

NEW ENGLAND TRANSPORTATION CONSORTIUM QUARTERLY PROJECT PROGRESS REPORT

A. PROJECT NUMBER AND TITLE:

NETC 20-2 Current Status of Transportation Data Analytics and A Pilot Case Study Using Artificial Intelligence (AI)

B. PRINCIPAL INVESTIGATOR(s) & UNIVERSITY(s):

Yuanchang Xie, PhD, PE, University of Massachusetts Lowell

C. WEB SITE ADDRESS (*If one exists*):

None

D. START DATE (*Per NETC Agreement*):

5/5/2021

E. END DATE (*Per NETC Agreement*):

12/31/2023

F. ANTICIPATED COMPLETION DATE:

12/31/2023

G. PROJECT OBJECTIVES:

- (1) Provide clear and comprehensive picture to the six New England state DOTs regarding their data assets, data needs and emerging data sources, modeling and workforce needs, and data collection, analysis, utilization, storage, and sharing practices related to traffic operations;
- (2) Provide strategic and practical recommendations to prepare New England DOTs for future data-driven transportation system analytics; and
- (3) Conduct a pilot case study of using AI techniques to analyze existing multi-source data for improving traffic operations and safety.

H. REPORT PERIOD:

October – December, 2022

I. ACCOMPLISHMENTS THIS PERIOD:

- We submitted a formal no-cost extension for this project. This request has been approved by NETC and the new project end date is 12/31/2023.
- We have identified 5 sites for curve trajectory data collection. They are highlighted in the map below (see those red stars)
<https://www.arcgis.com/home/webmap/viewer.html?webmap=99c46507a9bc4bfa8e9b399e2d72da8c>
- The team has received and tested the two radar sensors. We also purchased three thermal cameras. These thermal cameras are currently being tested on UMass Lowell campus. Using thermal cameras is to collect video data and verify the vehicle classification results from the radar data.

- The team visited NHDOT on 12/20/2022 to check out the trailer to be used for the data collection. The trailer provided by NHDOT is a great fit. However, the short daylight in the winter makes it challenging to charge the batteries. Therefore, starting the data collection towards the end of January (or even February) would be better.
- Both radar and thermal sensors will be tested using a trailer provided by NHDOT on 1/19/2023 at their headquarters. Once this final test is completed, we will be ready to collect data in the field. We are also trying to borrow another trailer from NHDOT, since we have two radar sensors. Having two trailers will help us speed up the data collection process and starting the field data collection a little late will not be an issue.
- We found another relevant trajectory data source made available through the Naturalistic Driving Study (NDS). We are working on the paperwork needed to access this dataset. This dataset covers many horizontal curves (not in the New England region) but is only for a relatively small sample of vehicles. For our data collection, we cover a limited number of horizontal curves in the New England region but all vehicles crossing those curves. This NDS dataset well complements the proposed data collection effort.
<https://dataverse.vtti.vt.edu/dataset.xhtml?persistentId=doi:10.15787/VTI1/EEEGND>

J. PROBLEMS ENCOUNTERED (If any):

None

K. TECHNOLOGY TRANSFER ACTIVITIES:

None

L. STATUS BY TASK:

Task	Description	% Complete
Task 1	Review of Current Data Collection and Utilization Practices	100%
Task 2	Assessment of Data Needs, Emerging Data Sources, and Data Processing and Analytics	100%
Task 3	Recommendations	100%
Task 4	Case Study	15%
Task 5	Draft Final Report	Not started
Task 6	Final Report	Not started

M. PERCENT COMPLETION OF TOTAL PROJECT:

50%

N. ACTIVITIES PLANNED FOR NEXT QUARTER:

The team will finish the field data collection.

O. FINANCIAL STATUS:

As of: January 10, 2023

Total Project Budget: \$200,000.00

Total Expenditures: \$29,965.44

Note: This report should not require more than 2-3 pages & should be e-mailed to the NETC Coordinator so as to arrive no later than three (3) working days after the end of each calendar quarter.