

US DOT Truck Platooning Research Program

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What is Level 1 Truck Platooning?

- Employs longitudinal control only (throttle and brakes), driver steers the truck.
- Builds on production adaptive cruise control (ACC).
- Uses vehicle-to-vehicle (V2V) communication.



Potential Benefits

- Reduced emissions and energy use from aerodynamic drag reduction.
- Improved safety from faster reaction times and supporting systems.
- Reduced highway congestion (shorter following distance).
- Reduced driver workload.

7%

“Average” Platoon Fuel Savings

Source: Recent Public and Private Sector Results

21% – 39%

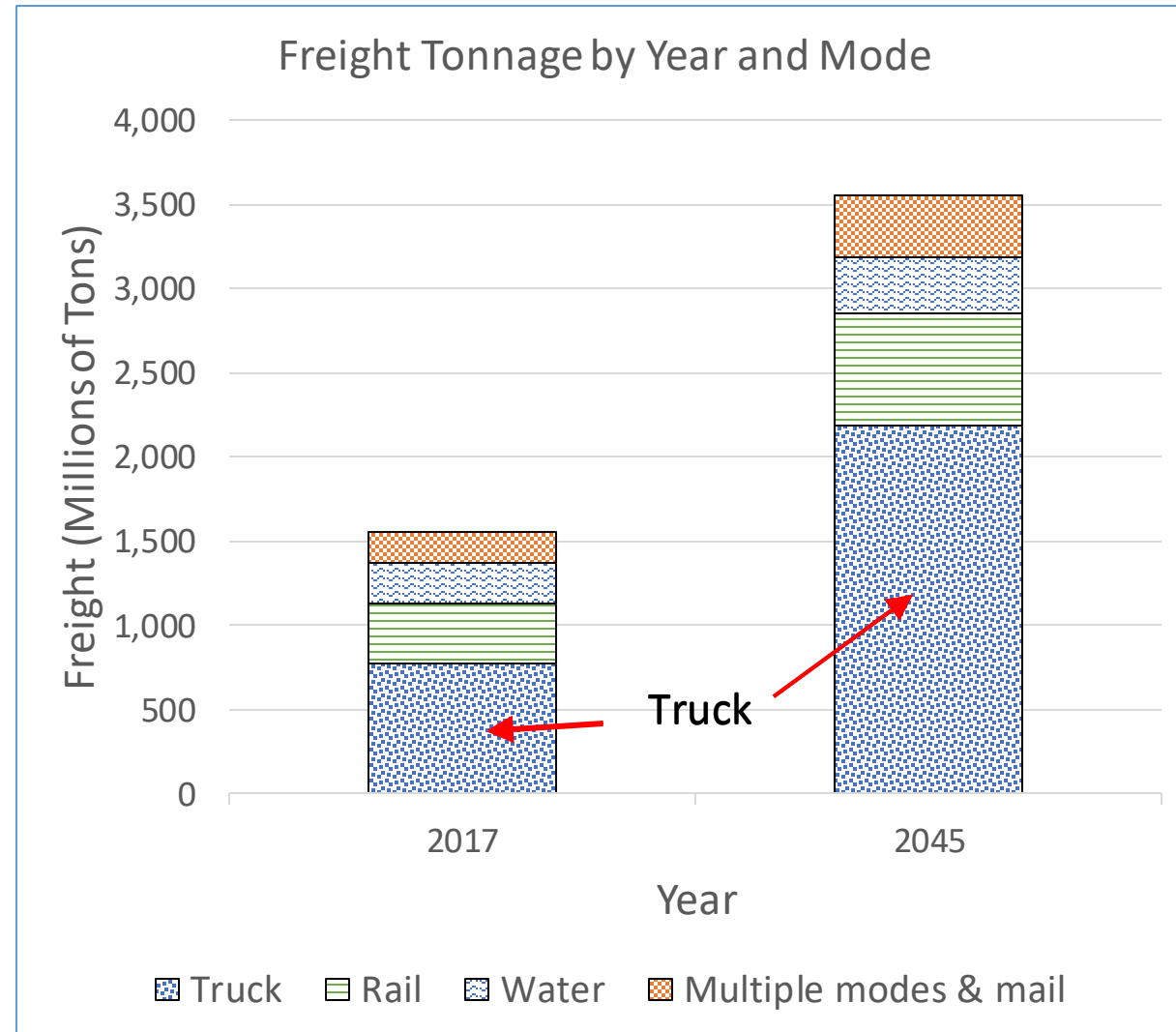
Range of Fuel Cost as a Percent of Total Motor Carrier Costs (2009 – 2017)

Source: ATRI



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Data Source: USDOT



Key Research Questions

Building on previous research, the technology is moving to early deployment, but questions still remain:

- Will truck platoons be safe over the long term?
- Under what conditions will truck platoons be able to operate?
- What impacts will truck platooning have on:
 - Truck driver behavior?
 - Other highway users?
 - Traffic flow?
 - Bridge infrastructure?



Current Research Efforts

- Human Factors Issues Related to Truck Platooning.
- Truck Platooning Early Deployment Assessment.
- Other Related USDOT Research Efforts.

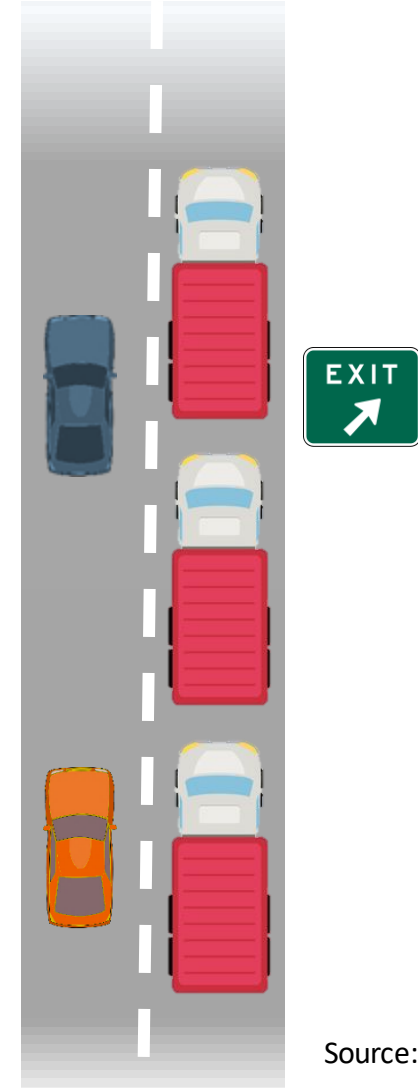


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Human Factors Issues Related to Truck Platooning Operations

- Main issue: How will other drivers behave around truck platoons?
- Approach:
 - Sign Laboratory Study.
 - Driving Simulator Study.



Source: FHWA



Human Factors Sign Laboratory Study

- Images of simulated trucks near highway entrance and exit.
 - Ask participants to report their understanding and likely actions.

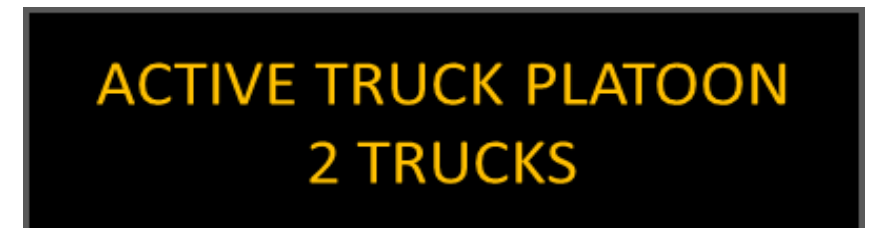
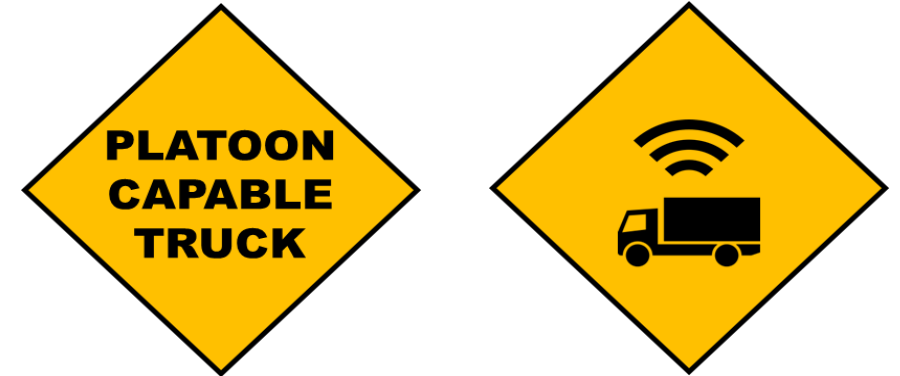


Source: FHWA



Human Factors Sign Laboratory Study

- Images of simulated trucks near highway entrance and exit.
 - Ask participants to report their understanding and likely actions.
- Test comprehension for various visual indicators.



Human Factors Driving Simulator Study

- Subjects experience driving a passenger car in the presence of truck platoons around freeway entry and exit.
- Variables include:
 - Platoon size (two or three-trucks).
 - Gap spacing.
 - Signage.
- “Twinning” with European Commission ENSEMBLE project.



Source: FHWA



Current Research Efforts

- Human Factors Issues Related to Truck Platooning.
- **Truck Platooning Early Deployment Assessment.**
- Other Related USDOT Research Efforts.



Truck Platooning Early Deployment Assessment – Goals

- Understand how truck platoons will behave in a regular operational environment.
 - Previous research involved limited testing and demonstration.
- Inform State and local stakeholders making decisions related to truck platooning regulations.



Source: FHWA



Truck Platooning Early Deployment Assessment – Approach

- Operate truck platoons on their regular delivery routes over an extended time period.
- Collect a variety of data related to the vehicles, environment, and drivers to assess safety, efficiency, and mobility impacts.
- Establish partnerships:
 - **External** to leverage current industry and State agency plans for truck platooning operations.
 - **Internal** to leverage research in other USDOT modes and in DOE.



Truck Platooning Early Deployment Assessment – Two Phases

- Phase 1 – Concept Development (*current*)
 - Three teams funded to develop detailed plans and proposals for an operational test.
 - Proposals due end of this year.
- Phase 2 – Field Operational Test and Evaluation
One or more teams selected for Phase 2.



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- Truck Platooning Early Deployment Assessment.
- Other Related USDOT Research Efforts.

Other Related USDOT Research

- FHWA Truck Platooning Impacts on Bridges
- NHTSA Truck Platooning Safety/Hazard Analysis
- FMCSA Braking Performance Stopping Distance Variability
- FMCSA Real Time Dynamic Brake Assessment
- FMCSA Law Enforcement Interaction with Commercial Automated Vehicles

In Summary

- Truck Platooning technology is in the early deployment stage.
- It promises potential benefits to transportation efficiency and safety.
- USDOT and its state and local partners want to better understand the potential impacts of the technology on our nation's highways.



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