The Puget Sound food distribution supply chain

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• How is food distributed within a large metropolitan region?
• How could we encourage the best use of alternative fuels in this supply chain?

Photo: ChinaFotoPress/Getty Images
Methodology

• **In-person Interviews**
• **Manual truck counts**
Interviews

**Strategy**
- Changes in policy
- Truck replacement
- Alternative fuels
- Scenarios

**Operations**
- Destinations
- Route choice
- Operating hours
- Trucks
Companies interviewed

- 2 large grocery retailers
- 1 small grocery retailer
- 1 warehouse-style retailer
- 2 large food distributors
- 2 small food distributors
- 2 small food producers

Small and large is determined by truck fleet size
Biggest issues

• Worker hours
• Weight restrictions
• Particulate matter filter regulations
• Fuel efficiency
Categories of businesses

- Full service food distributors
- Grocery store distribution centers
- Warehouse store distribution centers
Business oriented

Small food distributors

Independent grocery store suppliers

Large full service food distributors

Warehouse stores

Consumer oriented

Small (less than 50 trucks)

Small producers

Large producers

Large (More than 50 trucks)

Grocery stores
Alternative fuels policy

- 3 of 5 large firms instituted CNG or LNG pilot programs
- 0% of small and medium firms had any experience

Photo: http://www.truckinginfo.com/
Natural gas and propane

- Engines not as powerful as diesel
- Less range than diesel
- Vehicles are very costly
- Refueling infrastructure less developed than diesel
- Refueling is slower than diesel

Photo: http://www.truckinginfo.com/
Central dilemma

• Large companies have the resources institute natural gas pilot programs
• Emissions would be reduces more is smaller, urban delivery firms adopted CNG/LNG truck, but have few resources for natural gas trucks

Photo: http://www.truckinginfo.com/
Methodology

• In-person Interviews
• Manual truck counts
Average hourly truck arrivals at grocery stores
Grocery store deliveries by truck type

<table>
<thead>
<tr>
<th>Truck Type</th>
<th>Local Company</th>
<th>National Company or Subsidiary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small box truck</td>
<td>25%</td>
<td>5%</td>
</tr>
<tr>
<td>Large box truck</td>
<td>5%</td>
<td>20%</td>
</tr>
<tr>
<td>Semi Trailer</td>
<td>15%</td>
<td>20%</td>
</tr>
<tr>
<td>Step Van</td>
<td>15%</td>
<td>20%</td>
</tr>
<tr>
<td>Pick-up</td>
<td>25%</td>
<td>0%</td>
</tr>
<tr>
<td>Van</td>
<td>25%</td>
<td>0%</td>
</tr>
</tbody>
</table>
Truck deliveries by land use

Urban

Suburban

Rural

Local company

National company or subsidiary
Large companies
• 70% use dock
• 52% over 26k lb
• 45 minute turn-around

Small companies
• 90% use front door
• 76% under 26k lb
• 35 minute turn-around
Large companies:

• can afford to experiment with alternative fuels
• can take advantage of government incentives
• benefit from public relations boost of alternative fuels

Photo: www.totalairportservices.com
Large companies:

• Travel more miles
• Use highways more
• Use larger trucks
Smaller companies:

- cannot afford even one CNG/LNG truck
- don’t have resources to apply for government grants
- don’t have significant public image
Smaller companies

• Travel fewer miles
• Operate in urban areas
• Use smaller trucks
Business oriented

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Grocery stores
Dollars spent on CNG/LNG fuel proliferation ultimately benefits public image of large food distribution conglomerates, with little benefit to emissions

Public dollars and effort could be better utilized if they were targeted at smaller, local distributors and producers