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**Autonomous
Trucking:**

**Future Impact
on Railroads**

KSRRRA RAIL FREIGHT CONFERENCE



AUTONOMOUS TRUCKING

FUTURE IMPACT ON RAILROADS



Jason Sharp, Esq.
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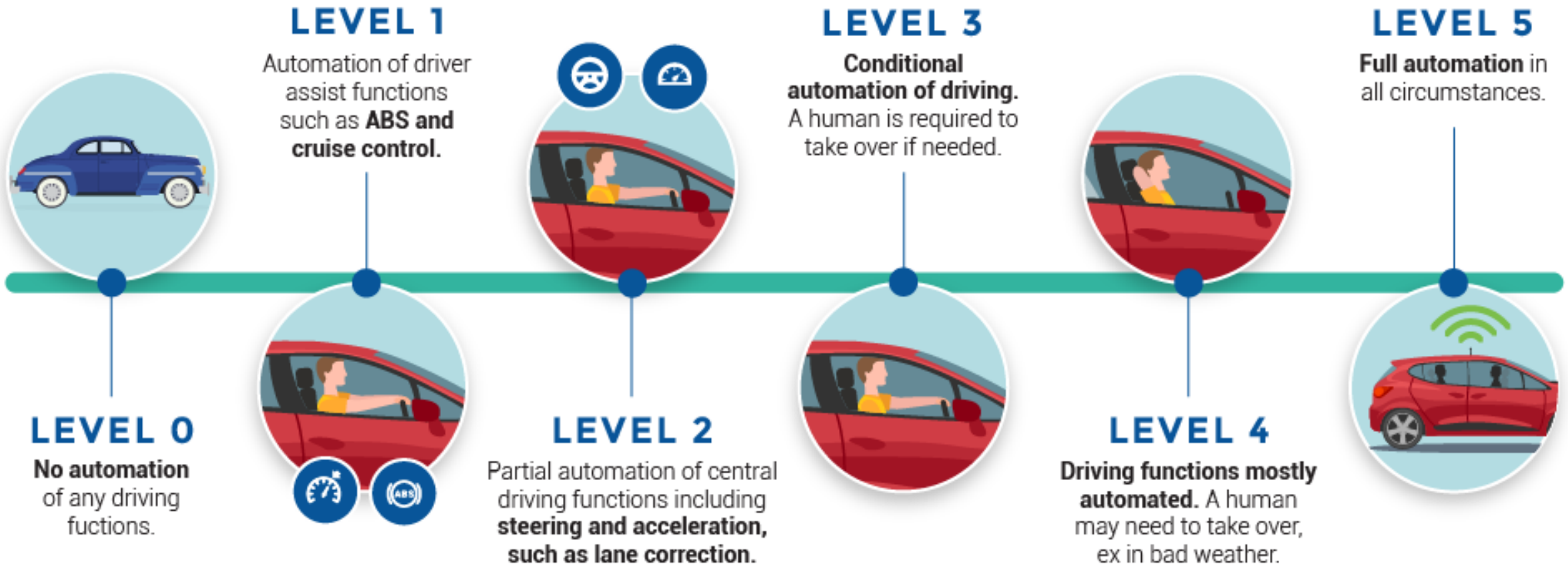
Mark C. Kopko

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AUTOMATED TRUCKING

LEVELS OF AUTOMATION



TYPES OF AUTOMATED TRUCKING



Automated Truck

- SAE Level 4 or 5
- Example: TuSimple



Automated Truck with Platooning Capabilities

- SAE Level 1 or 2
- Example: Peloton



Automated Truck with Platooning Capabilities

- SAE Level 4 or 5
- Example: Locomotion



WHY AUTOMATED TRUCKING?

- **What are the biggest drivers for automated trucking?**
 - Reduced/eliminated labor costs
 - Faster, all time delivery
 - Fuel efficiency, Particularly with Platooning



Fuel Savings
1st truck ~5%
2nd truck ~12%
3rd truck ~10%



- **What are the hurdles?**
 - Liability
 - Federal/State Approval of ADS systems and use
 - Public / Workforce Acceptance
 - Ability of large and small carriers to transition fleet
 - Electronification?



LOCATION, LOCATION, LOCATION

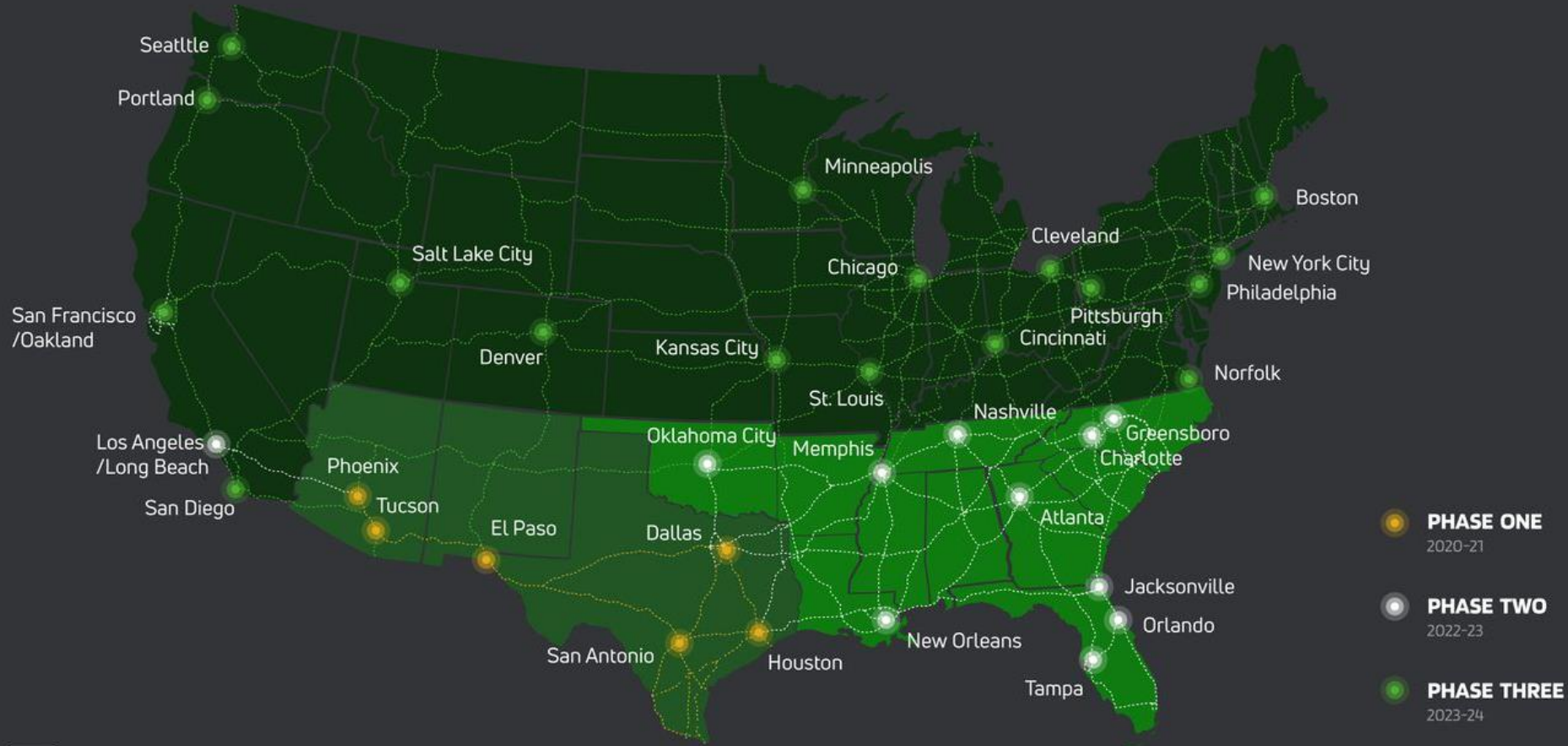


Top 5 Overall Corridors for Automated Freights

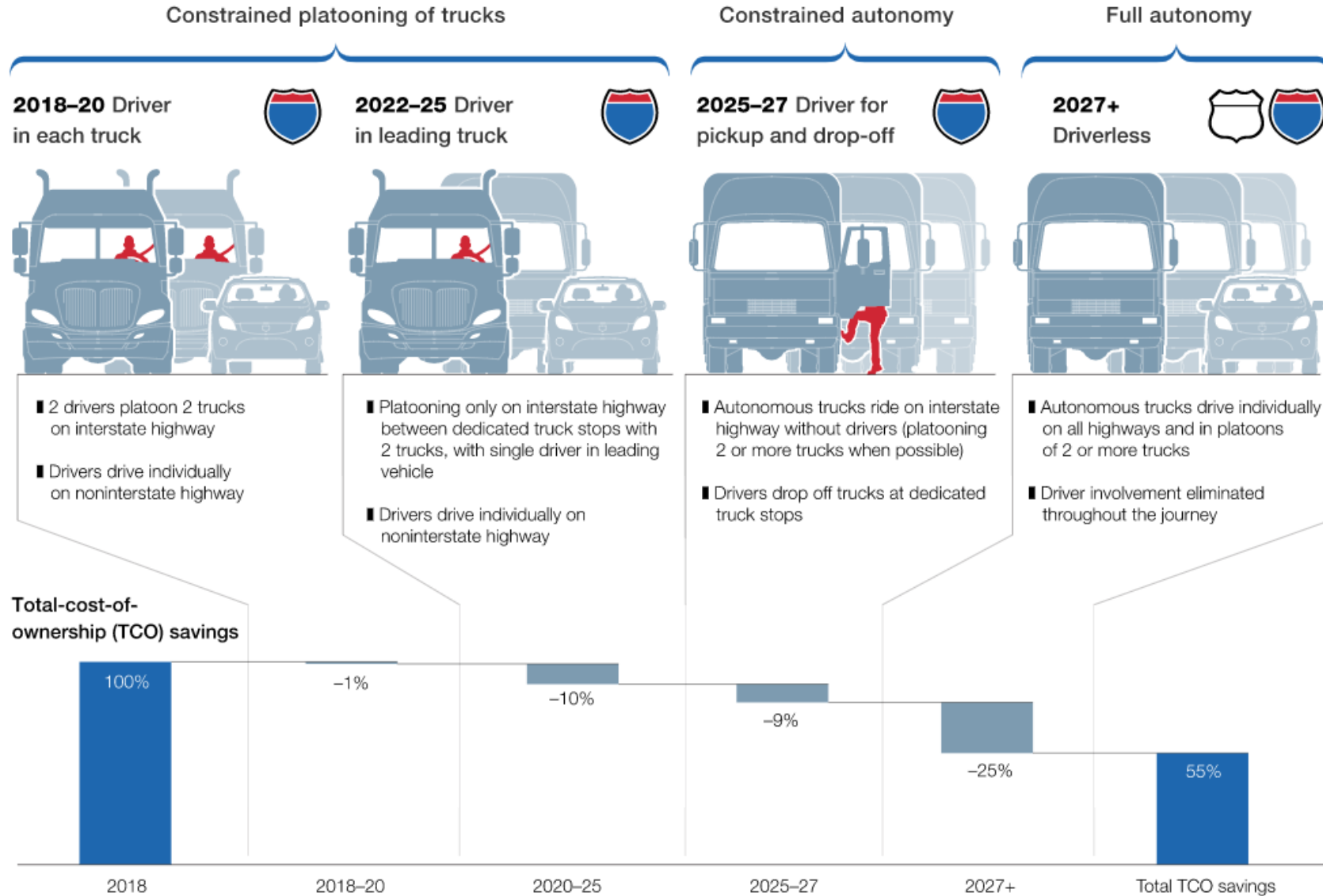


LOCATION, LOCATION, LOCATION

TuSimple Autonomous Freight Network Roll-Out Map



TIMELINE



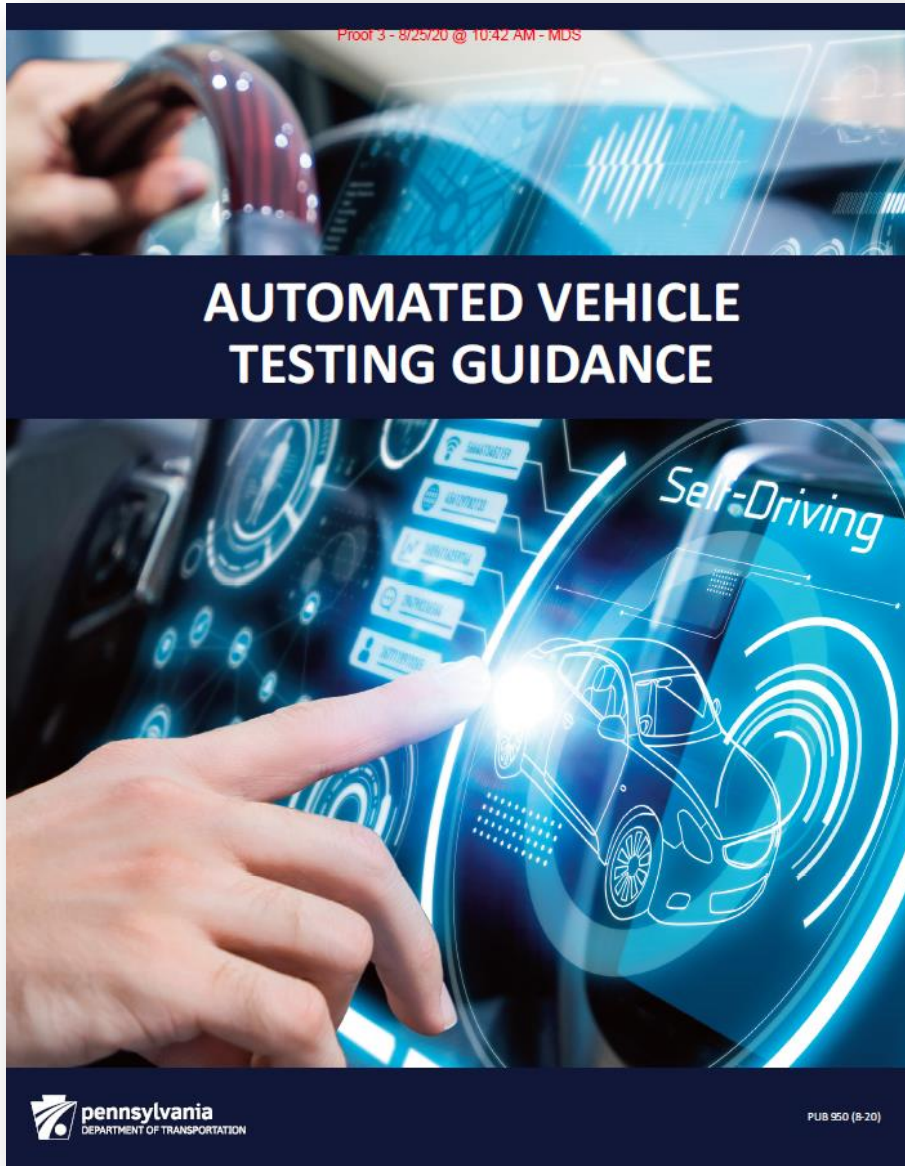
Source: *Route 2030: The fast track to the future of the commercial vehicle industry*, September 2018, McKinsey.com





AUTOMATION IN PENNSYLVANIA

AUTOMATION IN PA



- Under existing Pennsylvania law, the driver of any vehicle is a natural person who drives or is in actual physical control of a vehicle. Currently during AV testing, a licensed driver is required to be seated in the driver's seat with the ability to intervene in situations where the Automated Driving System (ADS) experiences a system interruption or other problem rendering the ADS unable to safely perform the dynamic driving task and the vehicle is unable to come to a minimal risk condition on its own.
- Under existing law, unoccupied and/or remote testing on trafficways is prohibited.



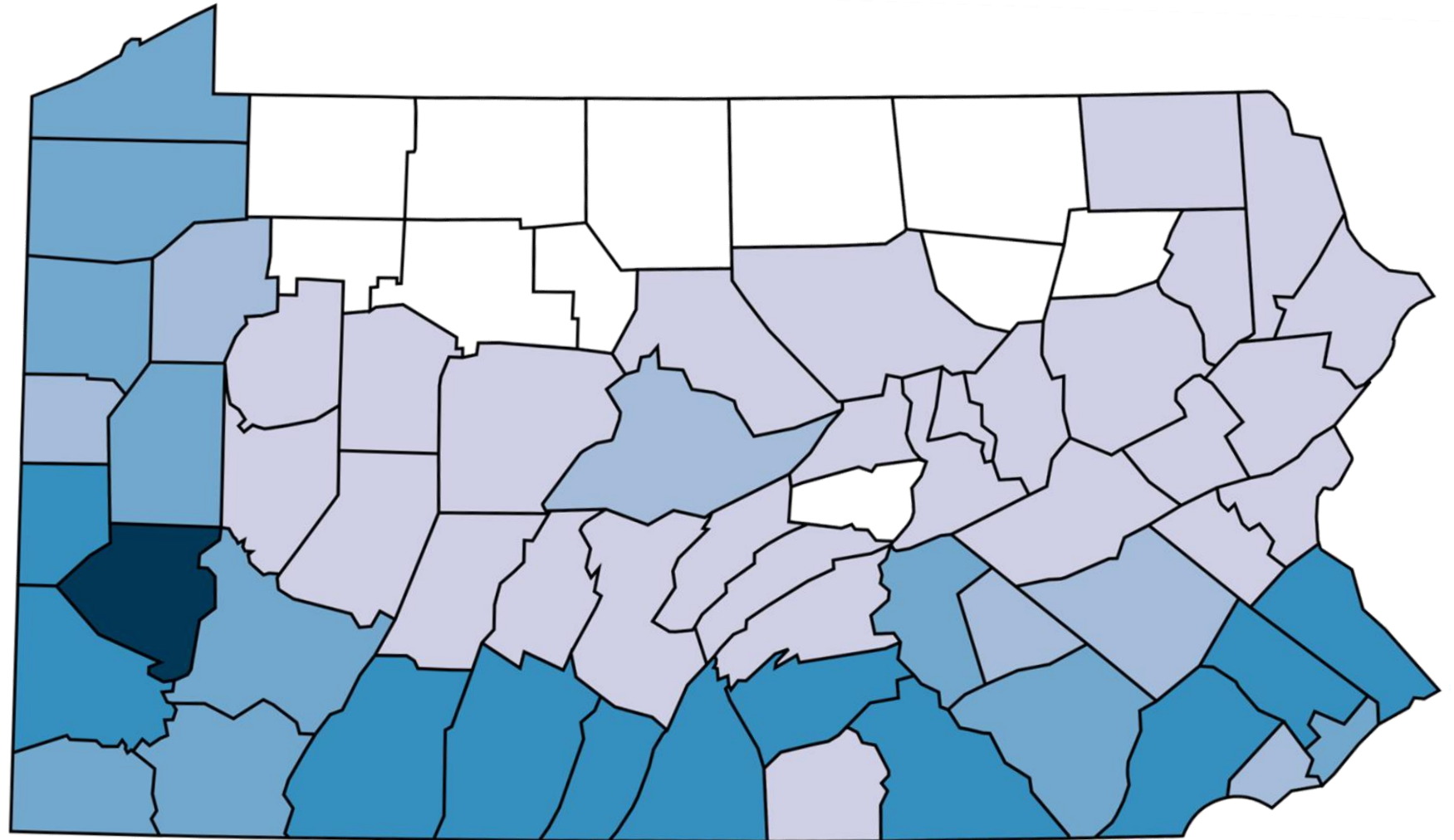
AUTOMATION IN PA

★ Aurora
Qualcomm
Carnegie Mellon University



★ plus.ai

★ LOCOMOTION



AV Testers by County



1

7



ACT 117 OF 2018



1st AV Legislation in Pennsylvania

- **Platooning**

- Limited to two or three buses, military vehicles or motor carriers.
- Restricted to limited access roadways
- Must have visual identifier
- Must submit operations plan for evaluation



PLATOONING IN PA



VEHICLE PLATOONING POLICY

April 22, 2019

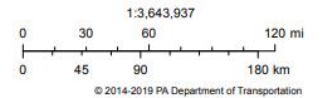


Base Platooning Routes



April 18, 2019

● Base Platooning Routes



PennDOT
PennDOT



MULTI-STATE DEMONSTRATION



Map Reference	Route Milestone	Segment		Cumulative		Location
		Duration	Length (mi)	Duration	Length (mi)	
A	Start Route	2 h 40 min	161	0 h 0 min	0	The Greater Pittsburgh Community Food Bank (1 N Linden St, Duquesne, PA 15110)
B	Service Stop	1 h 20 min	83	2 h 40 min	161	Middle Ridge Service Plaza (Milepost 139.5 – Westbound, Ohio Turnpike, Amherst, OH 44001)
C	Food Bank Stop	1 h 20 min	71	4 h 00 min	244	Toledo Northwestern Ohio Food Bank (24 E Woodruff Ave, Toledo, OH 43604)
D	End Route	n/a	n/a	5 h 20 min	315	Forgotten Harvest Food Rescue Organization (3000 W 14 Mile Rd, Royal Oak, MI 48073)





AUTOMATION & RAIL

CAN AV TRUCKS OR PLATOONS COMPETE WITH RAIL?

- According to GAO data, Class I railroads indicated that their average train length has increased by about 25 percent since 2008, with average lengths of 1.2 and 1.4 miles in 2017.
 - Difficult to envision how even longest of platoons could compete with that volume of movement.
- But how does that affect short lines, which can have trains of limited length and area of service?
 - Are AV Trucks a “threat, a challenge, or an opportunity”?
 - Do short lines try to compete or embrace, or both?



CAN AV TRUCKS OR PLATOONS COMPETE WITH RAIL? CONT.

- Does rail have an advantage because of advances in rail technology?
 - For example – Does rollout of technology for PTC and other advances give RRs a logistical leg up?
- “[H]ard to believe how automated trucks will actually work in a scaled environment with non-automated cars, pedestrians and all the other issues that come with a non-fixed right of way.”
 - But . . .



AV CORRIDORS? PLATOONS ON THE INTERSTATE?

- The Department of Transportation's Federal Highway Administration recently awarded a \$4.4 million grant to the Ohio Department of Transportation to help support the completion of the Interstate 70 truck automation corridor project, which will help advance truck automation technologies through the deployment of this technology along I-70 in both Ohio and Indiana.
- The project will provide freight companies and truck automation vendors an opportunity to deploy partially automated driving technology in daily "revenue service" operations on I-70 between Columbus, Ohio and Indianapolis, Indiana.



QUESTIONS?

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