

## PROJECT OVERVIEW REPORT

1. UTC Identifying Number  
DTRT13-G-UTC28
2. Center Identifying Number  
CAIT-UTC-NC62
3. Project Title  
Segment-Level Crash Risk Analysis for New Jersey Highways Using Advanced Data Modeling
4. Principal Investigator & Contact Information  
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7. Project Description  
The primary goal of this research is to develop a modeling framework for segment-level crash risk assessment considering roadway geometry characteristics and dynamic parameters affecting the crash risk, including temporal characteristic (e.g., season, day of week, time of day), traffic flow characteristics (e.g., vehicle volume, average speed or travel time), and weather conditions. In developing the model framework, the historical crash data for the State of New Jersey will be analyzed to identify important patterns and statistical significance of various contributing factors. Based on the results of this analysis, different modeling techniques will be considered in order to select the one or a combination of techniques that would yield the best crash risk assessment results. Depending on the initial data analysis, it is possible that the modeling framework will utilize a hybrid approach or ensemble methods, which implement multiple machine learning algorithms to obtain better predictive performance. Ultimately the model developed in this research could be utilized as the bases for a crash prediction decision support system in Advanced Traffic Management

Systems (ATMS) and traffic safety strategic planning analytics. These outcomes along with lessons learned will be useful to both research community and practitioners.

8. Implementation of Research Outcomes (or why not implemented)

The proposed research is expected to result in new insights in developing and calibrating proactive crash risk assessment models. These insights and lessons learned will be useful to both research community and practitioners. Moreover, the documented crash risk modeling framework and the underlying modeling process developed in this research could be replicated, integrated and extended in decision support system and data visualization tools to achieve practical benefits in improving the effectiveness of traffic safety and incident management practices. It is envisioned that this model could be implemented in a pilot deployment for a smaller area network with the main goal of evaluating its performance in a dynamic traffic environment.

9. Impacts/Benefits of Implementation (actual, not anticipated)

To Be Determined

10. Dates and Budget

Start date: 1/1/2020

End date: 5/31/2020

UTC (CAIT) Dollars: \$49,691

Cost Sharing: \$49,694

Total Dollars: \$99,385

11. Keywords

Traffic safety, crash risk forecasting, crash analysis, incident management

12. Web Links (Reports and Project Website)

<https://cait.rutgers.edu/research/segment-level-crash-risk-analysis-for-new-jersey-highways-using-advanced-data-modeling/>