

Users of Existing Toll Facilities in Hampton Roads



USERS of EXISTING TOLL FACILITIES in HAMPTON ROADS

PREPARED BY:



SEPTEMBER 2012

REPORT DOCUMENTATION

TITLE

Users of Existing Toll Facilities in Hampton Roads

AUTHOR

Robert B. Case, PE, PTOE

ABSTRACT

Having obtained from VDOT data concerning E-ZPass transactions at the three local toll facilities—Chesapeake Bay Bridge Tunnel, Chesapeake Expressway, and the Coleman Bridge—staff has calculated the portion of E-ZPass tolls paid by persons living, and businesses located, in the 13 HRTPO localities.

The CBBT and Chesapeake Expressway collect a small portion of E-ZPass toll revenue from Hampton Roads persons and organizations (12% and 15% respectively), whereas the Coleman Bridge collects approximately 4/5ths of total E-ZPass toll revenue (79%) from these locals.

NON-DISCRIMINATION

The HRTPO assures that no person shall, on the ground of race, color, national origin, handicap, sex, age, or income status as provided by Title VI of the Civil Rights Act of 1964 and subsequent authorities, be excluded from participation in, be denied the benefits of, or be otherwise subject to discrimination under any program or activity. The HRTPO Title VI Plan provides this assurance, information about HRTPO responsibilities, and a Discrimination Complaint Form.

REPORT DATE

September 2012

ORGANIZATION NAME, ADDRESS, & TELEPHONE

Hampton Roads Transportation Planning Organization

723 Woodlake Drive

Chesapeake, Virginia 23320

757.420.8300

<http://www.hrtpo.org>

ACKNOWLEDGMENTS

This document would not have been possible without the assistance of Eric Stringfield (VDOT), Burt Boehling (VDOT), and Robert Cafaro (Federal Signal Technologies) through whom the data was obtained.

This document was prepared by the Hampton Roads Transportation Planning Organization (HRTPO) in cooperation with the U.S. Department of Transportation (USDOT), Federal Highway Administration (FHWA), Federal Transit Administration (FTA), Virginia Department of Transportation (VDOT), and Virginia Department of Rail and Public Transportation (DRPT). The contents of this report reflect the views of the HRTPO. The HRTPO staff is responsible for the facts and the accuracy of the data presented herein. The contents do not necessarily reflect the official views or policies of the FHWA, FTA, VDOT or DRPT. This report does not constitute a standard, specification, or regulation. FHWA, FTA, VDOT or DRPT acceptance of this report as evidence of fulfillment of the objectives of this program does not constitute endorsement/approval of the need for any recommended improvements nor does it constitute approval of their location and design or a commitment to fund any such improvements. Additional project level environmental impact assessments and/or studies of alternatives may be necessary.

INTRODUCTION

In order to learn what portion of the tolls collected at existing local toll facilities are paid by local persons and businesses, HRTPO staff contacted VDOT for data from the E-ZPass system for transactions occurring over the 12-month period 4-1-11 thru 3-31-12 at the existing toll roads in Hampton Roads:

- Chesapeake Bay Bridge Tunnel,
- Chesapeake Expressway, and
- Coleman Bridge.

E-ZPass is a system of toll-collection agencies in 14 states in which persons with an account with one E-ZPass agency can use their transponders on toll roads associated with a different E-ZPass agency. For example, persons with an E-ZPass account with the West Virginia Parkways Authority can use their transponders on toll roads under the E-ZPass-associated Ohio Turnpike Commission, and vice versa. The E-ZPass agency in Virginia is called "E-ZPass Virginia".

VDOT provided E-ZPass data to the HRTPO in two forms:

1. VDOT provided summary statistics requested by the HRTPO staff. For example, VDOT reported to the HRTPO that E-ZPass Virginia vehicles with two axles and a Hampton Roads zip code spent \$2,756,176 at the Coleman Bridge between 4-1-11 and 3-31-12.
2. For the Chesapeake Bay Bridge Tunnel (CBBT) only, VDOT provided two databases of E-ZPass transactions:
 - a. A database of CBBT transactions of E-ZPass Virginia patrons, showing the zip code of their address
 - b. A database of CBBT transactions of patrons of other E-ZPass agencies, showing the name of that agency.



Existing Toll Facilities in Hampton Roads

Base Map Source: Google

This document is organized in accordance with the above two forms of data:

1. The first section, “Summary Statistics”, reports the summary statistics provided by VDOT.
2. The second section, “Chesapeake Bay Bridge Tunnel- Detail”, reports the findings and maps emerging from the analysis of the two CBBT transaction databases by HRTPO staff.

In this document, the E-ZPass trips and revenue are divided into three exhaustive categories:

1. “E-ZPass Virginia” Patrons with Hampton Roads Zip Codes¹
2. Other “E-ZPass Virginia” Patrons
3. Patrons of Other E-ZPass Agencies

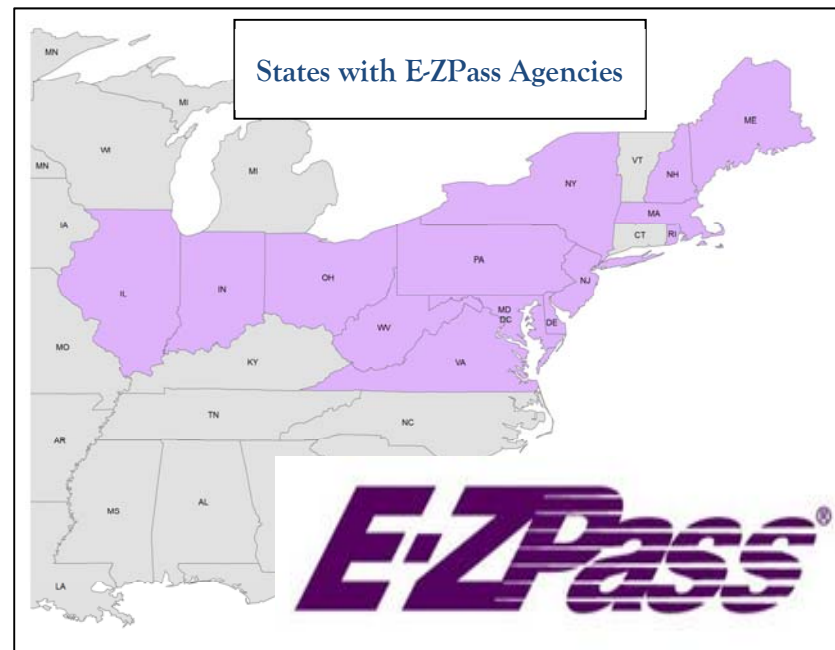
The first category gives reliable location information about the “home base” of E-ZPass patrons who use the tolled facilities. For private owners of transponders, it is assumed that the zip code corresponds to the address of their home. For transponders owned by organizations—businesses, government, etc.—it is assumed that the zip code corresponds to the address of the subject organization.

The second category—Other “E-ZPass Virginia” Patrons—provides imperfect location information because many E-ZPass Virginia patrons are located outside of Virginia. For example, many of the E-ZPass users of the Chesapeake Expressway live in NE North Carolina.

Likewise, the third category—Patrons of Other E-ZPass Agencies—provides imperfect location information. Even though these agencies, like E-ZPass Virginia, are typically associated with a given state—e.g. the Illinois State Toll Highway Authority—their patrons may be located outside of that state.

¹ Note that HRTPO staff provided VDOT a list of Hampton Roads zip codes for the 13 localities represented on the HRTPO Board. Note that, although only a portion of Gloucester is in the MPO Study Area established by FHWA, zip codes throughout the county of Gloucester were employed.

The findings in this document, of necessity, pertain only to the E-ZPass users of these facilities. No information is known about the home base of the persons who pay cash, and information about those who use credit/debit cards was not pursued. Note that, for the CBBT, E-ZPass trips (1,322,995) represented 37% of the total trips over the 12-month study period (3,578,008). For the Chesapeake Expressway, E-ZPass trips (2,102,511) represented 57% of the total trips over the 12-month study period (3,720,046).



Map Source: HRTPO using ESRI

SUMMARY STATISTICS

In this section, summary statistics from VDOT are reported for the three existing toll facilities in Hampton Roads:

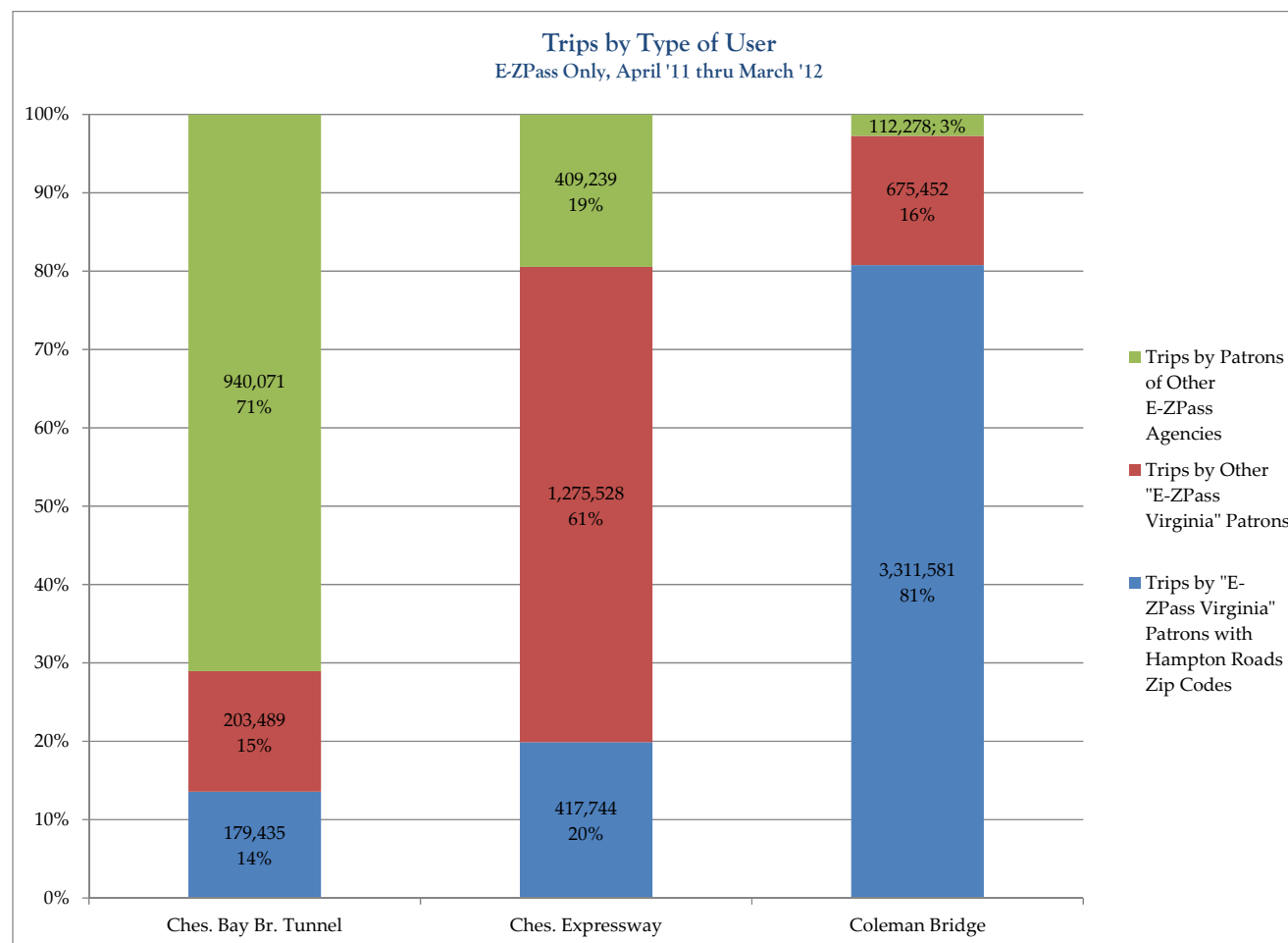
1. Chesapeake Bay Bridge Tunnel (CBBT)
2. Chesapeake Expressway
3. Coleman Bridge

The data on this page portrays the number of trips by E-ZPass users.

	<u>Trips by "E-ZPass Virginia" Patrons with Hampton Roads Zip Codes</u>	<u>Trips by Other "E-ZPass Virginia" Patrons</u>	<u>Trips by Patrons of Other E-ZPass Agencies</u>	<u>total</u>
Ches. Bay Br. Tunnel	179,435	203,489	940,071	1,322,995
Ches. Expressway	417,744	1,275,528	409,239	2,102,511
Coleman Bridge	3,311,581	675,452	112,278	4,099,311

Trips by Type of User, E-ZPass Only, April '11 thru March '12

Source: HRTPO analysis of VDOT data



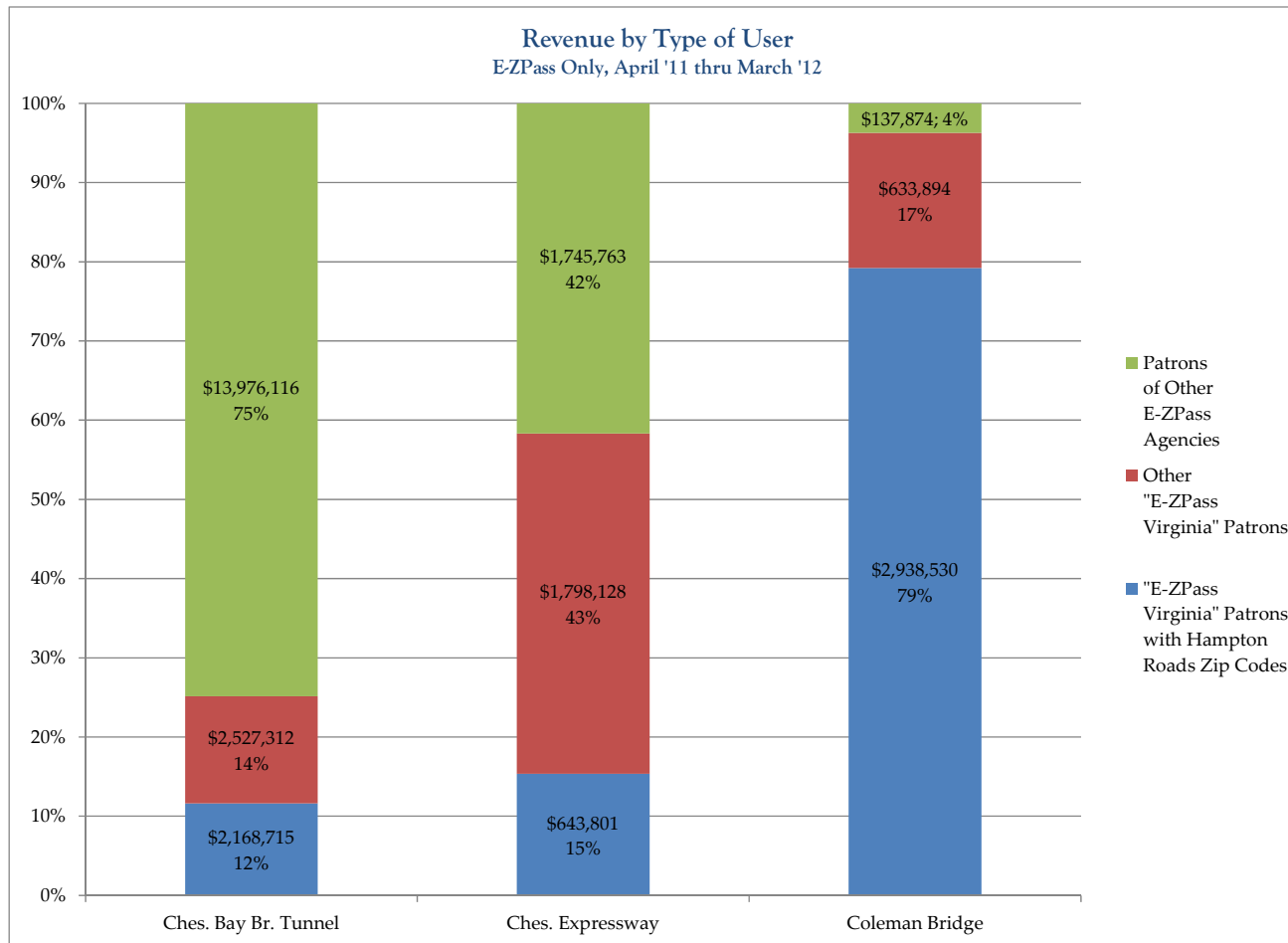
The data reveals that local persons and organizations make a small portion of the E-ZPass trips on the CBBT and Chesapeake Expressway, whereas they make a large portion of the trips on the Coleman Bridge.

The data on this page portrays revenue from E-ZPass users.

	<u>"E-ZPass Virginia"</u> <u>Patrons with</u> <u>Hampton Roads</u> <u>Zip Codes</u>	<u>Other</u> <u>"E-ZPass</u> <u>Virginia"</u> <u>Patrons</u>	<u>Patrons</u> <u>of Other</u> <u>E-ZPass</u> <u>Agencies</u>	<u>total</u>
Ches. Bay Br. Tunnel	\$2,168,715	\$2,527,312	\$13,976,116	\$18,672,143
Ches. Expressway	\$643,801	\$1,798,128	\$1,745,763	\$4,187,691
Coleman Bridge	\$2,938,530	\$633,894	\$137,874	\$3,710,298

Revenue by Type of User, E-ZPass Only, April '11 thru March '12

Source: HRTPO analysis of VDOT data



The CBBT and Chesapeake Expressway collect a small portion of E-ZPass toll revenue from Hampton Roads persons and organizations (12% and 15% respectively), whereas the Coleman Bridge collects approximately 4/5ths of total E-ZPass toll revenue (79%) from these locals.

It appears that there are two reasons for the disparity, in terms of portion of E-ZPass revenue coming from Hampton Roads, between—on one hand—the CBBT and Chesapeake Expressway, and—on the other hand—the Coleman Bridge.

The first reason is that E-ZPass drivers based in Hampton Roads tend to pay lower toll rates (than the average E-ZPass driver) at the CBBT and Chesapeake Expressway.

For the CBBT, drivers of small vehicles (auto, pickups, motorcycles, etc.) who cross the CBBT and return within 24 hours pay \$12 to cross and \$5 to return. Although any person is eligible for this fare, an inordinately large portion of these lower fares are paid by persons based in Hampton Roads (as shown in the Detail section below) due to their proximity to the facility.

For the Chesapeake Expressway, E-ZPass Virginia patrons may sign up for the Discount Program. The program costs \$20 for the first six months and \$3.33 per month thereafter. Instead of being charged \$3.00 (\$6.00 on peak weekends), members of the program with 2-axle vehicles are charged \$0.75 (365 days a year), a 75% to 87.5% discount. Although any E-ZPass Virginia patron is eligible for the program, a slightly larger portion of the discounts are given to persons based in Hampton Roads (as shown in the table and chart on this page), likely due to their more frequent usage of the facility and/or their greater knowledge of the discount program.

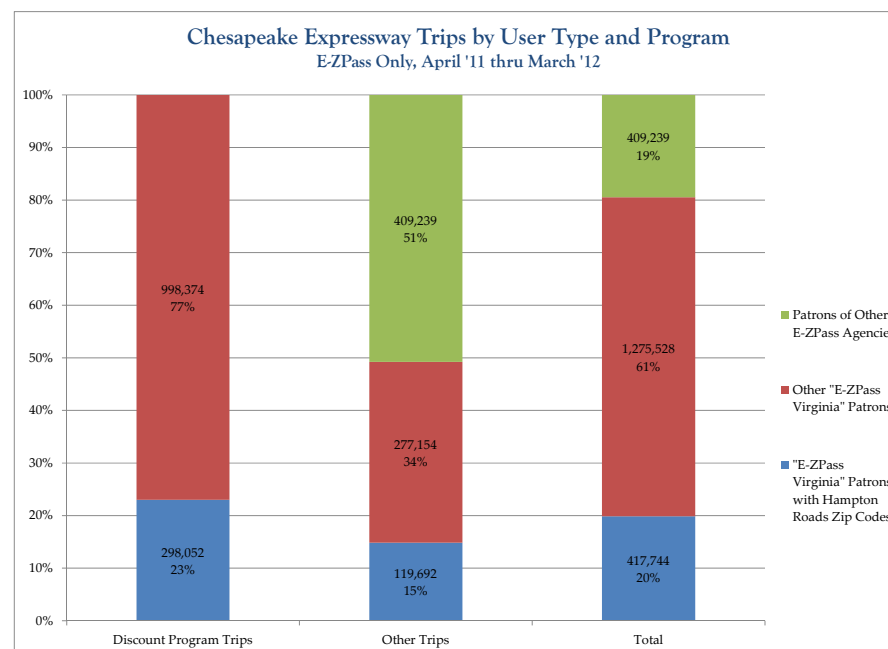
For the Coleman Bridge, however, a patron of any E-ZPass agency driving in a 2-axle vehicle automatically receives a discount, being charged \$0.85 instead of the \$2.00 non-E-ZPass rate. Therefore, considering only E-ZPass users—as in this analysis—the local and out-of-town user pay the same toll rate.

The second reason that drivers based in Hampton Roads pay a smaller portion of the total E-ZPass tolls at the CBBT and Chesapeake Expressway than they do at the Coleman Bridge is that the CBBT and Chesapeake Expressway are used largely by persons based outside of

	Discount Program		Total
	Trips	Trips	
"E-ZPass Virginia" Patrons with Hampton Roads Zip Codes	298,052	119,692	417,744
Other "E-ZPass Virginia" Patrons	998,374	277,154	1,275,528
Patrons of Other E-ZPass Agencies	0	409,239	409,239
	1,296,426	806,085	2,102,511

Ches. Expy. Trips by User Type and Program, April '11 thru March '12

Source: HRTPO analysis of VDOT data



Hampton Roads, whereas the Coleman Bridge is used largely by persons based in Hampton Roads. The CBBT and Chesapeake Expressway apparently serve many thru trips, e.g. to the Outer Banks. Although the Coleman Bridge (US 17) could be used by persons making thru trips (e.g. Northern Virginia to the Outer Banks), it is usually quicker to make most of these trips on I-95 and I-64 instead of US 17.

CHESAPEAKE BAY BRIDGE TUNNEL- DETAIL

In this section, detailed statistics extracted from the E-ZPass transactions databases are presented for the Chesapeake Bay Bridge Tunnel (CBBT).² The databases contain 1,323,058 trips, or 37% of the 3,578,008 total trips recorded during the study period (4-1-11 thru 3-31-12). They contain transactions of \$18,684,743, or 42% of the \$45,020,269 total toll collections.



<u>Agency</u>	<u>State</u>	<u>Revenue</u>
Delaware DOT	DE	\$1,972,895
Delaware River and Bay Authority	DE/NJ	\$157,408
Delaware River Joint Toll Bridge Commission	PA/NJ	\$97,934
Delaware River Port Authority	PA/NJ	\$83,740
E-ZPass Virginia	VA	\$4,706,027
Illinois State Toll Highway Authority	IL	\$160,365
Indiana Toll Road Concession Co.	IN	\$5,434
Maine Turnpike Authority	ME	\$60,545
Maryland Transportation Authority	MD	\$1,398,664
Massachusetts Turnpike Authority	MA	\$296,736
MTA Bridges & Tunnels	NY	\$1,380,805
New Hampshire DOT	NH	\$93,994
New Jersey Regional Consortium	NJ	\$3,620,132
New York State Thruway Authority	NY	\$2,420,595
Ohio Turnpike Commission	OH	\$9,432
Peace Bridge New York / Ontario	NY/ON	\$11,442
Pennsylvania Turnpike Commission	PA	\$1,395,140
Port Authority of New York & New Jersey	NY/NJ	\$675,561
Rhode Island Turnpike/Bridge Authority	RI	\$57,407
West Virginia Parkways Authority	WV	\$80,487
	Grand Total	\$18,684,743

Revenue by Agency, CBBT, E-ZPass Only, April '11 thru March '12

Source: HRTPO analysis of VDOT data

² Note that the figures calculated from these transaction databases differ slightly but insignificantly from those received from VDOT and published in the Summary section.

<u>Agency</u>	<u>State</u>	<u>Trips</u>
Delaware DOT	DE	122,738
Delaware River and Bay Authority	DE/NJ	10,275
Delaware River Joint Toll Bridge Commission	PA/NJ	8,016
Delaware River Port Authority	PA/NJ	6,658
E-ZPass Virginia	VA	382,974
Illinois State Toll Highway Authority	IL	7,856
Indiana Toll Road Concession Co.	IN	433
Maine Turnpike Authority	ME	4,282
Maryland Transportation Authority	MD	93,437
Massachusetts Turnpike Authority	MA	23,451
MTA Bridges & Tunnels	NY	108,544
New Hampshire DOT	NH	7,690
New Jersey Regional Consortium	NJ	267,138
New York State Thruway Authority	NY	113,647
Ohio Turnpike Commission	OH	638
Peace Bridge New York / Ontario	NY/ON	681
Pennsylvania Turnpike Commission	PA	111,873
Port Authority of New York & New Jersey	NY/NJ	45,345
Rhode Island Turnpike/Bridge Authority	RI	4,786
West Virginia Parkways Authority	WV	2,596
	Grand Total	1,323,058

Trips by Agency, CBBT, E-ZPass Only, April '11 thru March '12

Source: HRTPO analysis of VDOT data

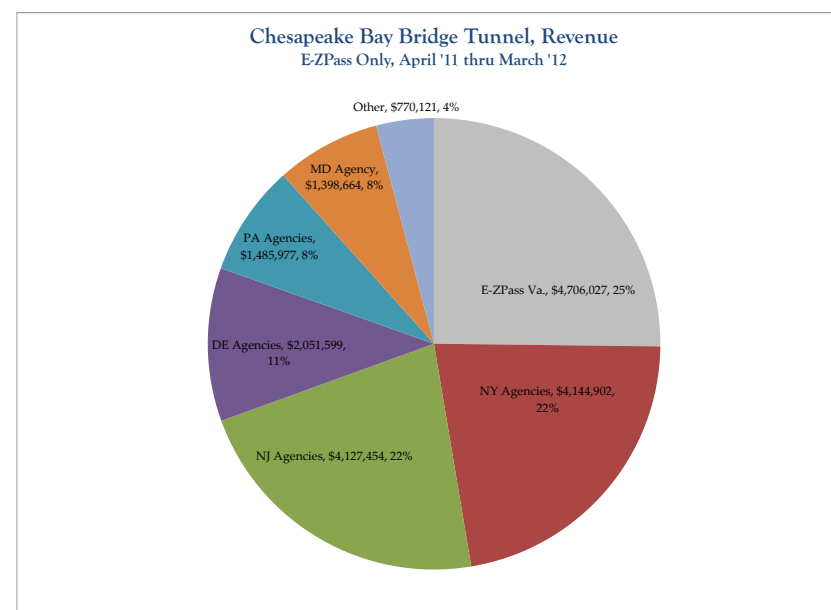
Consolidating the data by the state³ of the agency results in the following re-tabulation of the \$18,684,743 in revenue:

State	Revenue
E-ZPass Va.	\$4,706,027
NY Agencies	\$4,144,902
NJ Agencies	\$4,127,454
DE Agencies	\$2,051,599
PA Agencies	\$1,485,977
MD Agency	\$1,398,664
MA Agency	\$296,736
IL Agency	\$160,365
NH Agency	\$93,994
WV Agency	\$80,487
ME Agency	\$60,545
RI Agency	\$57,407
OH Agency	\$9,432
ON Agency	\$5,721
IN Agency	\$5,434
	\$18,684,743

CBBT \$ by State of Agency, E-ZPass Only, April '11 thru March '12

Source: HRTPO analysis of VDOT data

³ For the purpose of this analysis, the revenue from agencies associated with two states (e.g. the Port Authority of New York & New Jersey) was split evenly between those two states. Note also—as discussed above—that persons living outside the state of a given agency may have an account with that agency. For example, 28,008 trips, or 7% of the total 382,974 trips in the E-ZPass Virginia database of CBBT trips used for this report are associated with accounts with addresses in states other than Virginia.



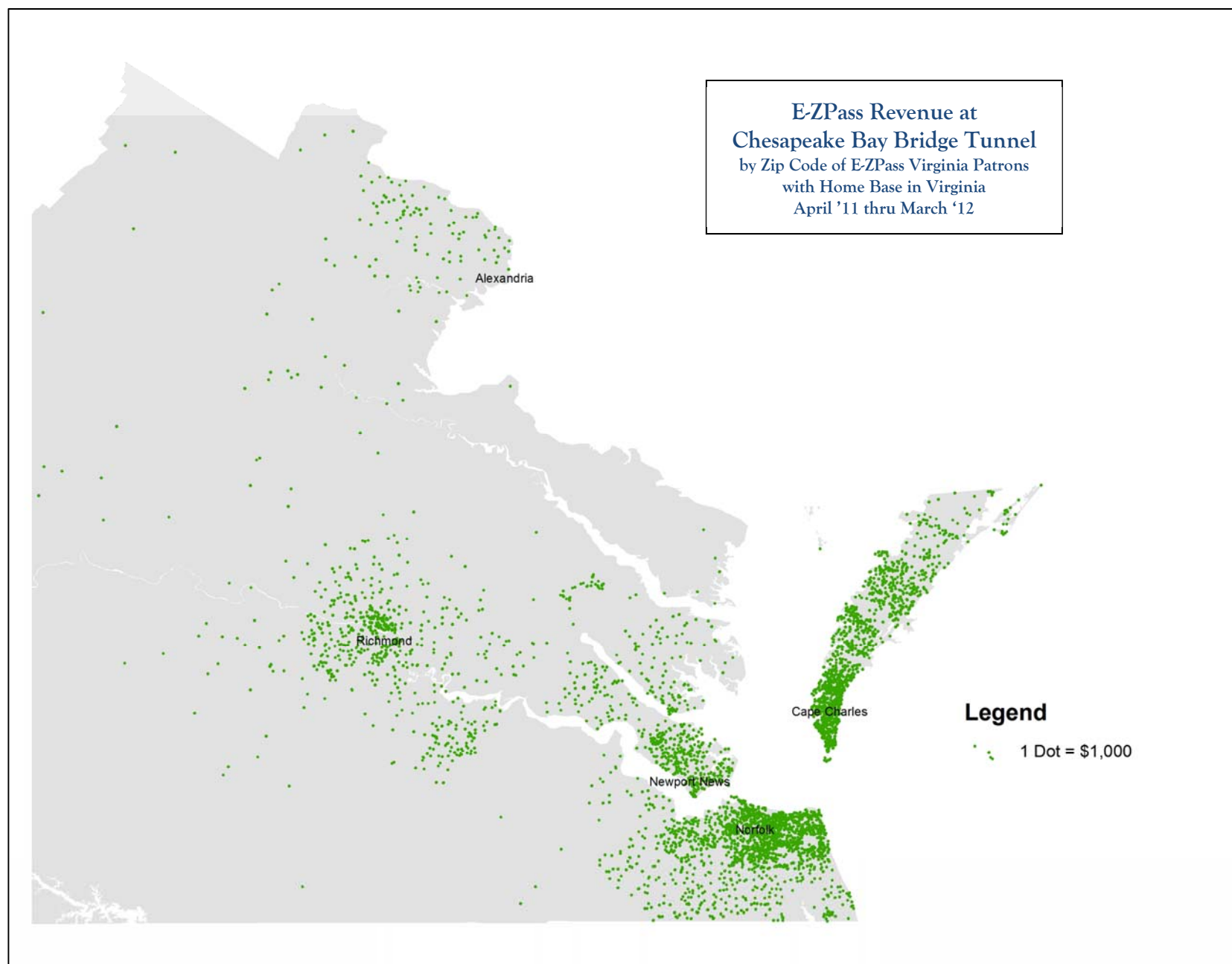
The maps on the following pages geographically display this data, with one dot for each \$1,000 spent at the CBBT.

On the first map (showing Virginia), dots representing CBBT revenue from E-ZPass Virginia patrons with Virginia addresses have been placed at the home base (by zip code) of these patrons.

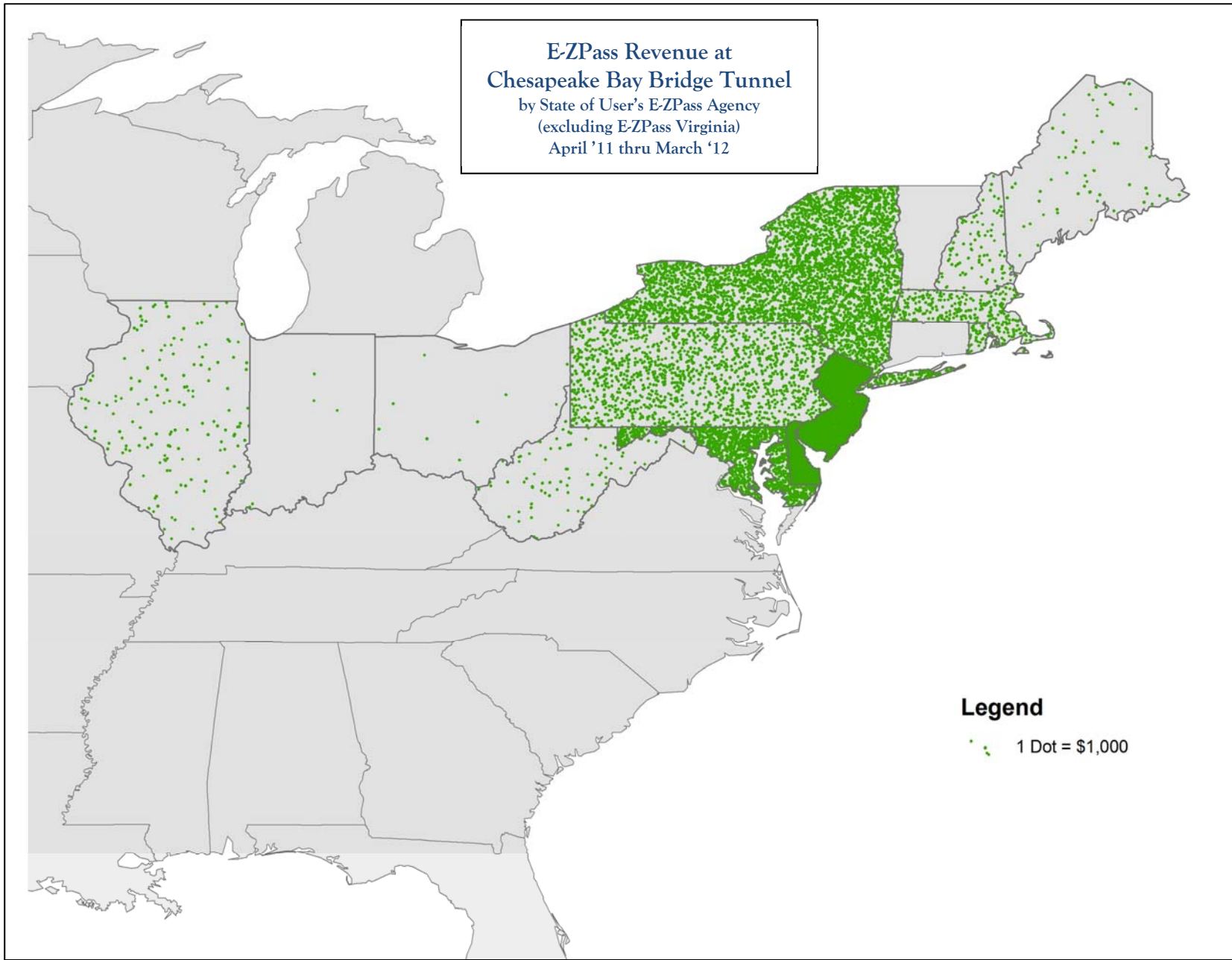
On the second map (showing the other 13 E-ZPass states), dots representing CBBT revenue from patrons of other E-ZPass agencies have been placed in the state of that agency (and randomly distributed around that state).⁴

The third map is a composite of the first two maps.

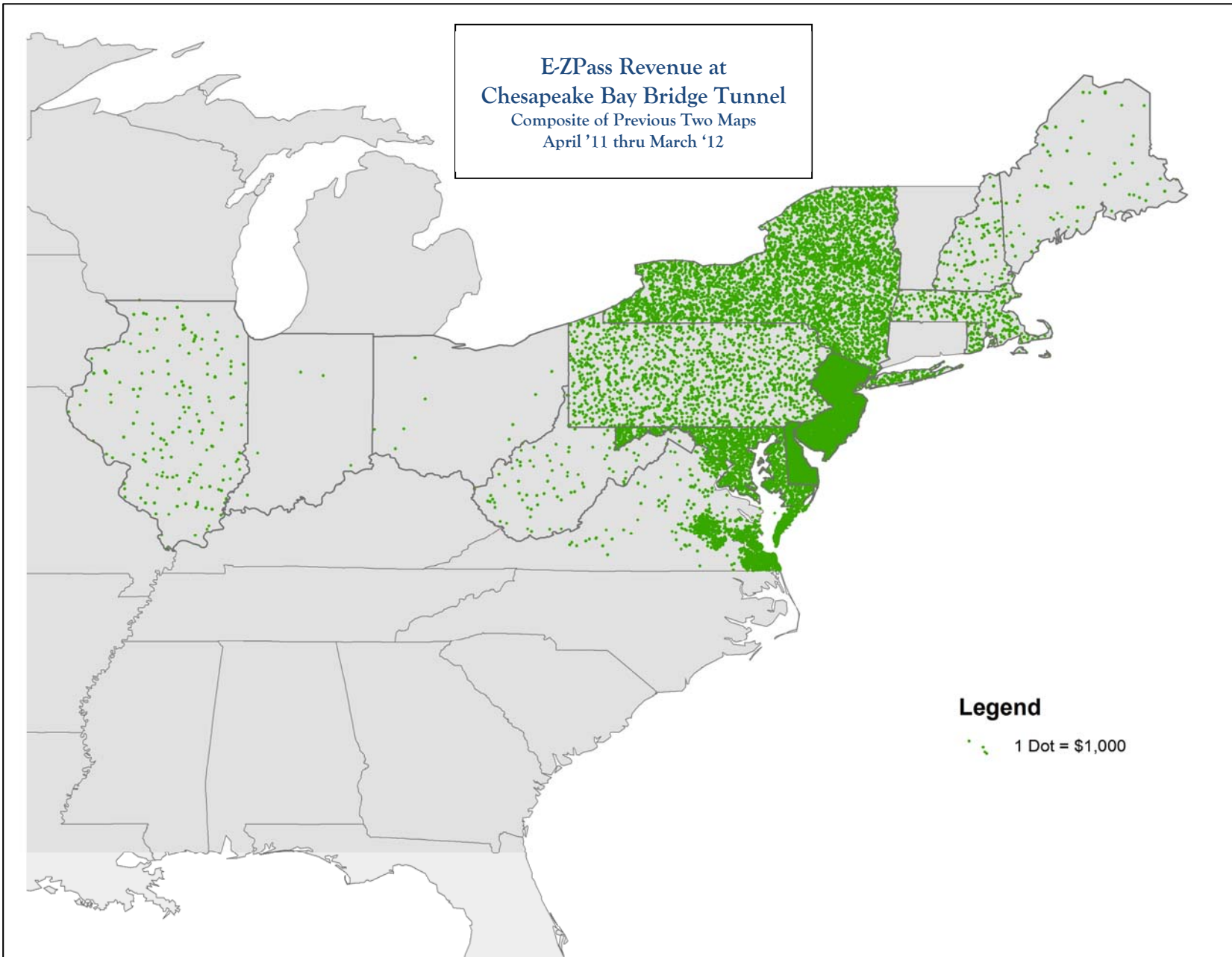
⁴ The small amount of revenue associated with the province of Ontario was not plotted.



Data Source: HRTPO analysis of VDOT data; Map Source: HRPTO using ESRI



Data Source: HRTPO analysis of VDOT data; Map Source: HRPTO using ESRI



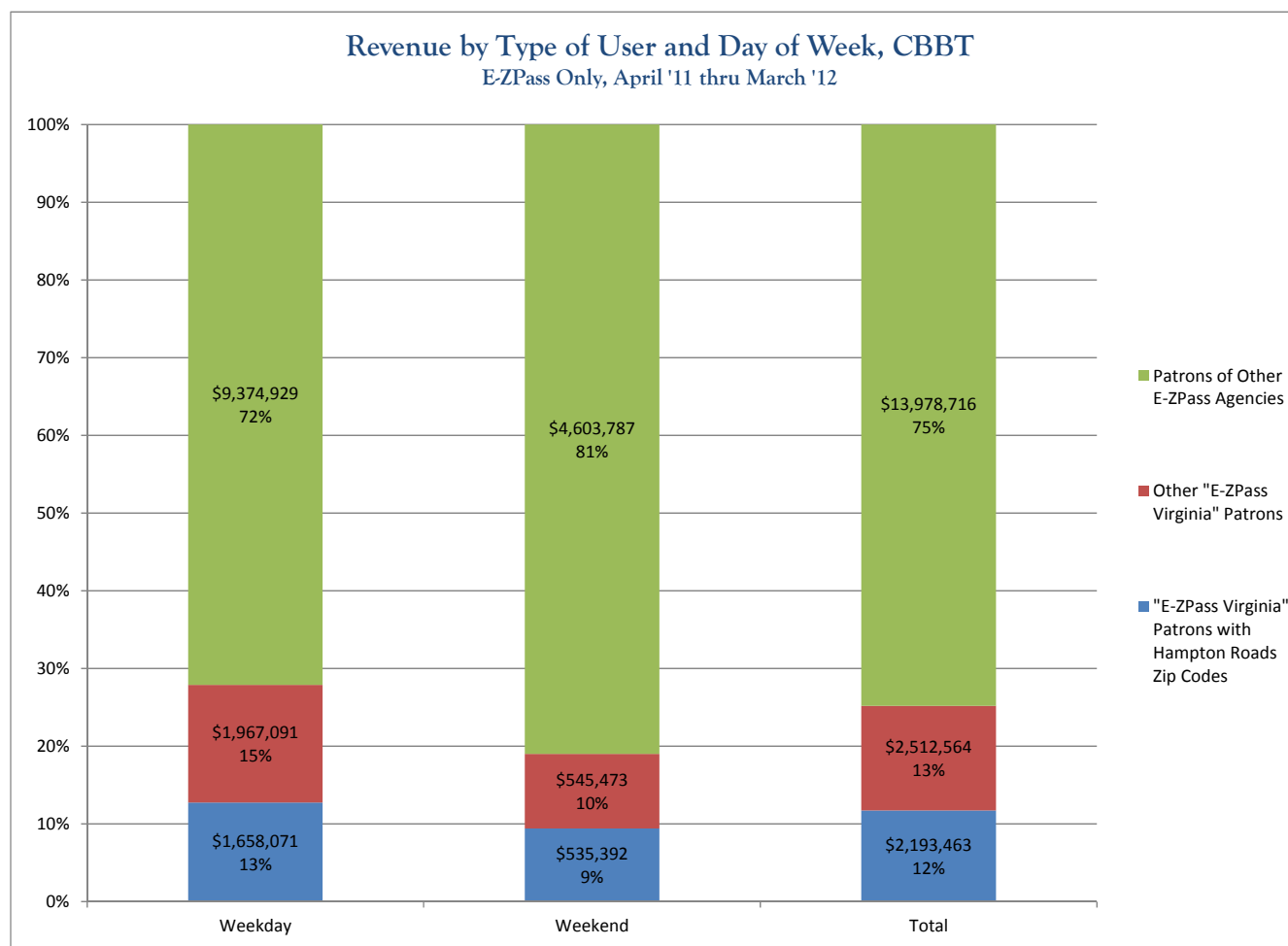
Data Source: HRTPO analysis of VDOT data; Map Source: HRPTO using ESRI

In this section, the trips and tolls of Hampton Roads customers are examined by various categories. Find data by day of week below.

	Weekday	Weekend	Total
"E-ZPass Virginia" Patrons with Hampton Roads Zip Codes	\$1,658,071	\$535,392	\$2,193,463
Other "E-ZPass Virginia" Patrons	\$1,967,091	\$545,473	\$2,512,564
Patrons of Other E-ZPass Agencies	\$9,374,929	\$4,603,787	\$13,978,716
	\$13,000,091	\$5,684,652	\$18,684,743

Revenue by Type of User and Day of Week, CBBT, E-ZPass Only, April '11 thru March '12

Source: HRTPO analysis of VDOT data



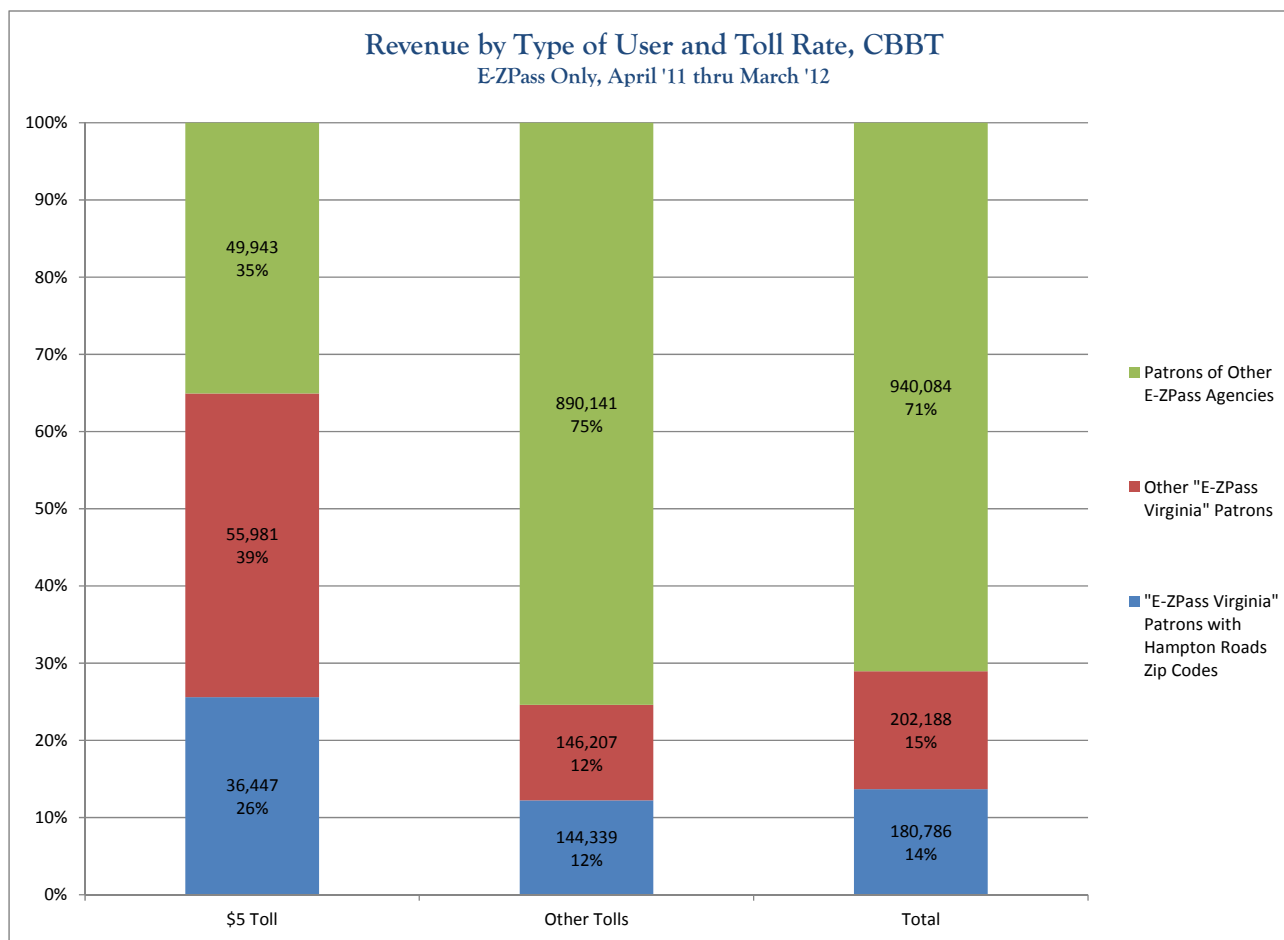
Note that the portion of total revenue from persons based in Hampton Roads does not vary significantly between weekdays and weekends.

Drivers of small vehicles (auto, pickups, motorcycles, etc.) who cross the CBBT and return within 24 hours pay \$12 to cross and \$5 to return. Find data by toll rate below.

	\$5 Toll	Other Tolls	Total
"E-ZPass Virginia" Patrons with Hampton Roads Zip Codes	36,447	144,339	180,786
Other "E-ZPass Virginia" Patrons	55,981	146,207	202,188
Patrons of Other E-ZPass Agencies	49,943	890,141	940,084
	142,371	1,180,687	1,323,058

Revenue by Type of User and Toll Rate, CBBT, E-ZPass Only, April '11 thru March '12

Source: HRTPO analysis of VDOT data



Note that—although users from Hampton Roads make only 14% of the total trips—users from Hampton Roads make 26% of the \$5 trips.

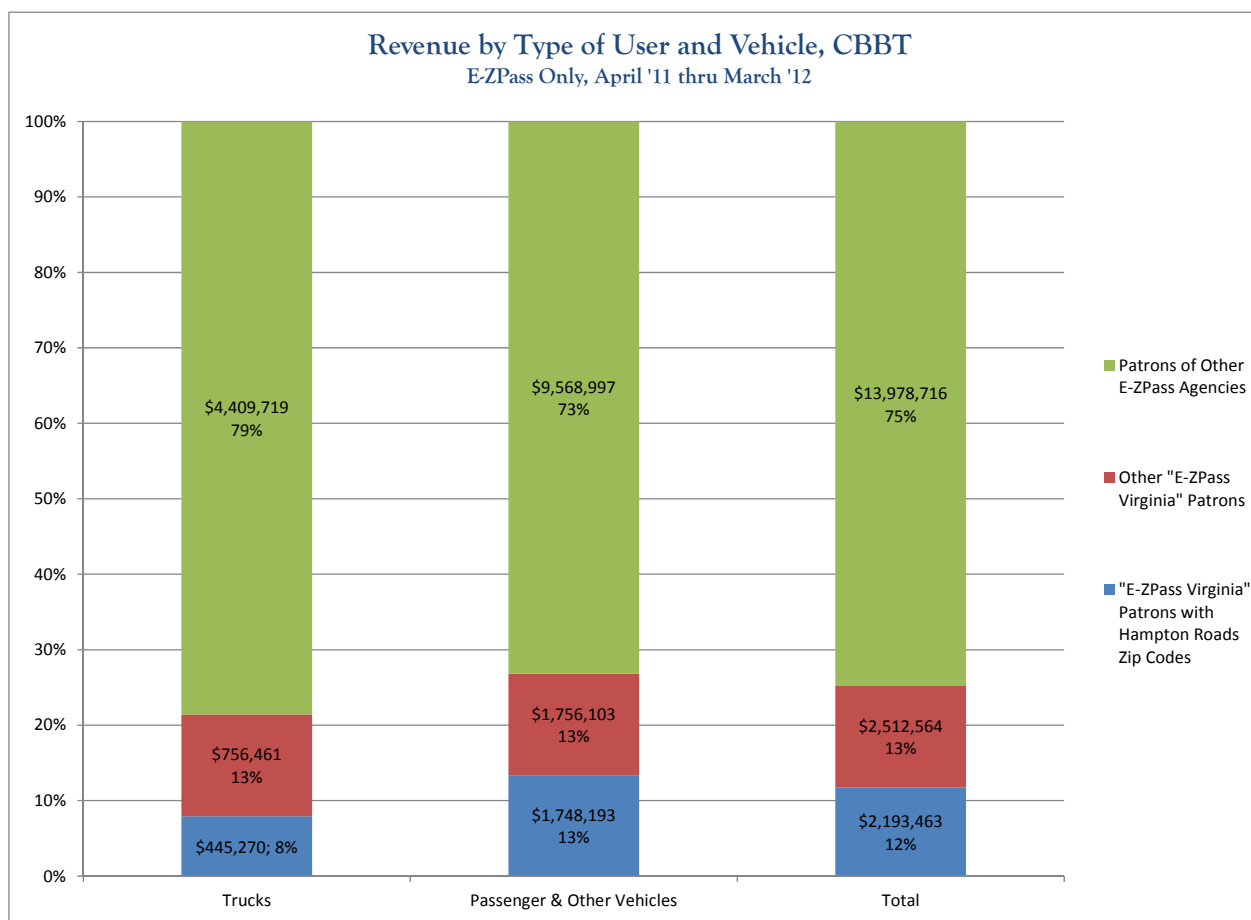
Note also that E-ZPass Virginia patrons from the Eastern Shore—that area not being part of the HRTPO—are included in the red portion of the chart.

Data comparing trucks to other vehicles can be found below.

	Passenger & Other		Total
	Trucks	Vehicles	
"E-ZPass Virginia" Patrons with Hampton Roads Zip Codes	\$445,270	\$1,748,193	\$2,193,463
Other "E-ZPass Virginia" Patrons	\$756,461	\$1,756,103	\$2,512,564
Patrons of Other E-ZPass Agencies	\$4,409,719	\$9,568,997	\$13,978,716
	\$5,611,450	\$13,073,293	\$18,684,743

Revenue by Type of User and Vehicle, CBBT, E-ZPass Only, April '11 thru March '12

Source: HRTPO analysis of VDOT data



Note that users from Hampton Roads pay only 8% of the truck tolls, whereas they pay 13% of the other tolls.

CONCLUSIONS

The above data reveals that the existing toll facilities in Hampton Roads vary greatly according to the portion of their E-ZPass revenues which come from persons based in Hampton Roads. On one hand, the CBBT and Chesapeake Expressway receive a small portion of E-ZPass revenue from persons based in Hampton Roads (12% and 15%, respectively). On the other hand, the Coleman Bridge receives the bulk of its E-ZPass revenue from persons based in Hampton Roads (79%).

It appears that the variance between a) the CBBT and the Chesapeake Expressway, and b) the Coleman Bridge can be explained in two ways:

1. For the CBBT and Chesapeake Expressway, E-ZPass users who are based in Hampton Roads are more likely (than the average E-ZPass user) to pay discounted toll rates. For the Coleman Bridge, discounts are given to all E-ZPass users, regardless of their E-ZPass agency and location of home base.
2. The CBBT and Chesapeake Expressway are used largely by persons based outside of Hampton Roads, whereas the Coleman Bridge is used largely by persons based in Hampton Roads.