data analytic methods and visualization tools when appropriate to analyze the data and to improve the accuracy (or effectiveness) of the messages displayed on DMS and explore new applications of DMS.

III. RESEARCH OBJECTIVES

Define specific research objectives. These may be more specific than the broad need described in Section II. These should be project objectives (expected results) and not tasks or methodology.

The objectives of this research include:

1. Review the practices of DMS Messaging in New England states.
2. Evaluate the effectiveness of safety and travel time related messages using existing and emerging data sources, and quantify their benefits.
3. Propose a case study using emerging data sources and data analytic methods to improve the accuracy (or effectiveness) of DMS messages.
4. Provide recommendations to state DOTs in New England on how to improve the effectiveness of DMS and potential new applications of DMS.

IV. COST ESTIMATE

An estimate of the funds necessary to accomplish the objectives described in Section III.

$200,000

V. RESEARCH PERIOD

An estimate of the number of months necessary to complete the research. In addition, include preparation of a Draft and Final Report and its review by the NETC project Technical Committee (90 days).

24 months

VI. URGENCY AND PAYOFF POTENTIAL

A description of the urgency of the need for this research in relation to the transportation needs of the six New England States. A discussion of the potential benefits to be derived from the anticipated research results i.e., time/cost savings, enhanced practice/performance, improved safety, other.

Dynamic message signs are used by several New England DOTs to convey different traveler or safety information to roadway users. However, it is not clear to what extent users respond to the posted messages. It is important to investigate the effectiveness of these signs in order to fully understand the benefits of the investment. Multiple state DOTs purchased several new and emerging data sources and use them in their daily analyses. These data sources potentially provide avenues to more effectively evaluate the effectiveness of DMS. Emerging data sources and data analytic methods can also be used in combination with DMS to provide more accurate (or more effective) information to travelers, or expand the use of message signs to new applications that improves traffic safety or operations.

VII. IMPLEMENTATION POTENTIAL

To aid NETC in deciding whether to fund this project, describe:

- *The intended transportation agency audience(s) for using the research products:* The intended DOT audience are staff involved in enhancing the safety and operations of roadways.

- *Type of implementation anticipated as a result of the project (i.e. confirm existing, adopt new or eliminate current standards, specifications, processes, policies, regulations or drawings, GIS application):* This project will provide insights for DOTs on effectiveness of dynamic message signs, and provide recommendations for enhanced effectiveness as well as new applications using emerging data sources and data analytics.

- *Activities to facilitate implementation (e.g. brochures, posters, exhibits at conferences, tech sheet summaries, webinars, presentations, training workshops, peer exchanges, pilot or demonstration project at host agency) to help create awareness and facilitate implementation of the research results:* Presentations at TRB, New England ITE, etc. Presentation of a webinar to DOT staffs in order to disseminate the research results.

- *Anticipated barriers or constraints to implementation and ways to overcome them:* Close collaboration with the host agency is critical for this research. Data access is also important.

- *Methods of tracking and measuring the impacts of implementation:* Number of presentations given at regional and national conferences, and number of agencies interested in adopting the recommendations about DMS messaging.

TWO TRANSPORTATION AGENCY STAFF ENDORSEMENTS ARE REQUIRED

(To be signed by separate individuals.)

VIII. ENDORSEMENT BY THE SPONSORING TRANSPORTATION AGENCY REPRESENTATIVE TO THE NETC ADVISORY COMMITTEE

By signing the endorsement, the transportation agency representative is certifying that:

1. *The Research Problem Statement follows the required format.*
2. *The Research Problem Statement addresses a transportation issue of relevance to NETC and does not duplicate another Research Problem Statement being submitted at this time.*

Dale Peabody — Name

MaineDOT — Transportation Agency

Dale Peabody

01/21/2021

ENDORSEMENT BY THE SPONSORING TRANSPORTATION AGENCY RESEARCH PROBLEM STATEMENT AUTHOR/SUBMITTER

By signing the endorsement, the transportation agency Research Problem Statement author/submitter is certifying that:

1. *I have technical knowledge of the project topic and will be committed to the research outcome.*
2. *I agree to serve as Chair of the project's Technical Committee if this Research Problem Statement is selected for funding by NETC.*

Colby Fortier-Brown — Name

Maine DOT — Transportation Agency

Colby Fortier-Brown — Signature*

1/21/2021 — Date

*Electronic signatures are acceptable.

NOTE: To expedite the processing of Research Problem Statements, NETC requires submittal by e-mail from signing Advisory Committee member to (netc@ctcandassociates.com) by January 22, 2021.