Technology Adoption for Tractor Trailer Fuel Efficiency

Northwestern University -
Center for the Commercialization of Innovative Transportation Technology

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NACFE Overview

• NACFE is a non-profit organization dedicated to doubling the efficiency of the freight transportation industry

• We pursue this goal by
  – improving the quality and credibility of information flow
  – and highlighting the success of high efficiency technologies.
2011 Fleet Study

“Real Fleets. Real Experience.”
Fleet Study

• OTR Tractors and 53’ Trailers
• 8 Fleets; 30k tractors & 88k trailers.
• 2010 - 3.1b miles & 496m gals of fuel.
• 60 available technologies and practices bought.

• Findings
  • Adoption by fleet, by technology & fuel performance.
  • Interesting adoption experiences.
  • Best Practices in fuel management.
  • Conclusions and Recommendations
Prior NACFE Views

NACFE will Accelerate *Innovation* and *Early Adoption*

[Diagram of adoption curve with categories: Innovators, Early Adopters, Late Adopters, Laggards. Arrow indicates focus of NACFE.]
Some of the 60 Technologies & Practices
Adoption of technologies across all fleets
Fleets continued adoption even though fuel prices dropped.
Actual average mpg for all trucks in all fleets. Total miles driven / by fuel purchased. Includes multiple model years.
Technology Adoption vs IFTA mpg

Average 5 year savings vs. business as usual: $22,000 per truck

- All Fleets mpg
- Business as Usual
- All Fleets Adoption
Example of Other Findings

- Adoption record of each technology or practice by fleet.
- 60 technologies and practices.
  - Fast or slow to 100%.
  - Ramping up.
  - Started and stopped.
  - Not purchased.

Each Fleet is represented as a column showing adoption differences.
Adoption by Fleet

• All Fleets are in some stage of adoption of most of these technologies.

• These 8 fleets fell into three categories.
  – Early adopters
  – Late adopter / slow follower
  – Aggressive adopters

• 7 of the 8 fleets are now very similar in their overall adoption percentage.
## Additional Findings

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<tr>
<th>Interesting Technologies</th>
<th>Fleet Best Practices</th>
</tr>
</thead>
<tbody>
<tr>
<td>IT#1 Practices</td>
<td>BP#1 “MPG” Committee</td>
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<tr>
<td>IT#2 Tractor Aerodynamics</td>
<td>BP#2 Competent Fuel Team</td>
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<td>IT#3 Trailer Aerodynamics</td>
<td>BP#3 Lifecycle Cost Analysis</td>
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<td>IT#4 Tires and Wheels</td>
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<td>IT#5 Tire Inflation</td>
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<td>IT#7 Automated Transmissions</td>
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<td>IT#8 Weight</td>
<td>BP#8 Ensure Latest Features</td>
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<tr>
<td>IT#9 Auxiliary Power Units</td>
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</tbody>
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Fuel Performance

- All eight fleet’s average adoption over the study period moved from 30% to 48%.
- Each provided an average mpg for their trucks in the study group, by giving total miles travelled and gallons of fuel purchased by year as reported under the International Fuel Tax Agreement (IFTA). MPG decreased through 2008, then drastically improved.
Next Projects

1. Fleet Fuel Update – adding 2011 & 2012 Data
2. Barriers to Technology Adoption - ICCT
3. Road Test 6x2 Axle Package Combinations
4. Deep Dive on Tire Pressure Options
5. Deep Dive on Anti Idling Options

Please contact the me if you would like to support these next projects.
Conclusions

• Fleets are saving fuel $s.
  – Technologies and practices to adopt.
  – Specific fleet adoption experiences.
  – Overcoming declining mpg.
• Best Practices in fuel management.
• Suppliers and Support Organizations can learn.
• Report is available at www.nacfe.org.
Thank You!

Questions?

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