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Should an agency implement all-electronic tolling?

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It's one of the biggest questions in the U.S. toll industry today: If and when should agencies implement all-electronic tolling? This paper discusses the advantages of AET, the processes for making an informed decision and eight best practices for successful implementation.

Interest in and adoption of AET is expanding across the United States

Understanding all-electronic tolling: a brief history

Is all-electronic toll collection right for every toll facility? And, if not, what factors determine if and when AET should be implemented? Many toll agencies and departments of transportation are struggling to answer those questions.

When considering implementation, it's helpful to have an accurate understanding of AET. The terminology, used by the toll industry to describe highway-speed cashless toll collection, has continually changed as electronic tolling concepts matured.

Highway-speed, non-stop ETC lanes were initially called "express ETC lanes." This configuration included cash lanes off to the side. At that time, open road tolling denoted express ETC lanes without cash collection. Then the industry began using ORT to describe express ETC lanes with or without cash collection. Recently, the phrase all-electronic tolling was developed to describe ORT without cash. AET and ORT without cash are synonymous in that both mean highway-speed, cashless toll collection. For purposes of this paper, we will use the terminology AET.

Customers, who historically have used cash, zoom at highway speeds under overhead gantries fitted with equipment that automatically tracks their use of the facilities. At the end of the month, customers receive a bill.

Eight U.S. toll agencies have converted to AET in the past two years and several use different terminology, as described above, to identify their cashless toll collection:

- Denver's E-470 (first to convert)
- Northwest Parkway in Denver
- All North Texas Tollway Authority facilities
- Central Texas Regional Mobility Authority's 183A Expressway
- Miami-Dade Expressway Authority's State Routes 874, 878 and 924
- Tampa-Hillsborough Expressway Authority's Selmon Crosstown Expressway
- The Homestead Extension of Florida's Turnpike
- Texas Turnpike Authority's State Highways 130 and 45 and Loop 1 have a full AET option but continue to accept cash for the near future

For the millions of customers who use these facilities each day, AET offers ease, convenience and shorter

travel times. For agencies, AET offers a way to operate more efficiently and at higher capacities. The cashless business model can reduce capital, personnel and maintenance costs, as well as create a safer, more sustainable facility:

Greater efficiency: A manual toll plaza processes approximately 200 to 400 vehicles per hour per lane. An AET lane can process up to 2,200 vehicles an hour – equal to the maximum capacity of a free-flowing highway lane.

Operational cost savings: AET eliminates the need for toll collectors, tollbooths and toll plazas – the costliest items on an agency's balance sheet.

Safer: A 2007 study conducted by the North Texas Tollway Authority found between 65 and 75 percent of incidents happened as vehicles jockeyed for position entering and exiting the toll plazas. AET's free-flowing lanes remove the need to weave and merge, creating a safer facility.

Greener: AET reduces fuel consumption and vehicle emissions, moving agencies closer to their sustainability goals.

Lower capital costs: Tollbooths and toll plazas require wider roads to accommodate their girth, but the price of right-of-way – especially in urban areas – can make a traditional toll project cost-prohibitive. AET cuts capital costs by eliminating the need for additional right-of-way.

Making the decision: a facility-driven process

Certain factors must be in place for AET to be successful. These factors differ from facility to facility, making the decision to convert or implement AET completely facility-driven.

Greenfield projects

Under the premise that any revenue is new revenue, most greenfield projects automatically are suited for AET with one caveat: If projections show a large portion of revenue would be generated from out-of-state tourists and/or commercial truck traffic, AET is not a viable option. The loss of net revenue would be too high to justify AET because reciprocity between states to enforce toll payment does not exist. That may change, however. There are initiatives underway in several regions of the United States to develop interstate agreements for video tolling and violation reciprocity.

Brownfield projects

Brownfield projects are different animals. An existing facility may be predisposed to AET if it:

- Has mobility or capacity issues
- Is located in a dense urban area

- Offers electronic toll collection and transponder penetration rates that are 70 percent or higher
- Serves a community that understands and supports electronic tolling

Even if a project meets several of these criteria, an agency cannot arbitrarily choose to change its business model to AET without first considering how that change would affect its standing with financial markets and bond rating agencies. More than likely, the agency has borrowed money based on the existing facility's ability to generate consistently a certain amount of revenue. AET implementation will cause a decline in gross revenue, which could hinder the agency's ability to repay the loans unless it can show operational efficiencies gained from AET implementation would offset the negative revenue impact.

A net revenue impact analysis

When an agency converts a facility to AET, violations automatically will increase to between 7 and 10 percent, and the facility may lose a certain percentage of cash-loyal customers. Thus, for AET to be successful, an agency must be able to mitigate that lost revenue by ensuring the net revenue generated after AET implementation will be equal to or higher than its current net revenue.

To conduct a net revenue impact analysis, an agency needs to have:

- A profile of current costs, including cost per transaction, the success rate of violation collection, direct and indirect personnel costs, and costs to maintain and operate existing facilities
- A profile of anticipated costs, including the cost of conversion, software modifications and other enhancements the system will require to support video tolling
- A traffic and revenue study that projects the number of vehicles expected to use the AET facility and the resulting revenue they will generate, minus the appropriate percentage for violators
- An operational analysis that accounts for the increase in customer contact in the back office or customer service center. AET will produce more mail, phone calls and walk-ups. The agency needs to identify the cost of these additional contact points, as well as their impacts on overall operational costs.
- A strong statutory law to help maximize collection efforts
- Business rules that outline how the agency will invoice video tolling customers, as well as how it will handle late payments and violators. Once the business rules are in place, the agency can test them against the traffic and revenue study to determine what the facility's net revenue will be

In addition to the net revenue impact analysis, an agency must identify and quantify all the benefits of implementing AET, including environmental and safety enhancements. Understanding the benefits and communicating them will help generate support from various, and sometimes disparate, stakeholder groups.

Implementing AET: eight best practices

If, after conducting a full analysis, the agency decides to implement AET, there are eight best practices it must adopt to mitigate associated risks and ensure successful execution:

- 1. Institute video tolling.** Agencies with AET must have a video tolling component to capture those customers who do not have transponders. Many agencies offset the additional cost of video tolling with a differential toll. For example, while transponder customers may pay \$1 per toll, video tolling customers will pay \$1.50 per toll to compensate for the higher cost of processing and mailing the invoice. By charging a higher fee to video tolling customers, agencies can fold the risk of collection into the toll structure, which also allows them to position transponder use as a way for customers to save money. Some agencies also use a fee per invoice to offset the processing costs.
- 2. Conduct extensive public and public official outreach.** This best practice is critical in AET conversions because the agency is asking its existing customers to change their habits. Public education campaigns - aimed at both consumers and elected officials - must explain clearly what the agency is doing and why. One of the biggest mistakes is assuming various stakeholders understand the concept of AET and what it will mean to them. It also is critical to think regionally when considering AET. Regions with multiple toll agencies and/or toll facilities should be considered as a whole, so the implementation plan is not too confusing or too complicated for the public or public officials to understand.
- 3. Proactively address work force displacement.** The NTTA purposely announced its decision to convert the President George Bush Turnpike to AET two years prior to implementation. Leadership wanted to provide ample time for the nearly 500 employees affected by the conversion to consider their options, which included early retirement, the opportunity to transfer to other positions or job hunt. Agencies also may want to consider offering buyout programs tiered to years of service.
- 4. Make accommodations for loyal cash customers.** Some customers won't sign up for ETC or AET programs because they don't have a credit card, or they don't like giving out personal information. To accommodate this user group, Florida's Turnpike Enterprise implemented a cash-preferred customer

program. The program, started in 2010, uses “anonymous” number-based accounts that allow these customers to obtain SunPass transponders and replenish their accounts with cash at customer service desks or kiosks in hundreds of retail outlets throughout Miami. Within four months of implementation, FTE had sold more than 6,000 transponders and received an average of 400 account replenishments per day, averaging \$20 per transaction. Today, 84.9 percent of customers on the Homestead Extension use SunPass transponders. (Note: The costs of a cash-preferred program also must be factored into the net revenue impact analysis.)

- 5. Take a segmented approach to multiple implementations.** If more than one facility is slated for conversion, and the facilities do not touch or share a common customer base, AET should be implemented on one facility at a time. Lessons learned during the first project can be applied to subsequent conversions, resulting in greater efficiencies.
- 6. Be patient.** Implementation isn't a sprint. If the delivery schedule is too ambitious and the agency falls behind, it could miss deadlines for reaching projected revenue levels, which in turn could impact the project's financing. Move at a measured pace.
- 7. Create and continually update a revenue assurance plan.** The purpose of a revenue assurance plan is to identify the implementation of financial and operational procedures and programs necessary to ensure AET implementation does not adversely affect an agency's net revenues. Having such a plan builds confidence among rating agencies and the bond market. Before conversion, the plan projects costs, identifies and mitigates potential risks, describes how the agency will measure the system's overall performance and benchmarks those indicators. After conversion, the plan becomes an effective measurement tool and should be continually updated.
- 8. Test before implementation.** Prior to implementing AET, it is critical for agencies to determine appropriate toll system performance and capacity criteria, pick a qualified system vendor, design the system to the requirements, and then test it to prove it works. Agencies also should ensure baseline requirements for transaction volumes, image quantities, phone calls, website hits, and all customer contact projections reflect real-world experience and incorporate safety factors. In general, don't underestimate customers' needs.

Looking to the future: AET, the standard mode of collection

AET is not a blanket solution, yet. Although many experts, including HNTB Corporation, agree it is where

the industry is headed, agencies should not rush to implementation. AET is a facility-driven decision that shouldn't be made without conducting the proper due diligence, understanding the risks and mitigations, and knowing that it soon may be the standard method of toll collection in the United States.

Additional resources

For more information about all-electronic tolling, consult the following:

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E-470 Public Highway Authority

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Florida's Turnpike Enterprise

www.floridasturnpike.com

International Bridge, Tunnel and Turnpike Association

www.ibtta.org

Miami-Dade Expressway Authority

www.mdx-way.com

North Texas Tollway Authority

www.ntta.org

Northwest Parkway LLC

www.northwestparkway.org

Tampa-Hillsborough Expressway Authority

www.tampa-xway.com

Texas Turnpike Authority

www.txdot.gov/about_us/administration/divisions/tta.htm

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