Truck Platooning
The State of the Industry and Future Research Topics

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Overview

- Background
- International Truck Platoon Testing and Demonstrations
- U.S. Truck Platoon Activities
- Safe Truck Platooning Deployment – Traffic and Roadside Enforcement Perspective
- Future Research Topics
Truck Platooning

- Definition:
  - Coordinated operation of two or more trucks via cooperative adaptive cruise control (CACC).
  - With CACC, the lead truck is wirelessly connected to following trucks and sending messages that affect throttle, brakes, and brake lights (longitudinal control).
  - Drivers are still behind the wheel to steer and identify hazards (lateral control).
  - Following trucks automatically increase separation if another vehicle intersects platoon.

- Platooning potential benefits:
  - Energy savings from aerodynamic drag reduction.
  - Potential for reduced highway congestion (shorter following distance).
  - Possible safety improvements from faster reaction times and supporting systems (e.g., AEB, air-disc brakes).
International Truck Platoon Testing & Demonstrations
U.S. Truck Platoon Activities—Public Sector

States Supporting Truck Platoon Demonstrations and Testing
(16 States)
Several entities conducting truck platoon demonstrations and testing:

- Daimler—Freightliner/Western Star
- Peloton
- PACCAR—Kenworth/Peterbilt
- Volvo (Caltrans, UC-Berkley PATH)
- Navistar—International (TxDOT, Texas A&M Trans. Inst.)
- TuSimple
- Tesla
Joint FHWA-FMCSA Truck Platoon and Inspection Demonstration

- FHWA-Caltrans-PATH-Volvo team used three specially equipped tractor semi-trailers and demonstrated cooperative adaptive cruise control.

- Demo consisted of 3-5 mile loop on Interstate 66 in Northern Virginia in September 2017.

- FMCSA field staff and the Virginia State Police conducted inspection demonstrations.

- Virginia Department of Motor Vehicles (DMV) demonstrated infrared inspection system van for demonstration of tire, brake, and wheel hub inspection.
Safe Truck Platooning Deployment – Traffic and Roadside Enforcement Perspective

Master Trooper Robert Tershak

- Key takeaways from the Virginia demonstration.
- Operational safety issues.
- Deployment issues to consider.

FMCSA photo
Safe Truck Platooning Deployment – Traffic and Roadside Enforcement Perspective

- **Operational considerations to support future deployment:**
  - Number of vehicles in a platoon.
  - Best practices for safe traffic merging.
  - Driver training.
  - Consensus on vehicle markings.
  - Weather.
  - Time of day.
  - Law enforcement training.

- **Additional considerations:**
  - Legislative changes to following distance statutes.
  - Uniformity of operations to support interstate commerce.
Safe Truck Platooning Deployment – Traffic and Roadside Enforcement Perspective

- Compliance:
  - Inspector Training
  - Inspections
  - Federal Motor Carrier Safety Regulations, State & Local Laws
  - Approved Equipment

- Safety:
  - Driver Qualification & Training
  - Authorized Carriers
  - Disqualifying Violations
  - Public Education
  - Government Officials (DMV)
Future Research Topics on Truck Platooning

- Human factors:
  - Surrounding traffic (drivers in vehicles around platoons).
  - CMV drivers (lead and following CMVs).

- Best practices for fleet maintenance and inspection:
  - Critical vehicle components (brakes, tires, lights).
  - Sensors and communications (radar, dedicated short-range communications [DSRC], cameras).
  - Predictive analytics for preventative maintenance.

- Best practices for safe operations:
  - Safe following distances.
  - Cybersecurity.
Contact Information

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