

# New York University – C2SMART Center

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**04/11/2019**



# NYC's Self-Induced Transportation Crisis

- Traffic from ride-hailing vehicles is thickening.
  - *Total passenger trips increased 15%, even as taxi trips declined from 2013 to 2017*
- NYC will become the first American city to charge congestion pricing fees.
  - *The new fees will be imposed on vehicles that enter Manhattan below 60<sup>th</sup> street. As of last year, average car speed fell to 4.7 mph, not much faster than walking.*
- Bike fatalities are on the rise.
  - *Although pedestrian fatalities have significantly declined since 2013, cyclist deaths and injuries are on the rise.*
- The subway's on-time performance is still 13% worse than it was in 2012
  - *This is mainly due to a host of maintenance delays and needed upgrades to the existing system.*
- 1.5 miles of the Brooklyn-Queens Expressway (BQE) needs to be replaced.
  - *It carries about 153,000 vehicles a day.*



# Open Source Multi-Agent Virtual Simulation Testbed

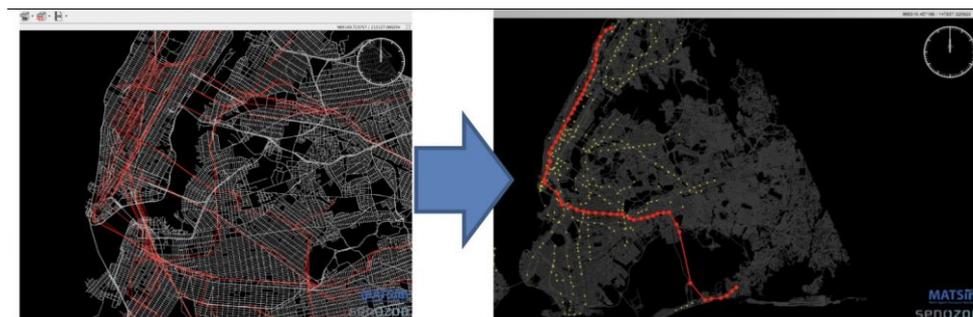
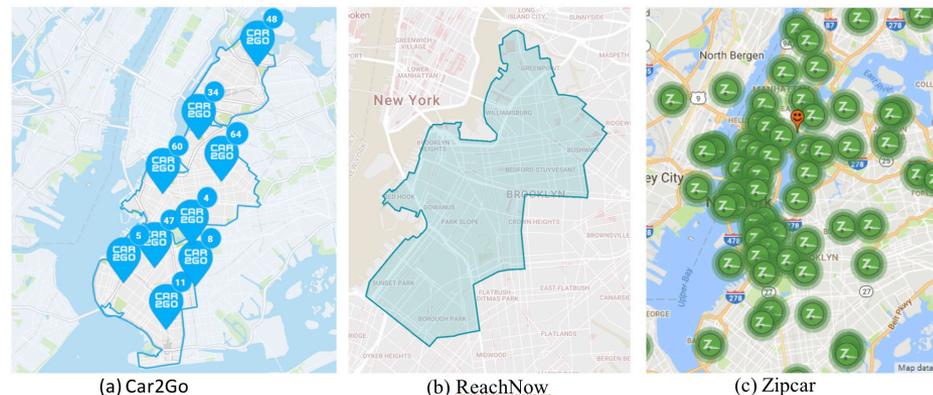


- The main objective of this project is to develop a large-scale, open-source, agent-based model of the study area in NYC using MATSim, an activity-based, extendable, multi-agent simulation framework implemented in Java, and calibrate it based on public sector data from the New York metropolitan area.
- This data-driven approach to validate and calibrate the proposed agent-based model will be one of the first attempts to develop a highly dynamic simulation tool.
- In addition, the research team will select one sub-area in lower Manhattan and downtown Brooklyn to develop using an open-source microscopic traffic simulation framework (i.e., SUMO (Simulation of Urban MObility)).



# Vehicle Balancing for Car-Sharing Services

- The research team aims to test a new queueing network-based dynamic rebalancing strategy in test cases provided by ReachNow in Brooklyn, NY.
- The strategy can operate in a non-EV as well as an EV setting, so computational experiments for both will be conducted.
- In addition, the researchers will develop a MATSim agent model of the study area in NYC, calibrate it based on household travel survey data from NYMTC, Openstreetmaps, traffic data from NYCDOT, and transit schedules from GTFS.



# NYC CV-Pilot Deployment Program



- The City plans to install the CV technology in approximately 8,000 vehicles
  - The benefits and challenges in deploying CV technology in the dense urban environment need to be evaluated.
  - NYU needs to test some these CV apps in a simulation environment and also help building a database server to store proprietary data
- The City is also working on an application that supports visually challenged by using the geometric information about the intersection and the signal timing information transmitted by the intersection to assist the pedestrian in crossing the street
  - The data collected in this project will be stored on NYU C2SMART servers. The research team will also build and maintain the secure data pipeline.
  - At the end of each analysis cycle, the team will report the application's effectiveness and other critical performance measures.



# Education Initiatives



- ITS/ITE-NYU
  - A student chapter of the Intelligent Transportation Society of America, this multi-disciplinary student club seeks to promote interest in intelligent transportation issues, create opportunities for student leadership, and build networks between students at different schools, faculty, and industry.
  - Women in Transportation Panel (March 28<sup>th</sup>, 2019)
- Vertically Integrated Projects (VIP)
  - The VIP program provides a multi-year, integrated approach to learning that emphasizes project-based, interdisciplinary, research-active education. It provides an opportunity to learn and practice professional skills while making real-world contributions.
- K-12 STEM
  - Applied Research Innovations in Science and Engineering (ARISE)
  - This full-time, seven week program is for academically strong, current 10<sup>th</sup> and 11<sup>th</sup> grade New York City students with a demonstrated interest in science, technology, engineering and math.
- Student Events
  - 2019 Northeastern District Collegiate Traffic Bowl (April 12<sup>th</sup>, 2019 )





# Technology Transfer

- Weekly workshops and Seminars
- DOT Research Brown Bags
- 6<sup>th</sup> Symposium on Connected and Autonomous Vehicles (October, 2018)
- The Forum on Policies for Heavy and Overweight Trucks
- The Adoption and Continues use of Applications
  - WeatherEVANT – Save-T – T.R.I.P.
- Urban Sustainability Projected presented to the Paris Deputy Mayor for Transportation
- Emerging Leaders Program is adopted by the NYCDOT
- Increased awareness among seniors in the El Paso area about the potential of their smartphones

