E-Commerce and Freight Forces Impacting the Interstates and the NHFN

Penn State Transportation Engineering and Safety Conference

December 12, 2019

pennsylvania
DEPARTMENT OF TRANSPORTATION

How many Amazon Prime members are in the audience?

Is this you?

Today's Road Map

How are e-commerce and other freight forces affecting Pennsylvania's Interstates?

What is PennDOT doing to address the challenges?

pennsylvania
DEPARTMENT OF TRANSPORTATION

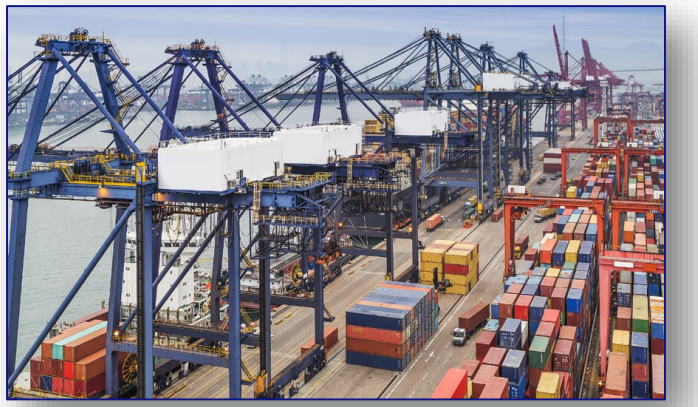
How are e-commerce and other freight forces affecting Pennsylvania's Interstates?

First Mile

Mid-Mile

Last Mile

No one is talking about the Mid-Mile!

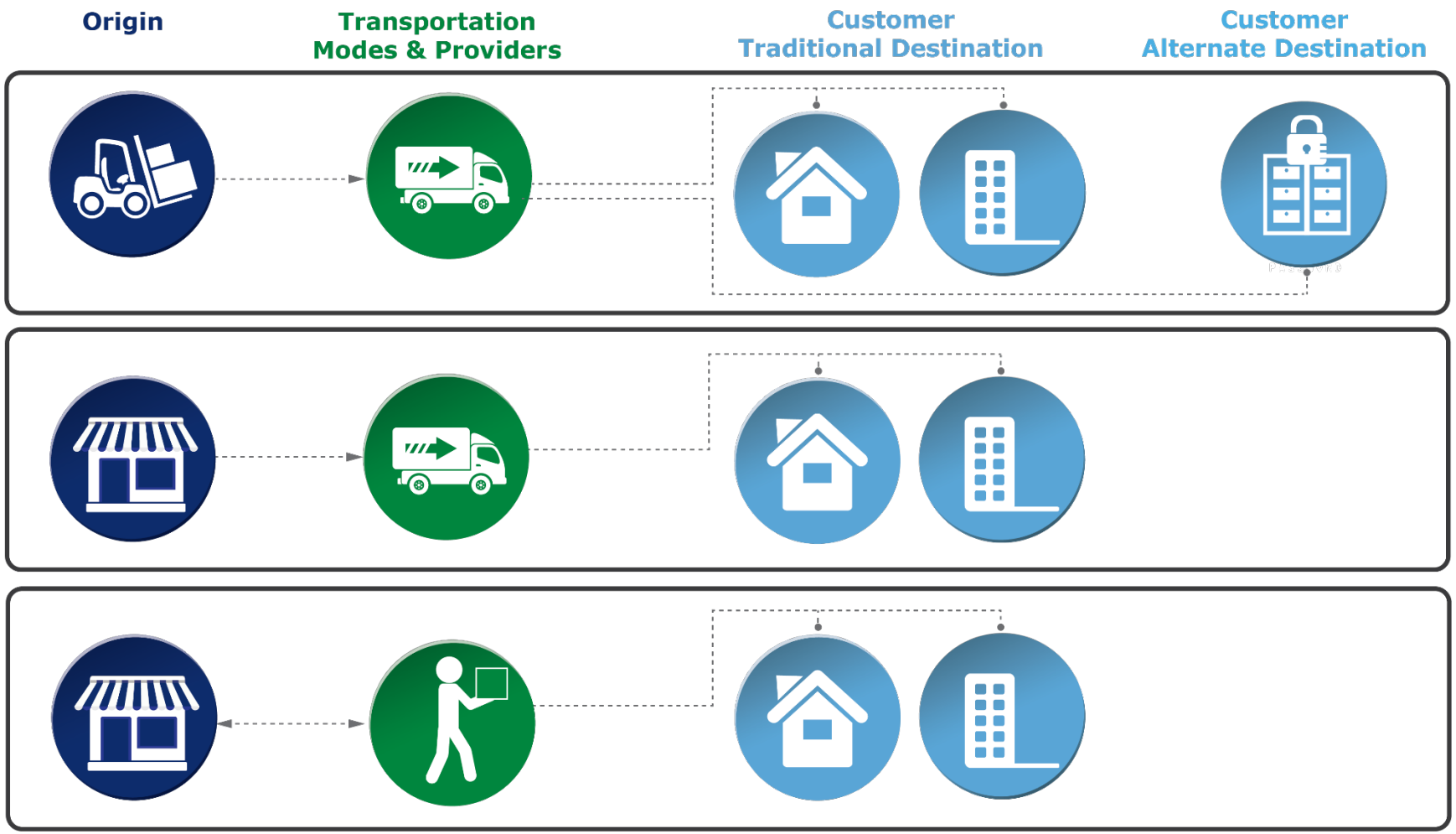


pennsylvania
DEPARTMENT OF TRANSPORTATION

Traditional Shopping

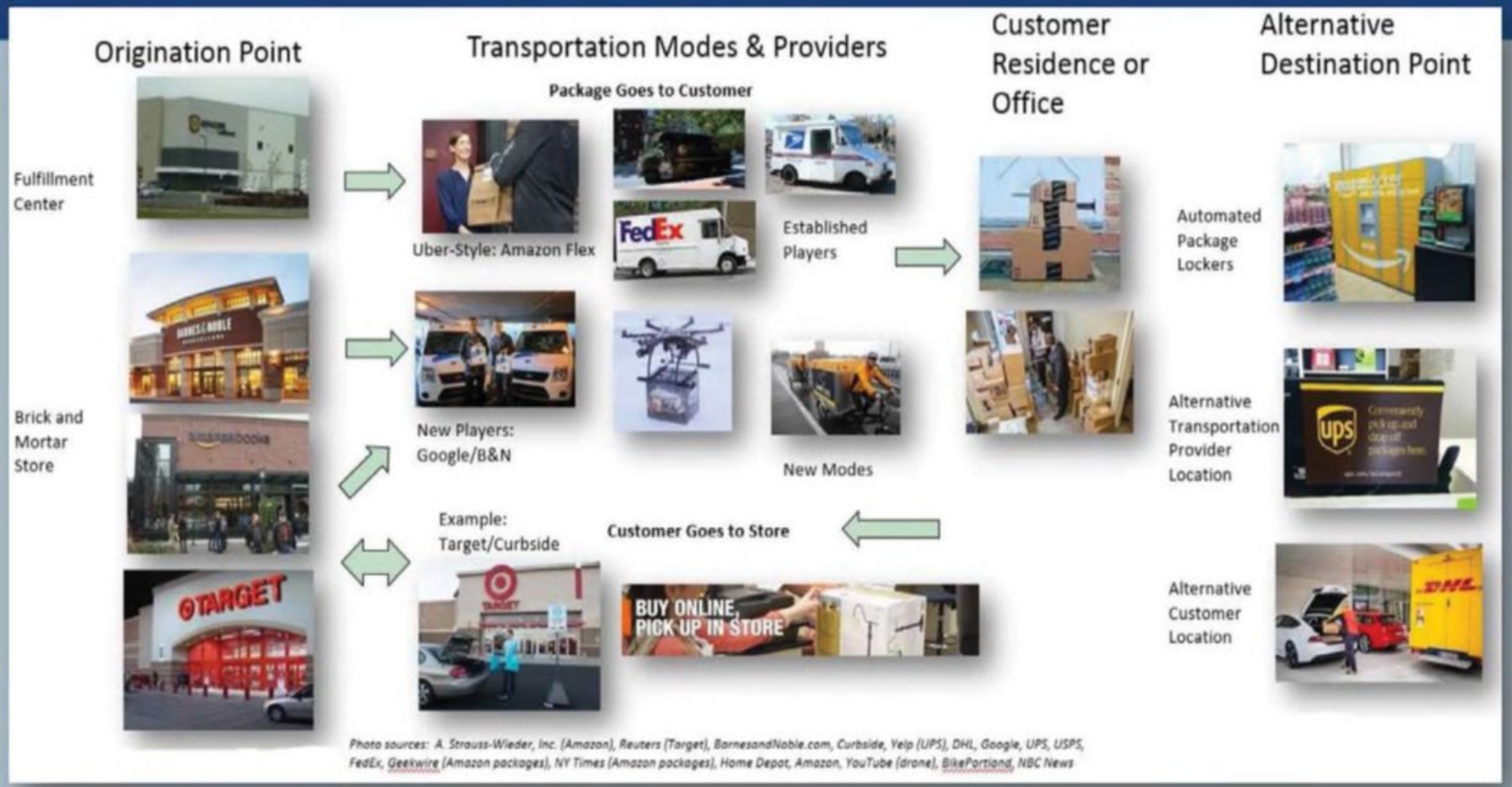
pennsylvania
DEPARTMENT OF TRANSPORTATION

Impacts on Freight Delivery (Last Mile)



pennsylvania
DEPARTMENT OF TRANSPORTATION

The Changing Last Mile of Retail



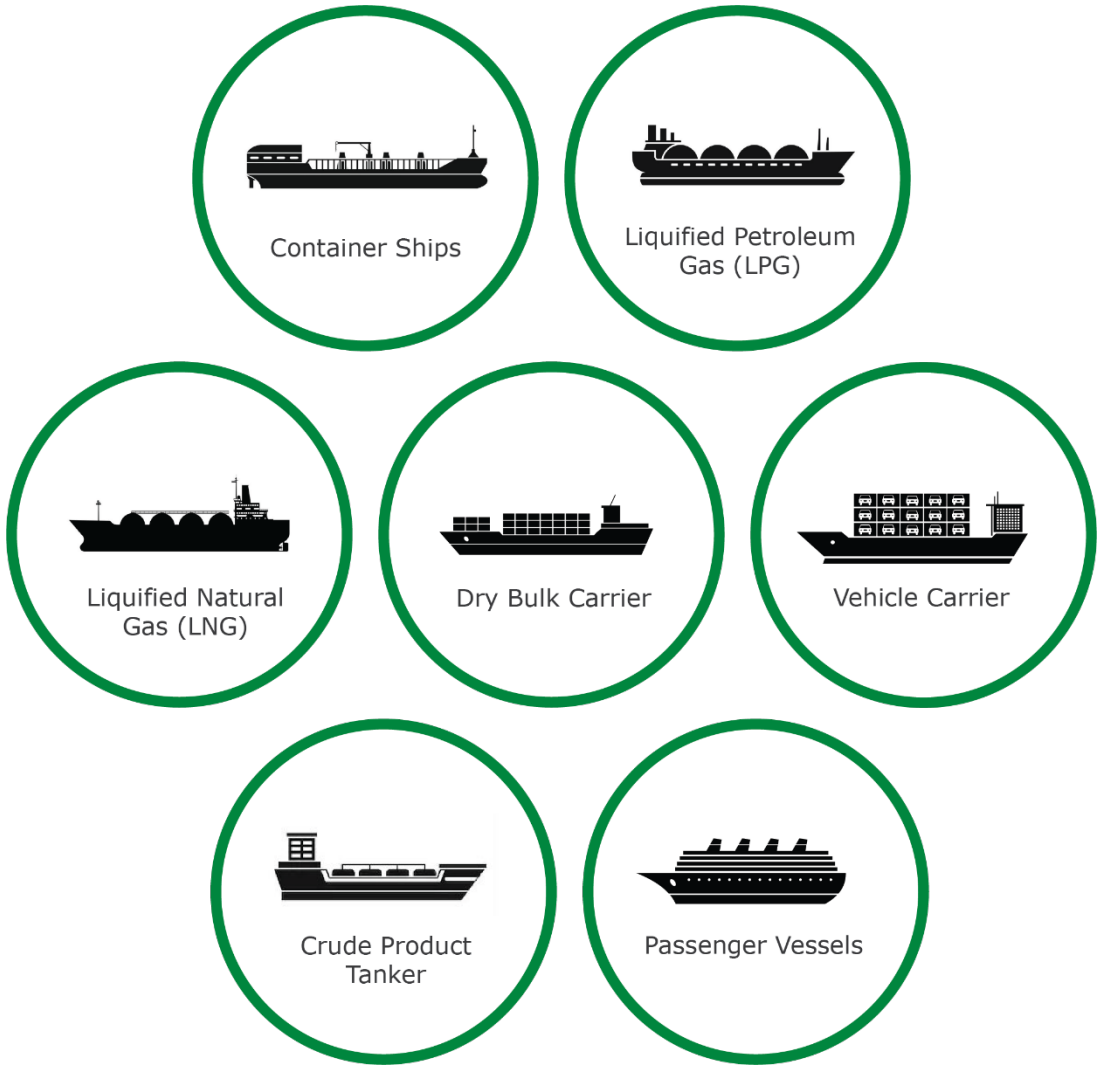
NJTPA

pennsylvania
DEPARTMENT OF TRANSPORTATION

Macro-level Freight Forces

- Widening of the Panama Canal
- Raising of the Bayonne Bridge
- Dredging of the Delaware River
- Increasing e-Commerce activity

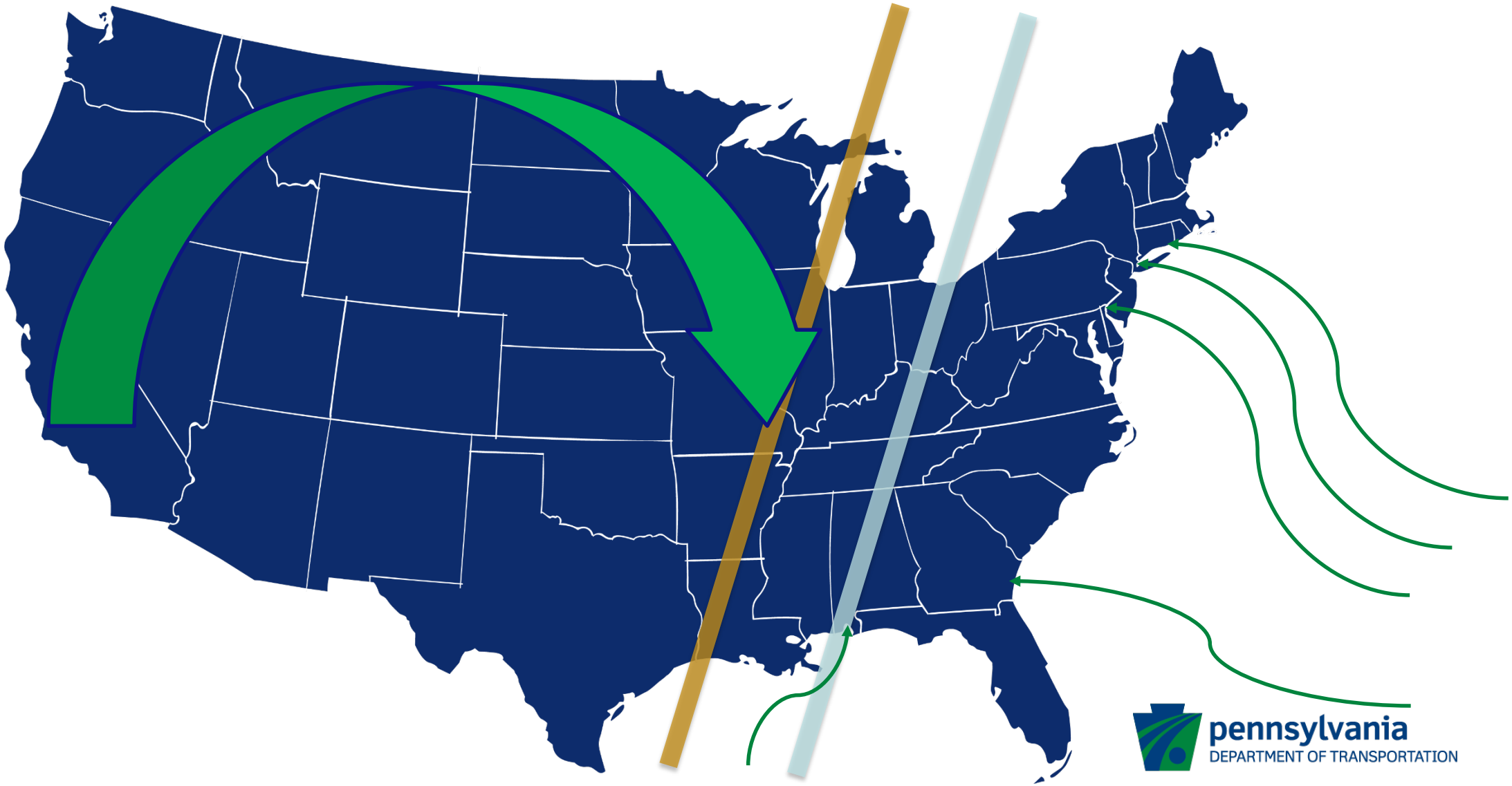
Panama Canal Expansion (2016)



Source: Kristen Sosulski, *The effect of the expanded Panama Canal*

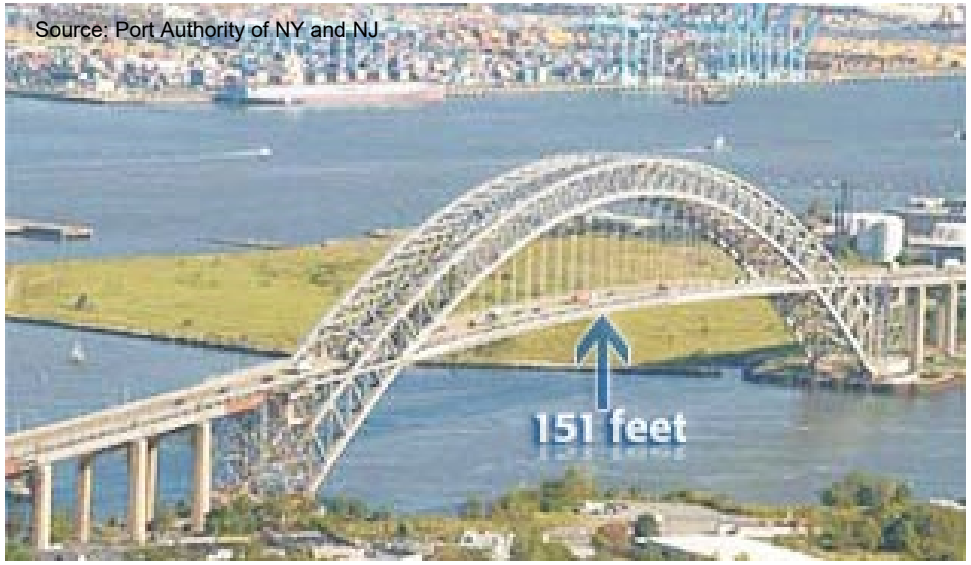
pennsylvania
DEPARTMENT OF TRANSPORTATION

Panama Canal - Affect on Supply Chains



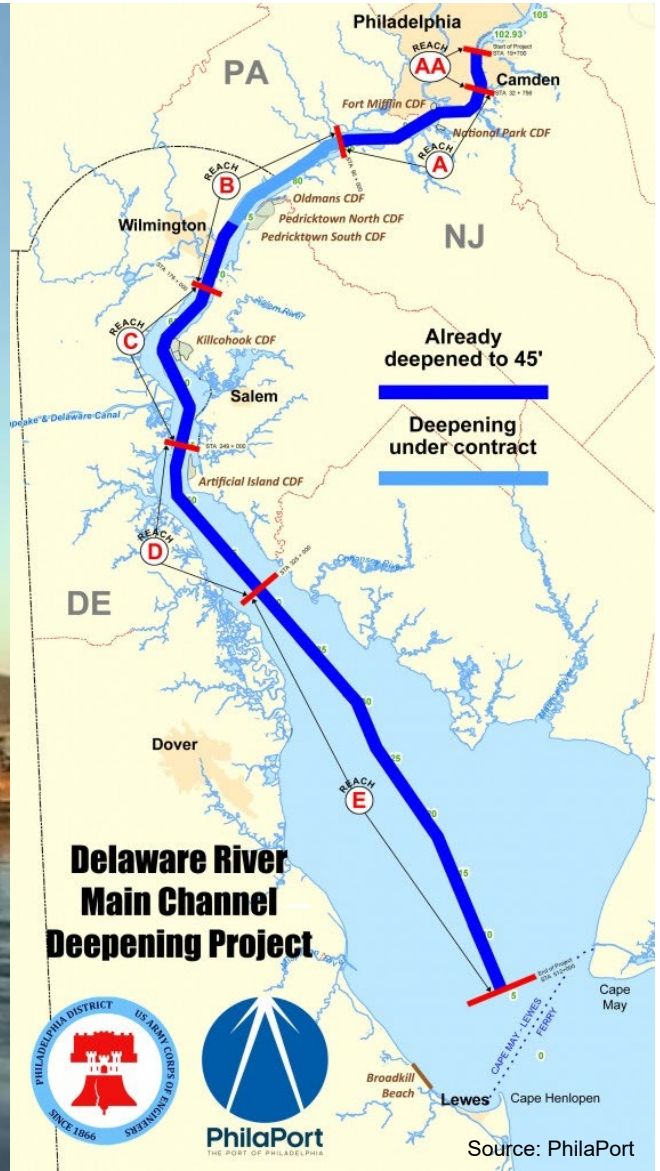
pennsylvania
DEPARTMENT OF TRANSPORTATION

Bayonne Bridge Raising



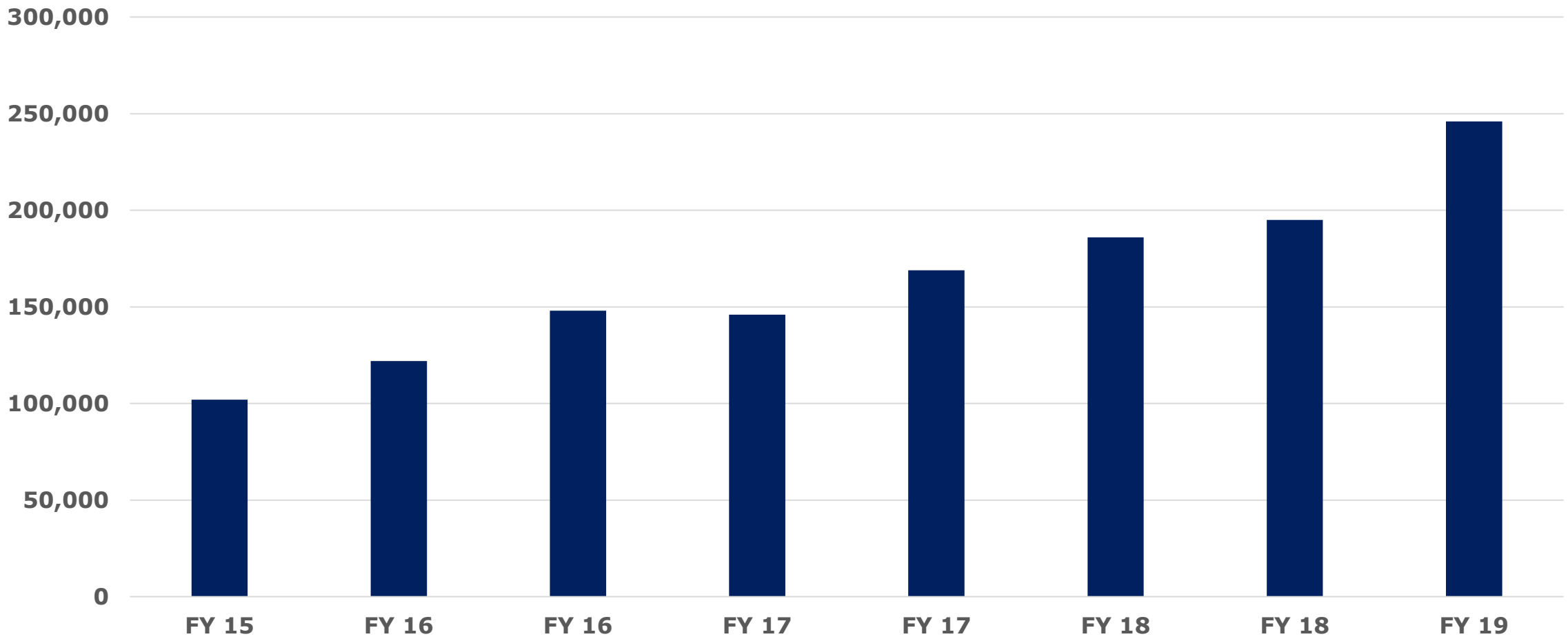
Delaware River Dredging

Source: NBC Philadelphia



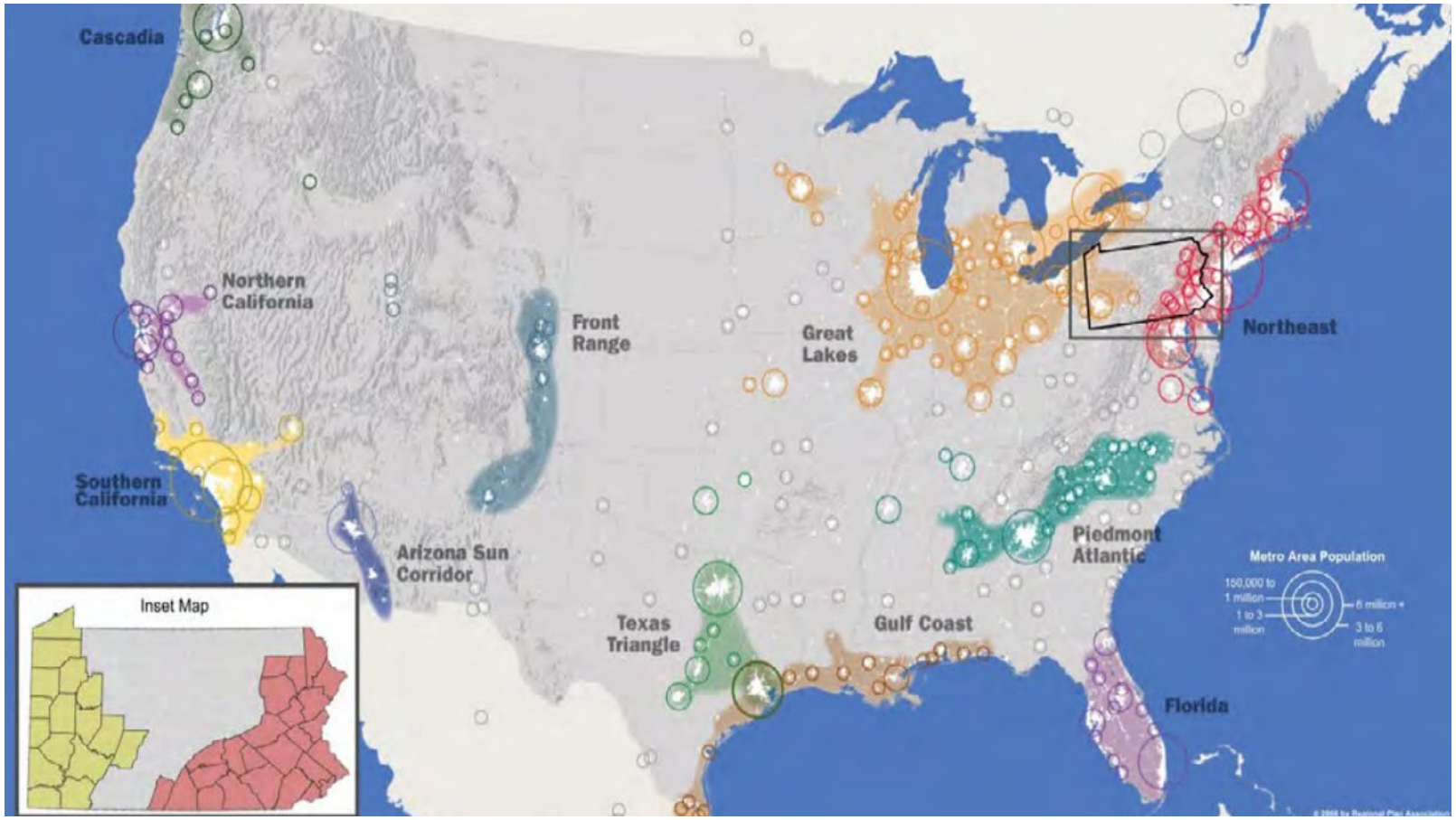
Source: PhilaPort

Port of Philadelphia: Total Container Lifts



pennsylvania
DEPARTMENT OF TRANSPORTATION

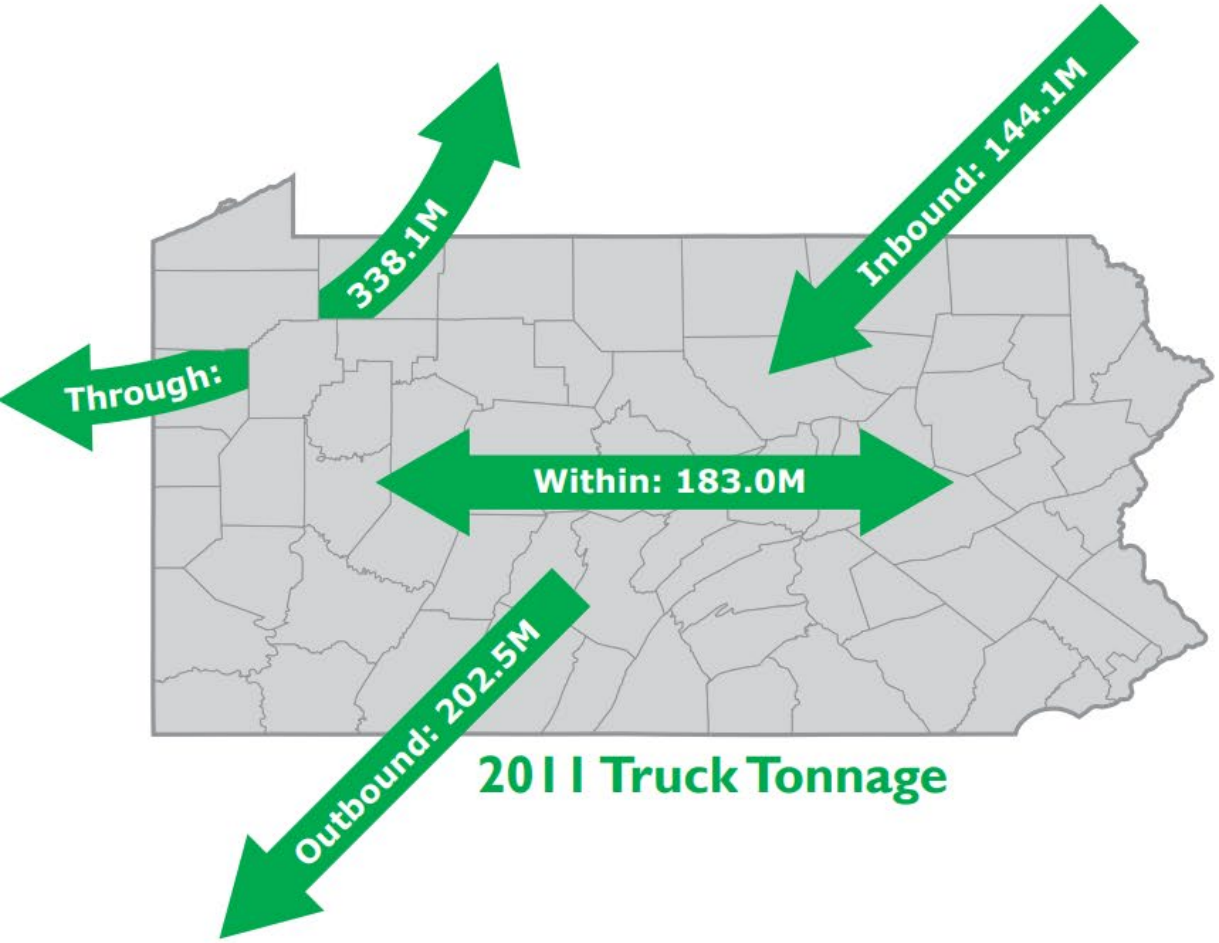
Big Picture: Mega-Regions

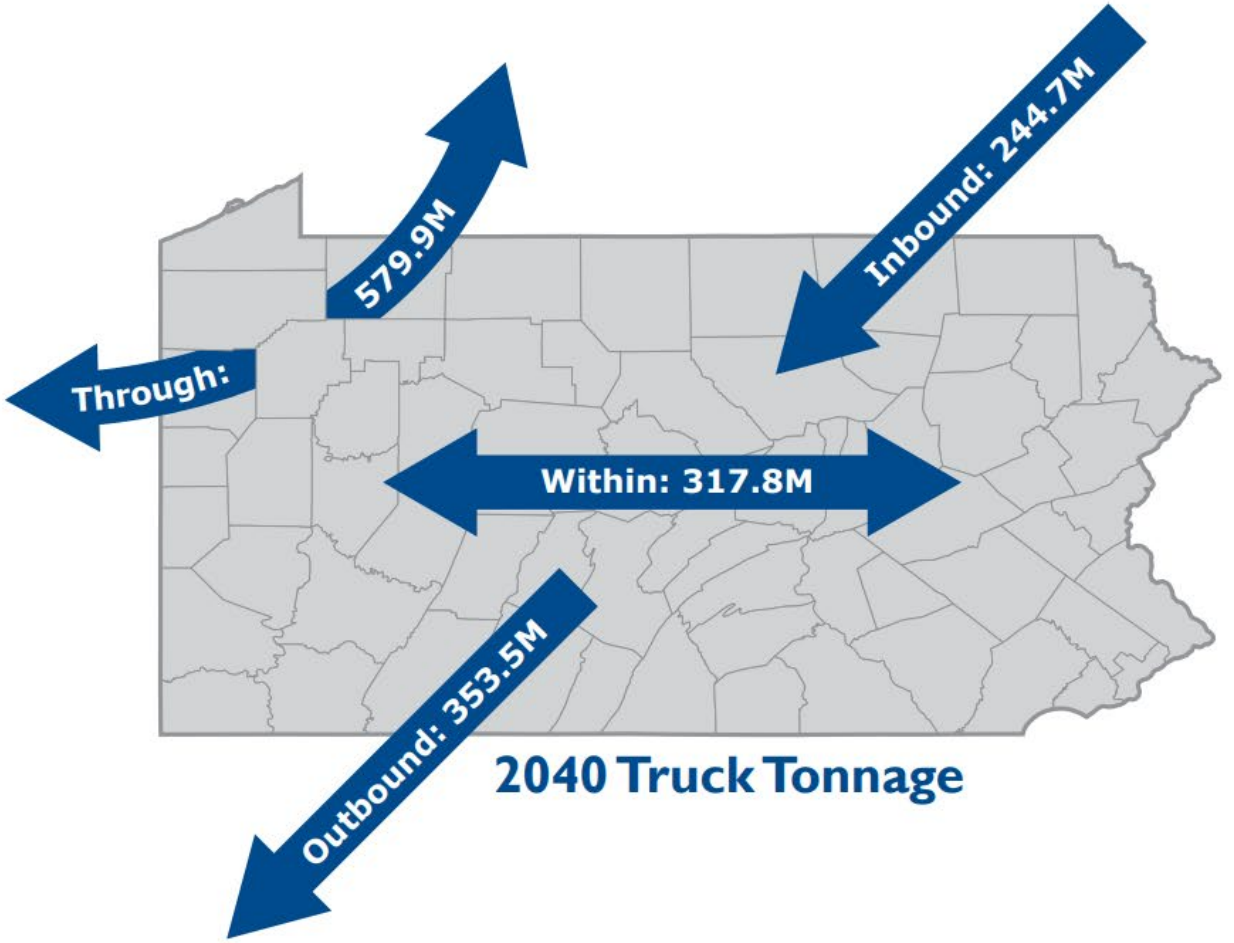


Source: Regional Plan Association, America 2050

pennsylvania
DEPARTMENT OF TRANSPORTATION

Pennsylvania Freight Movement





Source: IHS Global Insight Transearch data

pennsylvania
DEPARTMENT OF TRANSPORTATION

The Rise of e-commerce

1997

- Wal-Mart - $88.9B
- Home Depot - $43.1B
- Sears - $17.7B
- J.C.Penney - $15.1B
- Target - $14.7B

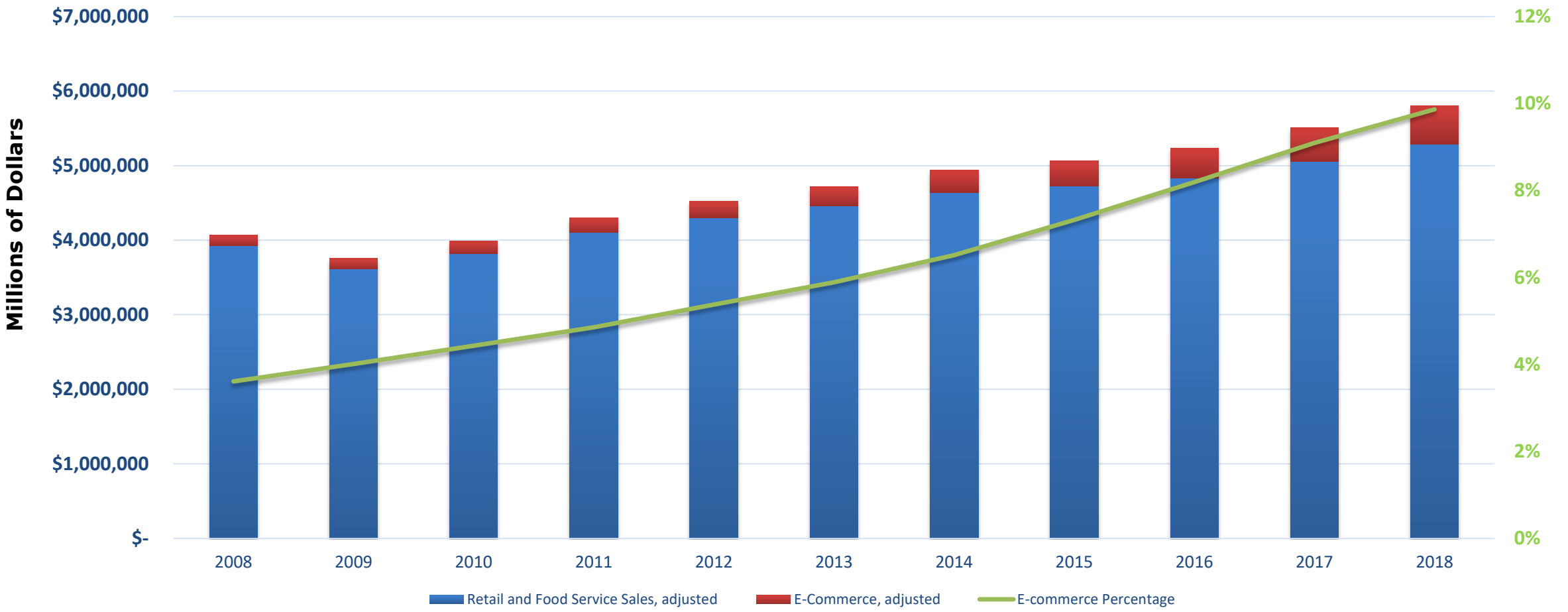
2017

- Amazon - $457.9B
- Wal-Mart - $231.3B
- Home Depot - $189.0B
- Priceline - $89.2B
- Costco - $75.3B

"Reduce the amount of time 'from click to knock.'"

pennsylvania
DEPARTMENT OF TRANSPORTATION

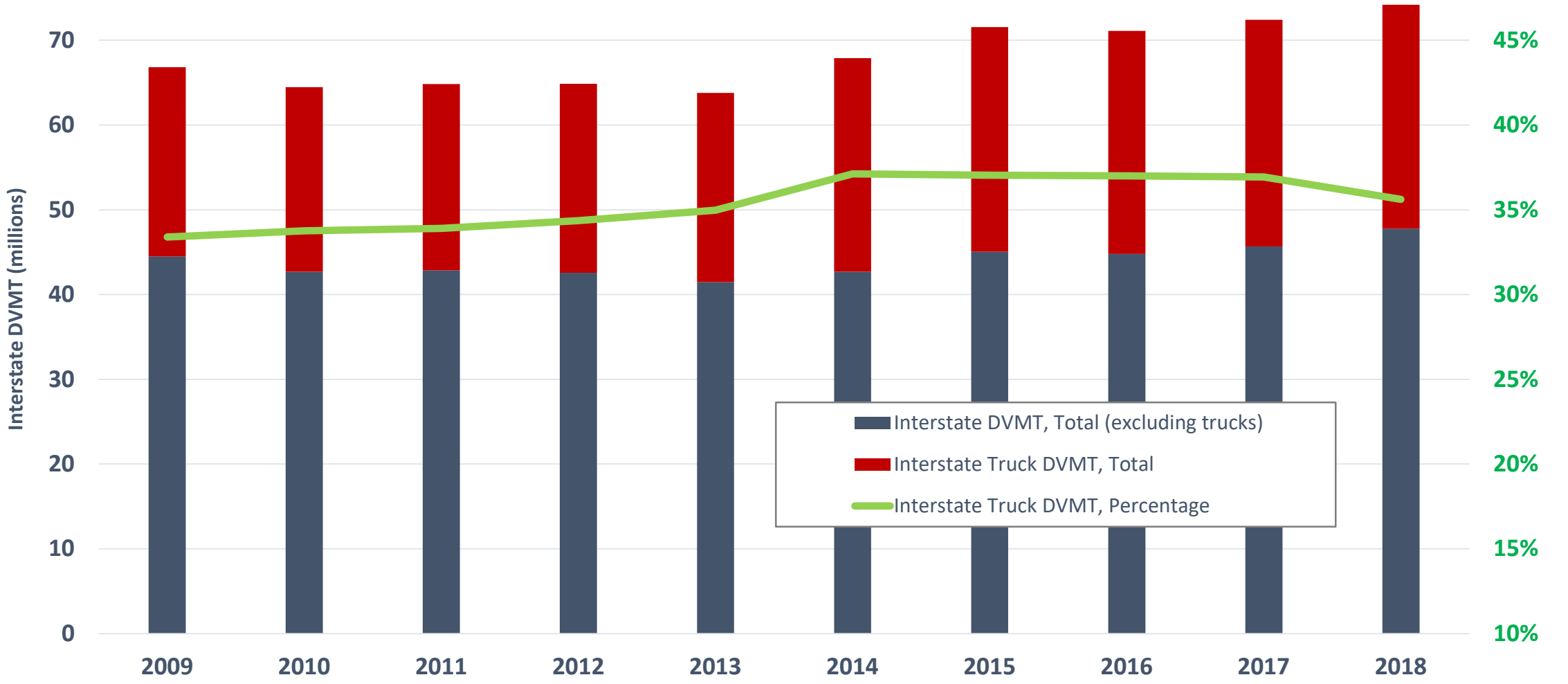
E-Commerce v. In-Store Retail Sales



Source: US Census Bureau Monthly Retail Trade and Quarterly E-Commerce Reports

pennsylvania
DEPARTMENT OF TRANSPORTATION

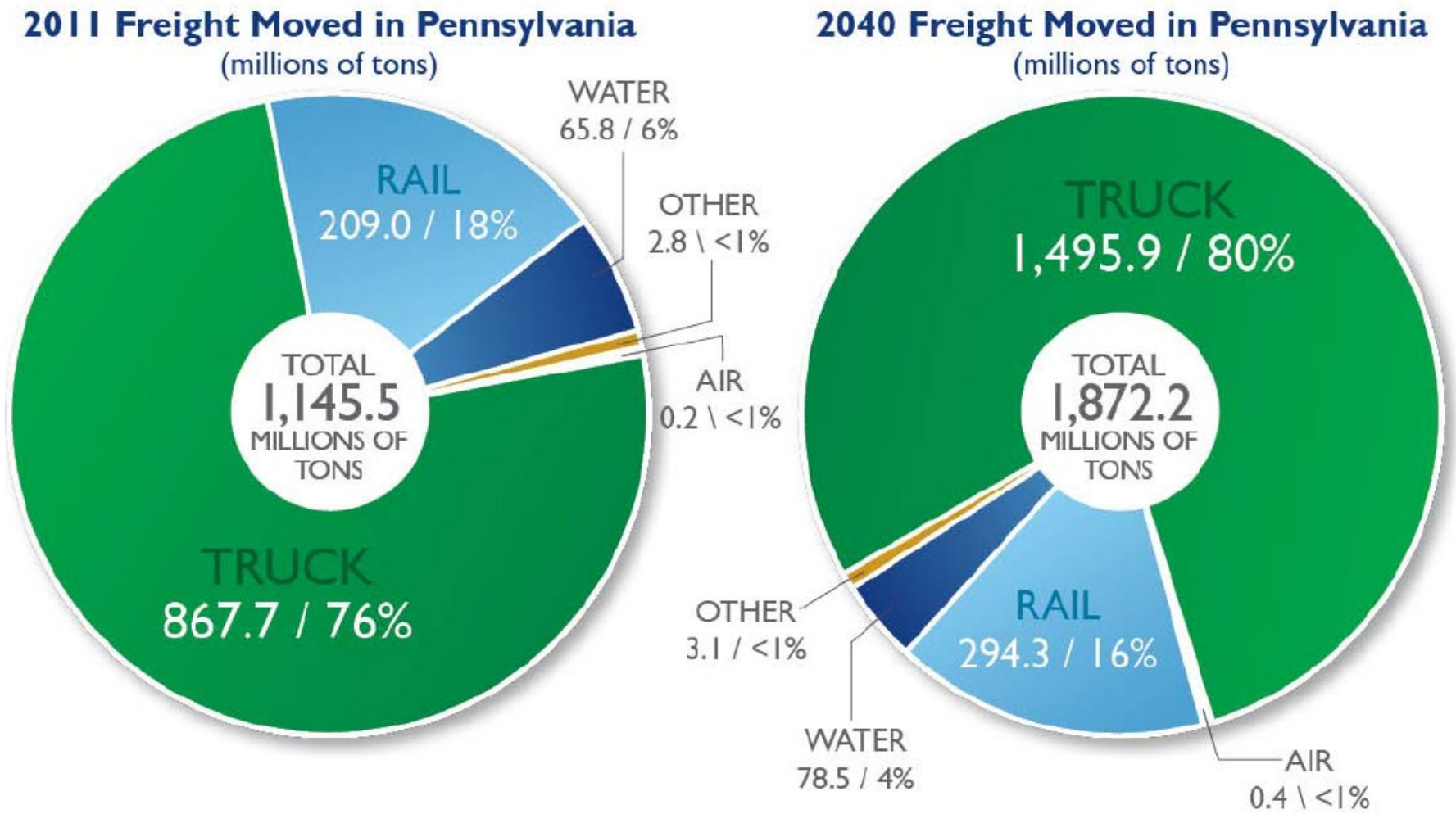
DVMT Trends on Pennsylvania's Interstates



Source: PennDOT Bureau of Planning and Research, Publication 600

pennsylvania
DEPARTMENT OF TRANSPORTATION

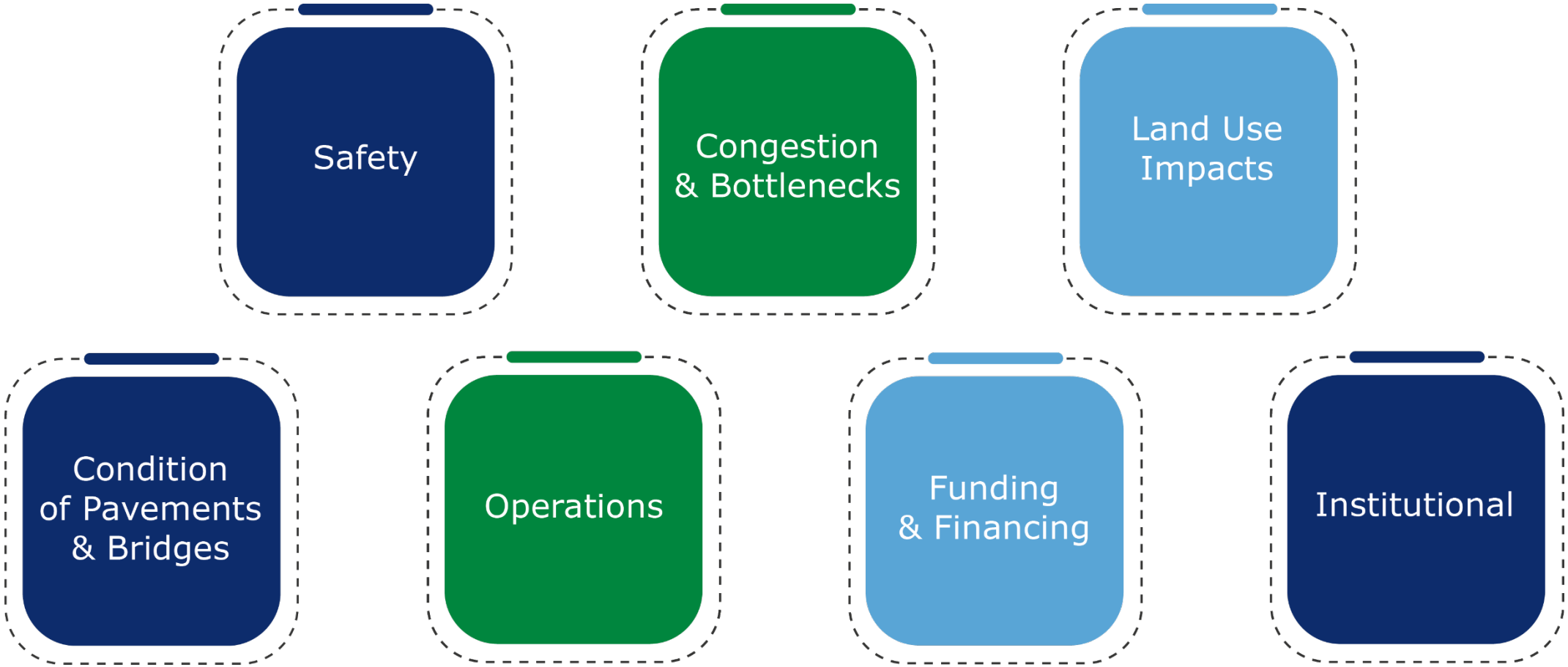
State Freight in Tons (millions), 2011 and 2040



pennsylvania
DEPARTMENT OF TRANSPORTATION

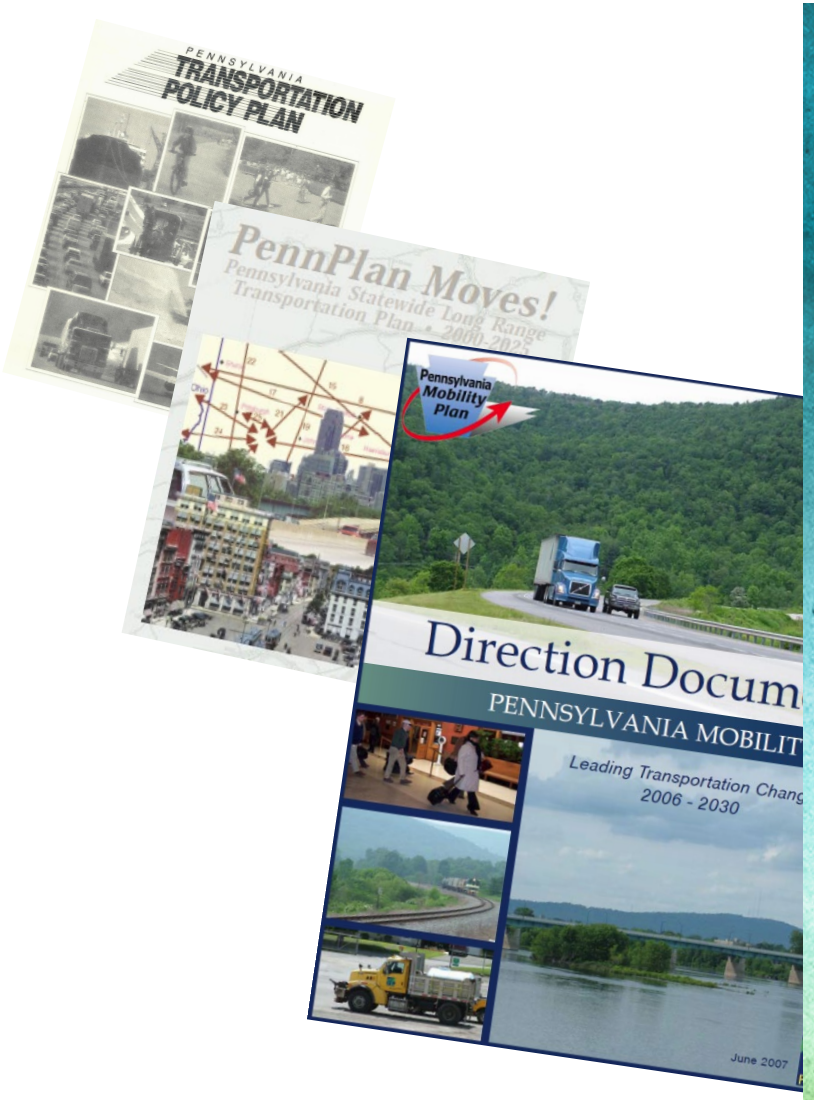
How is PennDOT preparing to address these challenges?

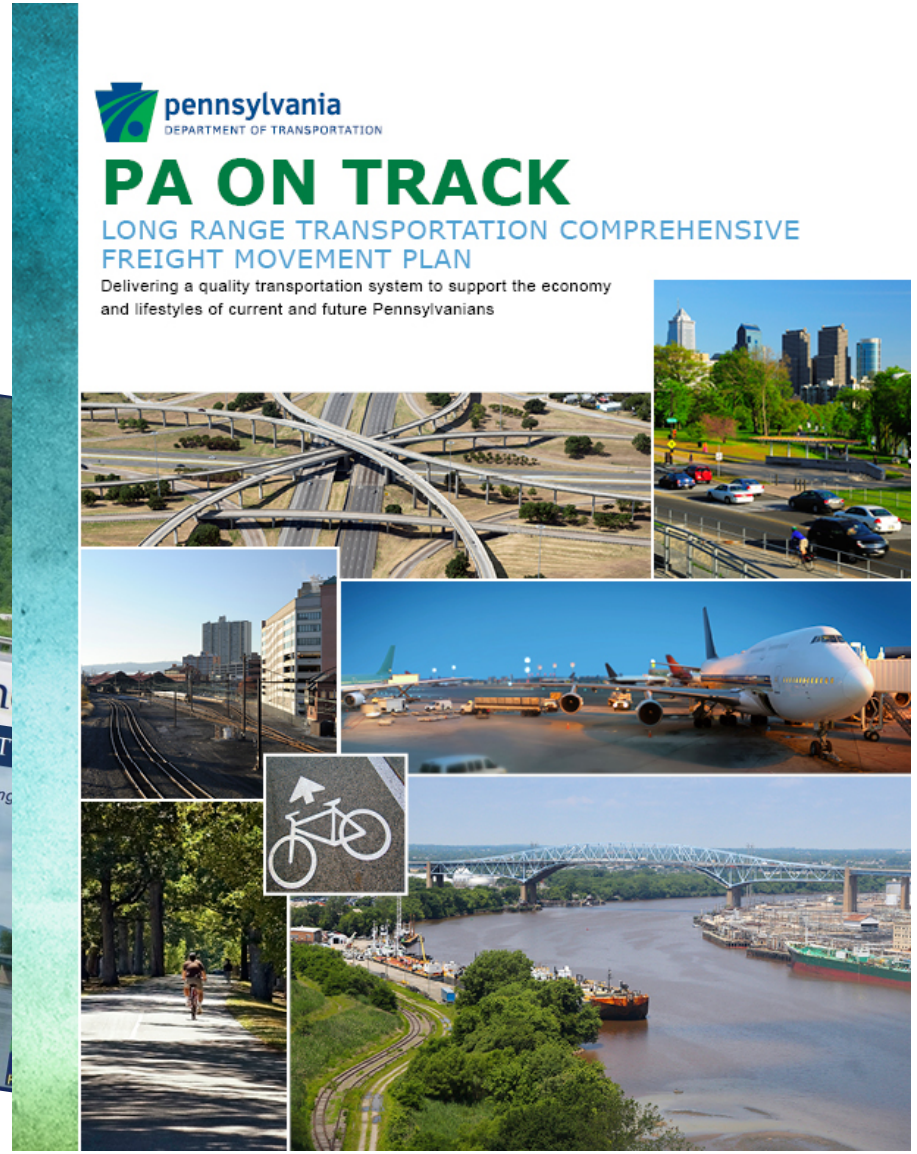
What challenges are we talking about?



pennsylvania
DEPARTMENT OF TRANSPORTATION

Where have we been?

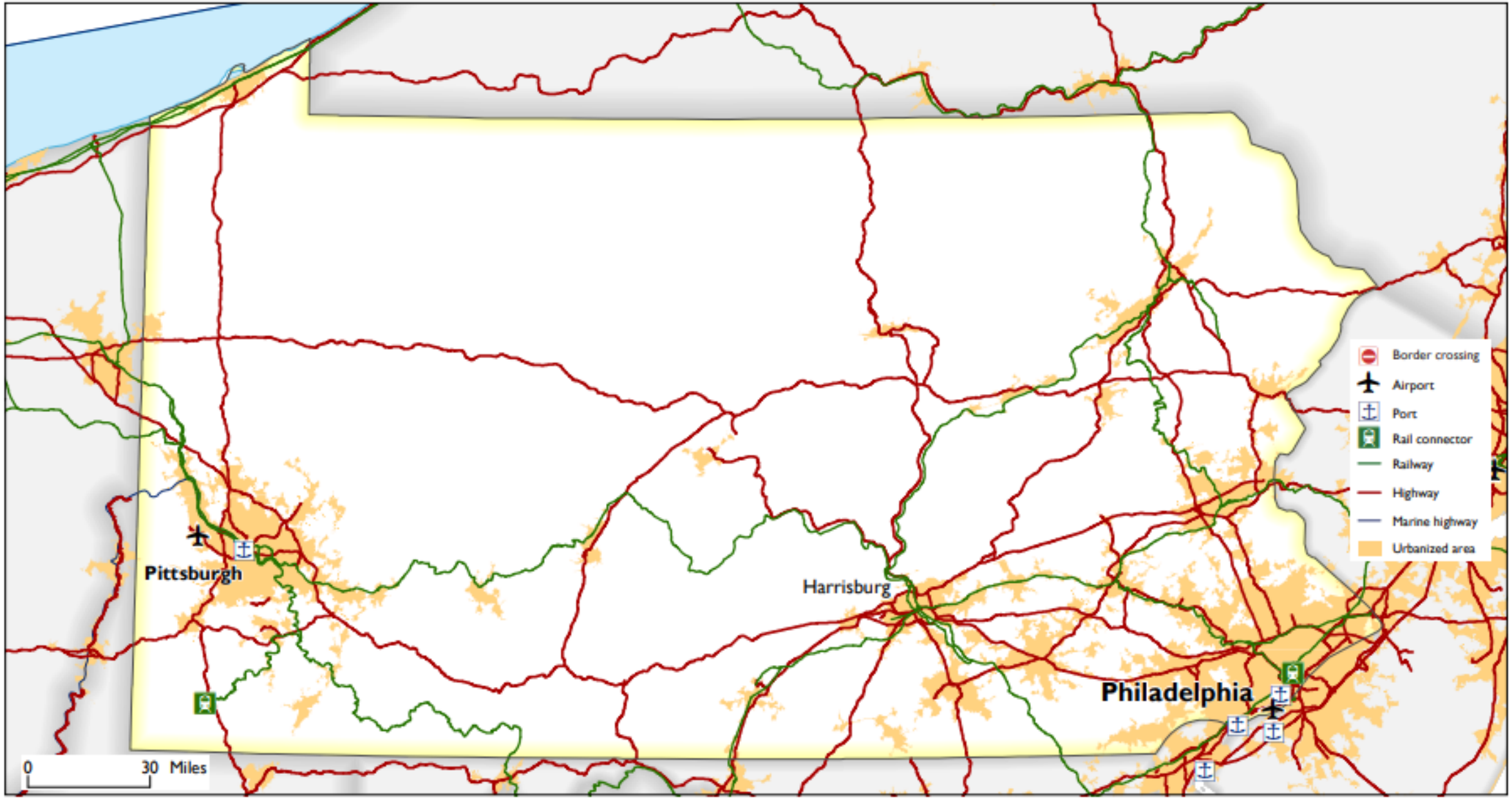




- Passage of the FAST Act (December 2015)
- PennDOT launches Freight Work Group (November 2017)
- FHWA Approves CFMP (November 2017)
- FHWA Certifies CUFCs and CRFCs as additions to NMFN (February 2019)
- PennDOT begins update of state freight plan (August 2019)

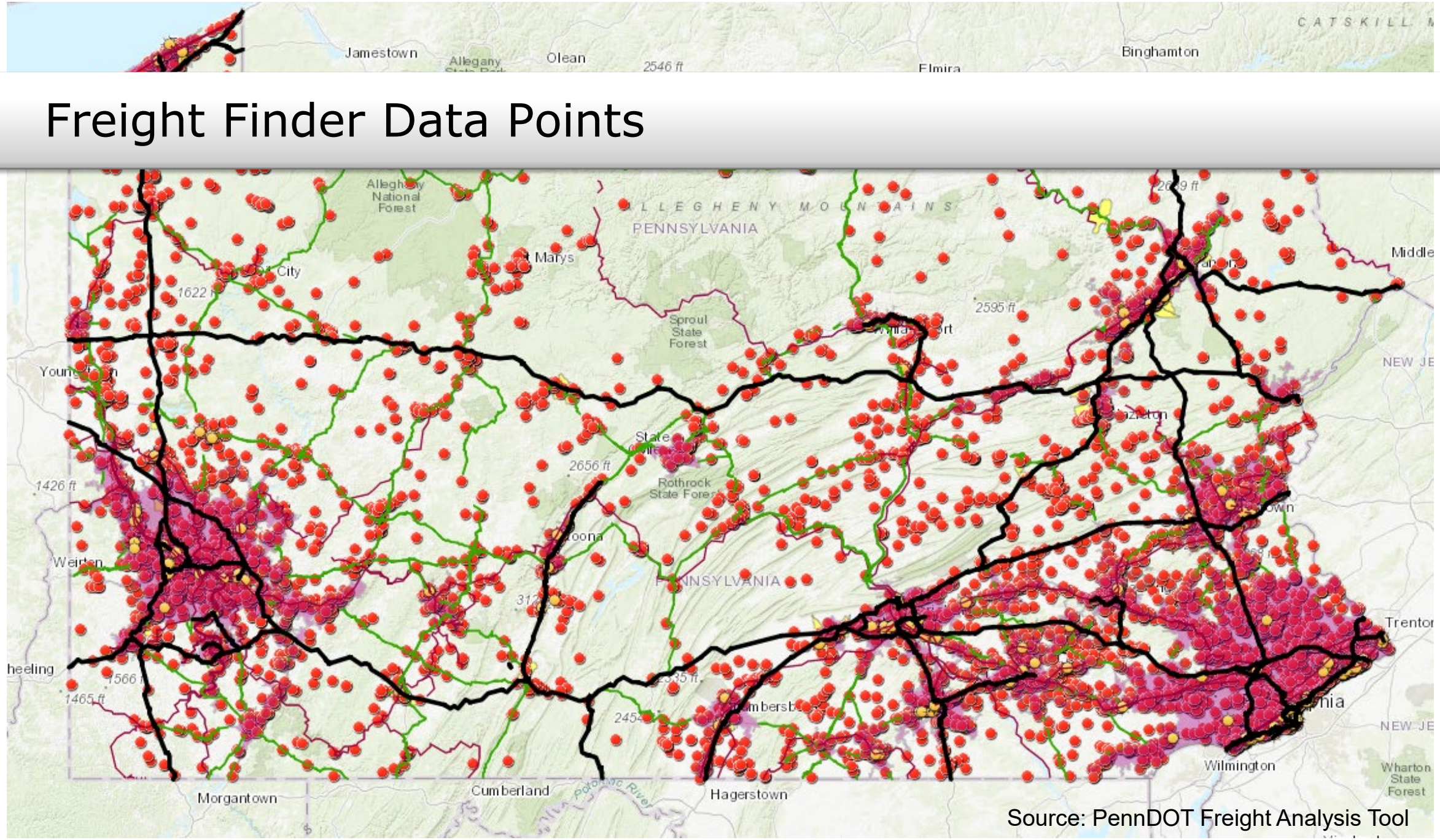
pennsylvania
DEPARTMENT OF TRANSPORTATION

Pennsylvania Multimodal Freight Network



Note: For information on methodology used for feature selection in this map, please see U.S. Department of Transportation, National Freight Strategic Plan, Appendix D, 2015.

Freight Finder Data Points

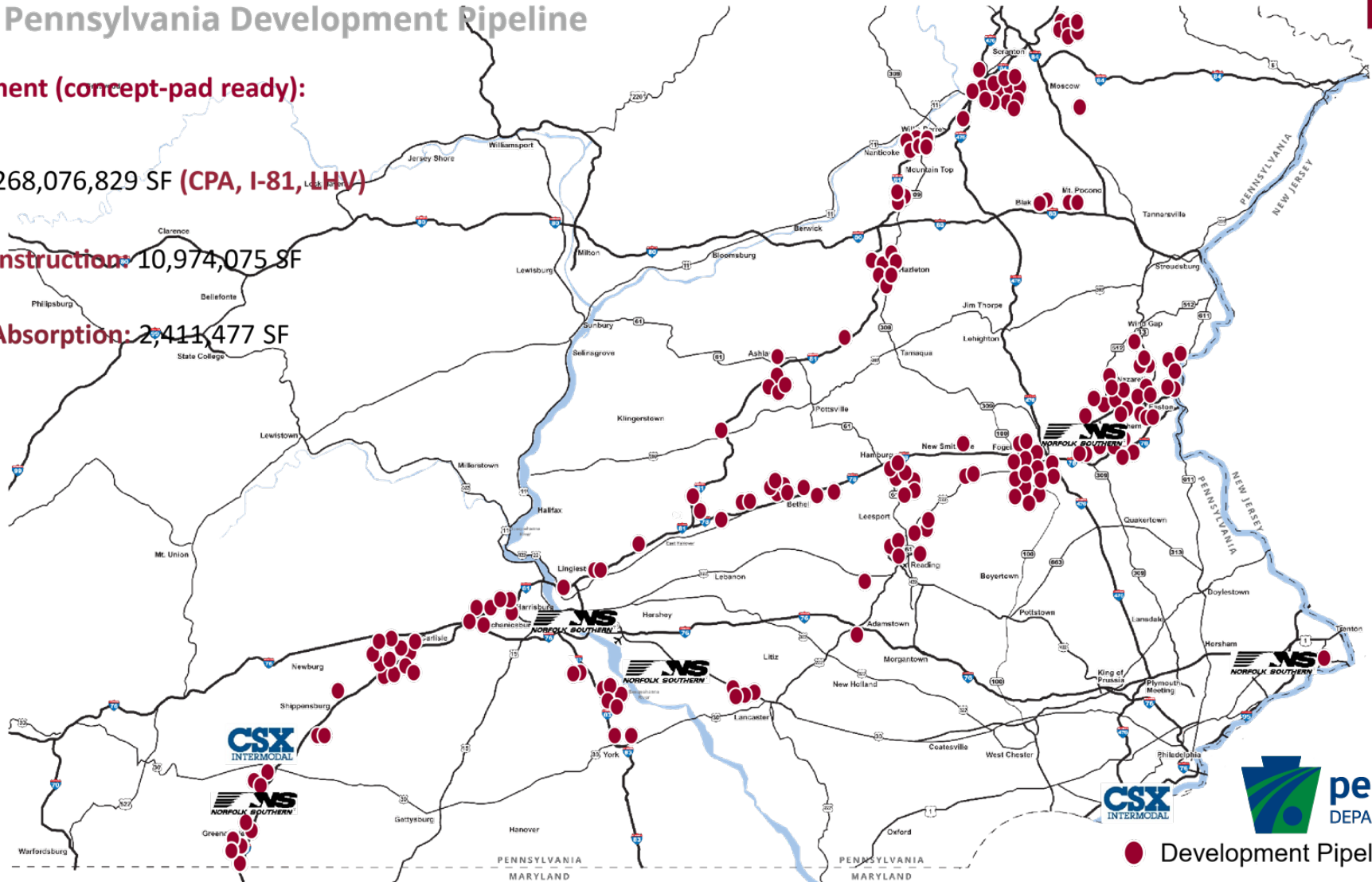


Eastern "Inland Empire"

"EMPIRical" Comparisons

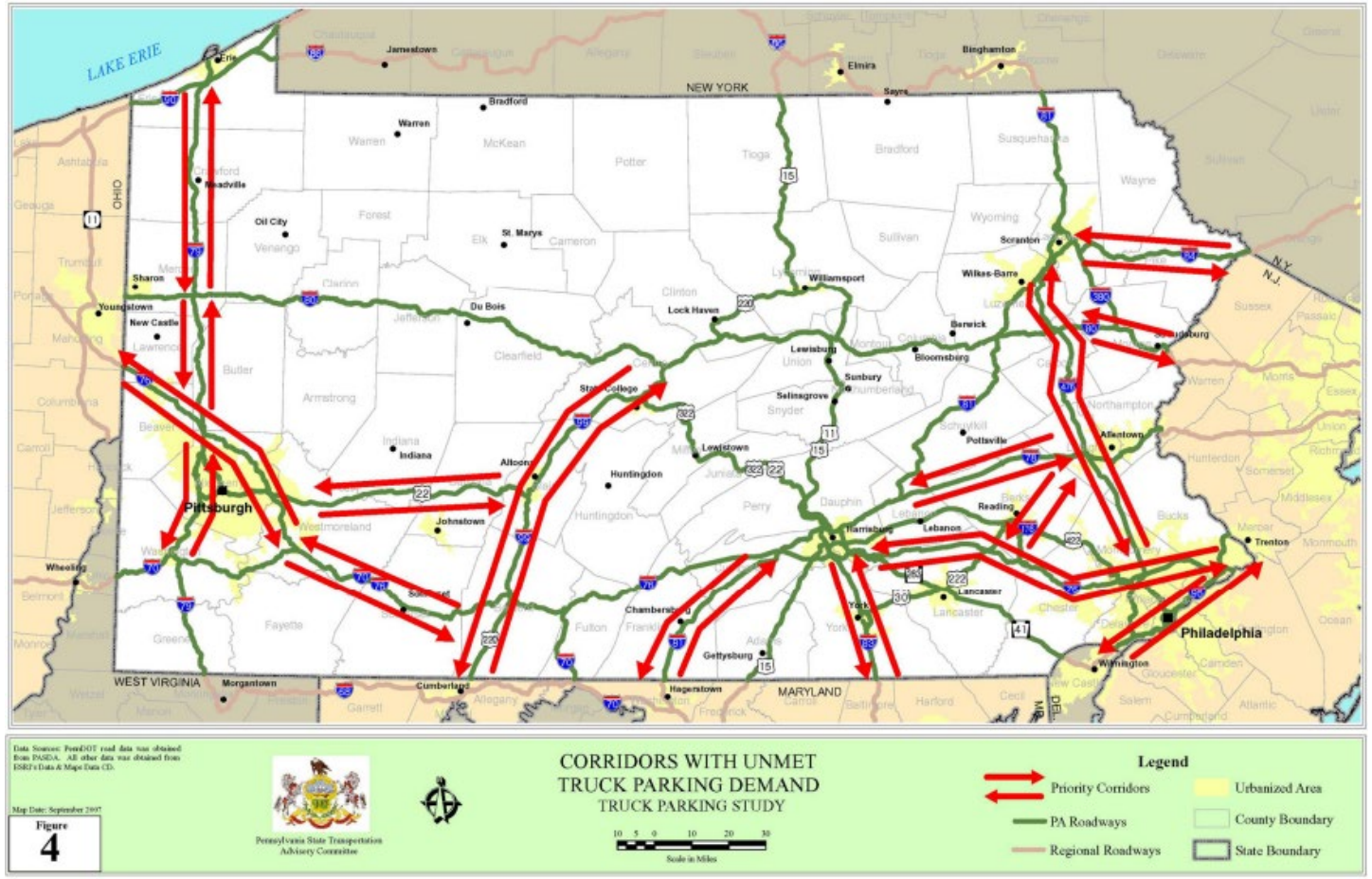
Eastern Pennsylvania Development Pipeline

- **Development (concept-pad ready):**
- **Existing:** 268,076,829 SF **(CPA, I-81, LHV)**
- **Under Construction:** 10,974,075 SF
- **Average Absorption:** 2,411,477 SF



pennsylvania
DEPARTMENT OF TRANSPORTATION

Pennsylvania's Truck Parking Shortage



Data Sources: PennDOT road data was obtained from PASDA. All other data was obtained from ESRI's Data & Maps Data CD.

Map Date: September 2007

Figure 4

Pennsylvania State Transportation Advisory Committee

CORRIDORS WITH UNMET TRUCK PARKING DEMAND
TRUCK PARKING STUDY

10 5 0 10 20 30
Scale in Miles

Legend
- Priority Corridors
- PA Roadways
- Regional Roadways
- Urbanized Area
- County Boundary
- State Boundary

Unmet Parking Demand Summary

#	Corridor Direction	Corridor Roadway	Limits	Est. Parking Demand	Parking Capacity	Parking Shortfall
18	EB	PA Turnpike	Harrisburg-Philadelphia	605	170	435
18	WB	PA Turnpike	Philadelphia-Harrisburg	599	180	419
6	EB	PA Turnpike	New Stanton-Breezewood	406	77	329
25	NB	I-95	Delaware-New Jersey	302	11	291
25	SB	I-95	New Jersey-Delaware	282	0	282
6	WB	PA Turnpike	Breezewood-New Stanton	406	131	275
23	NB	PA Turnpike (NE Ext.)	Philadelphia-Scranton	308	56	252
29	NB	I-79	Washington-Cranberry	248	17	231
29	SB	I-79	Cranberry-Washington	244	17	227
5	WB	PA Turnpike	New Stanton-Ohio	222	0	222
5	EB	PA Turnpike	Ohio-New Stanton	219	50	169
23	SB	PA Turnpike (NE Ext.)	Scranton-Philadelphia	290	136	154
17	SB	I-83	Harrisburg-Maryland	155	24	131
17	NB	I-83	Maryland-Harrisburg	155	37	118
24	WB	I-80	New Jersey - I-81	168	71	97
24	EB	I-80	I-81 - New Jersey	168	93	75
22	NB	US 422/222	PA Turnpike - I-78	70	0	70
27	WB	I-78	New Jersey - I-81	426	357	69
8	SB	I-99	I-80 - Maryland	67	0	67
22	SB	US 422/222	I-78 - PA Turnpike	65	0	65
8	NB	I-99	Maryland - I-80	62	0	62
28	SB	I-79	I-80 - Cranberry	83	29	54
28	NB	I-79	Cranberry - I-80	79	28	51
7	WB	US 22	Lewistown-Monroeville	106	63	43
7	EB	US 22	Monroeville-Lewistown	97	63	34
2	NB	I-79	I-80 - Erie	130	97	33
26	EB	I-84	Scranton-New York	107	76	31
10	SB	I-81	Harrisburg-Maryland	353	322	31
27	EB	I-78	I-81 - New Jersey	388	357	31
26	WB	I-84	New York-Scranton	106	78	28
10	NB	I-81	Maryland-Harrisburg	344	335	10
2	SB	I-79	Erie - I-80	108	101	7
15	NB	US 15	Williamsport-New York	76	73	3
					Total Shortfall	**4,396**

pennsylvania
DEPARTMENT OF TRANSPORTATION

What's Happening on an Institutional Level?

- Revisiting the 2007 "Truck Parking in PA" Report by the Transportation Advisory Committee
- Commercial Vehicle Navigation
- TSMO – Regional Operations Plan Development
- Exploring P3 Opportunities for Truck Parking
- Freight Summit scheduled for 2020
- Freight Work Group
- PA on Track Update
- Forthcoming TAC freight study

pennsylvania
DEPARTMENT OF TRANSPORTATION

2021 Interstate Management Program

- Shift in strategies and higher focus on Interstate investment
- Increased funding for the Interstates by $50 million each year beginning in 2022 - from $450 million today to $1 billion by 2030
- Interstate priority needs include:
  - Addressing the **current backlog of asset needs**
  - **Modernization**
    - Fiber network, ITS expansion, operational improvements, safety and guiderail upgrades
  - **Strategic investments** –
    - Selected capacity improvements, interchanges, truck climbing lanes

pennsylvania
DEPARTMENT OF TRANSPORTATION

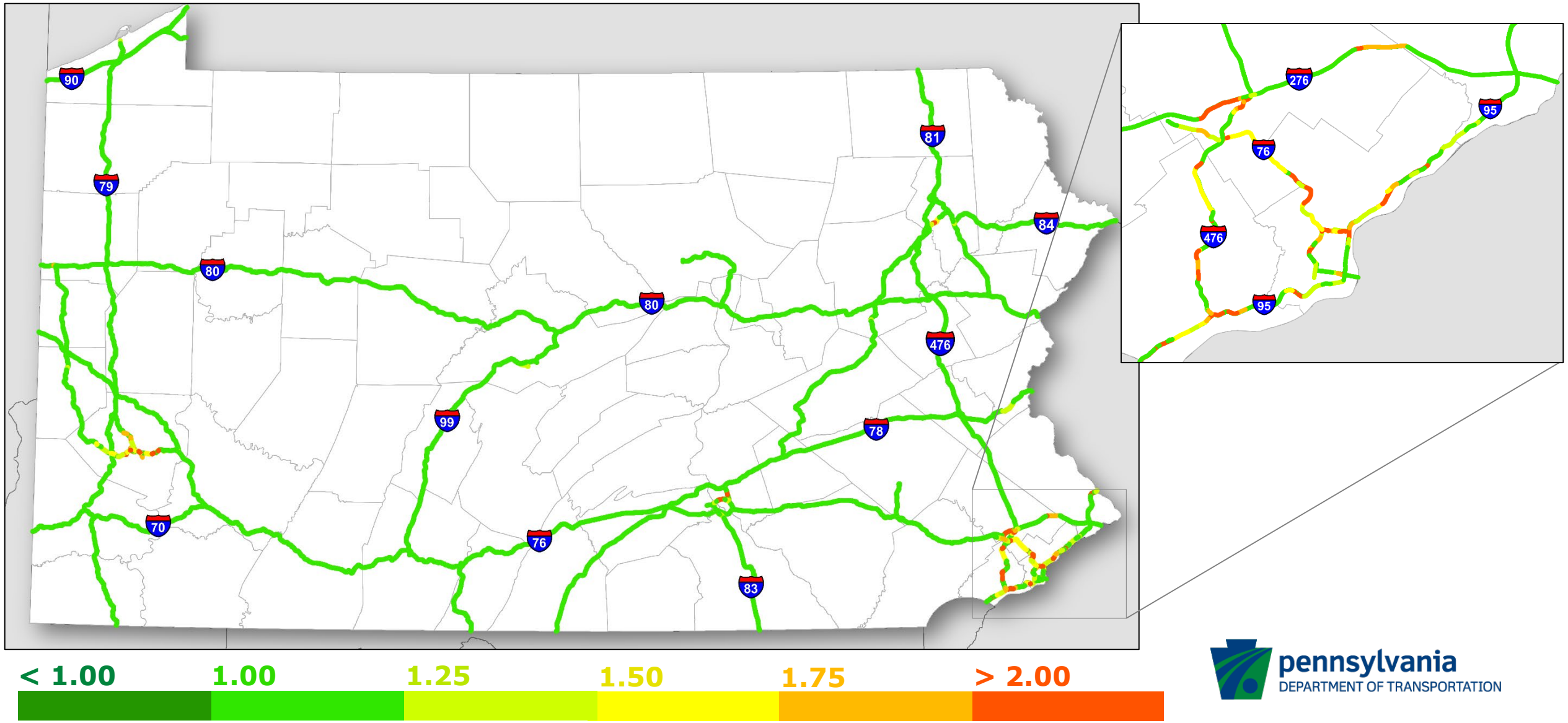
Performance Measurement and Management

- FHWA established a series of system performance measures:
  - Two system performance measures, one emission reduction measure, two traffic congestion measures

- PennDOT's Comprehensive Freight Movement Plan establishes four goals with 3-4 performance measures each:
  - System Preservation
  - Safety
  - Personal and Freight Mobility
  - Stewardship

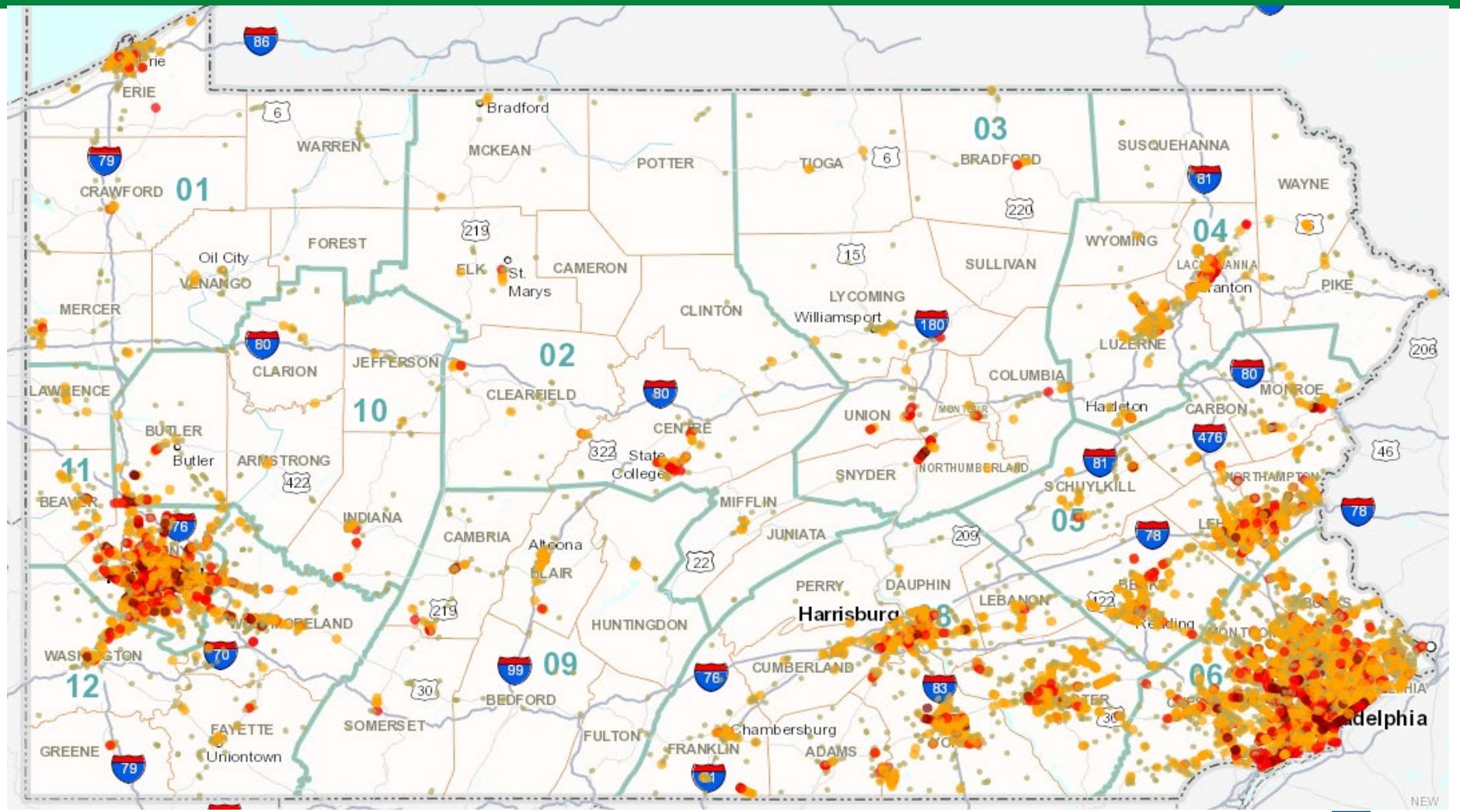
pennsylvania
DEPARTMENT OF TRANSPORTATION

Level of Travel Time Reliability (LOTTR)



pennsylvania
DEPARTMENT OF TRANSPORTATION

Congestion/Delay



pennsylvania
DEPARTMENT OF TRANSPORTATION

Staying Involved

Mike Rimer, AICP
Transportation Planning Specialist
PennDOT Program Center
(717) 836-3433
mrimer@pa.gov

pennsylvania
DEPARTMENT OF TRANSPORTATION

Discussion

pennsylvania
DEPARTMENT OF TRANSPORTATION