



# Route 1, Forrestal Rd. to Wynwood Dr./Whispering Woods Blvd. ITS Improvements Project

By New Jersey Department of Transportation

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## Benefits Statement

US Route 1 is a highly congested state arterial where there is often queuing for two miles where the highway narrows from three to two lanes causing travel delays and creating the potential for accidents. NJDOT studied low-cost transportation system management and operation (TSMO) solutions to address the problem. NJDOT drew upon their successful deployment of Hard Shoulder Running (HSR) for a solution. ITS and community outreach allowed for easy implementation, eliminating back-ups and enhancing safety.

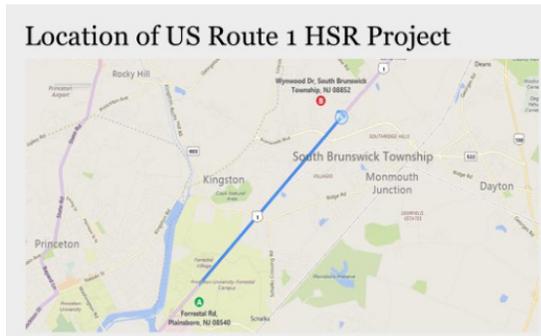
## In this case study you will learn:

1. How NJDOT and the community alleviated congestion using existing pavement and Hard Shoulder Running (HSR).
2. How Intelligent Transportation Systems technology including digital message systems, overhead lane use control signs and CCTV cameras helped to direct traffic and enhance safety during the use of HSR.
3. How TSMO partnership addressed congestion through an innovative out-of-box TSMO solution in a short time frame using limited funds.

# NOCoE Case Study

BEST TSMO PROJECT

## BACKGROUND



US Route 1 is a highly congested state arterial with numerous driveway access and egress servicing commercial properties. The route also has extensive traffic congestion, and overhead utilities. Queuing for two miles where the highway narrows from three to two lanes in each direction is common. The lane reduction also causes travel delays and creates the potential for accidents.

At the request of the South Brunswick Township, NJDOT studied low-cost transportation system management and operation (TSMO) solutions to address the problem. NJDOT drew upon their successful deployment of Hard Shoulder Running (HSR) along the freeway section of northbound NJ Route 29 approaching the Route 129 interchange in Trenton for inspiration and leveraged an on-going design contract that entailed full depth reconstruction of the US Route 1 shoulder in this area.

## TSMO PLANNING, STRATEGIES AND DEPLOYMENT

Beginning on June 26, 2017, NJDOT piloted HSR between Independence Way and Promenade Blvd between the hours of 6:00 – 9:00 AM and 4:00 – 7:00 PM. A pilot approach was chosen to minimize HSR implementation risk as it had never been deployed along an arterial like US Route 1. Static ground mounted signs were deployed to advise motorists of the allowable time periods for use. Due to the presence of 60+ access/egress

points and driveways, the signs were deployed at exiting driveways to avoid any issue when exiting onto the shoulder. At driveway locations, yield signs were changed to stop signs. Turf pavers were also installed to provide for maintenance vehicle staging areas and avoid the need to close lanes when responding to incidents.

### US Route 1 HSR Fixed, Static Guide Sign



In February 2018, after a six-month pilot had concluded and NJDOT had analyzed the results extensively, the department adopted the HSR project as a permanent strategy for relieving congestion and improving safety. NJDOT's decision was based upon improvements in mobility, reliability and delay costs. The University of Maryland's Regional Integrated Transportation Information System (RITIS) Probe Data Analytics (PDA) Suite was used to measure before and after HSR changes in vehicle speed, travel time, delay and congestion metrics. While the HSR pilot was successful, NJDOT did find motorists would violate the limited HSR operation guidance provided by the static signs and the local community became concerned with safety. NJDOT settled on deploying permanent Intelligent Transportation Systems technology to manage and monitor the HSR that included:

- Four dynamic message signs (DMS) to notify motorists of unusual traffic conditions, travel times and other planned or unplanned roadway events. DMS signs were mounted on both Cantilever and ground mounted structures at the beginning and end of the HSR corridor. Ground mounted DMS signs were installed at locations where cantilever structures could

not be deployed due to overhead utility lines.

- 10 CCTV cameras to monitor HSR operations as well as monitoring the corridor and remotely opening / closing the shoulder use depending on current conditions.
- 14 overhead lane use control signs (OHLUCS) to provide guidance when shoulders are available for travel use. Each LUCS includes Camera for HSR monitoring. A green downward arrow is used to indicate the shoulder is open for travel and a red "X" is used to indicate the shoulder is closed for travel.

#### Overhead Lane Use Control Signals (OHLUCS)



The OHLUCS per the Manual on Uniform Traffic Control Devices (MUTCD) are considered "traffic signals" to provide regulatory guidance for using a restricted section of an arterial. A signal timing directive (i.e., green arrow during the AM and PM peak travel periods and a red X during periods of non-shoulder use) was developed to allow the traffic operations center to remotely manage HSR operations. The signs were installed at intervals ranging from 1,000 – 1,500 feet and at a height of 15-ft 6-in which is the minimum traffic signal height allowed by the MUTCD.

Existing and new cameras were used to monitor weekday travel during HSR operations. No residual queues and spill backs on jug handles were observed. NJDOT also observed green times provided to US Route 1 main line and side street traffic both before and after the HSR implementation. There were no significant changes before or after HSR deployment during the AM and PM peak travel periods.

## COMMUNICATIONS PLANNING AND EXECUTION

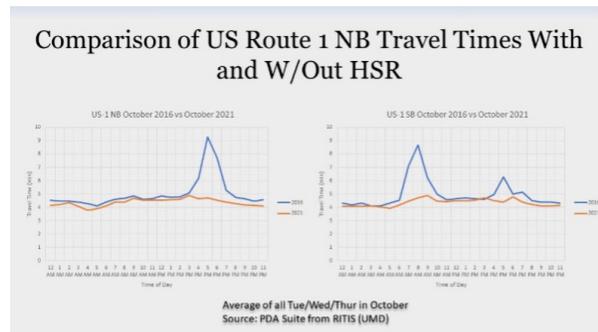
HSR is traditionally deployed along freeways. Gaining NJDOT executive leadership support for the innovative TSMO deployment of HSR on an arterial was obtained to demonstrate support with local community stakeholders.

Extensive public outreach efforts were also made during all project phases to ensure everyone directly and indirectly connected to the project was actively engaged and were aware of the progression of the project. These extensive communications efforts included:

- Meetings between NJDOT Staff and South Brunswick Officials: NJDOT and South Brunswick Township Officials regularly met to discuss the design and implementation of this project.
- Public Information Center (PIC): A PIC was held at the South Brunswick Municipal Building.
- Flyers Posted in Hotels along the Corridor: Flyers were posted in hotels located along the US Route 1 Corridor so that out-of-town guests could familiarize themselves with this initiative.
- Nixle Messages to Local Businesses and Residents: The South Brunswick Police Department coordinated a Nixle Blitz to send messages and information about the HSR project via phone, e-mail, and internet to local residences and businesses.
- Notification to the Trucking Industry: Outreach efforts were made to keep the trucking industry informed about this project. Although trucks are not permitted to use HSR, their travel time was improved once the hard shoulder running effort was implemented.
- Various Press Releases: These were issued by NJDOT and South Brunswick Township both before and during the project's implementation to keep the general public informed.
- Use of Variable Message Signs (VMS): VMS were used to alert motorists 1-2 miles in advance of the HSR limits and its hours of operation prior to commencing the pilot and permanent HSR deployment.

- [www.511nj.org](http://www.511nj.org): 511NJ was programmed to provide information
- Social Media: Project news was made available using Twitter @NJDOT\_info and on the NJDOT Facebook page.

## OUTCOME, LEARNINGS AND PUBLIC BENEFIT



“The US Route 1 HSR project in South Brunswick has achieved its intended goal in remarkable fashion by eliminating the bottleneck issue and delays that existed before its implementation. By utilizing the existing shoulder lanes on US Route 1 during peak hours, we now maintain continuous traffic flow with greatly diminished congestion while improving safety and reducing stress. In other words, it has improved the quality of life for those motorists who traverse US Route 1. It’s amazing how like-minded groups, in this cast the NJDOT and South Brunswick Township, were able to work together in a cooperative and collaborative effort to solve a longstanding egregious issue that many had claimed to be unsolvable.”

Much was achieved and learned through the successful deployment of HSR along US Route 1, including:

- NJDOT and the community alleviated congestion through the use of existing pavement to create additional, on demand operational capacity.
- Improved capability maturity gained through the confidence, knowledge and experience of addressing congestion through an innovative out-of-box TSMO solution in a short time frame using limited funds.
- Bridging a knowledge gap between NJDOT’s operational and roadway design project managers. NJDOT now considers HSR, with appropriate supporting ITS, a standard TSMO strategy when scoping cost-effective congestion management projects in the state.



The Township of South Brunswick’s Deputy Mayor said it best in a March 21, 2021 letter to the NJDOT.