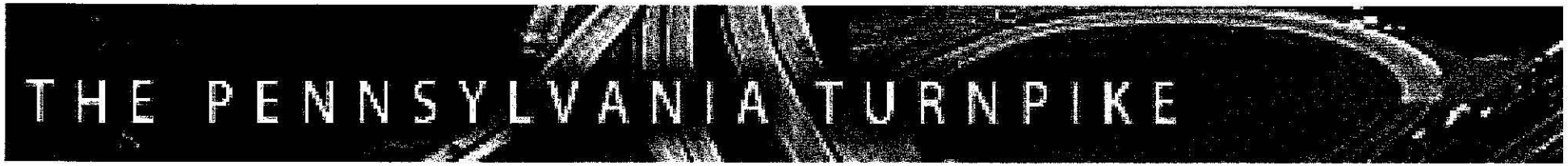


HOUSE TRANSPORTATION COMMITTEE PUBLIC HEARING ON ADVANCEMENTS IN TRANSPORTATION TECHNOLOGY MARCH 2, 2010

PENNSYLVANIA TURNPIKE COMMISSION

Electronic Toll Collection Technology

THE PENNSYLVANIA TURNPIKE COMMISSION – ELECTRONIC TOLL COLLECTION TECHNOLOGY

Purpose:

Offer testimony regarding transportation technology in use on the Pennsylvania Turnpike.

Topics:

- Electronic Toll Collection Technology
  - E-ZPass Program Summary.
  - Where is it implemented.
  - How it works.
  - Future technology applications.

Introductions:

Turnpike Commission Staff.

Bill Capone, Director of Communications and Public Relations

Craig Shuey, Director of Government Relations

Jeff White, Director of the Electronic Toll Collection Systems

Rich DiPiero, Director of Fare Collection

Tom Cohick, Manager of E-ZPass Customer Service Operations

E-ZPass Program Summary

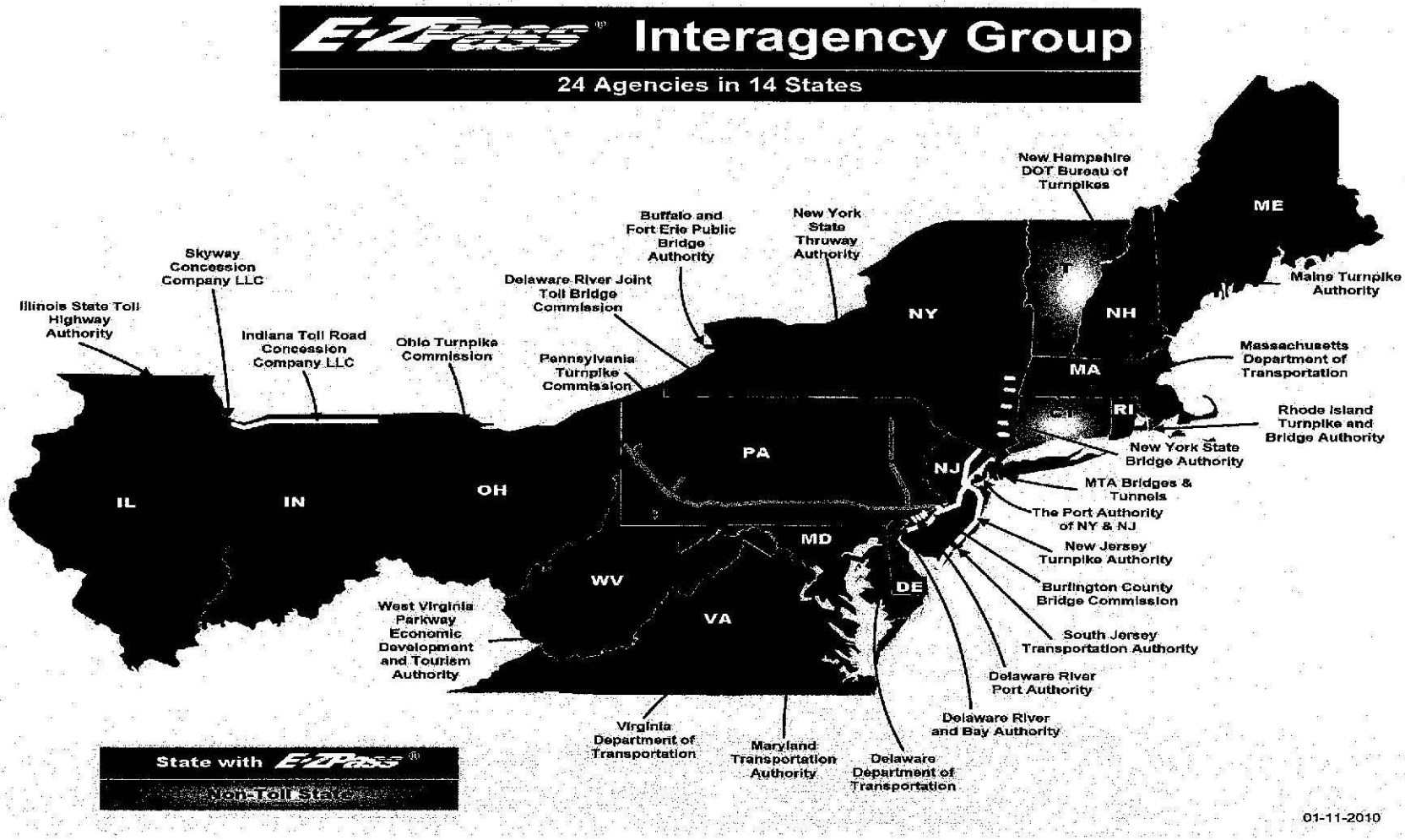
- December 2000 First launch of E-ZPass for passenger vehicles in Southeast Pennsylvania and Lehigh Valley.
- Congested Areas Targeted First
- December 2001, expanded west to Ohio and north to the Wilkes-Barre area.
- December 2002, E-ZPass opens for commercial vehicles.
- **Today, E-ZPass is available on the entire Turnpike system, including the western extensions.**
- Current Statistics
  - 886,000 active PA Turnpike E-ZPass accounts
  - 1,178,368 valid PA Turnpike E-ZPass transponders in use.

E-ZPass Interoperability:

Interagency Group (IAG)

- Mission-Simple, Accurate, Interoperable Electronic Toll Collection.
- 24 Toll Collection agencies.
- Available from Maine To Virginia and Delaware to Illinois.
- Ohio Opened E-Z Pass in the Fall of 2009 linking I-80 Tolls to PTC and Midwest Tolling Agencies.

E-ZPass Technology:



Overview of PA Turnpike:

- **545 miles of roadway**
- **459 toll collection lanes in operation at 62 tolling locations.**
  all lanes on the east-west mainline (I-76 & I-276); the Northeast Extension (I-476); the Greensburg By-pass (PA 66); the Beaver Valley Expressway (PA 60); the Mon-Fayette Expressway (PA 43); and the Southern Beltway (PA 576).

- **458 of 459 total operating lanes are E-ZPass capable.**
  -Ticket System (I-76 & I-276, I-476)
    - **135 Entry Lanes**
    - **47 Lanes are "Dedicated" E-ZPass**
    - **88 Lanes are Operated in "mixed mode" which allows our customers to use either E-ZPass or take a ticket.**
    - **200 Exit Lanes**
    - **83 Lanes are "Dedicated" E-ZPass**
    - **117 Lanes are operated in "cash only".**

Overview of PA Turnpike:

- **Extensions (PA 66, PA 60, PA 43, PA 576)**
  - **124 Exit Lanes**
    - **52 Lanes are "Dedicated" E-ZPass**
    - **72 Lanes are operated in "mixed mode" (E-ZPass or cash).**

- **A Violation Enforcement System (VES) is deployed in all "dedicated" E-ZPass exit lanes and captures license plates images of vehicles not equipped with a valid E-ZPass transponder.**

Overview of PA Turnpike:

• 14 "Express" E-ZPass lanes in which E-ZPass customers travel at the posted highway speed.

•A Violation Enforcement System (VES) in "Express" E-ZPass lanes captures license plates images at highway speeds.

- These locations are:
  - Gateway Interchange (Ohio Line, I-76) – two (2) lanes (eastbound)
  - Warrendale Interchange (I-76) – four (4) lanes
  - Mid-County Interchange (I-476) – four (4) lanes
  - M19 (PA 43) – four (4) lanes

Traffic Counts 2009:

- **In 2009**

  - Processed 105,090,628 E-ZPass transactions which represent 55% of all toll transactions and 61% of all toll revenue.

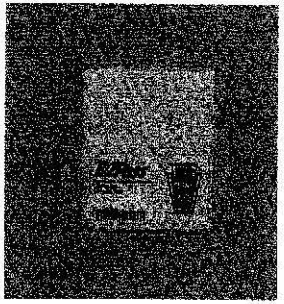
  - PA Turnpike E-ZPass customers accounted for 68% of all E-ZPass transactions while 32% were customers enrolled with other E-ZPass agencies/states.

  - Issued ~650,000 E-ZPass violation notices resulting from ~450,000 individual E-ZPass violations.

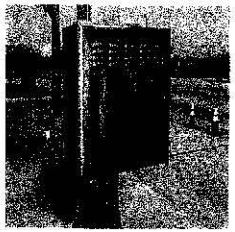
E-ZPass Technology:

Conventional Lane System Overview

Antenna



Transponder

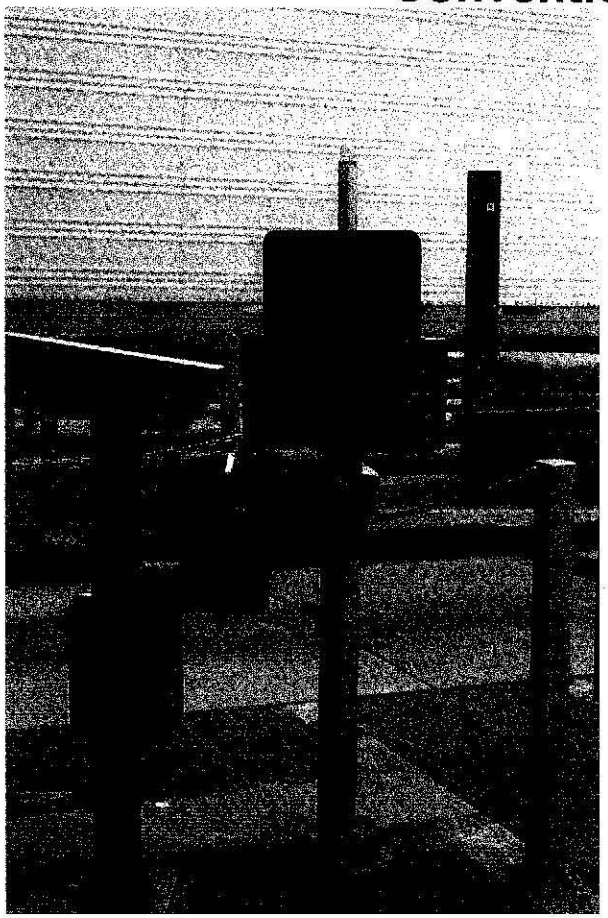


Reader

The three main devices that compose the E-ZPass system are the transponder, the antenna and the reader. These devices interact to complete the toll transaction. The antenna awakens and identifies the transponder. The reader records the toll transaction, including the time, date, and plaza.

E-ZPass Technology:

Conventional Lane System Overview



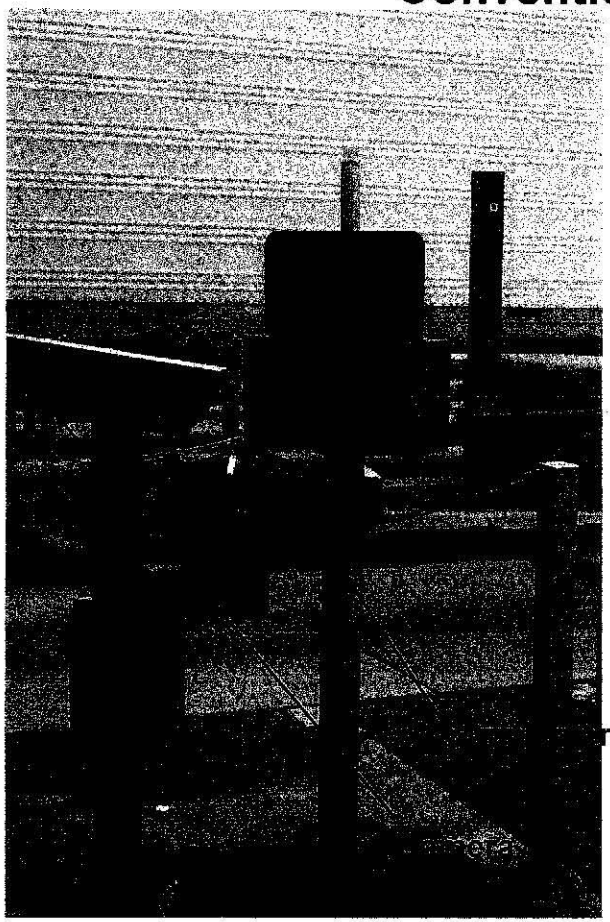
•The Violation Enforcement System (VES) is designed to ensure the collection of tolls from all customers exiting through "dedicated" E-ZPass lanes. When a vehicle exits through a "dedicated" E-ZPass lane without a valid E-ZPass transponder, an image is taken of the vehicle's license plate. This image is used to generate a violation notice.

• From the license plate images, the Commission works through individual state DOTs to obtain the name and address of the registered owner of the vehicle.

• Two (2) separate violation notices are sent at 30 day intervals. If a violator fails to provide payment within 30 days after receiving the second notice, the account is turned over to a collection agency.

E-ZPass Technology:

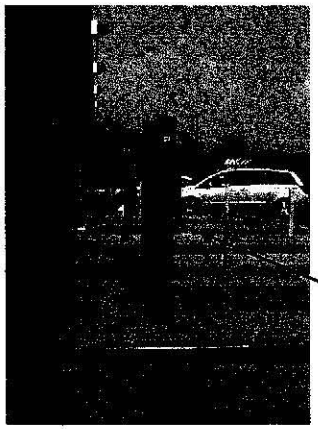
Conventional Lane System Overview



ntal

•The Violation Enforcement System (VES) consists of two cameras, a front camera which takes an image of the license plate on the front of the vehicle, and a rear camera which takes an image of the license plate on the rear of the vehicle.

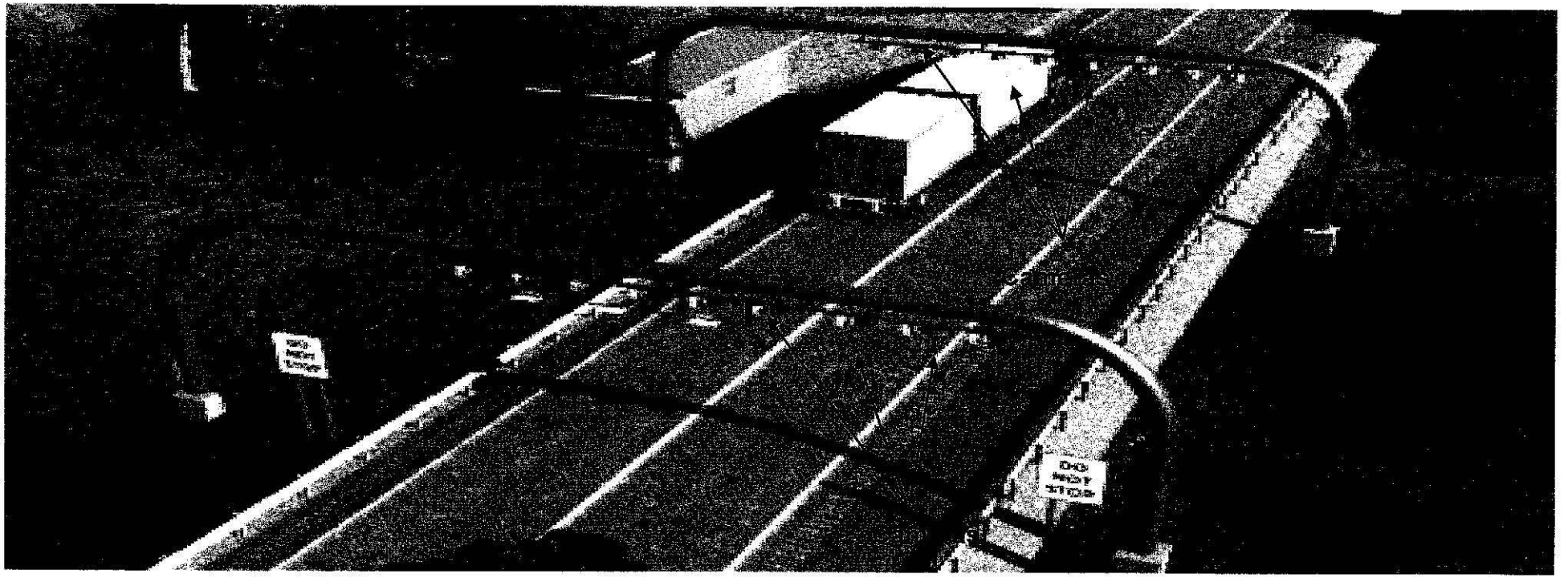
• The VES cameras in a conventional lane (as shown in picture) are placed at the most desirable position to capture all license plates regardless of their location on a vehicle.



Light Curtain

E-ZPass Technology:

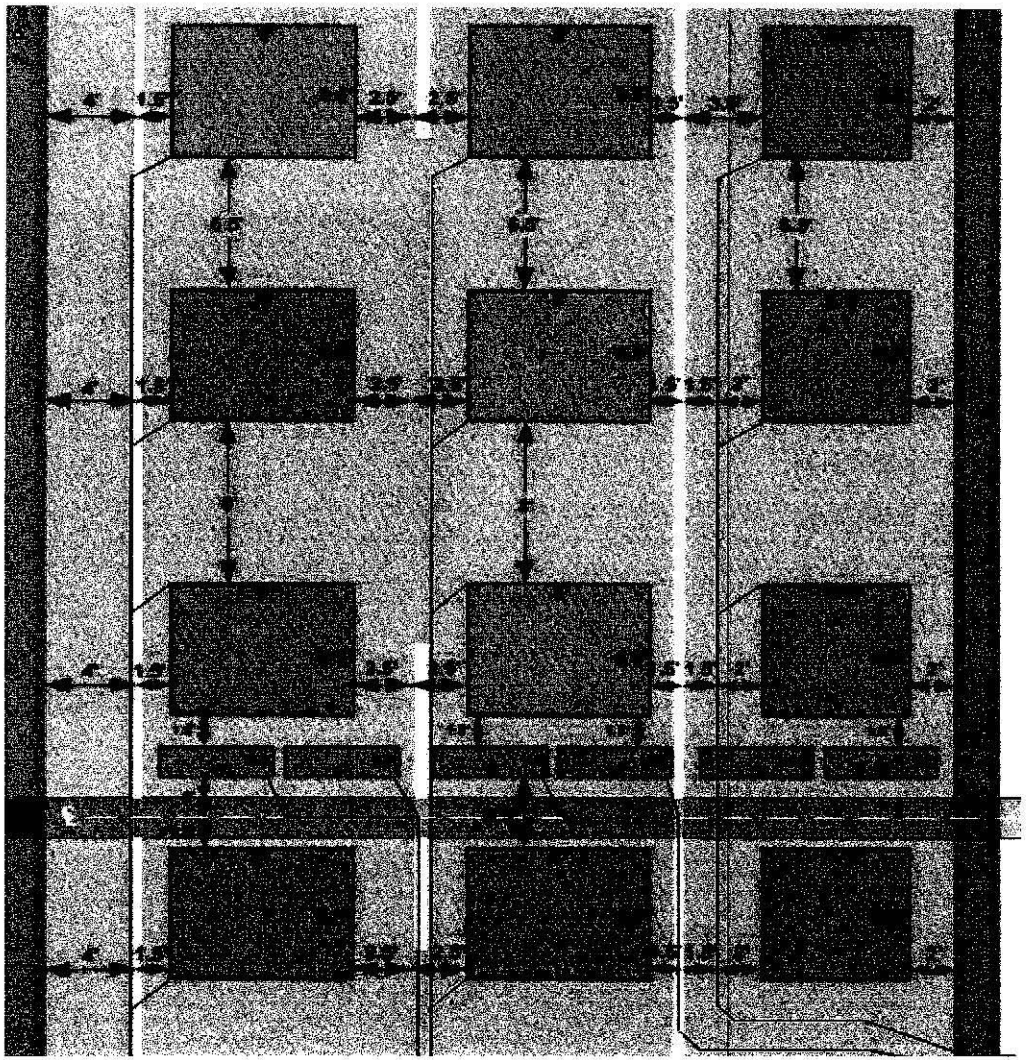
"Express" System Overview



• In the Express "E-ZPass" lanes the front and rear cameras and supplemental lighting are fixed to an overhead the gantry structure across all travel lanes at a height of 19' above the roadway.

E-ZPass Technology:

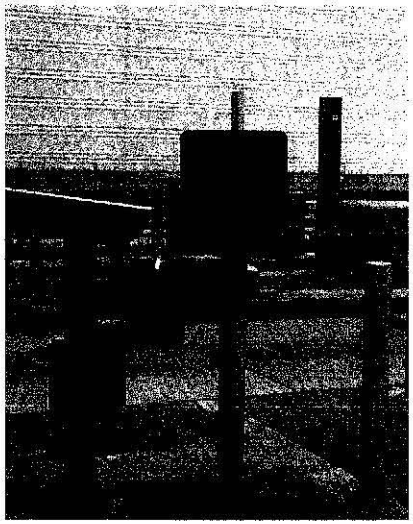
Express System Overview



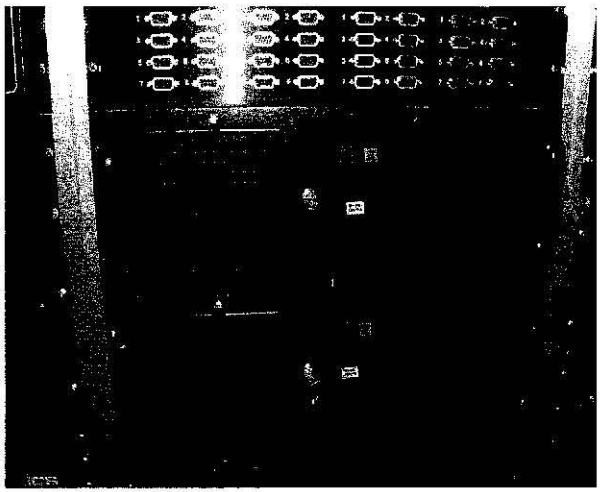
- **The cameras are triggered by loops that are installed in the roadway pavement. Other loops help track the vehicle in the lane and also count the number of axles on the vehicle.**

E-ZPass Technology:

System Overview: Transaction Processing



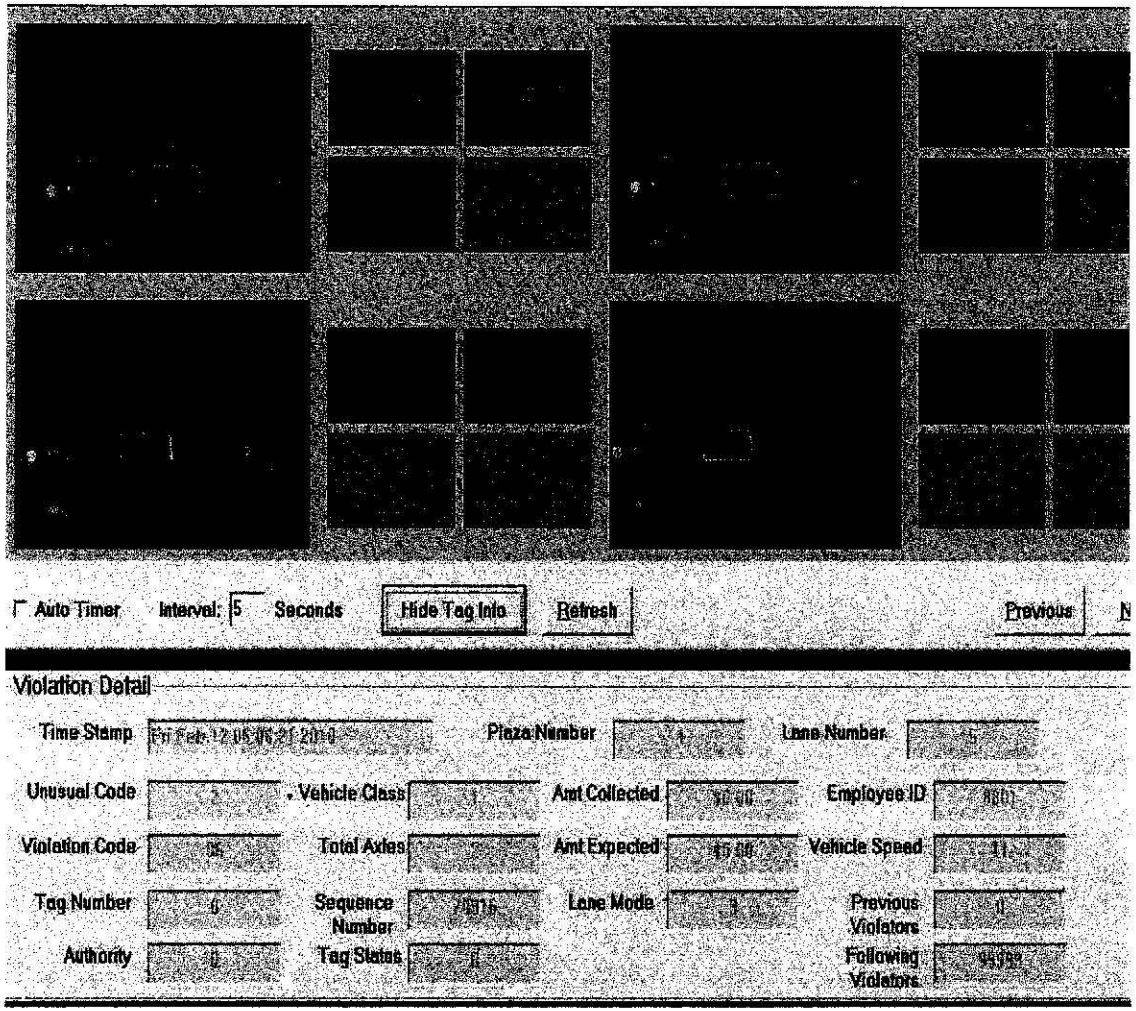
- The cameras in both the conventional and the "Express" E-ZPass lanes are connected to the VES controller. When a violation occurs the license plate images are saved and sent to the Commission's Violations Processing Center (VPC).



Violations Processing Center (VPC)

E-ZPass Technology:

System Overview: Violations Processing Center



- This is an example of the image taken in the lane and sent to the VPC.

- The Violations Processing Center (VPC) processes the images, performs DOT look ups, issues violation notices and processes customer payments.

E-ZPass - Future Applications
E-ZPass Plus

•E-ZPass Plus Program utilizes the E-ZPass system as a payment mechanism for vehicle parking at publicly and privately-owned parking facilities.

•E-ZPass Plus currently available at 6 airports in New York and New Jersey; and at 2 parking garages in Atlantic City, N.J.

•PA Turnpike E-ZPass customers can use their transponders to pay for parking at these facilities.

•PA Turnpike currently in discussions with Philadelphia Parking Authority about the Philadelphia International Airport; and also with some private parking facility operators near the airport.

Electronic Toll Collection - Future Applications
Video Tolling

- Video Tolling utilizes license plate images exclusively to collect tolls electronically, and would be used in combination with E-ZPass, as part of a cashless or all electronic system. The tolling zone is configured like the "Express" E-ZPass lanes previously described. Video tolls would be collected in two ways – via a pre-registered license plate account or by mail for those who are not registered.

- The Commission is planning to convert two (2) toll plazas on the southern-most portion of the Mon-Fayette Expressway in Fayette county to an all electronic system.

- A similar system is planned for Interstate 80 should it be converted to a toll highway.

- Future Needs for Effective Toll Collection
  - Additional Enforcement Authority
    - Similar to Philadelphia Parking Authority language allowing DOT to suspend vehicle registrations for toll payment evaders
  - Flexibility-current law for E-ZPass is restrictive as to our collections process
  - Reciprocity for IAG states-regional efforts to enact cooperative agreements on interstate collections would reduce loss of PTC revenue

HOUSE TRANSPORTATION

COMMITTEE PUBLIC HEARING ON

ADVANCEMENTS IN

TRANSPORTATION TECHNOLOGY

MARCH 2, 2010

PENNSYLVANIA TURNPIKE COMMISSION

ELECTRONIC TOLL COLLECTION TCHNOLOGY

(slide #2) Purpose: Offer testimony regarding transportation technology in use on the Pennsylvania Turnpike.

- Topics:
  - Electronic Toll Collection Technology
    - E-ZPass Program Summary.
    - Where is it implemented.
    - How it works.
    - Future technology applications.

(slide #3) Introductions: Turnpike Commission staff.

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- Craig Shuey, Director of Government Relations
- Jeff White, Director of Electronic Toll Collection Systems
- Rich DiPiero, Director of Fare Collection
- Tom Cohick, Manager of E-ZPass Customer Service Operations

(slide #4) E-ZPass Program Summary

- December 2000 First launch of E-ZPass for passenger vehicles in Southeast Pennsylvania and Lehigh Valley.
- Congested Areas Target First.
- December 2001, expanded west to Ohio and north to the Wilkes-Barre area.
- December 2002, E-ZPass opens for commercial vehicles.
- Today, E-ZPass is available on the entire Turnpike system, including the western extensions.
- Current statistics:
  - 886,000 active PA Turnpike E-ZPass accounts
  - 1,178,368 valid {A Turnpike E-ZPass transponders in use.

(slide #5) E-ZPass Interoperability:

- Interagency group (IAG)
  - Mission-Simple, Accurate, Interoperable Electronic toll collection.
  - 24 Toll Collection agencies.
  - Available from Maine to Virginia and Delaware to Illinois.
  - Ohio Opened E-ZPass in the Fall of 2009 linking I-80 Tolls to PTC and Midwest Tolling agencies.

(slide #6) E-ZPass Technology:

- Interagency Group Map

(slide #7) Overview of PA Turnpike:

- 545 miles of roadway
- 459 toll collection lanes in operation at 62 tolling locations.
  - all the lanes on the east-west mainline (I-76 & I-276); the Northeast Extension (I-476); the Greensburg By-pass (PA-66); the Beaver Valley Expressway (PA 60); the Mon-Fayette Expressway (PA-43); the Southern Beltway (PA 576).
- 458 of 459 total operating lanes all E-ZPass capable.
  - Ticket system (I-76 & I-276, I-476)
    - 135 Entry Lanes
    - 47 lanes are "Dedicated" E-ZPass
    - 88 lanes are operated in "mixed-mode" which allows our customers to use either E-ZPass or take a ticket.
    - 200 Exit Lanes
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    - 117 Lanes are operated in "cash only".

(slide #8) Overview of PA Turnpike:

- Extensions (PA 66, PA 60, PA 43, PA 576)
  - 124 Exit Lanes
    - 52 lanes are "Dedicated" E-ZPass
    - 72 lanes are operated in a "mixed-mode" (E-ZPass or cash).
- A Violation Enforcement System (VES) is deployed in all "dedicated" E-ZPass exit lanes and captures license plates images of vehicles not equipped with a valid E-ZPass transponder.

(slide #9) Overview of PA Turnpike:

- 14 "Express" E-ZPass lanes in which our customers travel at the posted highway speed.
- A Violation Enforcement System (VES) in "Express" lanes captures license plates images at highway speeds.
  - These locations are:
    - Gateway Interchange (Ohio line, I-76) - two (2) lanes (eastbound)
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(slide #10) Traffic counts 2009:

In 2009

- Processed 105,090,628 E-ZPass transactions which represent 55% of all toll transactions and 61% of all toll revenue.
- PA Turnpike E-ZPass customers accounted for 68% of all E-ZPass transactions while 32% were customers enrolled with other E-ZPass agencies/states.
- Issued ~650,000 E-ZPass violation notices resulting from ~450,000 individual E-ZPass violations.

(slide #11) E-ZPass Technology:
Convention Lane System Overview

- The three main devices that compose the E-ZPass system are the transponder, the antenna and the reader. These devices interact to complete the toll transaction. The antenna awakens and identifies the transponder. The reader records the toll transaction, including the time, date and plaza.

(slide #12) E-ZPass Technology:
Convention Lane System Overview

- The violation enforcement system (VES) is designed to ensure the collection of tolls from all customers exiting though "dedicated" E-ZPass lanes. When a vehicle exits through a "dedicated" E-ZPass lane without a valid E-ZPass transponder, an image is taken of the vehicles license plate. This image is used to generate a violation notice.
- From the license plate images, the Commission works through individual state DOTs to obtain the name and address of the registered owner of the vehicle.
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(slide #13) E-ZPass Technology:
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(slide #14) E-ZPass Technology:
"Express" System Overview

- In the "Express" E-ZPass lanes the front and rear cameras and supplemental lighting are fixed to an overhead gantry structure across all travel lanes at a height of 19' above the roadway.

(slide #15) E-ZPass Technology:
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- The cameras are triggered by loops that are installed in the roadway pavement. Other loops help track the vehicle in the lane and also count the number of axles on the vehicle.

(slide #16) E-ZPass Technology:
System Overview: Transaction Processing

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(slide #17) E-ZPass Technology:
System Overview: Violations Processing Center

- This is an example of the image taken in the lane and sent to the VPC.
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(slide #18) EZ-Pass – Future Applications
EZ-Pass Plus

- E-ZPass Plus Program utilizes the E-ZPass system as a payment mechanism for vehicle parking at publicly and privately-owned parking facilities.
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- PA Turnpike E-ZPass customers can use their transponders to pay for parking at these facilities.
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(slide #20) Future Needs for Effective Toll Collection

- Additional Enforcement Authority
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- Flexibility-current law for E-ZPass is restrictive as to our collections process
- Reciprocity for IAG state-regional efforts to enact cooperative agreements on interstate collections would reduce loss of PTC revenue.