New Jersey Route 18 Rehabilitation Project Incident Management Task Force

By New Jersey Department of Transportation

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Benefits Statement

The NJ Route 18 project enhances safety through coordinated incident management, TIM training for 900+ first responders, and reduced crash rates. It saves time with adaptive traffic signals, real-time monitoring, and effective detour planning. Financially, it delivers over $20M in annual savings through reduced crashes, congestion, vehicle wear, and emissions.

In this case study you will learn:

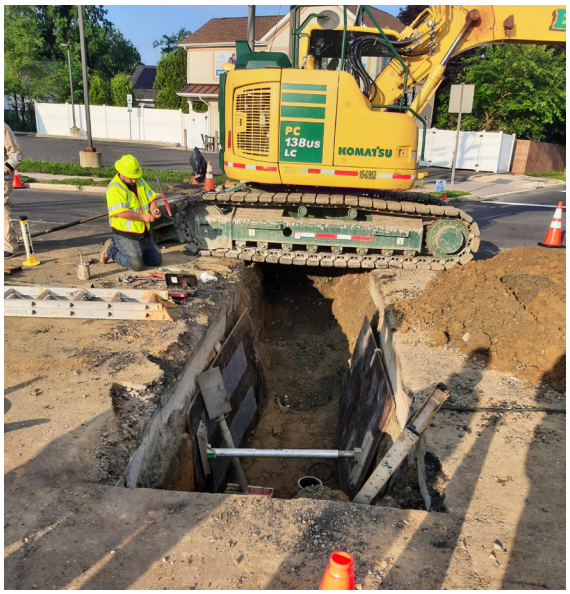
1. How NJDOT uses coordinated TIM strategies and training improve safety and reduce crashes.
2. How NJDOT's adaptive traffic systems and planning minimize delays and improve mobility.
3. How integrated operations save millions through reduced congestion, emissions, and vehicle costs.

Project #209

Version Number: 1

BACKGROUND

New Jersey Route 18 (NJ-18), originally designated as a proposed freeway in 1939, is a 47.92-mile-long state highway in central New Jersey. It serves as a major thoroughfare, providing access to various towns, universities, hospitals, major corporations, local businesses, and neighborhoods, as well as an entrance to the New Jersey Turnpike. The roadway consists of a multi-lane divided highway with a mix of grade-separated interchanges and traffic signals. Currently, NJ-18 is undergoing a major reconstruction of a 4.5-mile section in East Brunswick, New Jersey. This section is used by over 65,000 vehicles daily to access New Brunswick, a key commercial hub in central New Jersey, a transit hub for transit commuters to New York City and Philadelphia and home to Rutgers University's main campus. Scheduled to last four years, the project aims to rehabilitate the roadway by improving pavement conditions, addressing drainage deficiencies, and mitigating flooding. Additionally, it will reinforce the deteriorating roadway structure and relocate and upgrade gas and water mains and telecommunications duct banks. Safety and operational enhancements will include new traffic signals and improved pedestrian connectivity with ADA-compliant curb ramps.



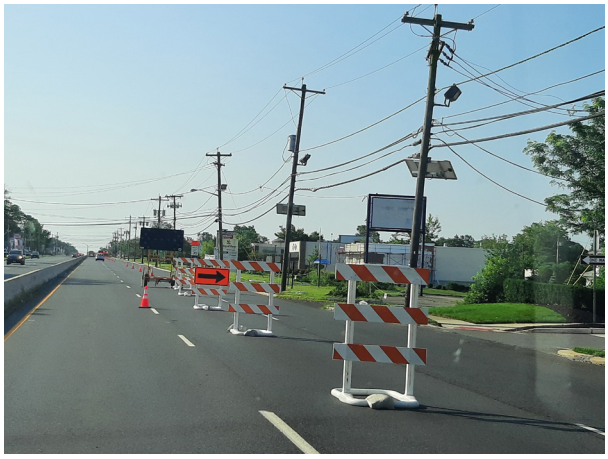
TSMO PLANNING, STRATEGIES AND DEPLOYMENT

NJDOT has initiated the Route-18 Task Force with multiple agencies. The Task Force stakeholders are representatives from NJDOT, NJSP, New Jersey Turnpike, local law enforcement agencies (East Brunswick, Old Bridge, South River, New Brunswick, Rutgers University Police Department), Middlesex County Hazmat, regional hospitals and towing companies. The Route-18 Task Force, committed to promoting the Traffic Incident Management (TIM) National Unified Goal, meets regularly to discuss current and future project stages, planned lane closures, the primary and secondary detour routes and serves as a forum for all agencies involved to voice their concerns and needs. The Task Force coordinated and facilitated the four-hour Traffic Incident Management Training for first responders that is focused on equipping first responders with techniques to detect, efficiently respond and clear incidents, as well as understanding the unique challenges posed by different types of incidents on their safety.

It is expected that throughout the various phases of construction, safety challenges are heightened by long-term lane closures, shifting traffic patterns, and the presence of construction workers and equipment in a highly dynamic traffic environment. Mobility will be also impacted, as reduced lanes, detours, temporary lane closures for material and equipment movement, and increased congestion contribute to delays, driver frustration, and longer travel times.

The New Jersey Department of Transportation (NJDOT) has adopted a two-pronged approach of mitigating impacts of the reconstruction project on mobility and safety. First, NJDOT developed the Traffic Operation plan for the NJ-18 project. The NJDOT Traffic Operations plan identifies construction scope, roles and responsibilities of NJDOT ITS and construction management personnel, communication protocols between the contractor, resident engineer and

Statewide Traffic Management Center (STMC) and detour routes for various work zone stages.



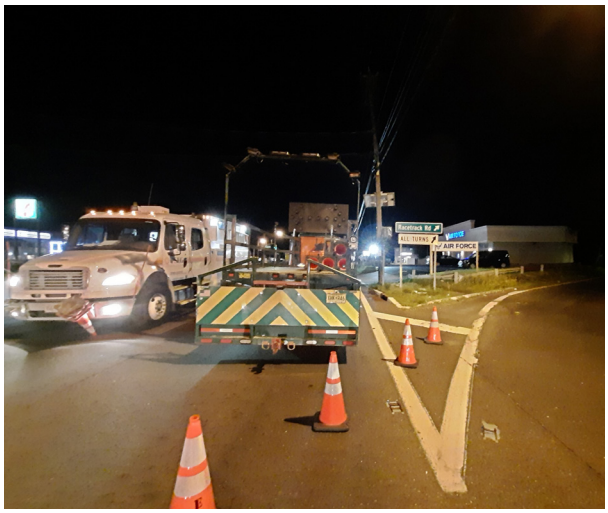
NJDOT STMC has dedicated staff to monitor traffic conditions and travel times, manage variable message signs and 511nj.org web portal to inform travelers of traffic conditions. In case of large-scale incidents STMC can deploy the Incident Management Response Team, consisting of twenty-five NJDOT personnel and eight NJSP troopers and NJDOT Safety Service Patrol (SSP). Since the Rutgers University Football Stadium resides in the vicinity of the project, NJDOT SSP is deployed for homegames throughout the season to maintain traffic mobility by assisting disabled motorists, providing advance warning and patrolling highways surrounding the stadium. Three UAS missions captured detailed aerial images and videos, allowing NJDOT to assess construction stages, full roadway closure and detouring traffic. The plan also identifies the resources such as CCTV (fixed and portable) and DMS signs that are dedicated to the project. Arterial Management Center staff monitors traffic conditions daily, looking to provide improvements to traffic flow during various lane closures or configurations by making adjustments to NJDOT's SCATS Adaptive Traffic Signal System. During incidents along the project limits, Arterial Management staff make adjustments to aid field personnel managing the traffic with greater ease, by implementing a variety of strategies remotely, until incidents and residual delays dissipate.

COMMUNICATIONS PLANNING AND EXECUTION

Outreach efforts are continuous during the entire duration of the project, including public meetings and specialized traffic and emergency responder meetings with local officials supported by the NJDOT Office of Community Relations that continuously put out press releases concerning this project. Throughout the project, updates on the construction project and traffic impacts were posted using social media. The East Brunswick Police Department provided regular updates on its webpage to keep residents informed. Basic email distribution was established with all Task Force stakeholders to keep everyone informed about pertinent progress and incidents. As the project progressed, coordination between NJSP and local law enforcement agencies were strengthened. Local law enforcement agencies expressed the need for greater support from the NJSP construction unit. NJDOT and NJSP assisted in developing a better flow of information and increasing the NJSP presence and adding on-call personnel to assist local law enforcement agencies.

Incident after-action reports were prepared for two incidents, the first being an NJSP trooper struck-by and a second when an unmarked gas pipe was damaged during excavation and because of the gas leak the road had to be closed and an evacuation zone needed to be established. The Task Force reviewed the report, discussed the incident response and made recommendations to improve and establish a dedicated communication channel or provide portable radios. The Task Force also identified that additional portable warning devices need to be placed due to the complex nature of the work zone.

OUTCOME, BENEFITS AND LEARNINGS



Using FHWA's recommended values, the Return on Investment (ROI) for implementing TIM strategies in work zones have shown that the total estimated annual savings per year are close to $20.26M because of deployed strategies and programs. NJDOT annual crash data for the years 2022 and 2023 shows the total number of crashes has reduced from 1,444 prior to the start of the construction to 1,298 during the construction, a decrease of just over 11 percent which is close to $8.5 million in crash cost reduction and congestion reduction savings of close to $3.4M. Operational savings associated with keeping traffic moving (e.g., fuel, oil, tires, maintenance and repair, and vehicle depreciation) totaled nearly $8.35M per year.

The estimated benefits of the adaptive signal system are the reduction in delays of 10%, 5% in fuel savings and 10% in emission-related costs which is close to $16 million. UAS flight provided NJDOT with visuals used for documentation, reporting, and presentations to stakeholders, offering clear insights into the project's status. Mission also helped to improve safety by minimizing the need for personnel to access hazardous areas during inspections.

An invaluable contribution is that the TIM training program resulted in close to 900 first responders trained in Middlesex County. Entire local law enforcement agencies responding to crashes within the project limits are trained and new local trainers are educating other first responders across the state. The success of the Route-18 Task Force will result in its transition to the Middlesex County Task Force, fostering responder safety, safe and quick clearance, and improving communication, coordination, and cooperation at incidents across the county.