RAIL ENERGY TECHNICAL ADVISORY COMMITTEE
Though not Near Levels of 2014/2015 Peaks, Orders and Backlog Increased in Q2 2017
Railcar Delivery Forecast

Reduced Railcar Demand in the Energy End Market Should Moderate Deliveries

<table>
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</thead>
<tbody>
<tr>
<td>Freight Car Deliveries</td>
<td>48,391</td>
<td>36,015</td>
<td>36,510</td>
<td>40,045</td>
<td>41,165</td>
</tr>
<tr>
<td>Tank Car Deliveries</td>
<td>17,841</td>
<td>8,948</td>
<td>12,525</td>
<td>17,675</td>
<td>19,625</td>
</tr>
<tr>
<td>Total Railcar Deliveries</td>
<td>66,232</td>
<td>44,963</td>
<td>49,035</td>
<td>57,720</td>
<td>60,790</td>
</tr>
</tbody>
</table>

Source: ARCI and FTR (March 2018 Forecast)

- After bottoming out at ~45K deliveries in 2017, improving covered hopper and tank car demand is expected to drive growth over the next few years.
- Covered hopper deliveries are expected to grow due to near-term demand for <3,500 c.f. and 3,500-5,500 c.f. improving in the longer-term.
- Tank car delivery is expected to be strong by historical standards, but well off the production pace during the shale boom.
- As of Q4 2017 there were 16,612 tank cars in the industry backlog, likely driven by higher tank car replacement demand and economic improvement.
Coal

Coal carloads starting new normal after 2016 lull

- While improved from 2016, coal carloads remained depressed in 2017 with low natural gas prices, coal plant closures, environmental regulations, and a warm winter all acting as headwinds
- 20.7% of open hoppers and gondolas are currently in storage and empty
- EIA forecasts coal production to decline by 5% to 738 million short tons (MMst) in 2018, due mostly to lower use in the electric power sector

Coal Carloads Terminating on U.S. Class I RR

*STCC Codes starting with 11 Source: STB
Biofuels

Ethanol carloads have moderated since Q1 2016 peak

- The USDA forecasts a 1% increase in U.S. fuel ethanol production in 2018
- Tariffs and trade restrictions from China and Brazil could also weigh on biofuel demand
- Of the 38,888 railcars that moved ethanol in 2017, 65.8% were DOT 111s, 9.4% were CPC-1232s, and 24.1% were built to the DOT-117 standard
- Other biomass-based diesel products are expected to grow from ~104 Kbdp to 149Kbdp in 2019

**Ethanol Carloads Terminating on U.S. Class I RRs**

*STCC Codes starting with 28184    Source: STB*
Crude Oil

U.S. CBR expected to remain down while Canadian CBR expands

- U.S. CBR movements have dropped by over 76% from their peak as of Q4 2017
- Crude oil exports (allowed as of December 2015) created more incentive for pipeline utilization to the Gulf Coast
- Due to lack of new pipeline capacity, Canadian crude oil carloads are expected to improve significantly over the next 2-3 years
- Railcars used to transport crude oil has dropped by over 29K from the 2014 peak
- 73.8% of all railcars used to transport crude oil in 2017 were CPC-1232s while 22% were DOT-117s

**Crude Oil Originations on US Class I RR**s

*STCC Codes starting with 131  Source: STB*
Petroleum Products

Mexico’s energy liberalization likely to drive carloads of petroleum products in 2018

- U.S. carloads are down 9% from Q2 2013 peak despite having growth in overall consumption from 2015-2017
- Domestic fuel consumption is not expected to drive growth in the U.S.
- Energy liberalization in Mexico is expected to provide opportunity for U.S. fuels

Petroleum Product Carloads Terminating on U.S. Class I RRAs

*STCC Codes starting with 291 exc. 2912 (NGLs)  
Source: STB
North America remains an advantaged geography for chemical production

- North American polypropylene projects are planned between 2020 and 2022 to exploit the continent's low cost inputs and high margins
- Export opportunities and the petrochemical capacity build out underway will drive up demand for natural gas liquids (i.e. propane and butane)

LPG Deliveries on U.S. Class I RR s

*STCC Codes starting with 2912

Source: STB
Frac Sand

Frac sand by rail continues to grow but faces challenges from in-basin brown sand

- Industrial sand deliveries hit the bottom in Q1 2016, but have almost doubled since
- More frac sand is being used in horizontal wells, likely increasing the rate of carload increases into 2018
- Permian likely to have highest demand for any region, but also has capability to produce sand in-basin
- As of Q4 2017 there were 17,605 small cube covered hoppers in the industry backlog

**Industrial Sand Deliveries on U.S. Class I RRs**

*STCC Codes starting with 14413

Source: STB
DOT 117J and 120J200 Fleet Growth

173 Cars Added in February (+ 1%)

Based on 3/1/2018 UMLER
DOT 117R Fleet Growth

534 Cars Added in February (+ 6.5%)

Based on 3/1/2018 UMLER
Based on Year End 2017 Numbers the Number of Cars that Need to be Replaced/Retrofit to DOT-111J or DOT-117R by Service/Date

<table>
<thead>
<tr>
<th>Commodity Category</th>
<th>Compliance Date</th>
<th>Number of Cars</th>
<th>Cars per Month</th>
<th>3rd Qtr 2017 Cars per Month</th>
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<tbody>
<tr>
<td><strong>Crude Oil</strong></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Non-Jacketed DOT-111's</td>
<td>1/1/2018</td>
<td>61</td>
<td>N/A</td>
<td>20</td>
</tr>
<tr>
<td>Jacketed DOT-111's</td>
<td>3/1/2018</td>
<td>122</td>
<td>61</td>
<td>24</td>
</tr>
<tr>
<td>Non-Jacketed CPC-1232's</td>
<td>4/1/2020</td>
<td>4,502</td>
<td>167</td>
<td>155</td>
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<tr>
<td>Jacketed CPC-1232's</td>
<td>5/1/2025</td>
<td>11,410</td>
<td>130</td>
<td>96</td>
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<tr>
<td><strong>Total Crude Oil</strong></td>
<td></td>
<td>16,095</td>
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<tr>
<td><strong>Ethanol</strong></td>
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<tr>
<td>JKT &amp; Non-JKT DOT-111's</td>
<td>5/1/2023</td>
<td>25,609</td>
<td>382</td>
<td>369</td>
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<tr>
<td>Non-Jacketed CPC-1232's</td>
<td>7/1/2023</td>
<td>2,815</td>
<td>41</td>
<td>38</td>
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<tr>
<td>Jacketed CPC-1232's</td>
<td>5/1/2025</td>
<td>859</td>
<td>9</td>
<td>7</td>
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<tr>
<td><strong>Total Ethanol</strong></td>
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<td>29,283</td>
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<tr>
<td><strong>Other Flammable Liquids</strong></td>
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<tr>
<td>Packing Group I</td>
<td>5/1/2025</td>
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<tr>
<td>Packing Group II &amp; III</td>
<td>5/1/2029</td>
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<tr>
<td><strong>Total Other Flammable Liquids</strong></td>
<td></td>
<td>32,017</td>
<td>235 - 364</td>
<td>215 - 326</td>
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<tr>
<td><strong>Total All</strong></td>
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<td>77,395</td>
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