

Electronic Tolling Technology & Implementation

Presentation to Joint Commission on
Technology and Science

Richmond, Virginia
June 29, 2005

TRANSSCORE[®]

WHEREAS, technologies exist that can collect tolls and debit the driver's account without the driver having to stop...

...(JCOTS) be directed to study technologies available for cost-effective toll collection.

WHEREAS, tolls are used to fund road construction and maintenance; and

WHEREAS, employing people to collect tolls may be not be an efficient method of collecting tolls;and

WHEREAS, technologies exist that can collect tolls and debit the driver's account without the driver having to stop; now, therefore, be it

RESOLVED by the House of Delegates, the Senate concurring, That the Joint Commission on Technology and Science (JCOTS) be directed to study technologies available for cost-effective toll collection. JCOTS shall make its findings available to entities studying the Commonwealth's transportation programs and financing.

All agencies of the Commonwealth shall provide assistance to JCOTS for this study, upon request.

JCOTS shall complete its meetings by November 30, 2005, and the chairman shall submit to the Division of Legislative Automated Systems an executive summary of its findings and recommendations no later than the first day of the 2006 Regular Session of the General Assembly. The executive summary shall state whether JCOTS intends to submit to the General Assembly and the Governor a report of its findings and recommendations for publication as a House or Senate document. The executive summary and report shall be submitted as provided in the procedures of the Division of Legislative Automated Systems for the processing of legislative documents and reports and shall be posted on the General Assembly's website.

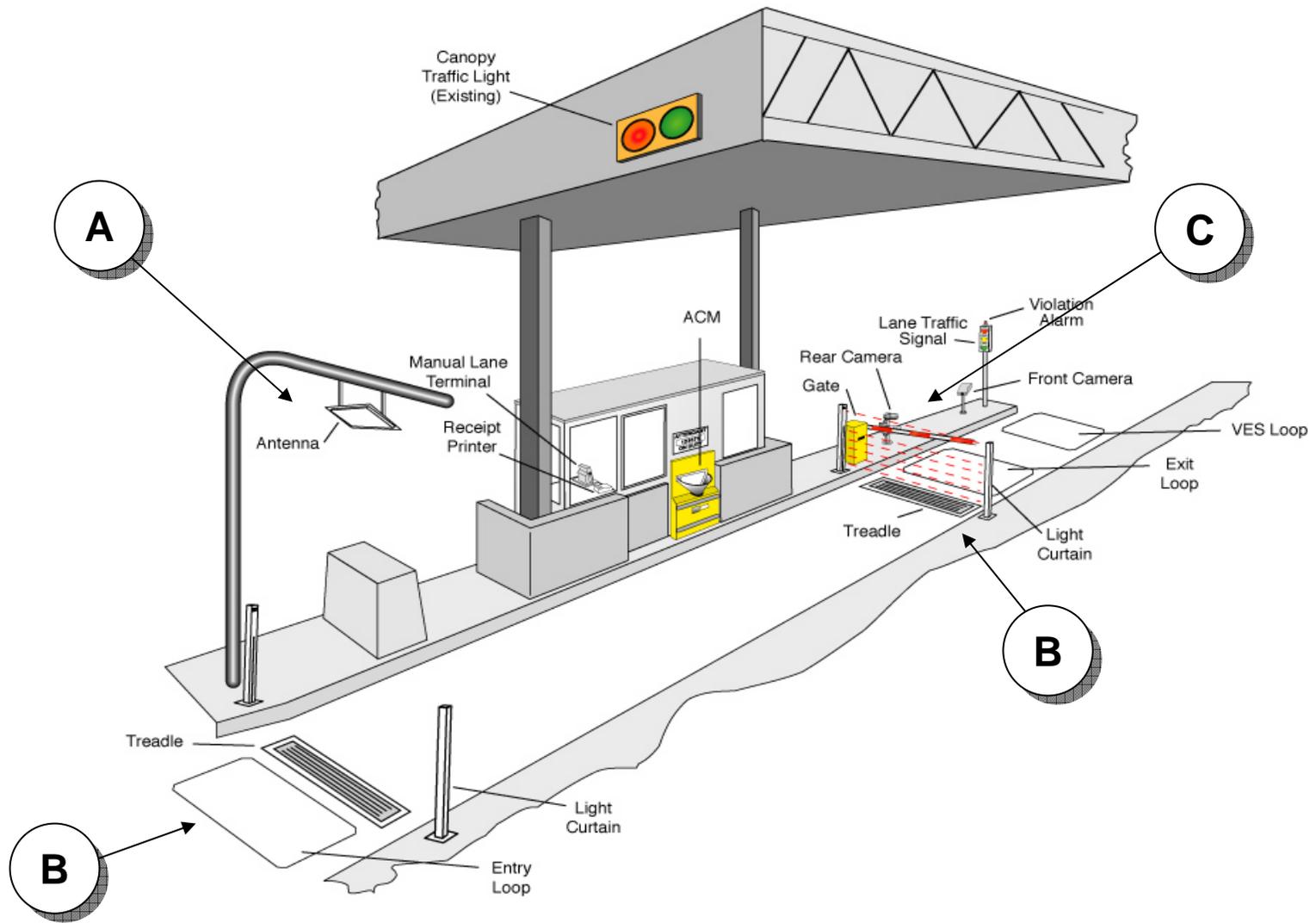
Toll Collection Technologies

- A** Radio-Frequency Identification (RFID)
 - Automated Vehicle Identification (AVI)
 - passive/active, battery/battery-free, single vs. multi-protocol

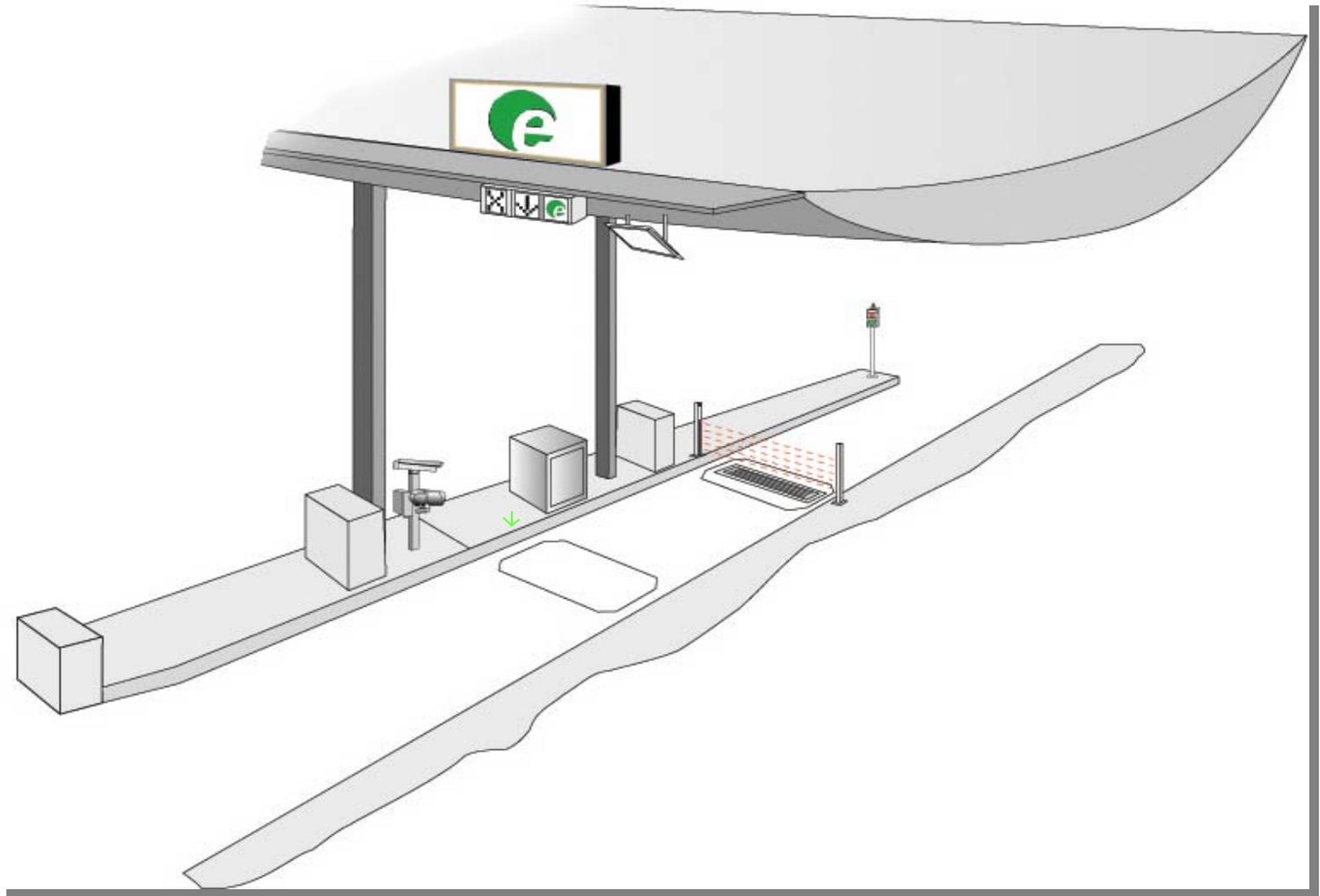
- B** Sensor technologies (light curtains, loops, treadles, lasers)
 - Automated Vehicle Classification (AVC)
 - AVI audit/override function

- C** Advanced optics & image processing (OCR, machine vision, LPR)
 - Violations Enforcement Systems (VES)

Toll Collection Technologies (typical layout)



Simplified Un-Attended Lane Layout



Supporting Backoffice Applications

- Customer service
 - Account management
 - Statement processing
 - Tag distribution
 - Web-based enrollment
- Violation processing
 - Image capture/OCR
 - Citation processing and collection
- Supervisory Control
 - Systems monitors
 - Maintenance alerts
 - Work Order Processing

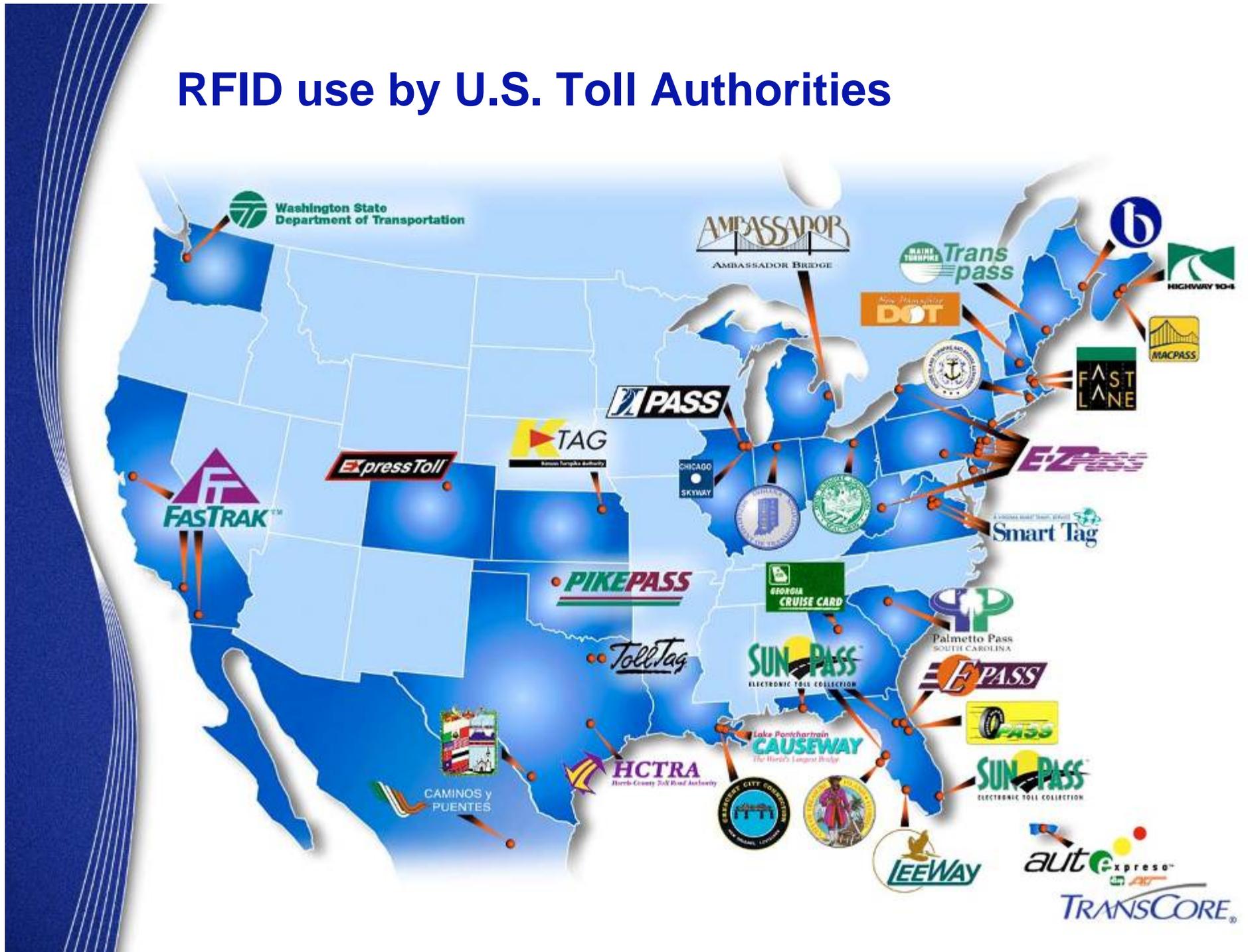


Wireless Technology - RFID

- RFID tag technology
 - TollTag®s
 - Rail tags
 - Fleet tags
 - eGo® sticker tags
- RFID readers and systems
 - Single protocol
 - Dual protocol
 - Multi-protocol



RFID use by U.S. Toll Authorities



RFID Use for Parking and Access Control

- 1.7 million tags and 9,600 readers deployed
- Private and commercial garages
- Preferred, VIP, and frequent parkers
- Electronic payment method
- Gated communities
- Institutional parking:

- Corporations

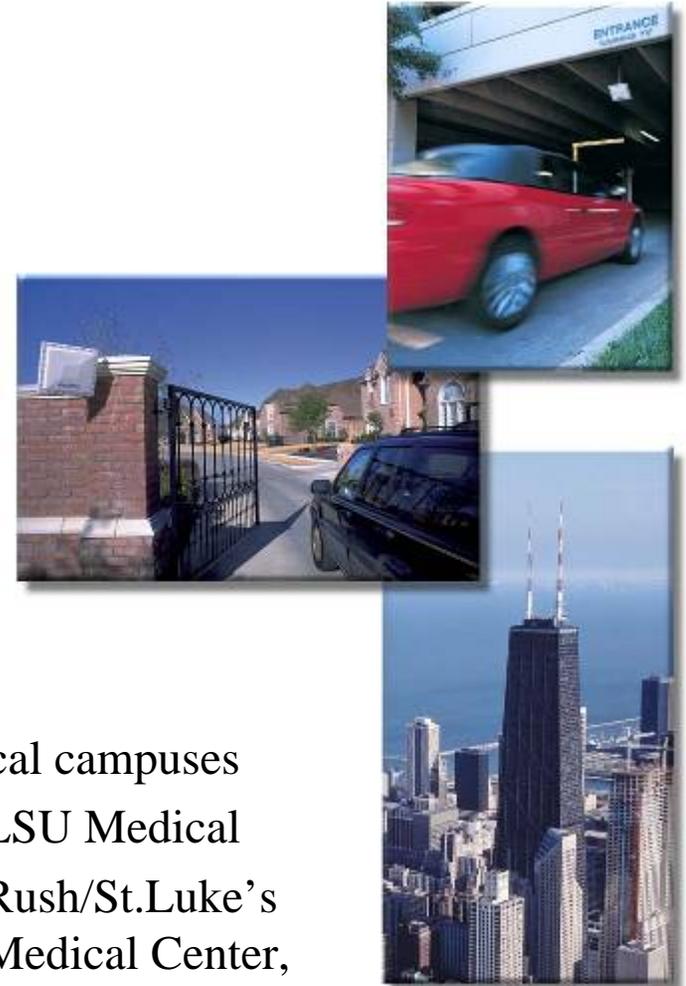
- Mobil Oil
- Sears Tower
- Compaq
- Coca-Cola
- Disney World

- Universities

- USC
- Harvard
- Texas A&M
- Michigan
- MIT

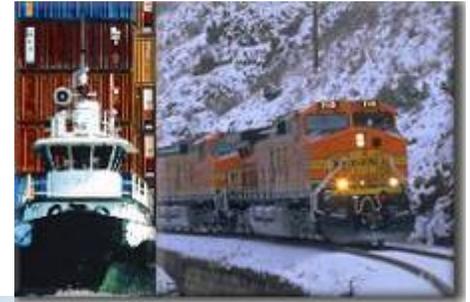
- Medical campuses

- LSU Medical
- Rush/St.Luke's Medical Center, Chicago
- Christ Medical Center, Oak Lawn, IL



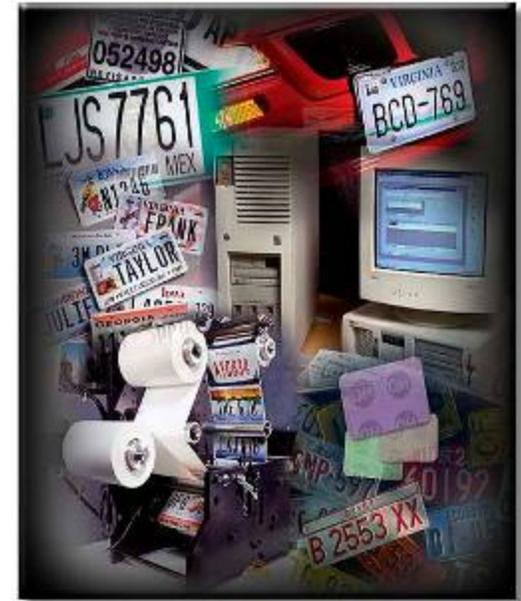
RFID Use for Border Crossings and Freight Tracking

- Secure facilities
 - Ft. Monmouth
 - Ft. McPherson
 - Ft. Belvoir
 - Hanscom Air Force Base
- Secure borders
 - Free and Secure Trade Program (FAST)
 - Secure and Electronic Network for Travelers Rapid Inspection (SENTRI)
 - Otay Mesa SMART Southern Border
- Secure freight
 - Northwest International Trade Corridor and Border Crossing Program (NWITC)
 - “Operation Safe Commerce”

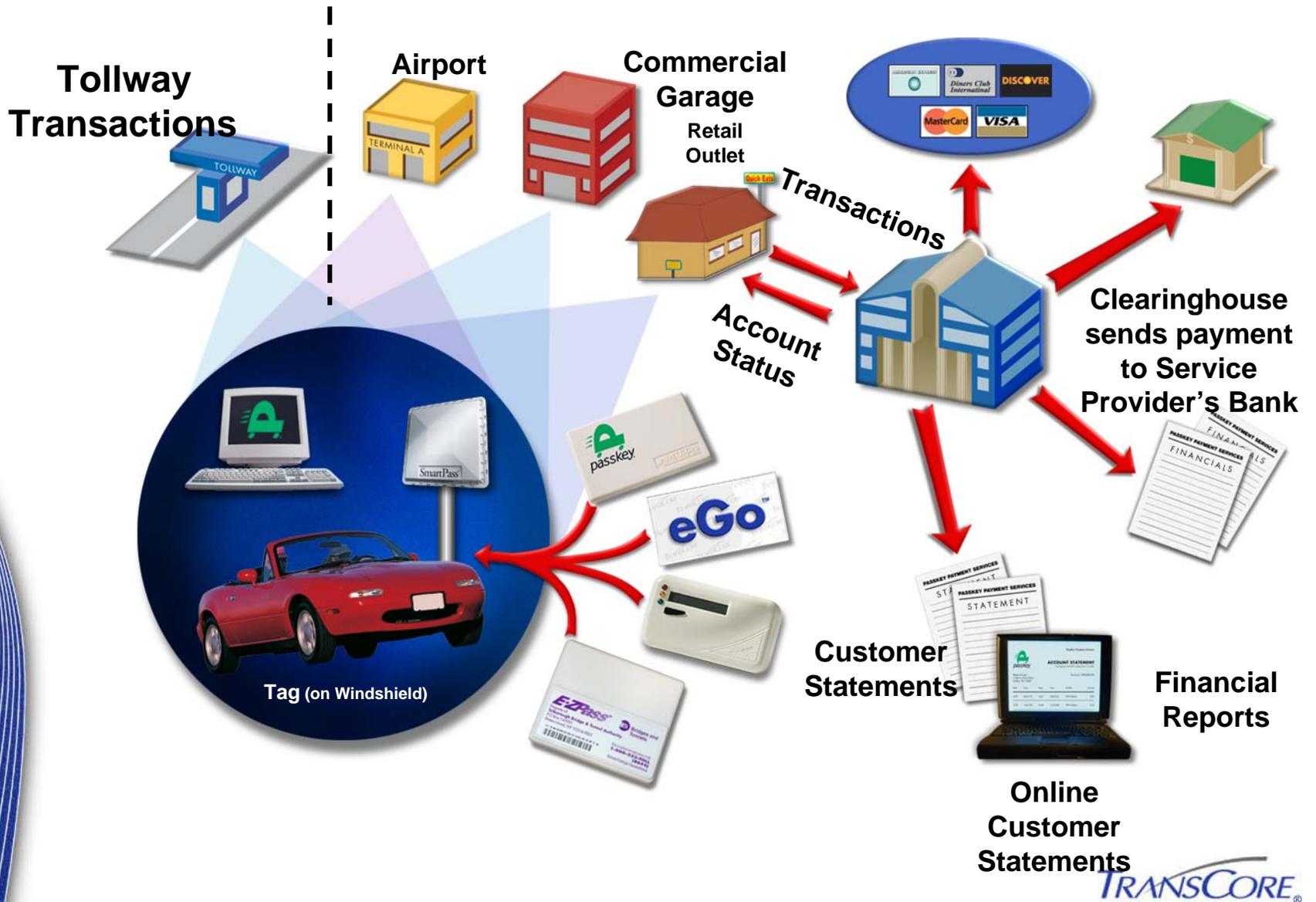


Electronic Vehicle Registration

- Products and services
 - Fixed reader and transportable reader vehicle monitoring using windshield sticker tags
 - Traffic incident reporting, vehicle data capture, and violation processing
 - Vehicle testing and data updating
- Benefits
 - Improved registration integrity and compliance
 - Enhanced agency revenue and cash flow
 - Potential reduction in registration administration and expenses
 - Improved public safety, environment, and use of law enforcement personnel



Regional Payment Systems



Newer RFID Tag - eGo[®] Plus Sticker Tag

- Lower cost
- Adhesive for windshield mount
 - License plate version also available
- Beam powered – no batteries
- High performance addressed triggering
- Tag readable at 100 mph in “ID only” mode
- Memory of 256 bytes (2048 bits) – read/write
- Emulates existing several existing tag formats
- Custom printing, barcode, & optional 4-color printing
- Sequential numbering



eGo Plus Sticker Tag (interior-facing side)

Future Technologies

- Satellite / GPS
- 5.9 GHz



Conclusion

- RFID is core technology for tolling applications in foreseeable future
- Price point & features of tag are becoming attractive for more widespread application