Making Micromobility Smarter & Safer

Clinton Andrews, Dimitris Metaxas, Desheng Zheng, Jie Gong, Kelcie Ralph, Leigh Ann Von Hagen, and Robert Noland

Rutgers University – New Brunswick, New Jersey

IRG-2, FY-2020

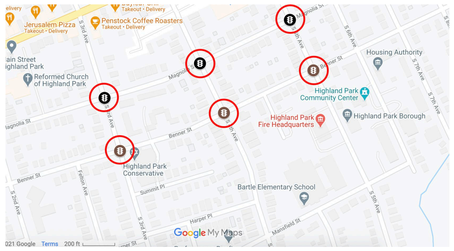
Assess how human behavior, road design, environmental conditions and technology impact crash risk and safety in several municipalities that have recently adopted e-scooters including:

- Asbury Park, NJ
- Hoboken, NJ
- Highland Park, NJ
- New Brunswick, NJ

Project Activities to Date

- Identifying locations for observational studies at traffic intersections.
- Developing trajectory prediction models and experimenting with sensors best optimized for e-scooters, e-bikes, and pedestrians.
- Creating an e-scooter Virtual Reality (VR) simulation that models real-world conditions micromobility users experience.

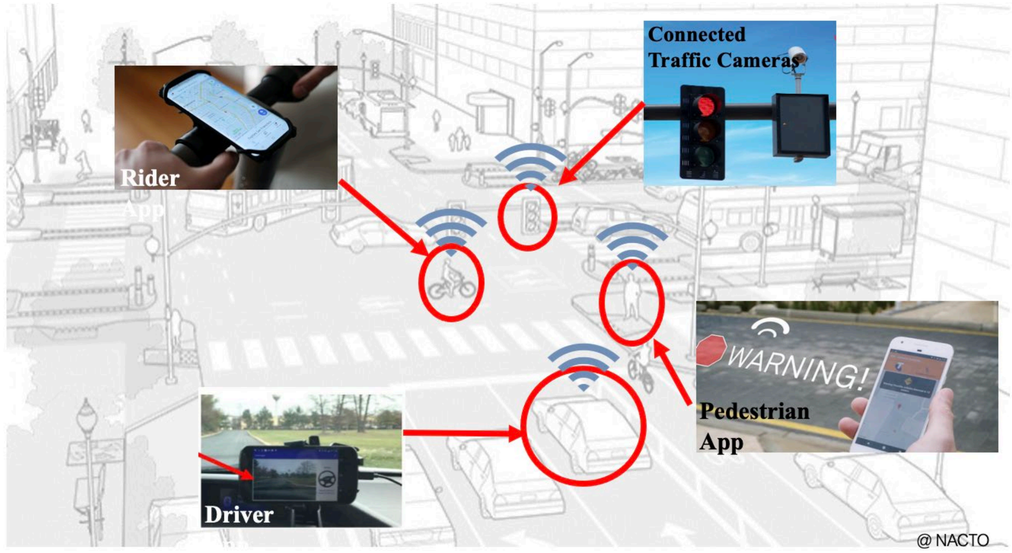
E-Scooter VR Simulation



Candidate Intersections in Highland Park, NJ

Intellectual Merit

- Analyze how **changes to the streetscape** through tactical urbanism experiments and smart-city technologies can **improve safety.**
- Create a **novel connected solution for E-scooter riders and pedestrians** for intervention via Mobile and Ubiquitous Sensing and Computer Vision technology
- **Produce evidence that informs the community deliberation** of plans involving the adoption of micromobility services within communities.



Connected Solution for Micromobility Safety

Broader Impacts

Immediate Impact to Society

- Community engagement in the adoption micromobility services in NJ and other states.
- Algorithms for sensor processing, learning and visualization and the development of a mobile application.

Sustainability

- The development of a test bed for vulnerable road users that evaluates social, technological, and integrated-risk reduction strategies.
  - Refined computer vision models that accurately detect pedestrians, e-scooters, e-bikes, and vehicles
  - Development of a predictive social model

Next Steps

- Perform **observational studies on traffic intersections**
- Design and perform **tactical urbanism experiments at intersections**
- **Optimize computer vision algorithms** to track micromobility users, pedestrians, vehicles, and other agents at an intersections