Grant Deliverables and Reporting Requirements for UTC Grants

UTC Project Information	
Project Title	Mobility in Post-Pandemic under Social Distancing Guidelines: Congestion, Emission and Transit Contact Network
University	Cornell University, New York University (NYU)
Principal Investigator	H. Oliver Gao (Cornell University) Kaan Ozbay (NYU) Joseph Chow (NYU）
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Funding Source(s) and Amounts Provided (by each agency or organization)	USDOT: $0 Cornell: $6,815
Total Project Cost	$6,815
Agency ID or Contract Number	Sponsor Source: Federal Government CFDA #: 20.701 Agreement ID: 69A3551747119
Start and End Dates	Start date: 10/01/2020 End date: 09/30/2021
Brief Description of Research Project	The COVID-19 pandemic, besides its human life costs, has locked down cities and has halted urban activities and therefore obviates traffic congestion and emission. With reopening the economy in progress, traffic congestion is slowly coming back to the urban areas, it is becoming evident that driving volume might increase after the full reopening phase. Data from Apple Mobility Reports suggests that driving mode dropped by 60% in early April but by mid-June the driving trips were 20% higher than in mid-January. Transit trips, however, were still down by 70% as of mid-June compared to mid-January. Health guidelines such as the one by the CDC directs people to practice social

	distancing as one of the most effective ways to flatten the pandemic curve across the world. While NYC is reopening and transit systems are held to social distancing rules, higher single occupancy vehicle mode share will exacerbate traffic congestion and vehicle emissions. Later, this will negatively affect public health and climate change issues. On the other hand, as health guidelines and previous studies suggest using transit services could trigger a second wave of outbreak. In this study we simulate various re-opening strategies to examine if it is possible to maintain social distancing on transit systems based on health authorities' guidelines, and satisfy daily activity needs while perpetuating transportation network performance and preserving energy consumption and vehicle emissions. To investigate the changes in transportation network performance, emissions, and the associated health risks, we will design different scenarios of possible transit system operations. We will assume different transit capacity levels at 50% and 100%. We will then evaluate the changes in the transportation network performance measures along with the risk of contracting COVID-19 for transit users. A well-calibrated simulation model in a multi-agent simulation platform was developed by C2SMART researchers for NYC, called MATSim-NYC. To study the travel behavior in the case of COVID-19, the MATSim-NYC model is recalibrated using ridership and work from home data during COVID-19 pandemic to update the mode choice utility functions for synthetic population. The Post Processing Software for Air Quality (PPS-AQ) developed by Cornell University is used to estimate the emissions and energy impacts. PPS-AQ integrates the outputs from transportation model with the emission rates from the U.S. Environmental Protection Agency (US EPA) Motor Vehicle Emission Simulator (MOVES).
Describe Implementation of Research Outcomes (or why not implemented) Place Any Photos Here	
Impacts/Benefits of Implementation (actual, not anticipated)	

Web Links • Reports • Project website	http://ctech.cee.cornell.edu/final-project-reports/