UTC Project Information

Project Title	MPC-657 – Knowledge-Based Machine Learning for Freeway COVID-19 Traffic Impact Analysis and Traffic Incident Management
University	North Dakota State University University of Utah
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Total Project Cost	$337,686.41
Agency ID or Contract Number	69A3551747108
Start and End Dates	June 24, 2021 to July 31, 2024
Brief Description of Research Project	The U.S. Department of Transportation needs to quick response and adapt to the coronavirus (COVID-19) to ensure continuation of critical infrastructure support and relief for the American people. The COVID-19 has placed significant impacts to the traffic across the U.S. It is clear to see that traffic pattern, traffic demands, and duration alter with COVID status. Therefore, there is a critical research needs of studying the impact of COVID on traffic patterns and analyzing the relationship among traffic demand patterns, daily confirmed cases/death, state policies, public perception, etc. An effective model, based on the principle of newly invented knowledge-based machine learning, will be

	developed to predict the traffic impact of traffic incidents and advance traffic incident management (TIM) considering long-term impact of COVID on traffic.
Describe Implementation of Research Outcomes (or why not implemented) Place Any Photos Here	The impacts and traffic patterns findings are shared with the Utah State DOT and the stakeholder now considered the new traffic patterns into their traffic management planning. The newly developed prediction model is introduced to the literature through journal publications and because of the recent publication, we currently only have 5 citations. We are expecting more researchers and stakeholders will get to know the developed model and cited and even adopted it in their own research activities in the near future because the two journals are accident analysis and prevention and journal of intelligent transportation systems and they both are high impacted journals.
Impacts/Benefits of Implementation (actual, not anticipated)	Our research had two journal publications in 2023 and within a year, they already had 5 citations through google scholar and more than 35 reads through ResearchGate. The research "provide valuable insights into how the pandemic affected traffic, adding in effective transportation planning and decision-making, and introduce a new way to predict traffic using a mix of machine learning and graph theory" as commented by one of the report reviewer.

Web Links
    • Reports
    • Project Website
	• MPC Research Report – Knowledge-Based Machine Learning for Freeway COVID-19 Traffic Impact Analysis and Traffic Incident Management