Date: August 15, 2018

To: High Performance Transportation Enterprise Board

From: Nicholas Farber, HPTE Head of Innovative Project Delivery

Subject: National Tolling Interoperability Status

Purpose
The purpose of this memo is to preface a presentation to the HPTE board that summarizes national tolling interoperability.

Action
Informational only – no action requested.

Background
Electronic toll collection (ETC) has been introduced in the United States in 1989 and has since been used by tolling agencies to collect billions of dollars in tolls. Some of these ETC systems talk to one another and recognize one another's customers; others do not. The goal of nationwide ETC interoperability (NIOP) is the establishment of a system in which customers have the choice of opting into and are able to pay tolls on any participating toll facility in the country using a single account. This presentation summarizes the history and status of nationwide tolling interoperability.

Overview of the presentation

1- Tolled infrastructure analytics (type, location, length, operators, toll collection methods)
2- Transponder tolling overview
3- Overview of current tolling protocols around the U.S.
4- History of tolling interoperability (including MAP-21)
5- Status and future of interoperability
6- Regional interoperability and regional hubs (Northeast, Southeast, Central, and Western)
7- Before and after interoperability use case

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NATIONAL TOLL INTEROPERABILITY CURRENT STATUS

August 15th, 2018

Tolled Infrastructure

General Analytics

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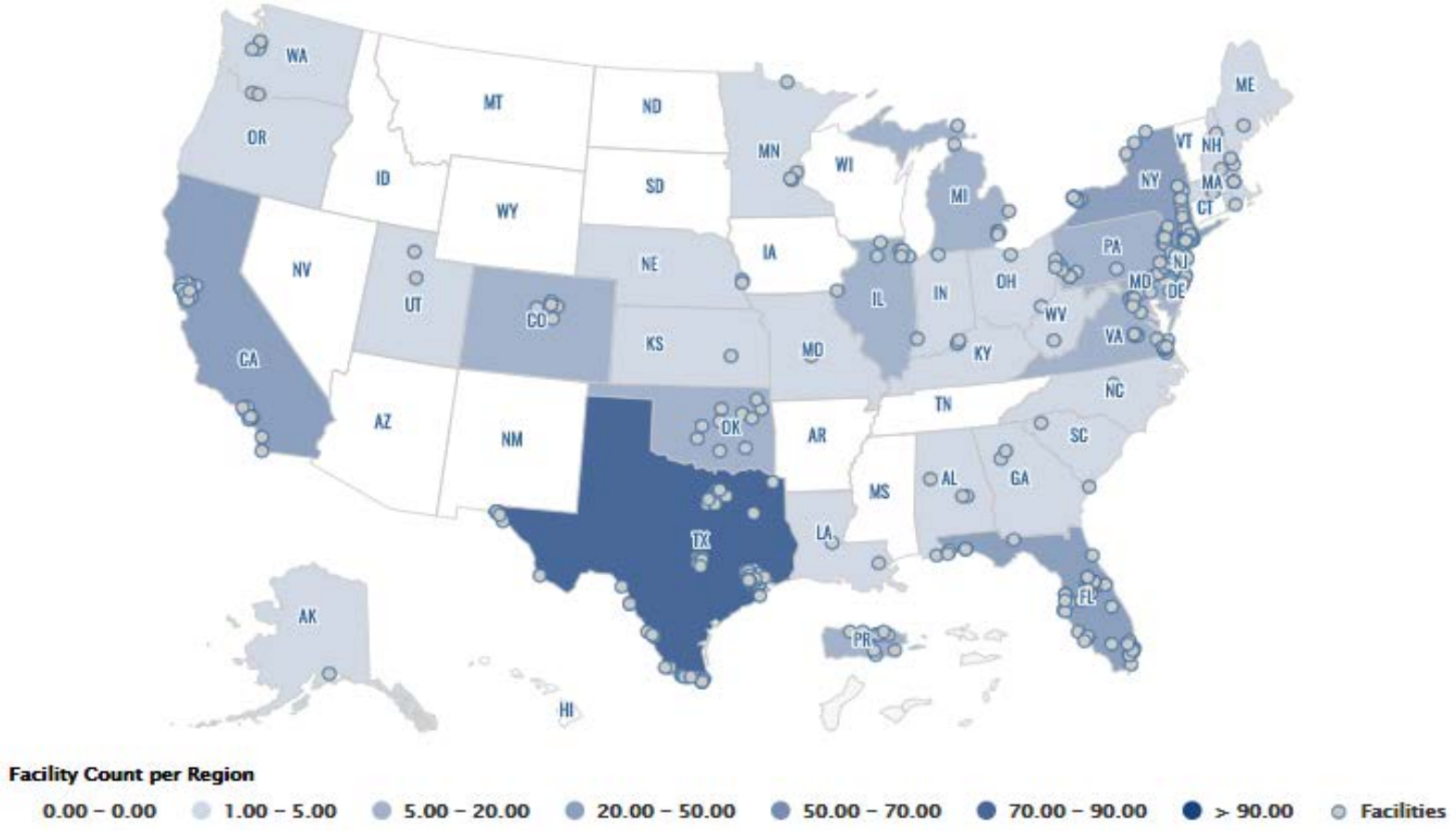
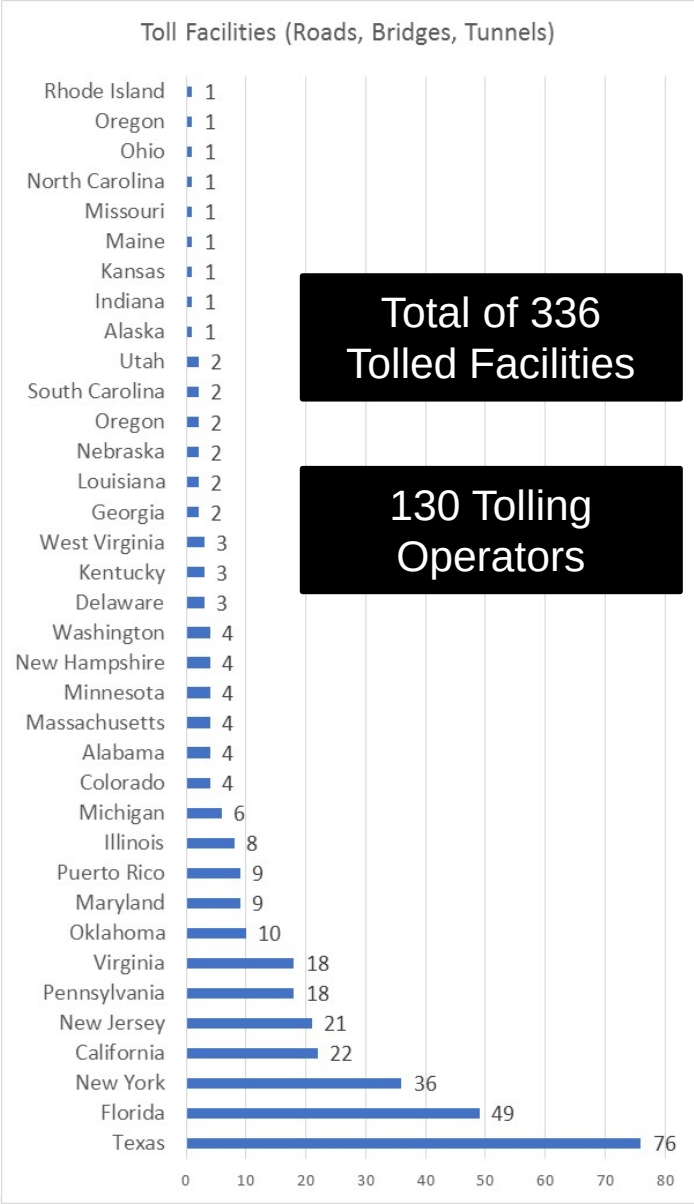
TOLLED FACILITIES AROUND THE U.S.- 35 States



Total of 6,220 Center Lane Miles



Total of 336 Tolled Facilities

130 Tolling Operators

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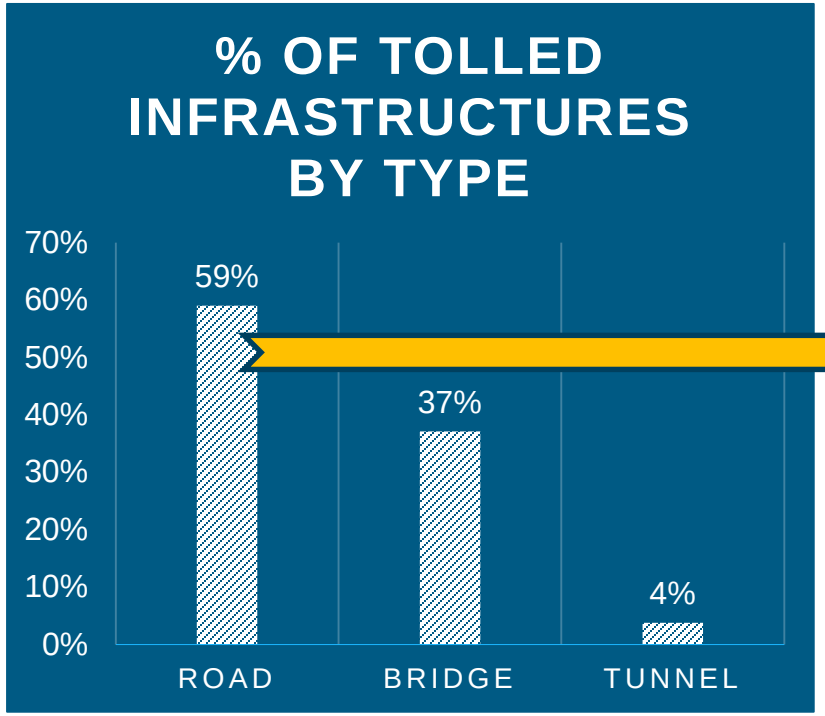
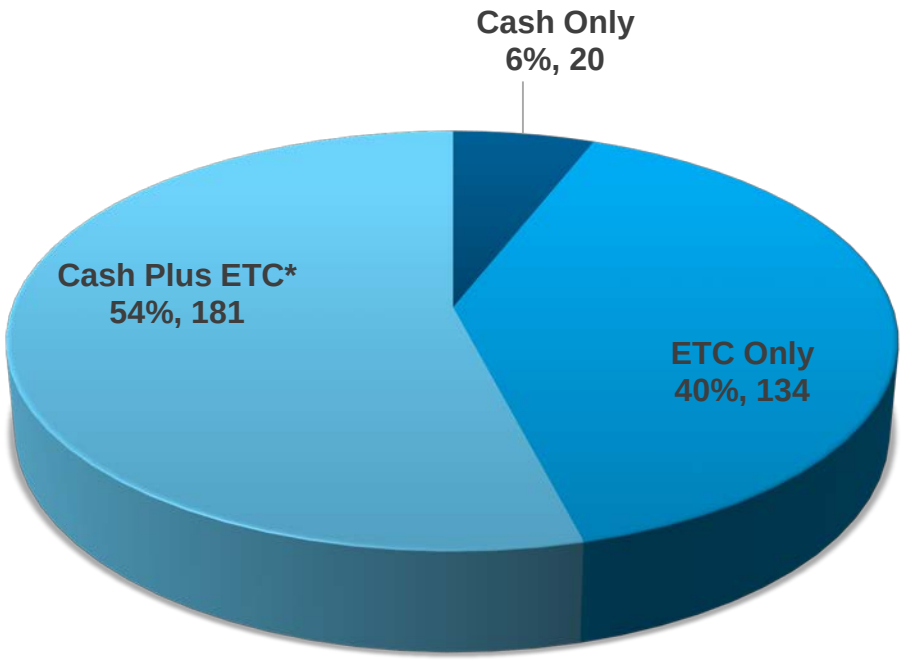
TOLLED INFRASTRUCTURE TYPES AND TOLL COLLECTION METHODS





*Electronic Toll Collection

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Electronic Toll Collection Protocols

An Overview

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TRANSPONDER TOLLING

- U.S. agencies in 35 states operate Electronic Toll Collection (ETC) systems
- ETC generates more than $13 billion in annual toll revenue
- There are more than 45 million transponder toll accounts across the country
- Transponder toll collection:
  - is efficient, accurate, and reliable
  - reduces the amount of human intervention in the process
  - allows for discounts/reduced tolls, i.e. HOV*, CAV** when using “flex” tags

*High Occupancy Vehicle
**Connected Autonomous Vehicles

CURRENT TAGs & TOLL PROTOCOLS IN USE IN THE U.S.

- Toll Protocol is the “language” used by the toll tag to communicate with the toll equipment. It is usually proprietary to the toll tag manufacturer. There are currently **20 major tags and 7 protocols**.

- For Interoperability to succeed, it is critical that agencies can “read” different toll tag protocols or that a single protocol is used across the regions or nation.

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WHAT IS TOLL INTEROPERABILITY?

Allowing customers with <u>valid accounts (transponders)</u> to pay for travel on all participating toll facilities across North America with a single account and choice of payment methods.

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INTEROPERABILITY HISTORY

AND CURRENT STATUS

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HISTORY

1990's – 2000's

- 1993: E-ZPass Interagency Group is established to coordinate an interoperable ETC system across seven agencies in three states (NY, NJ and Pennsylvania). First effort for regional interoperability. Currently, the E-ZPass system includes 24 toll agencies in 14 states.
- 2008: Alliance For Toll Interoperability (ATI) is formed. ATI's purpose is to promote and implement interstate interoperability for the benefit of its customers and member agencies.

2010-2013

- Fall 2010: International Bridge, Tunnel and Turnpike Association (IBTTA) Interoperability Committee is formed.
- July 2012: The Law under MAP-21 was enacted.

> *Section 1512(b) Electronic Toll Collection Interoperability Requirements -- Not later than 4 years after the date of enactment of this Act, all toll facilities on the Federal-aid highways shall implement technologies or business practices that provide for the interoperability of electronic toll collection programs.*

The MAP 21 deadline passed. However, the law did not include a penalty for being late hence the MAP 21 law is not enforceable.

HISTORY (CONTINUED)

2010-2013 – continued

- Fall 2012: National Interoperability Coordinating Group, whose members include IBTTA, ATI, E-ZPass and OmniAir, is formed
- December 2012: Florida and North Carolina reach an agreement for Toll Interoperability
- July 2013: An agreement for Interoperability between Florida, Georgia and North Carolina is reached
- OmniAir certifies the 6C protocol for tolling tag and reader interoperability

2014-2017

- 2014: IBTTA National Toll Protocol Requirements document is created
- August 2014: Oklahoma and Texas announce interoperability
- 2015: Regional Interoperability “Hubs” are created. SE HUB, Central U.S. HUB, E-ZPass and California FasTrak
- September 2015: U.S. Congress hearing on toll interoperability development
- September 2016: IBTTA and the Federal Highway Administration sign agreement for National Interoperability testing
- October 2017: IBTTA tests national protocols - 6C, SEGO, TDMA
- 2017: Central U.S. HUB and Southeast U.S. HUB integration agreement

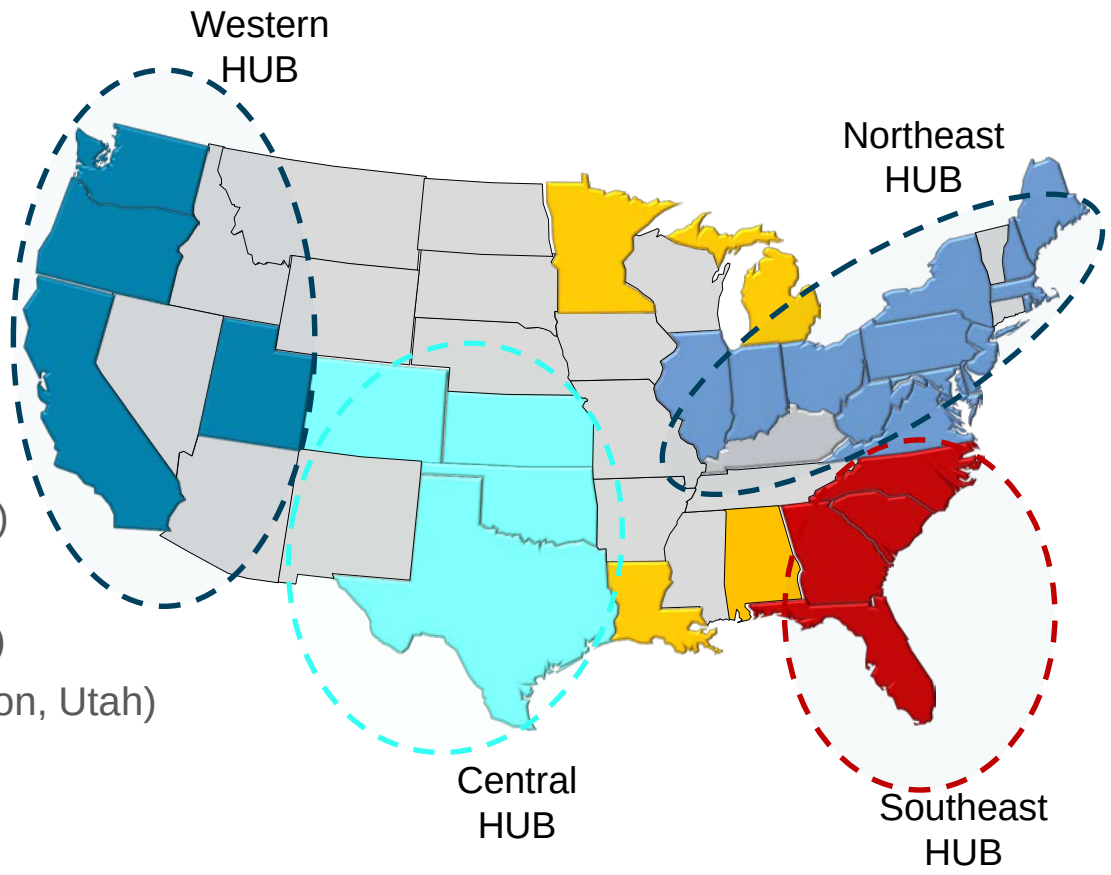
CURRENT AND FUTURE

2018 – Future

- 2019: ***Colorado*** will be integrated into Central U.S. HUB
- Multiple Radio-Frequency Identification protocols will be in operation (6C, SEGO, TDMA)
- Western states (California, Utah, Washington, Oregon) integration into FasTrak HUB
- FasTrak HUB integrates to other HUBs
- All U.S. HUBs become integrated

INTEROPERABILITY HUBS

- Northeast HUB (led by E-ZPass)
  - 26 agencies across 15 States
- Southeast HUB (led by Florida Turnpike Enterprise - SunPass)
  - 9 agencies across 4 States (Florida, Georgia, NC and SC)
- Central U.S. HUB (led by North Texas Tollway Authority - NTTA)
  - 8 agencies across 4 States (TX, Oklahoma, Kansas, ***Colorado***)
- Western U.S. HUB (led by California Toll Operators Committee - FasTrak)
  - 6 California agencies (future expansion with Washington, Oregon, Utah)
- Other solutions:
  - Private Tag Based Solutions: National Pass, Bestpass
  - License Plate Based Application Solutions: PlatePass, bancPass, PayTollo



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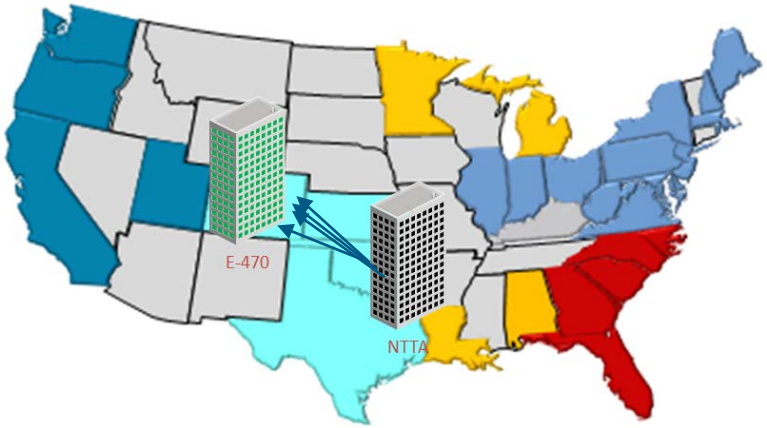
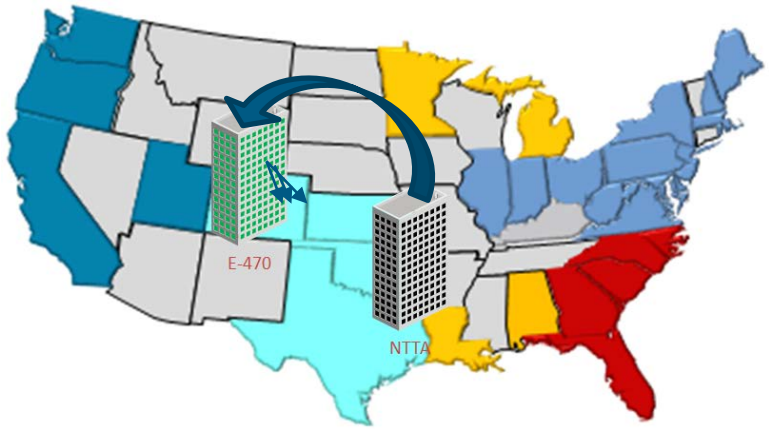
BEFORE AND AFTER INTEROPERABILITY EXAMPLE: A driver from Colorado with an ExpressToll Transponder is driving along Express Lanes in Dallas, Texas.

BEFORE



Since Texas transponder readers do not recognize ExpressToll transponders, this driver would be tolled using license plate tolling. An invoice would be sent by NTTA within 30 days after the toll was incurred to the driver's address in Colorado.

AFTER



Once interoperability is established with the Central United States Hub, NTTA will collect a transaction and send it to E-470. E-470 will deduct the toll amount from the customer's prepaid balance. E-470 will pay NTTA the toll amount, and NTTA will pay E-470 a small fee.