Autonomous Trucking

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An effort of the Carbon War Room and the North American Council for Freight Efficiency
Today

- Trucking Efficiency
- Fleet Fuel Situation
- Technologies
- Autonomous Trucking
- Questions
Dedicated to doubling the efficiency of North American goods movement

We pursue this goal in two ways:
1. By improving the quality of information flow and
2. By highlighting successful adoption of technologies

www.nacfe.org

www.truckingefficiency.org
US Trucking Fuel Costs

2014 = ~$70,000/year/truck, 2016 = ~$36,000/year/truck
2020 = ?, 2026 = ?
4th Annual Fleet Fuel Study
Fuel Economy Technologies

- Which ones are most popular on new trucks?
- Did they keep buying them?
- Are they delivering fuel savings?
Confidence Reports

Complete, unbiased review of available technologies for fleet confidence to adopt.

- Tire Pressure Systems
- 6x2 Axles
- Idle Reduction
- Transmissions
- Engine Parameters
- LRR Tires
- Lightweighting
- Downspeeding
- Maintenance for FE
- Determining Efficiency
- Trailer Aerodynamics
- Tractor Aerodynamics
- Lubricants
- Platooning
- Driver Coaching
Paradigm Shift in Trucking?

Trends

- Urbanization, Smaller stuff, Internet buying, Computing power, Labor shortage
- “Uber for Trucking”
- “Smarter” Powertrains
- Location Based Techs
- Safety Techs -> Automated -> Autonomous Driving
- Reliability Improves
- Mode Transfer More Efficient
- Alternative Fuels
- Incremental Tech Adoption
  E.g. Cameras replace mirrors
Paradigm Shift in Trucking?

Trends

• Urbanization
• Internet buying
• Computing power, labor shortage
• “Uber for trucking”
• “Smarter” powertrains
• Location based techs
• Safety techs
  - Automated
  - Autonomous
• Reliability
• Mode transfer
• Alternative fuels
• Incremental tech adoption
  - E.g. Cameras replace mirrors

Improved delivery times and aerodynamics
Path to Autonomous Trucking

- Early Adopters
  - Ag, Mining, Defense, Ports
- Evolution rather than Revolution
- Frost & Sullivan, TMC, + Studies
- Peloton, Daimler “2025”, Freightliner Inspiration, European Platoon Challenge, etc.
- Passenger Cars; Google, etc.
- Implications
  - Safety, Efficiency, Driver fatigue/attraction, Congestion
  - Technical, Legal, Social
  - Where is the value?
Path to Autonomous Trucking

• DOT Levels
  – L1 Assisted
  – L2 Semi-Automated
  – L3 Highly Automated
  – L4 Fully Automated

• Demonstrations

  L2: Peloton 2 Truck Platooning (2014)

  Verified savings @ 36ft, 64mph, 4200ft (CR England/NACFE):
  10% on rear truck
  4.5% on front truck

  L3: Daimler Highway Pilot Connect (2016)

Roeth Timeline

- **2016**: Scaling Current Techs (~ 9 mpg)
- **2021**: Bringing SuperTruck(s) to Market (~11 mpg)
- **2026**: Platooning (~12 mpg)
  - **2026**: Highly Automated Driving (~12+ mpg)
Summary

Fleets are Taking Action
Manufacturers are Delivering
Autonomous Levels of Operation are Here
Doubling Freight Efficiency is Possible
Confidence Remains a Barrier
Thank You – Questions?

www.truckingefficiency.org
www.nacfe.org

We ARE the people we have been looking FOR!

For questions, comments and suggestions, contact Mike at 260.750.0106,
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Save Fuel, Less Emissions

- Confidence Reports
- Decision-Making Tools
- Workshops / Industry Events
- Tech Guide at [www.truckingefficiency.org](http://www.truckingefficiency.org)
- Helping you profit within GHG
- Thought Leadership
- Collaboration
- 2016 Run on Less Roadshow