

DRIVING INNOVATION: TOLLING AND TRANSPONDERS IN MASSACHUSETTS

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INTRODUCTION

Expanding the use of transponders, beyond tolling, has been suggested at various times since Massachusetts first implemented electronic tolling in 1998. A test parking program was initially implemented at the Route 128 station parking garage in 2000, but this system has yet to expand to other area parking facilities. In 2001, Jordan Levy, then-Director of the Massachusetts Turnpike Authority (today consolidated under the Massachusetts Department of Transportation), saw an opportunity to increase efficiency and customer satisfaction at Logan airport garages, municipal garages throughout the state, and even private parking facilities.¹ Yet 15 years later transponders in Massachusetts are still used almost exclusively for tolling on the Massachusetts Turnpike.

The state is now on the verge of upgrading its tolling system and doing away with Turnpike toll booths altogether. Officials praise the new system for its cost savings, increased efficiency, and accident and pollution reduction.² By upgrading its tolling system, Massachusetts is following other states and countries which have more quickly embraced the evolution of transponder technology.

Each strand of this web of transit services utilizes unique payment mechanisms, fragmenting a system which should work together for the customer.

It is easy for government utilization of a technology to be outpaced by advancements in the technology itself. The planned upgrade to Massachusetts' tolling system is a laudable advancement, but should only be considered the beginning of a transportation transformation fueled by technology. The transponder could be re-imagined more creatively as a tool with broad applications instead of a simple tolling device. Making this fundamental change in the way the technology is viewed will require innovative thinking, cooperation between state agencies, and bringing in partners from private industry.

Greater Boston's current transportation system includes the highways and road infrastructure covered by tolls, but also contains parking lots, subway and commuter rail lines, ferries, and more. Each strand of this web of transit services utilizes unique payment mechanisms, fragmenting a system which should work together for the customer. While electronic payment options have been created

for parking and the train systems, the transit system as a whole requires further streamlining.

This policy brief will explore the changes that the all-electronic tolling system (AETS) will bring to the Commonwealth's drivers, examine the efforts of other states to fully utilize transponder technology, and offer recommendations for how Massachusetts should proceed with the roll-out of the AETS.

A SHORT HISTORY OF TOLLING

Tolls, once confined to private roadways, have become a routine and increasingly important component of public transportation funding in America. In 1792, the nation's first toll road, the privately-owned Philadelphia and Lancaster Turnpike, was created and soon followed by many others in New York, Massachusetts, and virtually everywhere else in the young and growing country. As demand grew for higher quality and larger roads at the turn of the 20th century, states and cities began to get involved with toll road operation as well. By 1930, most Americans owned a car and massive infrastructure projects like New York City's Holland Tunnel (1927) and San Francisco's Golden Gate Bridge (1937) were being partially funded through the tolls they collected.³

After World War II, President Eisenhower's interstate highway system was created and tolls were generally forgone in favor of tax-funded construction projects as America's auto-centric culture became further entrenched. By the 1980s, large portions of the nation's road and transportation infrastructure were beginning to reach the end of their useful lifetime while the number of cars stressing the system continued to grow. Faced with rising maintenance costs and the advent of electronic toll collection technology, many states implemented tolls to help fund road maintenance and expansion.⁴

For years tolling required cars to stop at a booth and pay before continuing on the road or across the bridge. In 1989, toll roads in Dallas and New Orleans implemented the nation's first electronic collection systems, and in 1991 Denver and Oklahoma went further with primitive open-road tolling programs. Electronic toll collection is similar to Massachusetts' E-ZPass system, requiring drivers to slow down significantly. Open-road tolling allows some drivers to continue at normal speeds, while those without transponders must use separate cash lanes. Toronto implemented an AETS (similar to Massachusetts' new system requiring no drivers to stop or slow down) in 1997, and was followed in the United States by Houston in 2004.⁵

Massachusetts officials instituted tolls along the Turnpike in the 1950s as the city and state focused on improving

vehicular transit in the region.⁶ With a few minor changes along the way, the Turnpike has remained a toll road, the revenue from which is used for debt service, maintenance and capital improvements related to the roadway itself. Even with this steady stream of funding for the Turnpike, the state's highway infrastructure fell into a state of disrepair, with 52 percent of bridges needing repair or replacement and 43 percent categorized as functionally obsolete.⁷

A 2007 report from the Massachusetts Transportation Finance Commission found that “the condition of [Massachusetts'] roads, bridges, and transit systems are all in broad decline.”⁸ While great strides have been made in recent years thanks to an accelerated bridge repair program, more than 8 percent of bridges in the state are still considered structurally deficient as of May, 2015.⁹ Facing a funding shortfall, MassHighway shifted much of its operating costs to the capital budget, thereby deferring maintenance and increasing the agency's debt burden.¹⁰

Driving remains the dominant form of travel in and out of Boston. In 2012, approximately 787,000 commuters traveled to core communities in Greater Boston on a daily basis, 71 percent of whom used a car. Despite the Big Dig, congestion in the Boston area has not improved, and now stretches further from the city.¹¹ As it has become increasingly clear that tolls on the Mass Pike, Tobin Bridge and Ted Williams and Sumner tunnels are here to stay, the state has moved to accommodate this reality.

In 1998, the Fast Lane transponder was introduced in Massachusetts and it was re-branded E-ZPass in 2012.¹² Massachusetts is a member of the E-ZPass Interagency Group (E-ZPass Group), a consortium of state agencies and authorities that cooperate in an interoperable electronic tolling system. This means that transponders from each state also work in other member states. Currently the E-ZPass Group is comprised of 38 agencies across 16 states and is the largest tolling network in the country, stretching from Maine to North Carolina in the South, and Illinois to the West.¹³ Unlike the Massachusetts Department of Transportation (MassDOT), some of these member agencies are tolling-specific entities that serve no larger function.

A 2007 report from the Massachusetts Transportation Finance Commission found that “the condition of [Massachusetts'] roads, bridges, and transit systems are all in broad decline.”⁸

E-ZPass transponders allow drivers in Massachusetts to forgo stopping and physically paying a toll by using a sensor array to automatically deduct the toll charge from the driver's pre-paid account as they drive under an overhead gantry. However, the Turnpike continued to maintain tollbooths for customers who paid cash at all mainline toll plazas and ramps. As toll technology has grown more capable and less expensive, the state moved to embrace the next generation of toll technology and turn the Turnpike into an entirely cashless toll road.

TOLLING AND TRANSPONDERS TODAY

In the summer of 2014, a pilot AETS was initiated on the Tobin Bridge to test a cashless tolling system. An AETS allows drivers to continue driving at normal speeds while an overhead reader and sensors in the pavement combine to determine and assess the toll charge. Those without transponders have their license plates photographed, and by matching records with the Registry of Motor Vehicles, invoices are then sent to the driver's home address as part of the pay-by-plate (PBP) system. The driver incurs additional fees for failing to pay their invoice every 30 days, culminating in a possible license suspension after 90 days. It is estimated that some of these tolls, about 15 percent based on early data from the Tobin Bridge pilot program, may never be recovered at all.¹⁴

In November 2014, the state awarded a \$201.6 million contract to TransCore to create and operate an AETS across the length of the Massachusetts Turnpike.¹⁵ Raytheon was awarded a simultaneous \$130.4 million contract to construct the sensor arrays necessary to read the transponders and operate the PBP system.¹⁶ The contracts' projected completion date for the AETS is fall 2016, at which time the entire Turnpike will become a cashless toll road.¹⁷ The cost of traveling end-to-end on the Turnpike will remain the same, and the large footprints of toll plazas will be removed as parts of the highway are straightened out and redesigned.¹⁸ Travel times will be reduced as plaza-surrounding congestion is alleviated, and the number of accidents and emissions levels on the Turnpike will be reduced.¹⁹

Owning an E-ZPass transponder allows a driver to avoid the PBP processing fee (similar to the current surcharges for paying tolls with cash), but the Turnpike tolls are otherwise evenly applied to all drivers. (See Chart 1 for an overview of toll charges). There are some discounts on Boston's bridge and tunnels for residents of the nearest neighborhoods. Qualified residents in Charlestown and Chelsea pay a discounted toll on the Tobin Bridge, while qualified residents of East Boston, South Boston and the

Chart 1: Toll Charges as of July 2016

	Cash Price	E-ZPass Price	Resident Price
Massachusetts Turnpike (I-90)*	\$7.10	\$6.60	–
Tobin Bridge**	\$3.00	\$2.50	\$0.30
Sumner Tunnel***	\$3.50	\$3.00	\$0.40
Ted Williams Tunnel***	\$3.50	\$3.00	\$0.40

* Toll charge for Turnpike is for full length

** Tobin Bridge discount applies to residents of Charlestown (Boston) and Chelsea, MA

*** Sumner and Ted Williams Tunnel discount applies to residents of Boston's North End, South Boston, and East Boston

North End receive discounts in the Ted Williams and Sumner Tunnels.²⁰ There is also a carpool program requiring three or more passengers in the vehicle at all times, members of which pay \$50-145 annually to cover all their tolling transactions.²¹

E-ZPass technology is extremely versatile and can be used for tolls, as well as for other innovative purposes such as granting access to parking facilities. Currently, E-ZPass can be used to pay for parking at the Route 128 station parking garage and to gain access to the Boston Common Garage for monthly parkers.²² The Common Garage system keeps payment separate from the transponder by simply linking a pre-purchased monthly pass with the user's transponder.²³ Limousines and taxis also use their transponders to pay a livery fee when they pick up or drop off passengers at Logan Airport.²⁴ Expanding transponder applications will help make them an indispensable item for drivers in the Commonwealth and help to reduce the PBP system's expenses.

As the Commonwealth moves forward with an AETS, it is clear that while electronic tolling is here to stay, the E-ZPass transponder itself could be replaced with other technology such as a smart phone or contactless card.²⁵ The same infrastructure will be necessary to read transponders in any form, so as E-ZPass technology becomes increasingly ubiquitous across our transportation system, it is prudent to fully understand this technology and seek other uses and industries which it might also improve.

A New Driving Experience

Drivers on the Massachusetts Turnpike will never again have to stop in a toll plaza to pay. Instead they will drive under gantries which read their transponder or license plate in order to assess the appropriate toll. Each gantry

uses an overhead sensor to read transponders, a camera to snap pictures of license plates, and underground sensors to determine the number of axles belonging to a vehicle. This information is then used to calculate the toll value which is sent to the Customer Service Center (CSC).

The CSC will either withdraw the charge from a transponder account automatically, or a bill will be sent through the mail to the known address of the vehicle's owner through the PBP system. The CSC is the nerve center of the state's tolling operations, handling all payments, complaints, and abuses. Each transponder's account is established and maintained at the CSC, which has access to Registry of Motor Vehicle and MassDOT files. This CSC will be managed and staffed by TransCore, which will supply MassDOT's Tolling Department with daily financial and operational reports.²⁶

For those who own an E-ZPass transponder already, the switch to an AETS will not affect how account balances are managed or tolls are applied. A single user is allowed to have up to four E-ZPass devices whose stored value can be managed using cash at one of over 250 retail locations or a CSC; by check; or using a credit card over the phone, online, at a CSC, AAA location, or Herb Chambers car dealership location.²⁷

For drivers without transponders, a monthly bill will be mailed with a tally of all charges associated with a driver's vehicles. Similarly, if the account has insufficient funds to pay for the toll, then the transaction is processed by the PBP system instead. This PBP system is costlier to operate than the E-ZPass transponder system, providing the state with an incentive to increase the transponder market share as much as possible.²⁸

As of November 2015, 78 percent of Western Turnpike transactions, 81 percent of Boston extension tolls, and

74 percent of bridge and tunnel charges were paid using a transponder.²⁹ The Tobin Bridge in particular has an 85 percent transponder usage rate, yet 15 percent of total revenue (including late fees) went uncollected during the early stages of the pilot period in unpaid PBP bills.³⁰ The state has estimated that once the AETS goes live on the Turnpike, about 5 percent of tolls will go uncollected.³¹ The higher the transponder usage rate, the less lost revenue there should be from the PBP system, therefore transponders will remain available for free after the AETS becomes operational.³²

Drivers who use a transponder currently pay less for tolls, a system that will continue under the AETS to reflect the increased processing costs associated with the PBP system. Transponders are lower maintenance for the CSC, requiring assistance only when something goes wrong. The PBP system requires image review clerks to visually confirm transactions and for bills to be sent to drivers through the mail, a portion of which will never be paid.³³

By eliminating toll plazas, an AETS makes toll roads safer by reducing unnecessary congestion and merges, while also eliminating the need to employ toll-takers along the Turnpike. Both toll workers and drivers have been involved in serious accidents at Turnpike toll plazas.³⁴ There are also drawbacks to the PBP program, mainly its lack of transparency and its reliance on bills to collect tolls, especially from out-of-state drivers. Those using a transponder have the toll deducted immediately, while drivers billed through the PBP system must pay after the fact, allowing for increased toll evasion.

Currently, about 80 percent of tolls on the Turnpike are collected using transponders, while a minority of drivers who have privacy concerns do not want to use them.³⁵ The federal Driver Privacy Protection Act and Section 13 of Chapter 25 of the Massachusetts Acts of 2009 make it very difficult for personal travel and transaction data to be used inappropriately, however. Only law enforcement officers armed with a warrant will be able to access a driver's tolling data. Deidentified data will be used to calculate trip times across various stretches of highway.³⁶

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E-ZPass Plus

Once the AETS goes live, the state plans to introduce the E-ZPass Plus program. Opting into the E-ZPass Plus program directly links the transponder to a credit card or bank account. These transponders, while identical to normal E-ZPass tags in structure, require a minimum tolling balance and will automatically replenish themselves using the payment information on file.³⁷ Additionally, E-ZPass Plus enrollees are able to use their transponder for non-toll payments, such as parking or, theoretically, at retail locations like a carwash or fast food establishment, which are billed directly to the credit card on file. With the exception of two parking facilities, transponders are currently solely used for tolling in Massachusetts.

CREATIVE USES OF TRANSPONDERS

While the primary use of transponders is tolling, there are a number of states within and outside the E-ZPass Group where transponders are used for payment at parking facilities including airports and a handful of state owned parking lots and garages. Just like with Massachusetts' new system, a customer must first sign up for E-ZPass Plus and register a credit card for E-ZPass to be used for parking. Parking transactions are charged directly to the card and do not affect the pre-paid tolling balance.

Some states, such as Florida, are converting existing HOV (high-occupancy vehicle) lanes to HOT (high-occupancy toll) lanes or express lanes with congestion pricing. This means surcharges can be set according to demand, rising and falling with the level of traffic.³⁸ Others are using transponders for traffic management by using deidentified data to calculate the speed of traffic between two points, something that Massachusetts will implement as well.³⁹ Bermuda has fully embraced transponder technology and is using a radio frequency identification (RFID) windshield sticker to replace vehicle registrations and track driving infractions for their more than 40,000 vehicles.⁴⁰

In Staten Island NY, a pilot program at Wendy's allowed customers at one of five drive-thru locations to use their transponder to pay for purchases. Customers first had to register with iDriveThru, a separate entity from E-ZPass, and link a credit card to their transponder for purchases.⁴¹ This program has since been discontinued due to high costs for the business and lack of interest from drivers.⁴²

The SunPass program in Florida is one of the nation's most advanced tolling systems. It is currently used for roadway and bridge tolling, express lanes and airport parking lots. This robust program includes hundreds of retail locations for purchasing and replenishing a SunPass, available as a portable transponder or windshield sticker, and a user

friendly app for account management. The SunPass program has the flexibility to calculate and apply rebates and discounts for frequent users of a specific toll road in the state.⁴³

While the uses of transponder technology are almost limitless — there are many industrial as well as commercial applications — there are not many states or countries that are truly testing the limits of this technology. In direct conversations, the E-ZPass Group acknowledged that it does little to encourage member agencies to try new ideas, such as parking or retail. In fact, some members are tolling-specific agencies that would not be interested in, or actively oppose, adding more functionality to transponders.⁴⁴

Recently, as the technology has become cheaper, the E-ZPass Group convened a non-toll opportunity working group to explore other applications.⁴⁵ Conversations with senior officials at Kapsch, the technology and transporta-

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tion company that supplies Massachusetts' transponders, make it clear that while transponder technology has many documented uses beyond tolling, most states are unwilling to pursue any additional applications.⁴⁶ While the sensor arrays necessary to read transponders are not very expensive to install, integrating the software into existing systems can create headaches and a large expense.⁴⁷

At the state level, tolling administration is often housed in its own transportation department, as it is in Massachusetts. This structure, just like the tolling-specific agencies within the E-ZPass Group, discourages innovative transponder uses since such ideas often fall outside the

department's scope of duties. This does not mean that there are a lack of opportunities. Here in Massachusetts alone there are dozens of parking facilities and rest stops that, if outfitted with transponder technology, could become much more consumer friendly and efficient.

RELATED PROGRAMS IN MASSACHUSETTS

Of the non-toll transponder applications used by other states and countries, parking is the most natural fit with the technology and the clear first step for Massachusetts to expand the scope of its transponder utilization. Many Boston-area parking facilities use some form of electronic payment or automated access, along with a number of parking apps and programs which may be specific to as few as two parking facilities each.⁴⁸

The MBTA is moving towards unattended parking lots and has phased out most honor boxes, now essentially requiring users to pay electronically through an app or by phone call. In particular, over 80 unattended MBTA lots require the user to pay via the Pay by Phone, mPay2Park or Parkmobile app, depending upon the lot. Those who do not make use of the app will receive a monthly invoice through the mail.⁴⁹

In addition to these parking apps, the Parking TAP Card is a pre-loaded card that can be used at eight MBTA parking garages. This program does not have an electronic payment option and the card only works at the garage where the application was originally processed.⁵⁰ Logan Airport parking facilities also have electronic payment options including the Exit Express Card and Lexus Parking PASSport Gold program which respectively processes payments and allows access to premier parking spaces.^{51, 52}

Unfortunately, none of these parking programs are interoperable and all require the user to have separate accounts, link to a credit or debit card, and enroll at separate

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locations. This means these programs are typically limited to those who frequently park at a specific facility and are not convenient for infrequent users.

This division of programs and apps is not unique to parking. A similar situation exists within the MBTA as commuters are faced with multiple options for purchasing single, round-trip or monthly passes. The MyCharlie account is used for managing the subway and bus lines and the MBTA mTicket app for the commuter rail and ferries.^{53, 54}

The common thread that binds the fragments of Massachusetts' transit system together is the compartmentalized nature of our payment systems. A theoretical commuter might have to input credit card information and create an account for their E-ZPass to get to a commuter rail station parking lot where payment information is required for a different parking account, only to get to the train where

yet another account is required. This creates a needlessly complex web of accounts and programs for the rider to navigate on their daily commute. The transportation system, both highway and rail, should operate in conjunction with one another, not in conflict.

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RECOMMENDATIONS

With the advent of the AETS there is an opportunity to rethink customers' transportation experience not only with regard to tolling, but also parking and mass transit. The more applications created for the transponders, the more people will be incentivized to get one. Approximately 80 percent of all tolling transactions are currently processed using transponders, leaving millions of dollars in toll revenue at the mercy of the less reliable PBP system. It is in Massachusetts' best interest to boost the market share of E-ZPass transponders to reduce the higher costs associated with the PBP program. The state should also look beyond tolling and draw lessons from other states and countries that have taken the initiative to fully utilize transponder technology.

1. Utilize transponders for parking payment

In the near term, the Tolling Department should work with the MBTA and Massport to expand the use of transponders to a select group of area parking lots and garages at which the transition would be easiest. Currently, the only parking facilities that accept the E-ZPass transponder for payment are the Route 128 station parking garage in Westwood and the Boston Common Garage (although it's limited to monthly pass holders at the Boston Common Garage). This is a convenient and efficient way for commuters to enter and exit the garage without having to stop to process a payment.

MassDOT's Highway Division should consider expanding the E-ZPass parking program to include other attended parking lots and garages in the Boston area including over 30 MBTA facilities; Logan Airport garages; and Logan Express

lots located in Braintree, Framingham, Peabody and Woburn. A radio-frequency reader and antenna must be installed in order for the transponder to be used for access and payment processing. Most of the lots and garages mentioned have the infrastructure in place to mount the required equipment. Under the current E-ZPass Group protocol, the user would be required to convert to E-ZPass Plus before using a transponder to pay at any of these facilities.⁵⁵

2. Create a Chief Technology Officer for Consumers position at MassDOT

MassDOT should hire a Chief Technology Officer for Consumers (CTO), similar to the position recently created at the MBTA, with the goal of using technology to improve the customer experience.⁵⁶ Having the transponder's administration within the Tolling Department naturally limits the scope of its

use and functionality, which is ironic given that expanding the transponder's uses will incentivize more people to get them, thereby saving money for the Tolling Department's PBP system. Going forward, the transponder's functionality could be replaced by a smartphone, contactless card or even a transponder preinstalled in cars. A CTO dedicated to modernizing our transportation system will be forced to anticipate these changes and view the transponder as a flexible payment mechanism, not just a tolling tool. The CTO must not be tied down to a specific department or agency, but should seek opportunities to work with members of other public and quasi-public agencies, as well as with private businesses.

3. Consolidate transportation accounts

Massachusetts should consider developing a centralized transportation program with "The Hub," a web portal and mobile app which would allow consumers to create a single account for managing parking, tolling and transit. Currently, commuters and drivers are faced with myriad accounts (each requiring a log in and password, as well as credit card information) for managing their transportation needs. The accounts are managed using a variety of technologies including apps and online accounts, in person at kiosks and retail locations, over the phone and via the US Postal Service.

There should be one system with one account that integrates the E-ZPass transponder with the various electronic parking accounts (Pay by Phone, Parkmobile, Parking Tap Card, Exit Express, Lexus Parking PASSport Gold) and MBTA ticketing (Charlie Card, Charlie Ticket and mTicket). (See Appendix 2 for a mock-up of what this app might look like and the features it might include). For consumers who prefer to pay by cash or check, additional retail sales locations will be important for providing equitable opportunities to manage their accounts. Another unique potential feature of the transportation app is an alert to the user when a transaction has been processed in the form of a push notification. This allows for greater transparency with purchases whether it is hourly parking, a toll or subway trip.

All these components of Massachusetts' transit system are managed by various state agencies including the Highway division, MBTA, Massport and Massachusetts Convention Center Authority, presenting an administrative challenge in the

creation, management and growth of a shared app. Notwithstanding these obstacles, such a tool would vastly simplify the commuting and travel experience for all Greater Boston area residents and visitors.

4. Enable other forms of in-car commerce

Once the AETS goes live, the state should look to turn the transponder into a tool that allows drivers to more easily engage in commerce from their car. This means creating a way for private businesses to install their own readers and process payments through the transponder. This concept has been tested with five Wendy's drive-thrus in Staten Island. The most obvious locations to test this idea in Massachusetts are at Turnpike service plazas. Involving the private sector is tricky, but a newly enlisted Chief Technology Officer could ally with the Massachusetts Technology Collaborative or Economic Development Council to get key stakeholders on board.

Commerce in a car is not limited to fast food; it can also be used for car washes, pharmacies, and potentially even at gas stations. In addition to private enterprise, there are other transponder uses that the state should investigate and consider implementing themselves. Some transponder systems, such as Florida's SunPass, use High Occupancy Toll (HOT) lanes that adjust restricted lane charges based on traffic levels.

5. Enhance MASSDOT's public information campaign

The AETS is inherently less transparent than its cash-based predecessor because it hides when and where each toll is paid and how much it will cost. This is bound to upset drivers who are not fully prepared for the transition away from toll booths. To combat this, MassDOT must couple the AETS' rollout with a public information campaign designed to inform drivers about how the new system will work. In addition to reducing the number of surprised or angry commuters, this campaign can also head off any privacy concerns by stressing that commuting data will not be shared outside of specific MassDOT departments and law enforcement agencies. Additionally, a strong public information campaign will convince more drivers of the benefits of using a transponder over the PBP system, such as mildly discounted toll charges, further reducing PBP program costs and lost revenue from unpaid bills.

CONCLUSION

The Commonwealth's shift to an AETS is sure to make waves among the region's hundreds of thousands of commuters and millions of residents. There may be concerns about privacy, undue toll charges and late fees, toll dodgers, and a lack of transparency, but the general consensus among Bay State drivers is sure to be positive. The smoother flow of traffic, absence of frustrating post-toll merges, and reduced pollution and travel times are bound to win over most skeptics.

This technology is not exactly new, places like Toronto and Florida have used cashless toll roads for years, and it's very flexible, New York has piloted retail sales using transponders and Bermuda uses them to track vehicle registration. Now that the Bay State has elected to move to a cashless tolling system, the next logical question is whether there are additional uses of transponder technology. As has been discussed throughout this paper, there are myriad applications for transponders ranging from buying a cup of coffee to predicting travel times.

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It seems that the state agencies currently in charge of tolling, and therefore transponder technology, are reluctant to break from their tolling mindset. Because transponder technology is housed in a tolling department, it should be no surprise that there have not been many efforts to expand parking programs or other applications in the state. There are dozens of parking lots that employ different payment programs while serving the same region and population. Starting with the low-hanging fruit, the MBTA's attended lots and garages and Logan's parking facilities, these parking programs should be modernized with transponder technology.

Similarly, the Commonwealth should challenge the status quo and pilot non-toll transponder uses. Service plazas along the Turnpike offer a perfect opportunity to test programs for food, fuel, and more. Thinking outside the box with transponders opens up limitless opportunities when the private sector is involved. The Commonwealth should also investigate opportunities for HOT lanes and other state-based transponder uses.

Part of the reason that transponders have not been fully utilized in Massachusetts is the structure of MassDOT. A tolling-specific department limits the uses of transponders because their focus can tend to be single-minded and not geared towards the entire consumer experience. Short of restructuring the agency, MassDOT could create a role inside the Tolling Department that is focused on non-toll transponder uses and increasing consumer satisfaction.

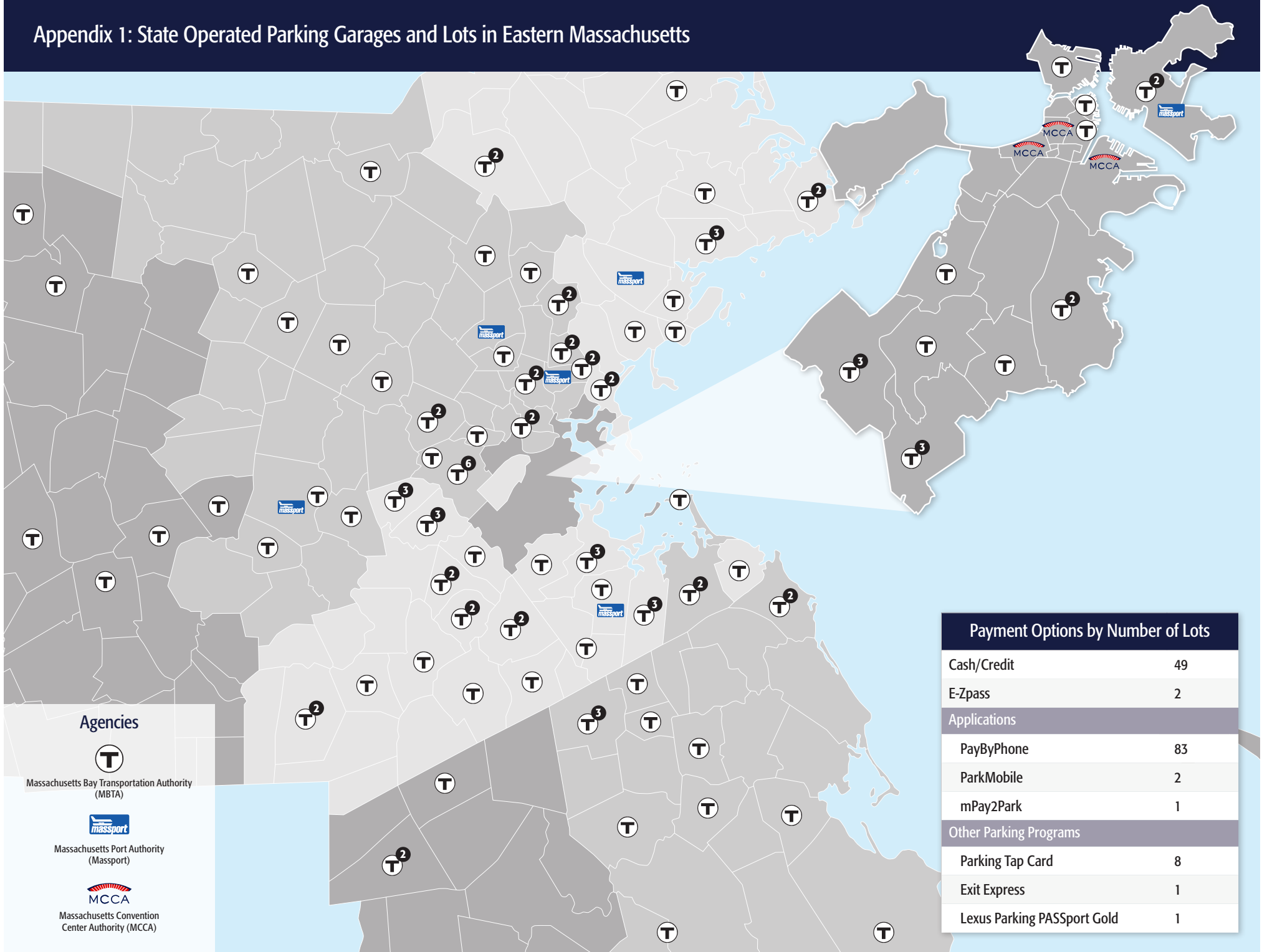
One of the major hurdles for simplifying transportation customers' experience are the numerous silos into which each program and mode of transportation are separated. Instead of having multiple accounts and credit card entry points for the MBTA, parking, and tolling, these accounts should be bundled into a central transportation account which could be maintained through a web portal, mobile app, at a CSC, or over the phone. Such a system would vastly simplify the customer's experience, boost transponder market share, and streamline MassDOT's service delivery.

The major lesson to take away from this overview of MassDOT's transition to an AETS is the constraining consequences of tunnel vision. Focusing on the transponder as a tolling device severely limits the applications of a versatile technology. Instead, it needs to be viewed as a crucial component of the transit system at-large as well as a commerce tool.

Whether it eliminates the need to take a ticket at a parking lot or stop at another drive-thru window, the transponder is built to simplify the consumer experience. MassDOT should help the transponder live up to its potential by increasing its applications, both public and private, and linking it to the rest of the transit system through a centralized account.

The major lesson to take away from this overview of MassDOT's transition to an AETS is the constraining consequences of tunnel vision. Focusing on the transponder as a tolling device severely limits the applications of a versatile technology. Instead, it needs to be viewed as a crucial component of the transit system at-large as well as a commerce tool.

Appendix 1: State Operated Parking Garages and Lots in Eastern Massachusetts



Agencies



Massachusetts Bay Transportation Authority (MBTA)



Massachusetts Port Authority (Massport)



Massachusetts Convention Center Authority (MCCA)

Appendix 2: Mock-up of "The Hub": One Account for Tolling, Commuting and Parking



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