

All-Electronic Toll System

Complete System Conversion for the New York State Thruway Authority

In 2014, Kapsch won an initial contract to produce an electronic toll collection (ETC) system at four sites for the New York State Thruway (NYSTA). These sites - including the Tappan Zee Bridge, which accounts for a significant portion of the Thruway's total daily revenue - were separate from the Thruway's distance-based ticket charging system in which patrons would get a ticket upon entry and pay the fare at exit based on distance traveled.

The launch of the comprehensive and advanced AET system highlights NYSTA's leadership in providing seamless and efficient transportation for drivers.

With the new AET system, drivers can travel seamlessly along Thruway roads without having to ever stop or pay tolls with cash. The improved traffic flow will also reduce congestion and emissions while improving safety at previously-manned toll points. Furthermore, NYSTA investment in a system design that can be maintained with little to no traffic disruption will save significant time and funding in the future, while maintaining a smooth driver experience. In addition to meeting budget goals and maintaining an aggressive delivery schedule, Kapsch teams were also able to complete the project one month early.



Project Scope:

Kapsch implemented a four-gantry all-electronic toll (AET) design for the Tappan Zee bridge that went into revenue service in 2016. Kapsch subsequently proposed a new single-gantry design to NYSTA for the additional sites at the Harriman Route 17 exits and the Yonkers mainline toll facility. Eight additional toll points with this new design were deployed in 2018.

In 2019, NYSTA elected to convert the rest of its mainline highway sites to the Kapsch single-gantry AET solution. This additional scope of work at 24 toll plazas included 44 new gantries, and would convert all of the high-volume toll sites along the New York State Thruway to fully electronic toll collection. Installation at these 24 sites began in March 2020 and was completed in October 2020.

Today, there are now 51 new single-gantry toll facilities and 148 lanes of toll equipment along the NYSTA highways to facilitate completely cashless toll transactions.

The Challenges:

- Variables that determine a vehicle's toll rate such as its height, length, and number of axles would need to be accurately assessed by the new automatic system.
- The NSYTA classification scheme lists 26 different vehicle classes that would need to be automatically distinguished.
- Converting so many sites within the timeframe required simultaneous deployment, which required Kapsch to significantly scale operations.

The Solution:

- Kapsch developed a complex algorithm to determine and verify the correct vehicle class for the NYSTA system. On single gantries where the Kapsch vehicle detection and classification sensor (NVDC) is used, the sensor provides many of the required details such as vehicle height, length, and weight. Use of the NVDC along with supplemental sensors provides the complete classification details to accurately determine vehicle tolling class at all NYSTA AET toll points.
- Kapsch built a staging facility and configuration laboratory at its Kingston facility in upstate New York in order to centralize operations. This streamlined process enabled the Kapsch team to support deployments at up to six sites in parallel across different sections of the state.
- Kapsch deployed the central host system at the NYSTA headquarters in Albany, New York, as well as a disaster-recovery backup system at remote location.
- The system is also designed to be maintained without requiring any lane closures.



The Added Value

- *Improved environmental outcomes and air quality*
- *Increased roadway safety*