Level One Truck Platooning:
Commercial Deployment Status

Richard Bishop
TRB Truck / Bus Safety Committee, Technology Subcommittee
January 15, 2019
Truck Platooning Commercial Deployment: Outline

• Who’s in the Game?
• How Does It Work?
• Regulatory Factors
• Summary
December 2017: Driver Assistive Truck Platooning Pilot on Florida’s Turnpike
PlatoonPro: View from Follow Driver’s Perspective
Truck Platooning: Who’s In The Game?
Platooning Seeing Extensive Validation of 1st Gen Products, Evaluation of Advanced Capabilities

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Real world deployment is defined by what commercial companies are doing!
Trucks

ON-HIGHWAY PLATOONING SHOWCASE

• First public on-highway platooning showcase between a truck OEM and transporter in the U.S.

• Volvo Trucks in platooning research collaboration with FedEx and North Carolina Turnpike Authority.

• Volvo’s Cooperative Adaptive Cruise Control (CACC) using wireless vehicle-to-vehicle (V2V) communication technology.
MAN Trucks Pilot in Bavaria w/ DB Schenker
Platooning OEM Deployment Prospects

- Daimler/Freightliner?
  - Publicly noted development, test, and evaluation ongoing in recent years
  - Announced at CES they will shift main automation focus to L4 standalone trucks
  - Higher automation platooning still of interest
  - Platooning testing has shown “less than expected” benefits
  - Daimler perspective could reflect EU-centric view (smaller fleets, more need for cross-fleet platooning)

- Commercial trials by others have shown better than expected results re fuel economy improvements

- Daimler view not widely held: Volvo, PACCAR, Navistar continuing to proceed
Peloton Technology: “connected and automated vehicle technology company”

- Startup founded 2011, backed by ten Fortune Global 500 companies.
- 2019 launch of Level 1 two-truck platooning augmented by Cloud Support.
- Most visible player....
Truck Platooning: How Does It Work?
First Generation Platooning: Not Driverless!

• Level One Automation per SAE J3016
• Leader:
  – driver drives normally
  – may or may not use Adaptive Cruise Control
  – Forward Collision Avoidance and Mitigation always on
• Follower:
  – truck driver still responsible for steering and adjusting to road conditions in real-time (cut-ins, traffic, weather)
  – longitudinal control (throttle, brakes) is automated
  – Forward Collision Avoidance and Mitigation always on
• “Driver-Enhanced” rather than “Driver-less”
  – both drivers in direct radio contact and benefit from teamwork.
Power of V2V

Combined savings 10% 7% 4.5%
CONNECTED BRAKING KEY TO SAFE TRUCK PLATOONING
Making Close Following Safe: V2V

- Constant communication
- Immediate knowledge of required braking
- Gap set to ensure safety
- Intelligent ordering
Safety: Handling Vehicle Cut-ins

Driver sees car cutting in and backs off

OR

If driver does not respond, system radar detects cut-in vehicle and automatically begins to back off follow truck

Follow truck will continue to back off to safe manual following distance (100+ ft) and then give full manual control back to follow driver
Safety: Only Enabled for Suitable Roads & Conditions

Peloton Network Operations Cloud (NOC) and Procedures limit platooning to:

- Multi-lane, divided, limited access highways
- Moderate or low traffic conditions
- Good traction conditions (no heavy rain, sleet, ice or snow)
- Appropriate topography (good line of sight; no steep grades)

NOC provides over-the-horizon alerts to drivers on roadway conditions
Peloton Network Operations Cloud

Internet/Other Data
- Traffic
- Weather
- Construction Zones

Vehicle Data
- Engine
- Drivetrain
- Braking

Platooning Sensors
- Radar
- Video
- GPS

With Drivers
- Link Finding
- Safety Approvals
- Platoon Ordering
- Alerts/Warnings

With Hwy Operators
- Granular Weather
- Hwy Condition
- Accident Patterns
- Congestion Monitoring

With Fleet Managers
- Analytics
- Diagnostics
- Predictive Maintenance
BUSINESS MODEL / DEPLOYMENT
Top Use Case: Single-Fleet, Hub-to-Hub Routes

Example Strong Customer Profile:

- 50+ “return-to-hub” runs (regional haul)
- Fleet drivers
- Scheduled and manual NOC pairing
- Homogenous tractor configurations
Maximize Platooning Usage

Low Hanging Fruit
- Intra-Fleet

Facilitated/Coordinated
- Major Shippers
- Brokerages/3PLs
- Peloton NOC
- Telematics Partnerships

Long-Term
- Ubiquitous Platooning
Maximize Platooning Usage

Low Hanging Fruit

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Long-Term

Ubiquitous Platooning

Still limited to suitable highways and conditions!
Solid Demand From Top Fleets
Truck Platooning: Regulatory Factors
National Context:
No Federal Barriers; Govt-Industry Collaboration

• Driver-assistive truck platooning complies with federal law, and requires no changes for commercial deployment, as confirmed by federal regulators.

• USDOT, USDOE, and others have participated in demonstrations and funded studies to promote and understand the benefits of the technology.

• USDOT’s recent Policy Guidance 3.0 calls on states to remove barriers to truck platooning, stating:

  “States should consider reviewing and potentially modifying traffic laws and regulations that may be barriers to automated vehicles. For example, several States have following distance laws that prohibit trucks from following too closely to each other, effectively prohibiting automated truck platooning applications.” – US DOT Automated Vehicles 3.0, Preparing for the Future of Transportation
Numerical Minimum Following States

- A defined numeric minimum following distance in 24 states
- Platooning requires change in law

“Reasonable and Prudent” States

- A flexible, discretionary standard in 26 states
- Platooning can be legal under current law
National Context: Platooning Allowance Clarified

Full Commercial Deployment allowed in 18 States
Summary
Key Activity Ahead – Peloton Technology

• Peloton bringing driver-assistive truck platooning into commercial ops with selected fleets, 2018-2019.
• Robust activity continues in California as Peloton continues joint integration and validation work with OEMs.
• Commercial freight platooning activity over the coming months in Texas with major fleets.
• Activity expanding into other states over next quarters in coordination with major fleets.
• Ongoing work with allies to explore platooning allowance in additional states and international markets.
Summary

• Platooning provides significant business and societal benefits at a low level of automation where drivers are fully engaged.
• Platooning systems with best-in-class safety equipment combined with best practices for safety design improve safety of the roadway.
• As long as safety measures are adequate, other impacts can be assessed in parallel with deployment.
• As truck platooning comes into use, empirical data should be collected to further understand safety and traffic factors.
Thank You

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