



case studies

customer success stories from the paramics community

Project

NJ 139 Construction Impact Mitigations

Organization

National Center for Transportation and Industrial Productivity (NCTIP), New Jersey Institute of Technology (NJIT)

Sector

Construction Mitigation, Traffic Operations, Toll Facilities

Objective

Construct a simulation model to test different construction impact mitigation strategies for the rehabilitation of the NJ 139 viaducts.

Highlights

- Construction Mitigation
- Tollbooth Plaza

Contact Point

Keir Opie, Manager of Simulation and Modeling

eoPie@njit.edu

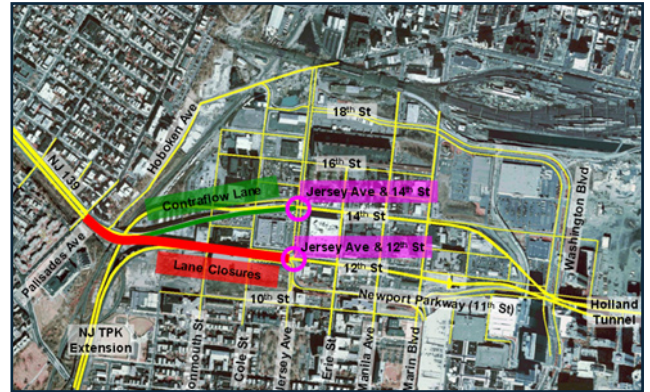
ph: 973.596.5259

transportation.njit.edu



NJ 139 Construction Impact Mitigations

With some structures dating back to the 1920's, NJ Route 139 was in need of complete rehabilitation. NJ 139 is a short but major roadway providing connections between many Northern New Jersey roadways and the Holland Tunnel (which connects New Jersey to Lower Manhattan in New York City) and the Jersey City Waterfront. The NJ 139 'roadway' actually consists of an upper signalized roadway and a lower controlled-access roadway, both of which connect to both local streets and the Holland Tunnel via two directional viaducts (elevated structures). Approximately 80,000 vehicles use the facilities every weekday, and the roadway operates at or near capacity for many hours of each day.



Due to the regional importance of NJ 139, the impact of the construction on traffic needed to be minimized. The age of the roadways, combined with the complexity of the needed construction staging, resulted in a multi-year, multi-stage construction process. Each stage of the construction presented different impacts on traffic, and each stage needed different mitigation techniques to minimize the construction impacts.



Paramics was selected as the model platform as the network needed to simulate a variety of construction mitigation techniques, including time-of-day lane closures, time-of-day reversible lanes, traffic detours, adaptive signal controls, and traffic direction by police officers at intersections. Impacts of incidents (vehicle breakdown or accidents) within the construction zone also needed to be tested. The model was also complicated by several closely spaced, well-coordinated signalized intersections

and the toll booth plaza for the Holland Tunnel, which collects both cash and electronic tolls from traffic headed into New York City.

While many of the mitigation strategies were analyzed using traditional traffic operations principles, the strategies were also tested in the simulation environment. The visualization of the simulation model added a level of understanding of what a mitigation strategy would entail and what the consequences would be. Through the use of the simulation model, some mitigation strategies were eliminated as they were shown to not be beneficial, while others were confirmed as improving conditions and were implemented in the field. The use of on-the-fly editing of networks also allowed for quick visual 'what-if' testing of changes to signal timings, signal phasing, and detour options during project meetings. Vehicle markings also allowed for ready identification of those vehicles moving through the network that were effected by detours or rerouted due to new turn prohibitions.



The use of on-the-fly editing of networks also allowed for quick visual 'what-if' testing of changes to signal timings, signal phasing, and detour options during project meetings. Vehicle markings also allowed for ready identification of those vehicles moving through the network that were effected by detours or rerouted due to new turn prohibitions.