The Smart Way To Save Fuel, Money and the Environment

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US EPA Region III/MARMA
Air Toxic Summit
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How efficiently are you moving your freight?
Freight Background

- Transportation accounts for 67% of fuel consumption in the US
  - Freight accounts for 20% of energy use in transportation

- Annually the 7 Million freight trucks and 20,000 locomotives:
  - Travel over 200 billion miles
  - Consume over 35 billion gallons of fuel
  - Produce approximately 350 million metric tons of CO$_2$
  - Will increase usage dramatically over next decade

2003
35 Billion Gallons

2012
45 Billion Gallons
SmartWay Transport History

- **EPA** developed SmartWay cooperatively with industry
- **Charter Partnership** group worked directly with EPA to finalize details

<table>
<thead>
<tr>
<th>Carriers</th>
<th>Shippers</th>
<th>Associations</th>
</tr>
</thead>
<tbody>
<tr>
<td>FedEx</td>
<td>Canon USA</td>
<td>American Trucking Associations</td>
</tr>
<tr>
<td>UPS</td>
<td>IKEA</td>
<td>Business for Social Responsibility</td>
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<tr>
<td>Schneider National</td>
<td>Nike</td>
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<tr>
<td>Roadway Express</td>
<td>Interface</td>
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<tr>
<td>Yellow Transportation</td>
<td>The Home Depot</td>
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<tr>
<td>Swift Transport</td>
<td>Norm Thompson Outfitters</td>
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<tr>
<td>Coca Cola</td>
<td>HEB Grocery</td>
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<tr>
<td>CSX</td>
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- **Partnership opened for business** February 2004 at ATA’s Winter Leadership Conference in Washington, DC
  - EPA welcomed 50 companies into the Partnership

- **SmartWay is designed to create a market demand throughout the freight industry for cleaner more efficient freight transportation**
The SmartWay Transport Partnership Goals

**Carrier Goals:**
- Reduce fuel consumption
- Lower emissions
- Better public image
- Better relationship with government

**What carriers do:**
- Measure and benchmark their environmental performance
- Integrate innovative strategies into their fleet operations to improve performance
- The better a carrier’s environmental performance, the more valuable they are to shippers

**Shipper Goals:**
- Better understand and control their transportation footprint
- Promote corporate citizenship and sustainable business practices
- Green marketing to the public

**What shippers do:**
- Agree to ship 50% of goods with SmartWay carriers
- Improve transportation operations in their control: loading dock efficiency, no idling policies, electric equipment

**EPA goals:**
- Reduced CO₂, NOx, and PM emissions
- Reduced national fuel consumption

**What EPA does:**
- Recognize, publicize, and market corporate involvement
- Reward best performers with SmartWay logo
- Provide technical support, Verify new innovative technology
### SmartWay Transport Progress

- **211 companies and organizations have joined**
  - 169 Trucking Carriers, 24 Shippers, 7 Shipper/Carriers, 8 Railroads, 3 Affiliates

<table>
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<tr>
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<th>Industry Totals</th>
<th>SmartWay Carriers</th>
<th>% Industry</th>
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<tbody>
<tr>
<td>Total No. of Companies</td>
<td>525,000</td>
<td>176</td>
<td>0.04%</td>
</tr>
<tr>
<td># of Trucks (Heavy and Medium)</td>
<td>5,400,000</td>
<td>300,000</td>
<td>5.00%</td>
</tr>
<tr>
<td>Gallons Consumed</td>
<td>35 billion</td>
<td>2.27 billion</td>
<td>6.48%</td>
</tr>
<tr>
<td>Tons CO₂</td>
<td>385,000,000</td>
<td>25,000,000</td>
<td>6.47%</td>
</tr>
<tr>
<td>Tons NOₓ</td>
<td>2,800,000</td>
<td>226,000</td>
<td>8.00%</td>
</tr>
<tr>
<td>Tons PM</td>
<td>90,000</td>
<td>5,300</td>
<td>5.87%</td>
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- **53 Idling Reduction projects in the US either active or developing**
- **International agreement with Canada**
- **Public Service Announcement campaign in industry/trade journals and mainstream financial magazines**
SHIP SMARTER

An environmentally appealing way to transport goods that’s also deliciously profitable.

SmartWay Transport helps shippers and for-hire carriers lower greenhouse gases and other emissions, while at the same time giving the average truck a fuel savings of $2,000 per year.

To find out more about this new partnership, call for your info kit at 1-734-214-4767 or log onto www.epa.gov/smartway.

A new voluntary program from the U.S. Environmental Protection Agency

CALCULATE YOUR SAVINGS TO THE ENVIRONMENT. TO YOUR BOTTOM LINE.

For logistics managers, SmartWay can add up to 7% in fuel savings.

SmartWay Transport helps shippers and for-hire carriers lower greenhouse gases and other emissions, while at the same time giving the average truck a fuel savings of $2,000 per year.

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A new voluntary program from the U.S. Environmental Protection Agency
Opportunities for Increased Efficiency

Total Energy Used per Hour
(65 mph, fully loaded, level road for one hour)
Base = 400 kWh (6.6 mpg) · Target = 255.5 kWh (10.3 mpg)

Idling Losses
Non-driving losses
100%

Engine Losses
Base = 240 kWh
Target = 143 kWh
Engine Efficiency
Base = 40%
Target = 44%
60%

Aerodynamic Losses
Base = 85 kWh
Target = 68 kWh
21%

Rolling Resistance
Base = 51 kWh
Target = 30.6 kWh
13%

Drivetrain
Base = 9 kWh
Target = 6.3 kWh
2.25%

Auxiliary Loads
Base = 15 kWh
Target = 7.5 kWh
3.75%

Fig. 4.1. Class 8 truck energy audit.
What have These Companies Done?

- Freight Projections with No EPA Programs
- First Wave of SmartWay

Results based on 42 corporate emission reduction plans
PM-10 Emissions From Freight by Mode, 2002

ICF, “Impacts of Freight Movement on Air Quality.” Prepared for U.S. FHWA, January 26, 2005
ICF, “Impacts of Freight Movement on Air Quality.” Prepared for U.S. FHWA, January 26, 2005
Average 2005 HD Diesel Truck PM 2.5 Emissions--By Model Year*

*Preliminary results from MOBILE6 inputs and SmartWay Fleet Model analysis
National Idling Program

• **Goal:** To eliminate all unnecessary diesel engine idling
  – Truck stops, travel centers, borders, ports, rail yards, loading docks, markets, roadside, etc.

• **2004:** $1 Million grant program for 9 TSE locations

• **2005:** $5 Million grant program

• **2006:** $95 million **authorized** in Energy bill

• **Hosting workshops to create model idling law**
  – Create consistency among the various state and local idling laws
  – Baltimore (May 6th), Atlanta (June 16th, 17th), Chicago (June 28th), San Francisco (July 14th), Connecticut (July 27th)

• **Hosting workshops to create standardized design specifications for truck stop electrification:**
  – Power, voltage, safety considerations, wiring, and plugs
Capitalization & Innovative Deployment Strategies:

• **Creation of SmartWay Upgrade Kits:**
  – Technology bundle of idling control, wide base tires, trailer aerodynamics, and PM control device
  – Capital needed for Upgrade Kit is offered to owner and re-paid over time
  – **Monthly Fuel savings exceed the monthly loan payment**

• **Capitalization Programs:**
  – Pennsylvania, Arkansas and Minnesota (other states to follow)
  – EPA is currently creating a national capitalization program
  – Could expand to private lending institutions
  – Could begin to evolve into Energy Service Companies (ESCOs) contracts

• **Potential DOT Financing:**
  – CMAQ:
  – State Infrastructure Banks (SIBs)
  – Transportation Infrastructure Finance and Innovation Act (TIFIA) funds
Capitalization & Innovative Deployment Strategies: The Business Case for SmartWay Upgrade Kits: Long Haul Truck

<table>
<thead>
<tr>
<th>Device</th>
<th>Cost/Unit (Retrofit)*</th>
<th>PM Reduction</th>
<th>NOx Reduction</th>
<th>FE Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct Fired Heater</td>
<td>$1,000</td>
<td>5%</td>
<td>7%</td>
<td>7%</td>
</tr>
<tr>
<td>Super Single Tires w/ alum. wheels</td>
<td>$3,500</td>
<td>--</td>
<td>5%</td>
<td>5%</td>
</tr>
<tr>
<td>Trailer Aero Kit</td>
<td>$2,400</td>
<td>--</td>
<td>5%</td>
<td>5%</td>
</tr>
<tr>
<td>Oxidation Catalyst</td>
<td>$1,000</td>
<td>25%</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td><strong>Totals:</strong></td>
<td><strong>$7,900</strong></td>
<td><strong>30%</strong></td>
<td><strong>17%</strong></td>
<td><strong>17%</strong></td>
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For a truck traveling 100,000 miles/year @ 6 mpg (16,667 gallons/year)
- Fuel savings: 2,833 gallons @ $2.75/gallon → $7,790/year
- Payback period: $7,900 / $7,790 → ~1 year
- or a 3 year loan @ 4.8% APR:
  Monthly Fuel Savings: $649
  Monthly loan payment: ($236)
  Monthly cash for driver: $413
For a truck traveling 50,000 miles/year @ 4.5 mpg (11,111 gallons /year)

Fuel savings: 1,044 gallons @ $3/gallon  →  $3,132/year

Payback period: $5,750 / $3,132  →  1.8 years

- or a 3 year loan @ 10% APR:

  Monthly Fuel Savings: $261
  Monthly loan payment: ($185)

**Monthly cash for driver:** $76
Financing and Funding

- **PA Energy Efficiency Loan Program**
  - wide base tires
  - idle reduction technologies
  - Retrofit technologies don't qualify
- **Businesses may borrow up to $100K**
- **Loan terms will not exceed 10 years, 2% interest**
- **PA small businesses are eligible**

**Energy Bill**
- SmartWay Idle Reduction program gets $140 million over a 3 year period
- Diesel Emission Reduction Act (DERA) gets $120 million over a 5 year period
- Diesel Truck Retrofit/Modernization gets $100 million over a 3 year period
Common Chassis Pools

- Picking up and dropping off truck chassis can substantially increase creep idle and truck vmt
- Terminals don’t typically share chassis
- Port of Virginia is first to require a chassis pool
- Moves per truck have increased from 2-3 per day to up to 10 containers per day
- Port has recaptured 40-60 acres of land
- Other ports are seriously considering chassis pools
Mitsubishi Chassis Stacker
Terminal Appointment System

- Overloaded gates and terminals increase air pollution and waste fuel
- Automated terminal appointment systems can prevent congestion and reduce gate processing time
- GA Port Authority has a mandatory appointment system that is saving per day
  - 3020 gallons of fuel
  - 0.5 tons of NOx
  - 33 tons of CO2
- New Orleans also has a mandatory scheduling system and other ports are considering it.
Drayage Scrappage Programs

- Many older drayage trucks are good candidates for scrappage programs
- Replacement of pre-1987 trucks with post-1999 trucks can
  - Reduce NOx emissions by 50%
  - Reduce PM emissions by 90%
- Gateway Cities Diesel Modernization Program in LA has replaced 350 trucks at a cost of $8 mil.
  - 193 tons per year of NOx and 42 tons per year of PM
Win-Win-Win-Win Win-Win Opportunities

• Need to consider benefits for:
  – Terminal Operators
  – Port Authority
  – Truck Drivers
  – Shippers

• Everyone benefits from more efficient operations
  – Lower fuel costs
  – More space
  – Increased reliability
  – Less pollution
  – Better community relations
OTAQ currently evaluating options for a SmartWay drayage initiative

- Technologies and Strategies
- Terminal and Port Strategies
- Financing and Funding
- Targeted Participants