

## First of Type for New Jersey Turnpike Authority

What do Asbury, Toms River & Raritan all have in common? Quite a bit actually, all three are tolling plazas situated within the state of New Jersey on the Garden State Parkway. They use the ACS State & Local Solutions “Vector Express” tolling solution and all three plazas are designed for Open Road Tolling (ORT).

What is unique about this project is that NJTA, (New Jersey Turnpike Authority) together with ACS and their associated providers, have successfully completed a “*first of type*” ORT environment at the Raritan plaza consisting of five running lanes with axle classification and two shoulder lanes.

ACS' Technology Centre, achieved the integration, implementation, testing and opening of three new plazas in a period of less than a month. The whole project from construction to reality took less than 12 months, a feat made possible due to the innovative decisions of ACS to use technologies designed and developed to handle multi-lane environments. The plaza layouts consist of;

- Raritan: 5 running lanes and 2 shoulders traveling in one direction,
- Asbury: a single direction plaza of 3 running lanes and 2 shoulders,
- Toms River: a bi-directional plaza with 2 lanes and 2 shoulders in each direction.

Each plaza uses the ACS *Vector Express* Tolling Solution, a purpose designed multi-lane ORT solution which is supported by the Idris AVC (Automatic Vehicle Classification) and AVI (Automatic Vehicle Identification) correlation technology and Mark IV tag readers.

The AVC is carried out by Idris, a loop-based classification and detection system, with proven multi-lane ORT capabilities, including the ability to correctly place lane-straddling vehicles. Due to the unique ability of Idris to determine the location of vehicles crossing the detection array it is also able to carry out the vehicle-to-tag correlation. All the lane information then passes on to a fully redundant solution, one lane controller, backed up by a redundant lane controller with fail-over capabilities. ACS and the developers of the Idris technology, Diamond Consulting Services (DCS), believe in the provision of a robust, multi-functional system capable of meeting all the demands of the tolling operator. Included amongst these functions is the ability of one lane controller to handle all the lanes, deal with the correct assignment of tags, straddling vehicles etc. to ensure a complete picture of the toll lanes and plaza.

Without this type of multi-tasking solution the client would need to provide yet another level of technology to perform these functions. ACS is able provide this complete solution including lane discrimination, through their integrated system. They monitor the position of the vehicles knowing exactly when and where the vehicle is at all times.

ACS had already been contracted by NJTA to implement ORT at other toll plazas in New Jersey. The Vector Express Solution at Exit 1 and Exit 18 on the New Jersey Turnpike and Pascack Valley on the Garden State Parkway had already been implemented with great success. With this proven credibility NJTA added a scope of works to the existing Professional Services contract, for ACS to implement the Vector Express Solution to Raritan, Asbury and Tom's River toll plazas.

The project design included the conversion of existing manual and ETC lanes to ORT lanes. As

Vector Express and the Idris technology were already operational in a number of other lanes and sites, the technical challenges facing ACS were already understood and part of their skill set. However, overcoming the limitations of the AVI technology's capabilities to handle multiple readers across all the lanes was a real achievement and once complete, the whole system went into operation.

The most challenging aspect of the project was the co-ordination between the construction consortium time scales and ACS' implementation time frame. As is so often the case, the construction stages were allocated the majority of the available time, leaving less than one month for the implementation of the tolling system. ACS' testing schedule had to be compressed down to just 15 days, less than five days at each plaza.

The ACS team along with assistance from DCS' Systems Engineer, Wendy Shafer, achieved the rigorous schedule of testing and ironing out any imperfections prior to the plazas opening. Not only did the team achieve the openings on time but some of the ACS engineers managed to make time for the Idris training program and established themselves as ICE's (Idris Certified Engineer).

The official opening dates for the plazas were, 4 - 5<sup>th</sup> May for Asbury, 5<sup>th</sup> - 6<sup>th</sup> May at Raritan and Tom's River was 9<sup>th</sup>-10<sup>th</sup> May 2005 which shows the fine time line the ACS team had for fault finding should any errors have arisen. Even on this tight schedule they managed to establish operational and stable systems at all plazas upon opening. From day one, the lanes were running with around a 99% accuracy level, and this will raise to the contract specification of 99.5% with a little fine tuning of the system.

Reflecting the satisfaction of the NJTA with the results, Michael Huerta, Managing Director of ACS Transportation Systems and Services said "The success of this implementation is a clear example of the private and public sector working as a partnership. Everyone from the component providers and ACS to NJTA worked together accepting responsibility where necessary to ensure the project moved forward as a whole. The end result, is a true ORT solution."