UTC Project Information	
Project Title	MPC-642 – Resilience-Based Recovery Planning of Transportation Network Following Earthquakes
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Start and End Dates	November 11, 2020 to July 31, 2024
Brief Description of Research Project	Earthquakes can cause severe damages to infrastructures and significantly affect the entire community (Coburn et al. 1992). Transportation networks support critical post-hazard emergency response and recovery efforts of the whole community. A degraded transportation network may cause traffic congestion and delay and even impact travel safety on the degraded system during the recovery process. The extensive repairs of degraded transportation infrastructures usually take months or even years following earthquakes to finish, making the transportation network in the region remaining partially disrupted over an extended time during the long-term recovery stage. In addition, the reconstruction of partially damaged transportation infrastructures such as bridges will create work zones, which may significantly increase travel time and travel safety risks. It is critical to have a systematic framework to study the recovery planning for a traffic system following hazards to optimize the time-dependent resilience performance. This study will develop a new analytical framework of assessing the transportation network resilience during the recovery periods following an earthquake. With the framework, the time-dependent population recovery, partially functional infrastructures, traffic efficiency and safety will be considered for the recovery period. The proposed methodology will help building improved resilience assessment and more optimized recovery planning efforts following earthquakes.

Describe Implementation of Research Outcomes (or why not implemented) Place Any Photos Here	The research has not yet been implemented. Further research with community specific data and model expansion is needed to simulate real world scenarios.
Impacts/Benefits of Implementation (actual, not anticipated)	It was demonstrated using a hypothetical network in an earthquake-prone area to validate the framework's effectiveness. This simulation approach allowed the researchers to test various scenarios and analyze the potential impact of different recovery strategies without actual real-world deployment. The study's findings provide insights that could guide future real-world applications for resilience planning and post-disaster recovery in transportation networks.
Web Links • Reports • Project Website	• MPC Final Report – Resilience-Based Recovery Planning of Transportation Network Following Earthquakes