



What tolling
technology means
for parking

RECOGNIZING ADVANCES



By Joseph Wenzl

At one time or another, we have all used the toll road system. If you live on the east coast, traveling on a toll road may be a daily experience. Residents of the south know that Florida's toll roads can present a welcome relief from the congestion frequently encountered on the public expressway between the northern reaches of the Palm Beaches down through Miami.

The original tolling system—still in use at many locations today—requires the driver to take a ticket that denotes the location of his initial entry into the tolling system. Those tickets are either handed out by attendants or distributed by devices between toll lanes. Payment is made upon exit, where the amount due is calculated by the total distance travelled.

The tolling industry eventually realized that to increase the potentially enormous throughput and revenue generated by daily drivers, better methods and systems were needed to identify vehicles, enforce toll road use, and manage the money. Solutions to fit these needs evolved into the prevalent technology used today: Radio Frequency Identification (RFID), Automatic Vehicle Identification (AVI), and License Plate Recognition. LPR, RFID, AVI, LPR: all these acronyms sound very familiar, right? Well, they should, because they are the very same technologies used in the parking industry today. It's common knowledge that parking revenues account for the vast majority of top-line income in many markets, especially airports. Some airports collect more in parking revenue on the land side than all airside airline gate fees combined. AVI and LPR are more prevalent at many airports because of their ability to secure accurate and traceable data, adding a high level of credibility to a vendor's revenue control solution.

AVI is used to identify a valid vehicle—one that has registered to use the service—and LPR is used to capture a visual authentication of that vehicle. Comparing how parking and toll roads use the same technology will help us understand its underlying value, and may help us solve the age old question debated among scholars and laypersons alike: “Is

parking just a slow toll road, or is a toll road just a fast parking lane?”

How it Works

A toll road transaction using AVI and LPR goes something like this: as a vehicle approaches the toll plaza, it passes through a lane equipped with an AVI antenna and LPR camera. The vehicle passes through the toll lane at about 35 miles per hour; it doesn't stop and the driver does not collect a ticket. Two events occur with the process: the AVI tag of the registered vehicle is read and authenticated by the back office system, and the LPR captures both the license plate number and an image of the rear of the vehicle. If the AVI tag is valid, all is well and the business rules are applied to track the appropriate charges for that patron. If the AVI tag is invalid or the system didn't detect one, the data is retained with a notation that an invalid event occurred. The way these exceptions are managed varies with each system, but at the end of the day, the expectation is that a toll will be charged to the owner of the vehicle based on the license plate number and registration.

This process is used in both controlled lanes at toll plazas (typically with red and green lights and/or audible feedback from the AVI transponder) and in open-road tolling, where AVI antennas and LPR cameras are mounted on gantries above the lane; this includes areas where High Occupancy Vehicle (HOV) lanes are enforced side-by-side with the normal toll lanes. In these situations, the vehicle continues at full toll road speeds, creating the least amount of interruption to the travel experience.

The capability to enforce virtually every vehicle's usage of the toll road, detect exceptions, create and collect citation payments,

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and reconcile hundreds of thousands of credit card transactions every month has greatly enhanced the revenue-producing capability of the toll system, not only domestically but on a global basis.

So how does toll road technology link to parking? Excellent question!

Tolls and Parking

Both the tolling and parking industries share common wants and needs:

- Ensure correct fee calculation.
- Ensure full revenue reconciliation.
- Maximize vehicle throughput.
- Optimize the patron experience.
- Centralize reporting, command, and control.

Large, high volume parking systems such as those at airports may be easiest to compare and contrast with toll roads. While the typical toll fee may be \$0.75 to \$2.00 per payment event for tens of thousands of payments every day, a parking fee may be \$80, \$100, \$150 or more, and number in the hundreds to thousands per day, which means a lot will likely see a full magnitude less than a toll road's volume. This transactional imbalance is what allows a toll operator to permit a continuous vehicular flow while absorbing the risk that a few vehicles may not be fully accounted for, while a parking operator is forced to politely detain the patron until their fee has been settled.

That's the contrast; let's look at the similarities. At the airport parking facility entrance, the patron's vehicle is associated with some type of primary ID. This is typically through a ticket dispenser and is not unlike the ticket a toll patron would be required to take should they not have a registered AVI tag. LPR technology adds another ID to the patron's vehicle by associating the license plate number and vehicle image with the ticket number taken by the patron. This two-step approach creates an entry record that is stored in the back office and compared to the ticket number, license plate number, and vehicle image at exit. All criteria must match or an exception is created.

How can we apply some of the efficiencies gained by the toll road system to the parking industry? How can we keep traffic flowing and patrons happily on their way? One solution that has been applied at several airport parking facilities in close proximity to toll roads has been to integrate the recognition and acceptance of the toll tag into the parking system. With this integrated solution, the patron experience in both areas becomes

almost identical. As the vehicle approaches the entry lane, the AVI antenna recognizes the vehicle's toll tag, reads the tag, and passes the tag data to the parking system's back office. This data is then passed to the toll road system's valid tag list, which is typically resident in an LDAP server within the airport or directly within the parking back office system. An approval response is sent back to the lane and if valid, the gate is raised.

While the vehicle cannot maintain toll road speeds through the lane, with properly placed AVI antennas it can maintain a steady speed there. The same holds true at the exit. As the patron traverses the lane, the tag is accepted and the fee is computed and charged against the appropriate toll tag account. Should an exception occur, the barrier gate remains lowered and local business rules are applied to complete the transaction.

What about the patron with no access to a toll road? While a free-flow traffic experience is usually enough to entice a toll road patron to register his vehicle and use an AVI toll tag, one who uses the airport parking facility once or twice a month may be more reluctant to do so. In addition, the patron who has a toll tag may be hesitant to store what might be considered excessive amounts of value on its account to cover parking fees, which are more expensive than most toll road charges. The value proposition needs to be enhanced.

The way some operations are doing this is through a frequent parker or VIP program. These initiatives help draw and retain regular airport parking patrons by providing them with AVI tags that optimize their stay in the parking facility with several value added features, including:

- Pre-pay or space reservation.
- More favorable parking areas.
- Easy free-flow entry and exit.
- Points and rewards.
- Additional services (car wash, detailing, fuel fill-up, etc.).

Other technologies are quickly being embraced and leading-edge payment methods are already surfacing at major trade shows. While the parking lane and open road tolling will always have their differences due to the sheer practicality of how they are used, evolving technologies will continue to be applied to both industries on a continuous basis. Someday in the future, there no longer will be toll road patrons and parking patrons, but just customers who use the services of both industries transparently and efficiently.



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