

Research at a Glance

Technical Brief

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New Brunswick Innovation Hub Smart Mobility Testing Ground (SMTG)

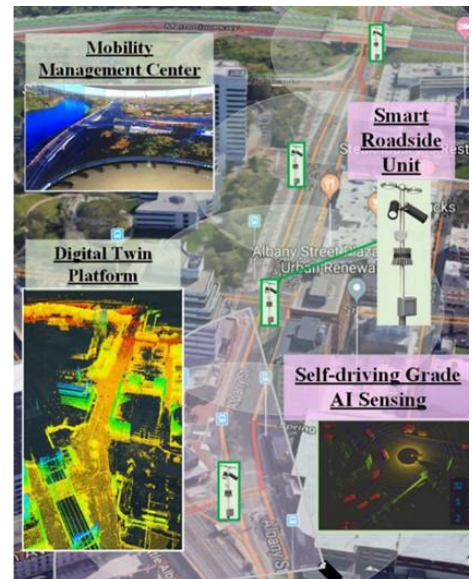
The Smart Mobility Testing Ground (SMTG) will establish a living laboratory for smart mobility and smart city technology R&D in downtown New Brunswick, New Jersey. The SMTG will serve as the foundational element of an innovation hub that will attract public and private sector researchers testing advanced driving system applications in real-world conditions while serving as a source of high-resolution transportation data.

Research Problem Statement

Echoing NJDOT Commissioner Diane Gutierrez-Scaccetti's vision on "Commitment to Communities," the SMTG team's initial focus would be on easily accessible safety applications; such applications would be deployed in early year-one by leveraging existing partner technologies. The SMTG team would work closely with NJDOT and local agencies to prioritize community needs and identify opportunities for rapid development or implementation. The SMTG would create a dedicated testing ground and data infrastructure on 2.4 miles of multi-modal corridor in downtown, supporting Governor Phil Murphy's vision towards building a New Brunswick Innovation Hub to promote an innovative economy.

Research Objectives

The SMTG corridor is equipped with Self-Driving-Grade, high-resolution roadside sensors, and computing devices to enable smart mobility services to all travelers on the corridor without the need for expensive on-board units or high-end vehicles. A Living Laboratory with data computing, modeling, data sharing interfaces, and application testing interfaces will be implemented to provide operational data support for NJDOT and local agencies as well as high-resolution datasets for private sector R&D.



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Methodology

- **Self-Driving-Grade Roadside Sensing and Computing Infrastructure:** The SMTG corridors are equipped with self-driving-grade, high-resolution roadside sensors, and computing devices. It enables smart mobility services for all travelers, eliminating the need for expensive on-board units or high-end vehicles.
- **Physical and Virtual C-V2X Deployment:** It includes the deployment of both physical and virtual Roadside Unit (RSU) technologies that broadcast SAE J2735 Connected Vehicle MAP, TIM, SPaT, BSM, and PSM messages. A community mobile application interface was developed to receive those messages from a regular smartphone and CV On-Board Units (OBUs).
- **Digital Twin 3D Data Modeling and Visualization Platform:** Leveraging the high-resolution data and comprehensive coverage of the corridor, a virtual digital twin of the SMTG has been developed. This platform facilitates early-stage R&D activities. Users can view, interact with, and export visual data from any perspective, and create their own smart mobility test datasets.



- **Industrial-Grade Smart Mobility Data Visualization Dashboard, Data Hub and Testing Services:** A data portal has been established for sharing and exchange high-resolution smart mobility data collected from the SMTG to support mobility R&D.

Results

This project instrumented 12 roadside locations along the Route 27 and Route 18 corridors to provide complete coverage of the 2.1-mile testing ground with self-driving grade sensing, computing, and physical and virtual C-V2X technologies. The DataCity testing ground created a living laboratory environment to promote the research, development, and testing of smart mobility, CAV technologies.



SMTG provides four major services, including a technology proving ground for transportation agencies, a high-resolution smart mobility data hub, a digital twin platform to support early-stage research and development, open-road technology testing facilities, and community mobility applications for traffic safety application deployment and testing.