Annual Energy Outlook 2015:

Modeling updates in the transportation sector

For
AEO2015 Working Group
July 30, 2014 | Washington, DC

By
Nicholas Chase, Trisha Hutchins, John Maples
Office of Energy Consumption and Efficiency Analysis
Data updates

• Update historical fuel consumption data to latest state energy data (2011), annual national data from *Monthly Energy Review* (2012), and most recent *Short-Term Energy Outlook*

• Update historical light-duty vehicle attribute data through 2013 (pending)

• Update historical light-duty vehicle fleet operations share (pending)

• Update historical aircraft sales, stock, travel, and fuel use data (pending)

• Update heavy-duty vehicle sales and travel demand through 2014
Data updates (continued)

• Update historical freight rail travel demand and efficiency through 2013

• Update historical domestic marine travel demand through 2012

• Update historical lubricant and recreational boating energy consumption
Modeling updates

- New regional freight travel demand methodology (truck, rail, domestic marine)
  - Freight Analysis Framework (FAF) data instead of Commodity Flow Survey (CFS)
  - Shortest route method used for trucks to estimate travel demand share in between origin and destination points
  - Re-estimation of travel demand metrics

- Re-estimation of coefficients for air model equations
  - Revenue ton mile, aircraft sales, and yield coefficient updates
Freight Analysis Framework (FAF) and shortest route optimization compared to Commodity Flow Survey, Truck 2007

- Increase in truck travel through intermediate regions (census divisions 4, 6, 8)

<table>
<thead>
<tr>
<th>Census Division</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>-23%</td>
<td>-21%</td>
<td>-6%</td>
<td>+40%</td>
<td>-13%</td>
<td>+24%</td>
<td>-11%</td>
<td>+121%</td>
<td>-33%</td>
</tr>
</tbody>
</table>

- FAF better captures non-manufactured goods moving on trucks (primary metals, petroleum products, agriculture, and mining) and domestic legs of international trade flows

<table>
<thead>
<tr>
<th>Commodity</th>
<th>chemicals</th>
<th>rubber</th>
<th>plastic</th>
<th>primary</th>
<th>metals</th>
<th>processed</th>
<th>food</th>
<th>paper</th>
<th>products</th>
<th>petroleum</th>
<th>products</th>
<th>stone</th>
<th>clay</th>
<th>glass</th>
<th>concrete</th>
<th>metal</th>
<th>durables</th>
<th>other</th>
<th>manuf</th>
<th>agricul</th>
<th>mining</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>-15%</td>
<td>+21%</td>
<td>-42%</td>
<td>-37%</td>
<td>+24%</td>
<td>-12%</td>
<td>-4%</td>
<td>-11%</td>
<td>+108%</td>
<td>+33%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Freight Analysis Framework (FAF) compared to Commodity Flow Survey, 2007

• Rail
  – Substantial reduction in census division 8
  – Substantial reduction in coal and increase in all other commodity groups

• Domestic marine
  – Substantial increase in ton-miles in census divisions 5 and 9, substantial reductions in census divisions 3, 4, and 7
  – Substantial increase in petroleum products and decrease in agricultural products
Comments/Discussion

• Pressing suggestions for AEO2015

• Comments or suggestions for AEO2016
  – Contact Transportation Team if interested in taking part in topical Working Group meetings starting early next year
Discussion/questions

Nicholas Chase  | phone: 202-586-8851  
               | email: nicholas.chase@eia.gov

Trisha Hutchins  | phone: 202-586-1029  
                 | email: patricia.hutchins@eia.gov

John Maples  | phone: 202-586-1757  
             | email: john.maples@eia.gov


Annual Energy Outlook | www.eia.gov/forecasts/aeo