

NCDOT Center of Excellence on Mobility and Congestion

Center Outcomes Summary

North Carolina Department of Transportation

NC-TIC

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Project 1: Deep Learning Software for Traffic State Prediction

Key Outcome: a Deep Learning (DL) Artificial Intelligence software model that *improves estimation of traffic state parameters* on arterials by fusing video, loop detector and Bluetooth sensor data. During the execution of the project

- synthetic data was created from software co-simulation of traffic simulation and photorealistic traffic video rendering
- the DL software model was trained and tested on synthetic video data
- additional synthetic loop detector and Bluetooth sensor data was created from the same software co-simulation

Project 2: Smart, Connected and Automated Vehicle Fleet Management

Key Outcome: Congestion Alerting Decision Support (CADS)

- Simulation that assists in planning for the impact of connected and/or autonomous vehicles
 - Leverages the open-source simulation program Simulation of Urban MObility (SUMO)
- What-if analysis for AV impact analysis as well as traffic congestion mitigation
 - Digital sign placement, both conventional and mobile
 - Includes different traffic mixes (traditional, connected, autonomous)
- Results can show areas of congestion around schools, hospitals, fire stations, etc.

Project 3: First Mile to Health: Improving Healthcare Access in North Carolina

Central Question: How changes in health care policy (e.g. Medicaid Transformation) and global events (Covid-19 Pandemic) impact Individuals, Health systems, and Public transportation

- **Key Findings:**

- Covid-19

- The pandemic effect has had a more measurable and impactful short term effect
- Trip volumes, trip lengths, geography served, vehicles needed and shared rides decreased

- Medicaid Transformation

- The impacts experienced by individuals, DSS, and transit systems are uneven and depend on numerous factors
- Transportation brokers inserted between DSS and transit result in a decreased ability to address of the needs of the individual beneficiaries by these agencies

- Overall

- Further research is necessary to differentiate between the long term pandemic impacts which appear to be phasing out compared to the long term Medicaid Transformation impacts which are phasing in.