



Autonomous Transportation Review

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PVMI PROGRAM *on* VEHICLE
and MOBILITY INNOVATION



Ryder's Business

- \$6.8 billion
- 234K vehicles
- 800+ maintenance locations
- 5,900 technicians
- 7,700+ drivers
- 250+ DCs
- 50,000+ customers



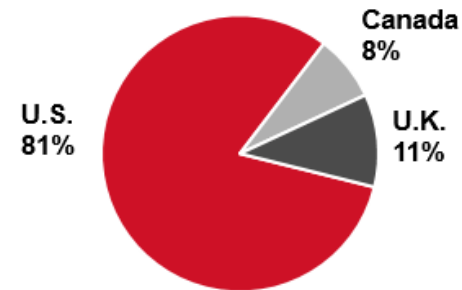
Fleet Management Solutions

FMS Overview

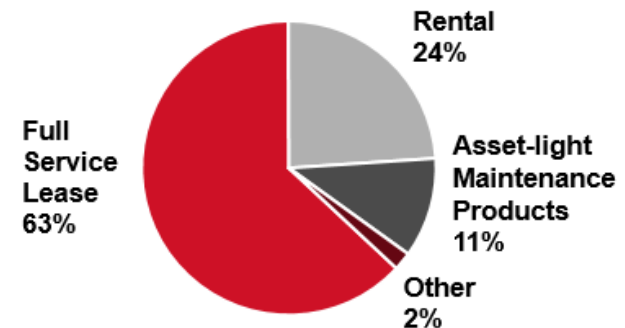
Operating Statistics

Assets	\$10.1B
Vehicles Maintained	234,000
Rental Fleet	37,000
Employees	12,400
Technicians	5,900
Refrigerated Tech	+1,000
Maintenance Shops	800
Used Vehicle Sales (annually)	+20K

Geographies



Product Mix



Transportation services with a well established business model and unmatched shop network

Dedicated Transportation Solutions

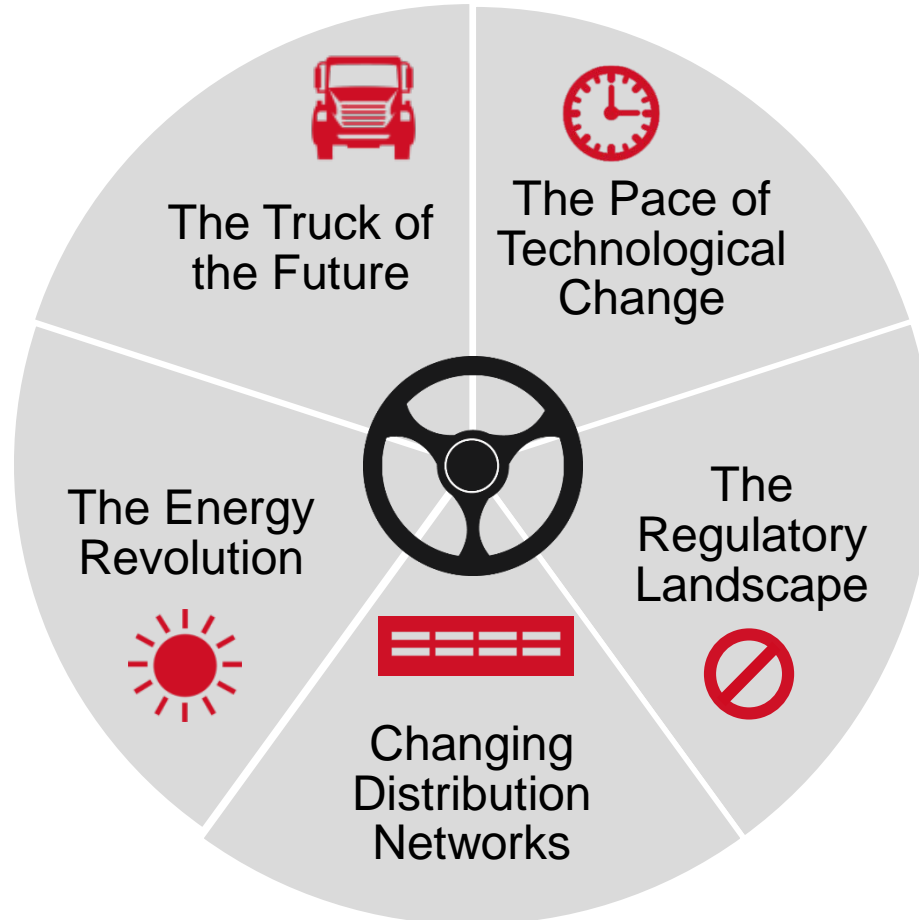
Dedicated Transportation Solutions



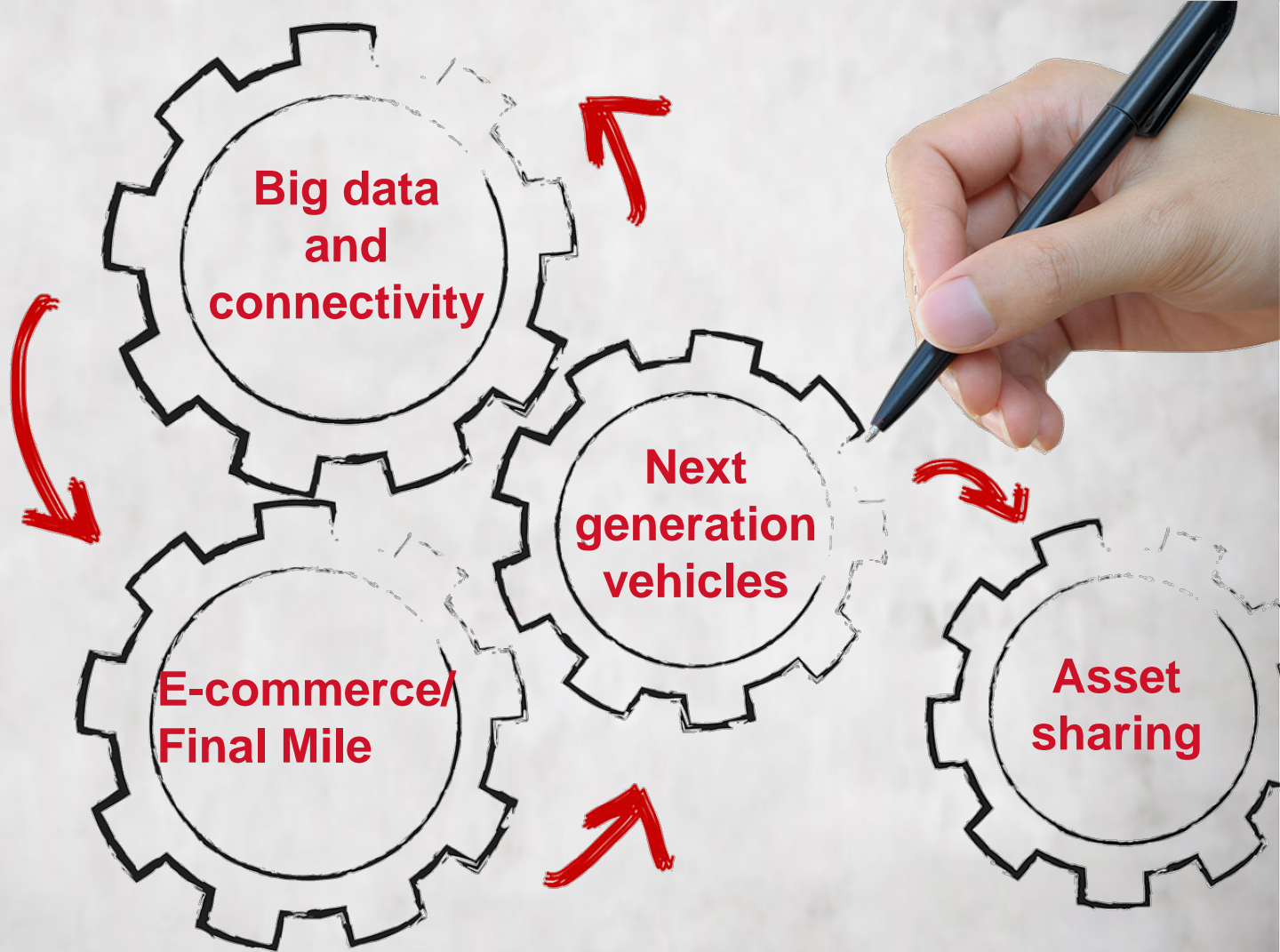
Operating Statistics

Total Vehicles	7,600
Power Vehicles	4,000
Drivers	7,700
Customer Locations	400
Lanes Operated	11,000+

Multiple Paradigm Shifts Facing the Industry



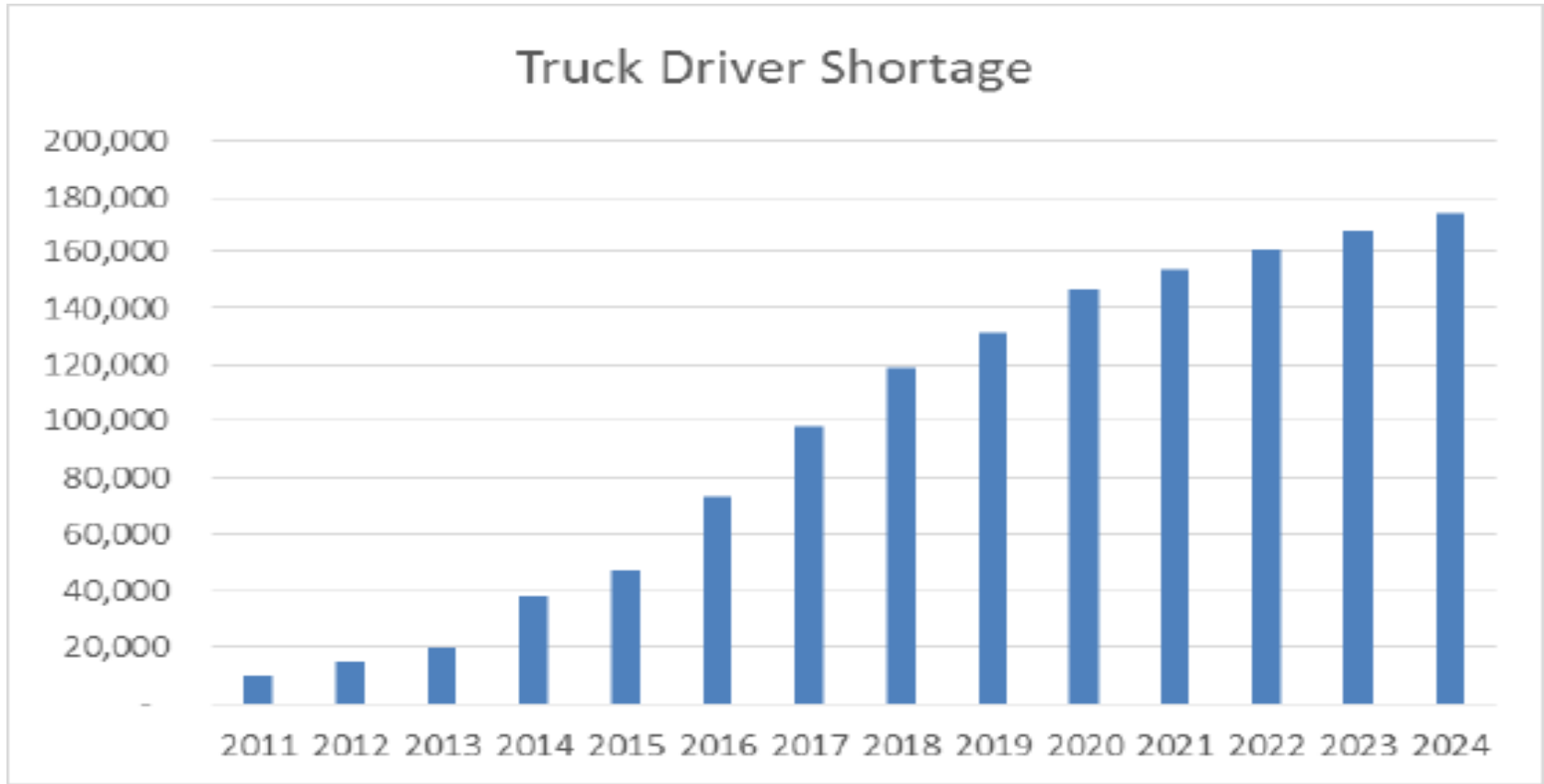
**RYDER HAS
LAUNCHED
STRATEGIC
INITIATIVES
TO ASSESS
THE IMPACT
OF FOUR KEY
DISRUPTIVE
TRENDS**



Autonomy's Impact On Employment

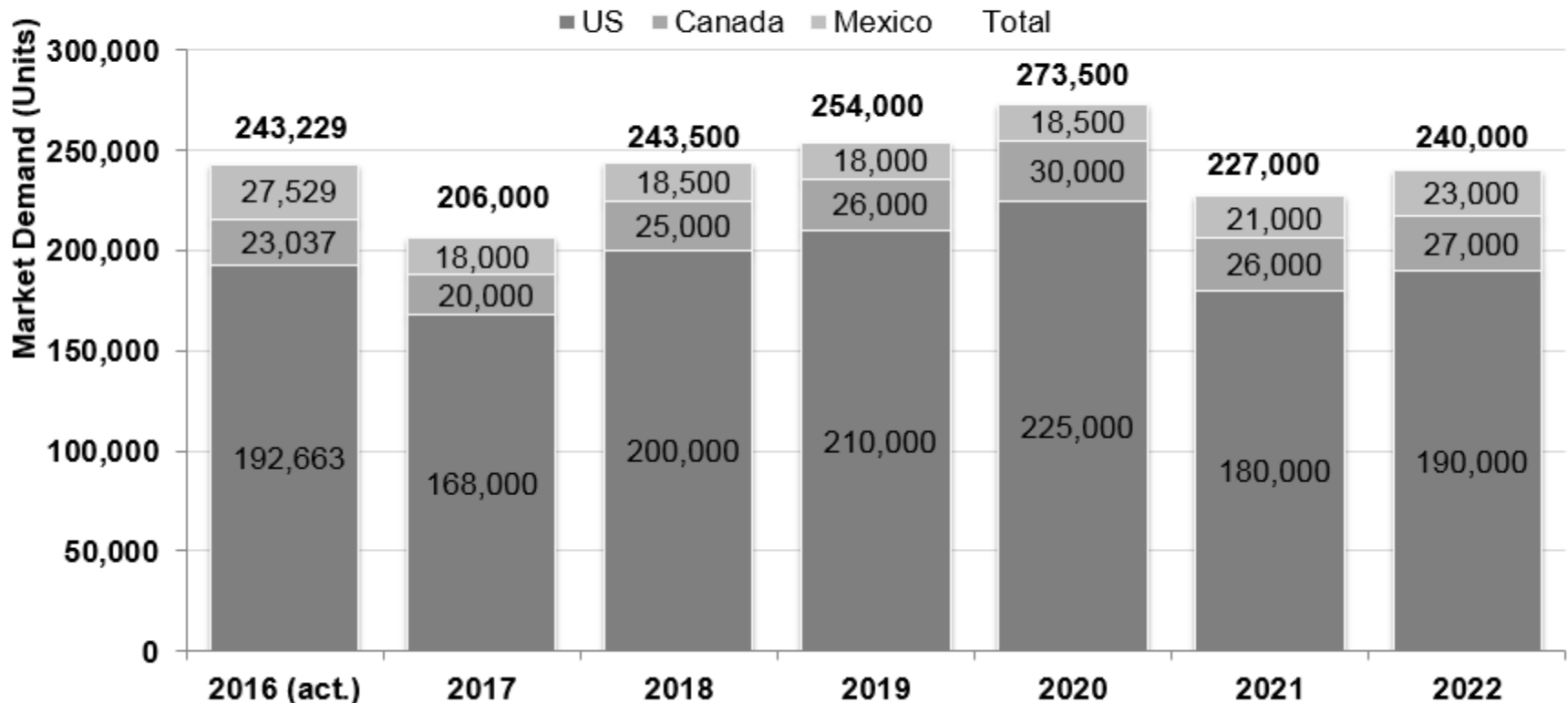


Talent Shortage – ATA Study (2015)



Class 8 Commercial Vehicle Production

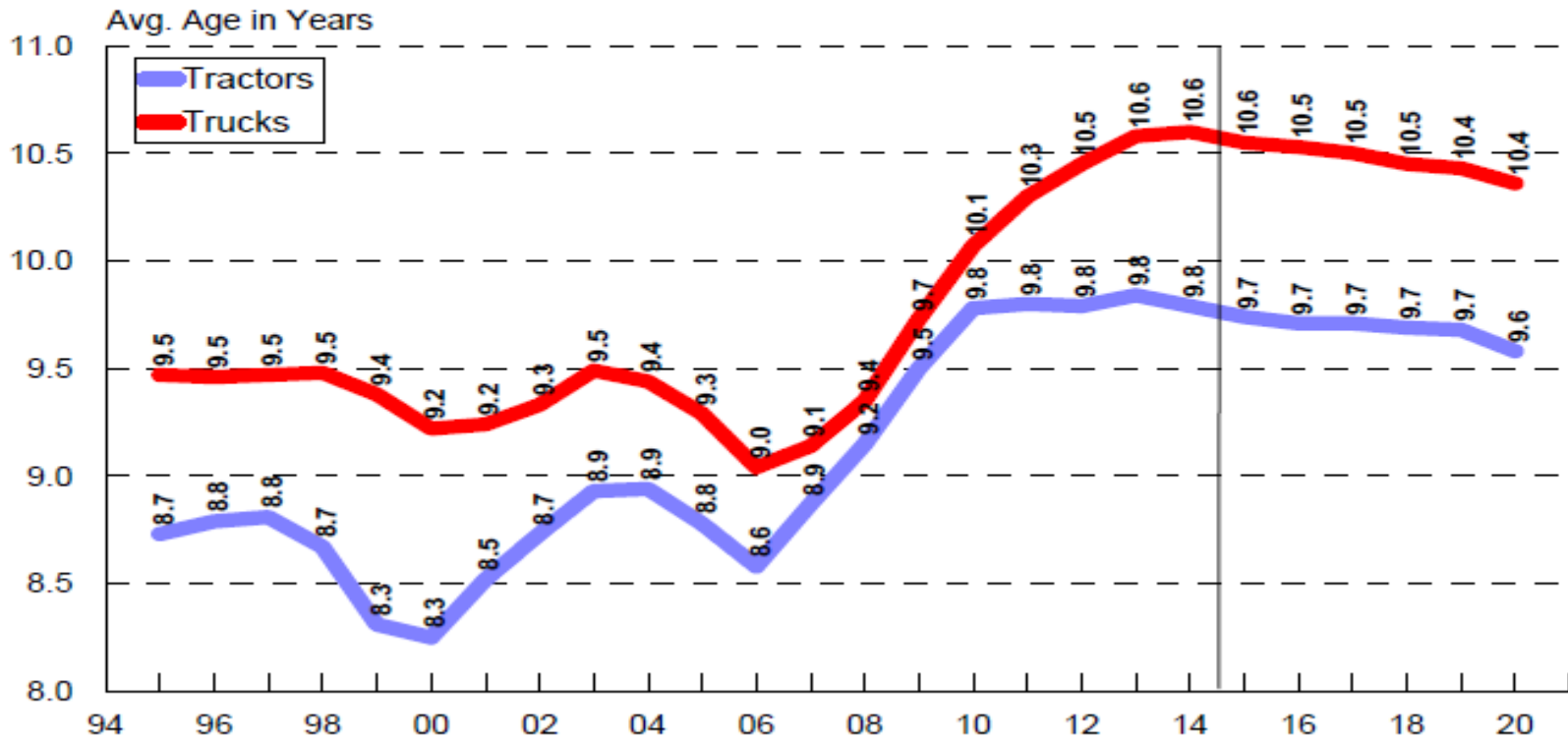
NAFTA Market Demand Forecast (2017-2022)



Average Vehicle Age-

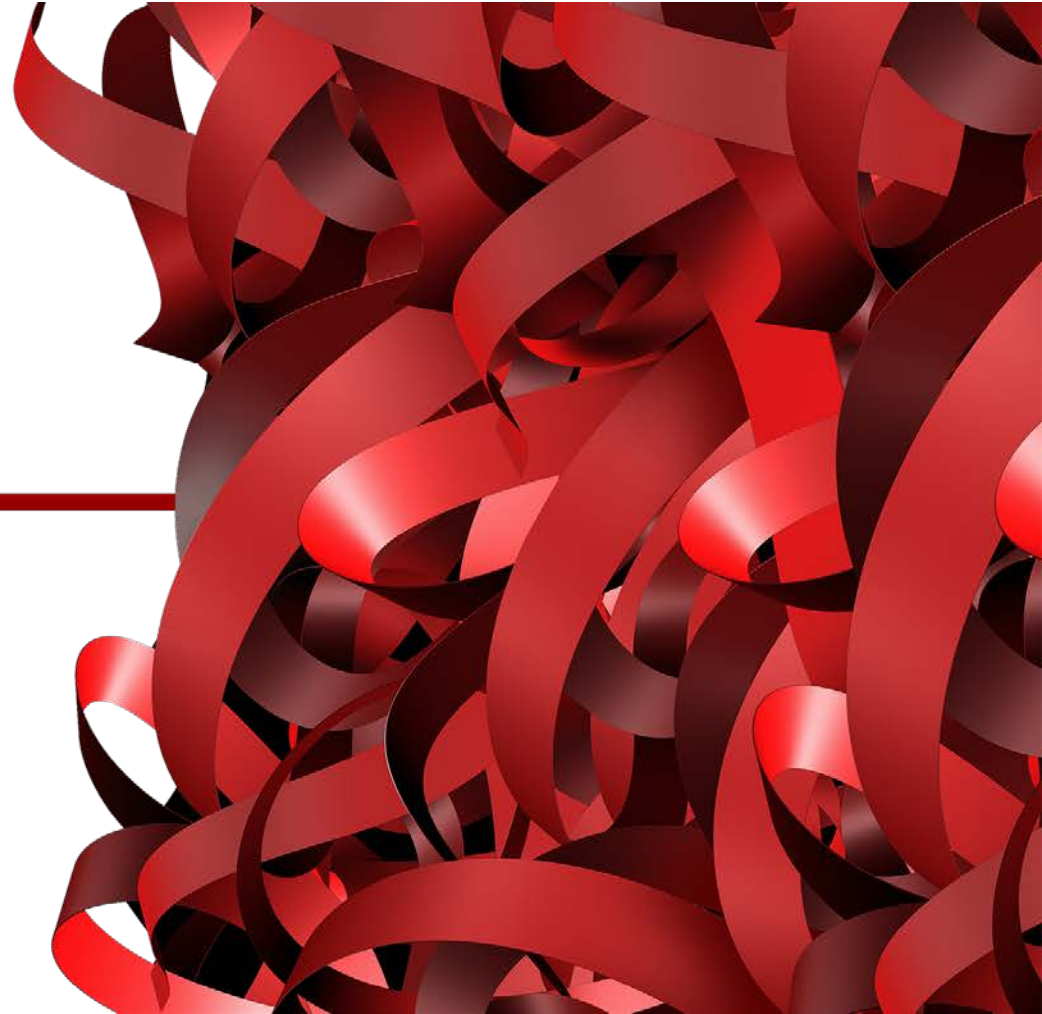
U.S. Class 8 Population Model Outputs: Average Age, TOTAL Population

1995 - 2020

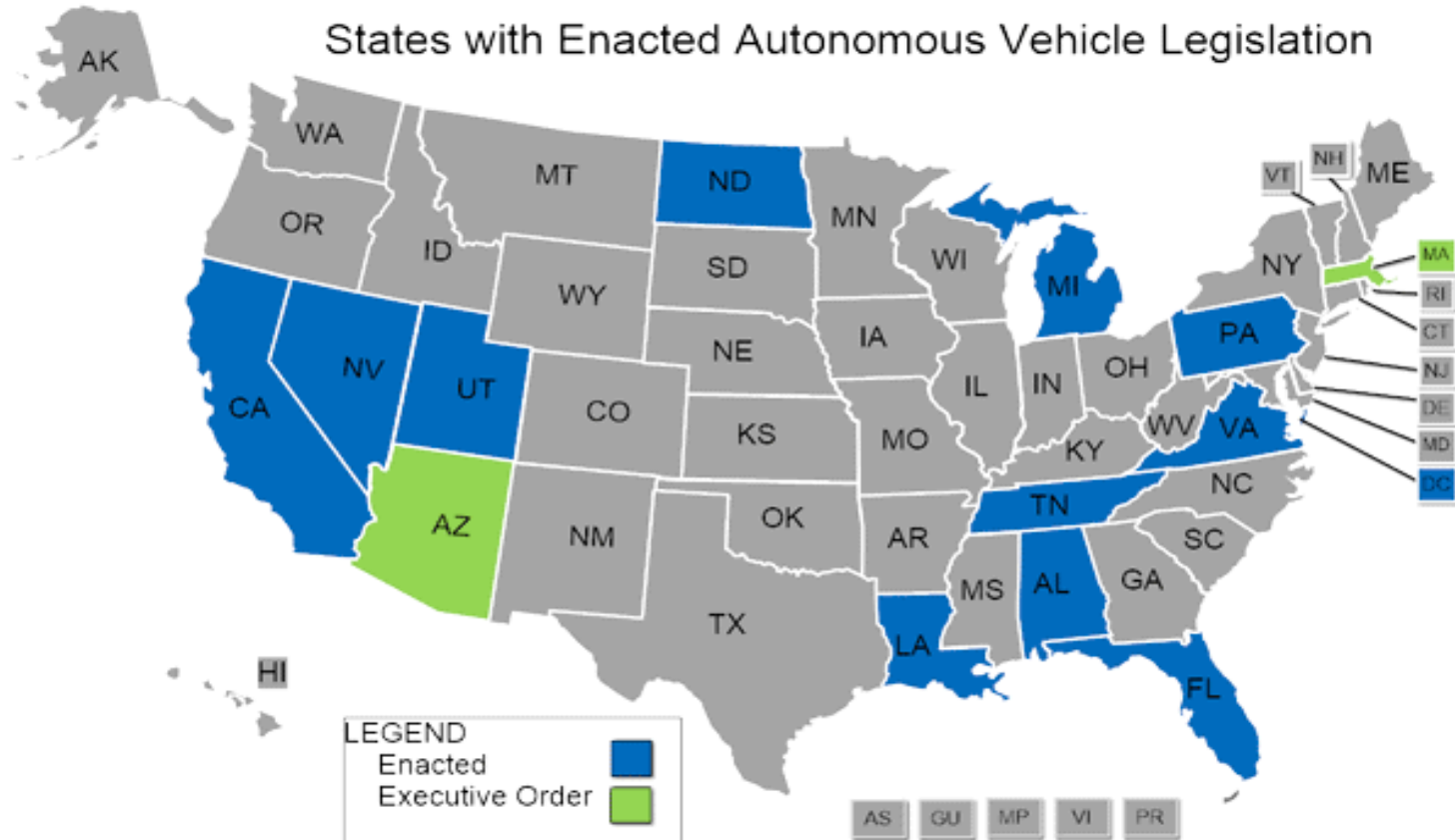


ACT Research Co., LLC: Copyright 2015

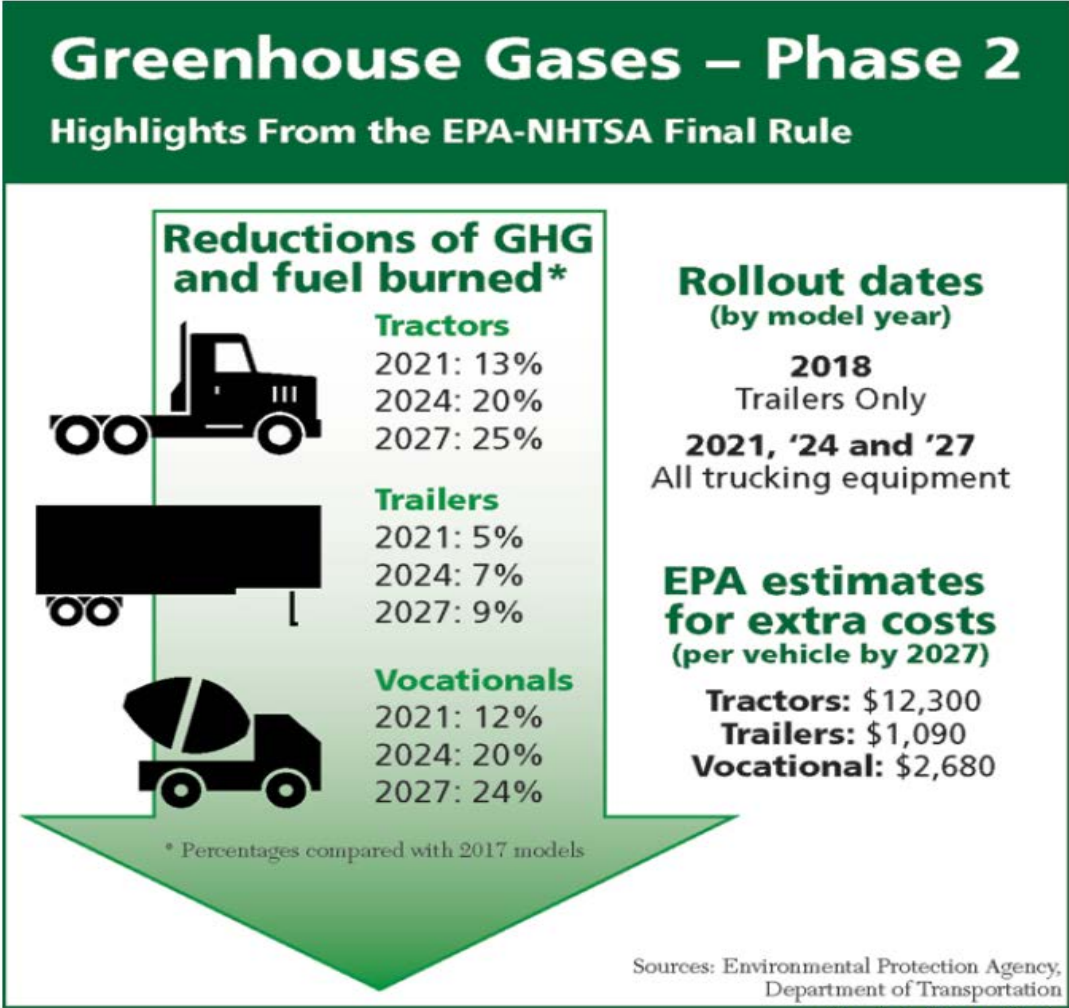
Regulatory Factors



Who's clearing the way?



GHG - Phase 2 Program Summary



Debra Devine/Transport Topics

Electronic Logging Device Mandate 2017

ELD Mandate Compliance Timeline

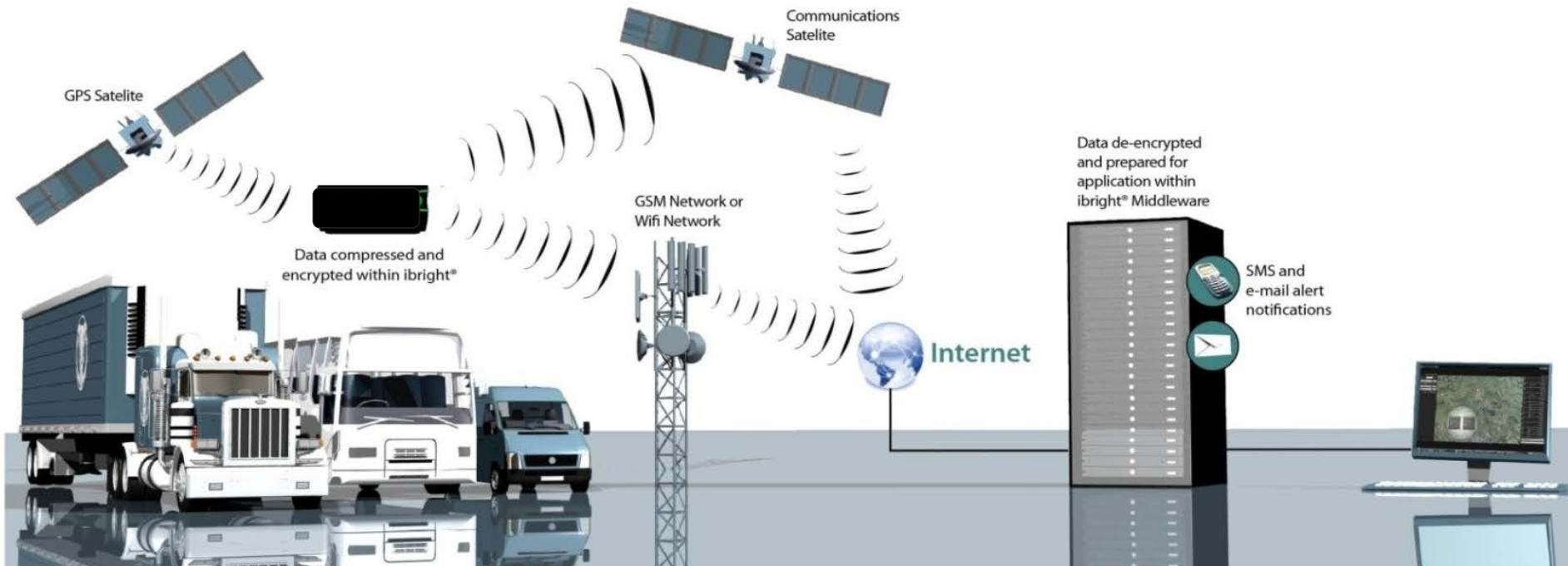
		"Compliance Date"		
		<u>Phase 1</u> Year 1-2	<u>Phase 2</u> Year 3-4	<u>Phase 3</u> Year 5+
		Before Dec 18, 2017	Dec 18, 2017 -to- Dec 16, 2019	After Dec 16, 2019
RODS Solution	Paper Logs	✓	✗	✗
	Logging Software (e.g. phone app)	✓	✗	✗
	AOBRD*	✓	✓	✗
	ELD	✓	✓	✓

Current RODS solutions all acceptable for customer use until Dec 2017 Compliance Date

FSMA- Cold Chain Tracking

Telematics is an Industry Best Practice, but is not mandated by the regulation

In this final rule, the demonstration must only be made if the shipper or receiver requests it, which is consistent with industry best practices and would likely only be done in situations in which it is suspected that there has been a material failure of temperature control.



Benefits of Autonomy in Highway Applications

- Safety
- Productivity
- Relieves Congestion
- Closes gap on driver shortage by reducing involuntary turnover

- Focuses driver efforts in elements of the supply chain where lower turnover is already being experienced (hourly/LTL – 11% versus 98% for TL), and where value-added activities occur.

- Allows for a gradual transition of workforce (starting in long-haul, highway duty cycles).

Challenges for Fleets

- More rigid maintenance protocols
 - Current State: 1X per year federal annual inspection
 - Future State: more rigorous and frequent **certification** of autonomous systems
- Requires a more technically focused maintenance team
 - Industry already facing a technician shortage
 - Complexity of current systems reducing pool of capable service providers

Asset Ownership

- Will ownership models change?
- Technology developers most focused on software and algorithms (IP), not hardware or manufacturing assets (tractors)
- Will integration of autonomous technologies shift the risk burden to the OEM versus the operator? Will dramatically higher safety performance mitigate that risk from an overall industry perspective?
- Compounding effect of next generation powertrains?

Mixed Fleets

- Autonomous & Traditional within the same fleet?
 - Technical Training
 - Driver Training (New classes/designations of drivers?)
- Autonomous Commercial Vehicles and Autonomous Passenger Vehicles?
 - Neural Networks
 - Infrastructure
 - V2V

Disruption – Ready or Not.....

