Presentation Overview

• Axiom/Opportunity
• Class 8 Trucks by the Numbers
• Demand Drivers
• Population/Average Age
• Forecast
• Emissions/Fuel Efficiency Standards
• Alternative Fuels
• Alternative Modes
• Questions
Axiom

• There is no substitute transportation mode for heavy trucks and tractor-trailers.
  • None. Not even if you live here.
The Opportunity
Class 8 Truck by the Numbers

- GVWR = 33,001+ lbs
- GCWR = 80,000 lbs
- Population\(^1\) = 2,552,865
- Vehicle miles traveled\(^1\) = 175,910,268,555
- Gallons of fuel consumed\(^1\) = 29,884,860,000
- MPG\(^1\) = 5.89
- Average Length of Haul\(^2\) = 206 miles

\(^1\) Combination vehicles only - Source: US DOT FHA Highway Statistics 2010
\(^2\) Source: Bureau of Transportation Statistics and US Census Bureau Commodity Flow Survey 2007
US Classes 3-8 Truck Retail Sales

History at a Glance

Percent Mix 1946 - YTD 2012
Class 8 Configurations

Straight Trucks

Sleeper

Non-sleeper (Day Cab)

Tractors (Combinations)
# Length of Haul

## Average Length of Haul

<table>
<thead>
<tr>
<th>Mode</th>
<th>2007</th>
<th>2002</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Modes</td>
<td>619</td>
<td>546</td>
</tr>
<tr>
<td>Truck</td>
<td>206</td>
<td>173</td>
</tr>
<tr>
<td>- For-hire</td>
<td>566</td>
<td>523</td>
</tr>
<tr>
<td>- Private</td>
<td>57</td>
<td>64</td>
</tr>
<tr>
<td>Rail</td>
<td>728</td>
<td>807</td>
</tr>
</tbody>
</table>

## Distribution of 2007 Truck Only

<table>
<thead>
<tr>
<th>Distance (Miles)</th>
<th>% Truck Tons</th>
<th>% Ton-Miles</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 50</td>
<td>65%</td>
<td>10%</td>
</tr>
<tr>
<td>50 – 99</td>
<td>11%</td>
<td>7%</td>
</tr>
<tr>
<td>100 – 249</td>
<td>11%</td>
<td>15%</td>
</tr>
<tr>
<td>250 – 499</td>
<td>6%</td>
<td>18%</td>
</tr>
<tr>
<td>500 – 749</td>
<td>3%</td>
<td>13%</td>
</tr>
<tr>
<td>750 – 999</td>
<td>2%</td>
<td>10%</td>
</tr>
<tr>
<td>1,000 – 1,499</td>
<td>1%</td>
<td>11%</td>
</tr>
<tr>
<td>1,500 – 2,000</td>
<td>1%</td>
<td>8%</td>
</tr>
<tr>
<td>&gt; 2,000</td>
<td>0%</td>
<td>7%</td>
</tr>
</tbody>
</table>

Source: Bureau of Transportation Statistics and US Census Bureau Commodity Flow Survey 2007
Demand Drivers

• Replacement
  – Roughly 75% of demand in any given period

• Economy/Freight
  – Each percentage point change in GDP equates to a 10-12,000 unit increase/decrease in trucks needed

• Trucker Profitability
  – Truckers do not add capacity during periods of weak profitability

• Used Truck Values
  – At record highs
Marginal Demand Considerations: *Evolution not Revolution*

<table>
<thead>
<tr>
<th>Detracting from Demand</th>
<th>Accretive to Demand</th>
<th>Trend Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retail Consolidation</td>
<td>Population Growth</td>
<td>Long-term</td>
</tr>
<tr>
<td>Packaging evolution</td>
<td>Internet Shopping</td>
<td>Long, Medium-term</td>
</tr>
<tr>
<td>Electronics Miniaturization</td>
<td>Ubiquitousness of electrons</td>
<td>Long-term</td>
</tr>
<tr>
<td>Intermodal</td>
<td></td>
<td>Long-term</td>
</tr>
<tr>
<td>Rising Oil Prices</td>
<td>Cheap Natural Gas</td>
<td>Recent/Now</td>
</tr>
<tr>
<td></td>
<td>Mfg. On-shoring</td>
<td>Coming</td>
</tr>
<tr>
<td>Rising Equipment Prices</td>
<td>Regulatory Onslaught</td>
<td>Now</td>
</tr>
</tbody>
</table>
Used Class 8 Sales Gap: Average Selling Price vs. Estimated New Class 8 Price
January '03 - July '11  (Not Seasonally Adjusted)

New Price Estimate (Tractor Sleeper)
$95K $100K $108K $117K $123K

Average Used Class 8 Price

$ GAP: New - Used

ACT Research Co., LLC: Copyright 2012
U.S. Class 8 Population

Active Pop  Total Pop

Millions


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EPA Emissions Standards

- Sulfur: 15 PPM, 500 PPM
## Combination Tractor Standards

### EPA GHG
\( \text{g CO}_2/\text{ton-mile} \)

<table>
<thead>
<tr>
<th></th>
<th>Low Roof</th>
<th>Mid Roof</th>
<th>High Roof</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class 7 DC</td>
<td>104</td>
<td>115</td>
<td>120</td>
</tr>
<tr>
<td>Class 8 DC</td>
<td>80</td>
<td>86</td>
<td>89</td>
</tr>
<tr>
<td>Class 8 Sleeper</td>
<td>66</td>
<td>73</td>
<td>72</td>
</tr>
</tbody>
</table>

### NHTSA Fuel Efficiency
\( \text{gal/1,000 ton-mile} \)

<table>
<thead>
<tr>
<th></th>
<th>Low Roof</th>
<th>Mid Roof</th>
<th>High Roof</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class 7 DC</td>
<td>10.2</td>
<td>11.3</td>
<td>11.8</td>
</tr>
<tr>
<td>Class 8 DC</td>
<td>7.8</td>
<td>8.4</td>
<td>8.7</td>
</tr>
<tr>
<td>Class 8 Sleeper</td>
<td>6.5</td>
<td>7.0</td>
<td>7.1</td>
</tr>
</tbody>
</table>
Replacement Will Take Time

Total Population by Model Year

- 2010: 3.5% (EPA 2010), 5.5% (EPA 2002/2004)
- 2007: 4.7% (EPA 2007), 8.6% (2006 Pre-Buy)
- 2004: 3.8% (EPA 2002/2004)
- 2001: 3.5%
- 1998: 1.5%
- 1995: 0.5%
- 1992: 0.3%
- 1986: 0.1%
- 1983: 0.01%
- 1980: 0.001%
- 1977: 0.0001%
- 1974: 0.00001%

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Alternative Fuels

- Alcohol
- Ammonia
- Battery/electric
- Biofuels
- Carbon neutral/negative
- Compressed air
- Hydrogen
- H$_2$CNG
- Liquid Nitrogen
- Natural gas (CNG, LNG, LCNG)
- Nuclear
- Propane
- Hybrid
Stages of U.S. Class 8 Natural Gas Adoption--Baseline Scenario
(Class 8 Truck Retail Sales Plus Transit Buses)
Alternative Modes
U.S. Freight Market: 2010
(as a % of Revenues)

Source: American Trucking Association, ACT Research Co., LLC
Questions To Be Answered

• How can consumption (freight) be reduced?
• How can equipment/fuel efficiency be maximized?
• What can be done to speed replacement?
• How can the development, commercialization and adoption of alternative fuels be accelerated?