



### ETC and the Infrequent Customer

Electronic toll collection has stimulated a renewed interest in tolling as a transportation funding source and a tool for demand management. The first ETC system was deployed in 1987 in Norway and twenty years later it is commonplace. This single tool has created a renaissance in tolling and has removed one of the chief arguments against tolling, having to stop to pay a toll. Pricing public highways is now a part of the transportation policy debate in a way not possible without ETC. Without ETC congestion pricing, demand management, High Occupancy Toll (HOT) lanes and express toll lanes would not be possible.

To take ETC to the next level will require a leap of faith much like the one that created ETC in the late 1980's. ETC has saved travel time, improved air quality and made payment of tolls more convenient. Increasingly the question is what is next and how do we get there? There are many technological possibilities. Global Positioning Satellite (GPS), Electronic Vehicle Registration (EVR), the Vehicle Infrastructure Initiative (VII), Galileo and mobile telephony are some of the new tools that are being applied around the world. Will these new tools precipitate tolling policy innovation in and of themselves? What is the goal of implementing these new technologies? Though technology advances can be a powerful stimulus to innovation in electronic toll payment, the requirements of the business case must take precedence.

#### **The Future of ETC**

Rather than focus on the tool, we should ask what the goals are. Many toll operators have begun to set strategies to attain All Electronic Toll Collection (AETC) environment. AETC envisions no cash collections, toll plazas are replaced with gantries and all collections are done through some electronic means. The benefits of AETC are increased time savings, greater environmental benefits from less stop and go at the toll plazas and operational cost savings. Finally the cost of plaza and building construction, maintenance and utilities are eliminated along with the fixed costs of handling and counting cash. The mixture of ETC and manual collections operationally and technically have presented challenges as well. Conceptually it is less confusing and technically less complicated to be either all cash or all ETC. The most complex configuration of toll collection from a technical perspective is the combination of coin machines and ETC in a single mixed lane. AETC will eliminate complicated mixed lane configurations.

From the outset of ETC deployment the industry expected reduced operations costs. However, as violation enforcement and account management functions were added and the fixed costs of cash collection lingered, operations costs tended to increase. AETC will immediately provide significant savings. Capital costs will be significantly less and structures will be more uniform and less costly.



## Creating Practical Solutions Through Innovation

The technology needed to implement AETC is in use today. There are now several fully operational examples of AETC systems deployed as a part of the construction of a new toll highway but recently toll agencies have begun to consider a conversion to AETC. While the goal seems clearer, it has remained elusive. Perhaps the question we should be asking is not what the technology is that will make AETC successful but rather who are our customers and what do they want in an AETC system.

With the deployment of ETC we have become accustomed to addressing the needs of the frequent customer. The commuter or business person who uses the system daily is more than willing to purchase a transponder, set up an account with a deposit and ensure that the transponder is properly mounted in the vehicle. The industry understands the frequent customer; they want transaction speed, convenience in payment and time savings. Processes are designed with the assumption that the majority of users are frequent repeat customers. This approach has been sufficient, until we come to the point of a full conversion to AETC. At this point we must focus on the infrequent customer. The infrequent customer also wants convenience of payment but only for a short time or for a relatively few times per month or year. Because they use the toll road less frequently they are less willing to purchase a transponder, place a deposit on account and deal with batteries or other annoyances of electronic payment. They are less interested in expansion plans and the day to day operations of the toll road because they are less impacted than a frequent customer would be. If a truly convenient means is available to pay tolls in an AETC environment, the infrequent customer is even willing to pay a little more per transaction for the service.

### The Infrequent Customer

Recent studies on several toll agencies in the U.S. have been quite revealing of the composition of the typical toll road customer base. Data was collected through the distribution of surveys at key locations. The frequency of use was defined as daily, once per week, twice per month, once per month and twice per year or less. The survey process was conducted and verified to yield statistically valid results by firms that are entirely familiar with survey design and analysis. Statistical accuracy of the number of customers within each frequency range varied but was in the range from  $\pm 3\%$  to  $\pm 5\%$ . The toll roads involved included urban high volume segments and rural low volume segments and the results can therefore be generalized to other toll roads.

The results were astounding! Customers who used the toll roads daily generated 33% of the total trips and yet comprised only 2% of the customers that used the toll road. The next most frequent category of once per week, generated 27% of the trips and represented only 9% of the customers. When combined,



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these two frequency categories represented only 11% of the customers but 60% of the total trips on the toll road. These customers and trips by frequency category were:

<u>Frequency</u>	<u>% of Customers</u>	<u>% of Trips</u>
Daily	2%	33%
Once/Week	9%	27%
Twice/Month	14%	20%
Once/Month	18%	13%
Twice/Year	58%	7%

The significance of this distribution is amplified when one considers the number of discrete customers that fall in each frequency classification. The table below uses an average annual Daily traffic of 150,000 which approximates the travel on the toll roads studied.

The customers who travel daily generate 33% of the traffic and therefore 49,500 of the 150,000 AADT. Since there is one daily use customer per day per trip, there are a total of 49,500 customers per year that travel daily. All subsequent frequency categories require more than one customer on a daily basis to generate the percentage of trips reported by the survey. For example, those customers that travel once per week comprise 27% of the trips or 40,500 on a daily basis. It requires 7 weekly customers to generate the 40,500 daily trips or 283,500 customers per year.

Freq.	trips/yr /cust	% trips/ freq/day	Cumul	trips (000)/day	cust/ trip freq/day	cust/ year	% cust/ freq	% trips/day (Cumul.)
daily	365	33	33	49500	1	49500	1.51	1.51
1/wk	52	27	60	40500	7	283500	8.65	10.16
2/mo	24	20	80	30000	15	450000	13.72	23.88



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1/mo	12	13	93	19500	30	585000	17.84	41.72
2/yr	2	7	100	10500	182	1911000	58.28	100.00
		100	AADT	150000	Total # cust	3279000	100	

More than one customer is required to satisfy each frequency category except the daily frequency. When this number is multiplied by the number of trips per day, the number of customers in each frequency can be calculated. For a roadway that has annual average daily traffic of 150,000 there are approximately 3.3 million unique customers and have the distribution shown. The table indicates that 88% of the customers are infrequent users of the toll roads, that is customers that use the toll road less than once per week. Yet most ETC programs are devised to serve the 12% of customers. Clearly, a strategy of using transponders only, will simply serve to drive the infrequent customer into a violator status. Decision processes for the infrequent customer are not driven by the cost of the transponder or the effectiveness of marketing programs.

If the toll industry remains set on the goal of converting existing systems to AETC, electronic payment program focus must shift from the frequent customer to the infrequent one. Electronic payment methods must be developed that serve the infrequent customer as efficiently as we have served those who are daily users.

**Electronic Payment Options for the Infrequent Customer**

In the past the infrequent or occasional visitor used cash to pay tolls and it was quite convenient. If toll agencies wish to dispense with this form of payment, new payment methods must approach the convenience of cash and must be implemented so that associated operational costs are less than those associated with cash collections. These data imply that a strategy of using ETC for all customers is unlikely to succeed. Other electronic payment methods must be considered.

Toll operators that have implemented AETC in the past have done so on Greenfield projects where there is no expectation of paying with cash. To convert to AETC, the toll operator must devise methods that will attract large numbers of cash paying customers to electronic payment. Otherwise the tendency of current cash paying customers will be to drive through the toll gantries and become violators. The likely response of the toll agency is to increase enforcement and tighten the rules for sending notices. In this situation, the costs for processing non ETC transactions will grow proportional to the number of customers involved and the data show that nearly 90% of the customers are infrequent customers. It is the last 30-40% ETC penetration that is composed mostly of infrequent customers.

Some toll agencies have simply billed customers if they don't have an ETC transponder and have passed through the administrative costs on each transaction. While this allows the toll operator to recover the back office costs of AETC, it does not attract infrequent customers to use the facility. This approach might be termed a post payment process.



## Creating Practical Solutions Through Innovation

Some agencies have begun to introduce prepaid infrequent programs or pre-registered accounts. The concept is to obtain payment and license plate information in advance of or within a short time after having used the toll road. Information can be provided using a cell phone during travel or over the Internet before or after the trip. Because the back office costs are less, the costs that are passed through to the customer are less. The pre-registered account is similar to an ETC account but require much less information. Once established, tolls can be charged using Automatic License Plate Recognition (ALPR) technology. These accounts are sometimes established for a short period of time, perhaps a vacation period. Basic information that is collected includes payment data, name, license plate number and termination date.

If an infrequent customer fails to establish a prepaid ETC or ALPR account or to pay a bill sent from the agency, the customer goes into a violator status. Many in the toll industry attempt to convert these delinquent accounts into customer accounts. It is an excellent opportunity to convert these customers into prepaid customers, either ETC or ALPR. Beyond this point, the violator must be pursued through the court system. This process can be very costly to both the toll agency and the customer. Just as businesses sell receivables to a third party, toll operators have begun to turn the collections process over to a contractor in exchange for a payment equal to the tolls due and accumulated administrative costs.

### Conclusion

As the toll industry moves toward AETC, the payment methods offered infrequent customers will be crucial. Because ETC has been such a great success some have assumed that more is better. The data demonstrate that we have dealt with only 10% of the customer base when 60% ETC penetration is reached. To accomplish AETC conversions we must deal with the other 90% of the customer base. We must offer programs that offer convenience for the infrequent customer. It would seem that the future of tolling has more to do with understanding the customer than with the technology tools available.