The SmartWay Transport Partnership

Webinar

SmartWay 2.0 & Supply Chain

October 14, 2008

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The SmartWay Transport Partnership

Part I

SmartWay Status Update

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SmartWay Transport Partnership

- Over 1,114 Partners (As of 10/10/08)
- Drive approximately 600,000 trucks (7% of industry)
- Travel over 51 billion miles per year (24% of industry)
- Consume over 12 billion gallons of fuel (24% of industry)
- Are on track for 2008 to:
  - reduce greenhouse gas and pollutant emissions by:
    - 6 million tons of CO_2 (carbon dioxide);
    - 800 tons of PM (particulate matter);
    - 30,000 tons of NOx (oxides of nitrogen);
  - Save over 540 million gallons of diesel fuel this year;
  - Save the freight industry over $2 billion in annual fuel and maintenance costs.

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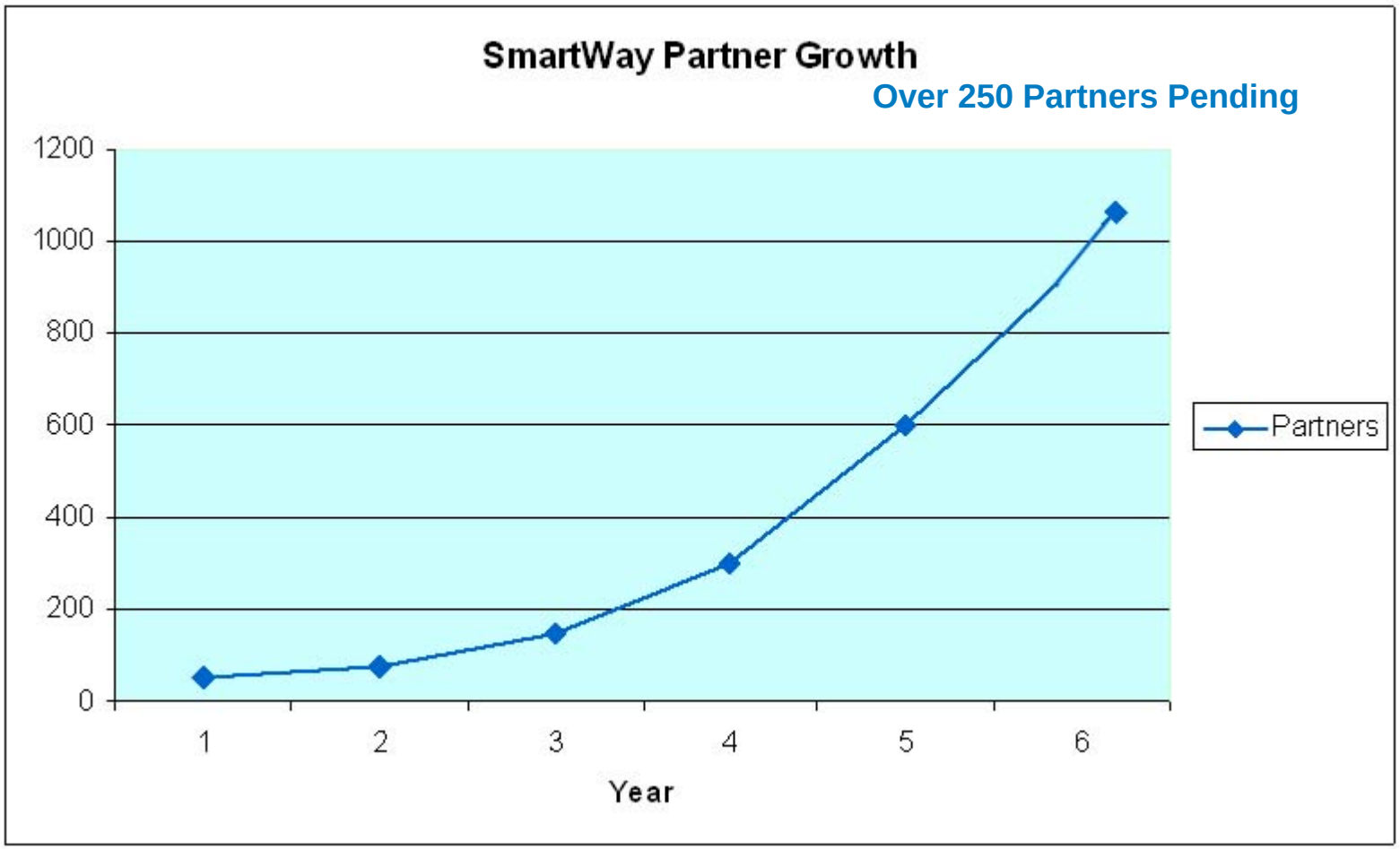
SmartWay Partner Growth



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Partner Recognition

CONGRATULATIONS TO THE 2008 SMARTWAY EXCELLENCE AWARD WINNERS

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Transport Partnership
U.S. ENVIRONMENTAL PROTECTION AGENCY

Thank you to all of our partners!

www.epa.gov/smartway

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New SmartWay Web Portal

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New PSA Campaign
Multi-media: TV, Radio, Print

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SmartWay Certified Vehicles

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SmartWay Certified Tractors &Trailers

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Part 2

SmartWay 2.0 Vision

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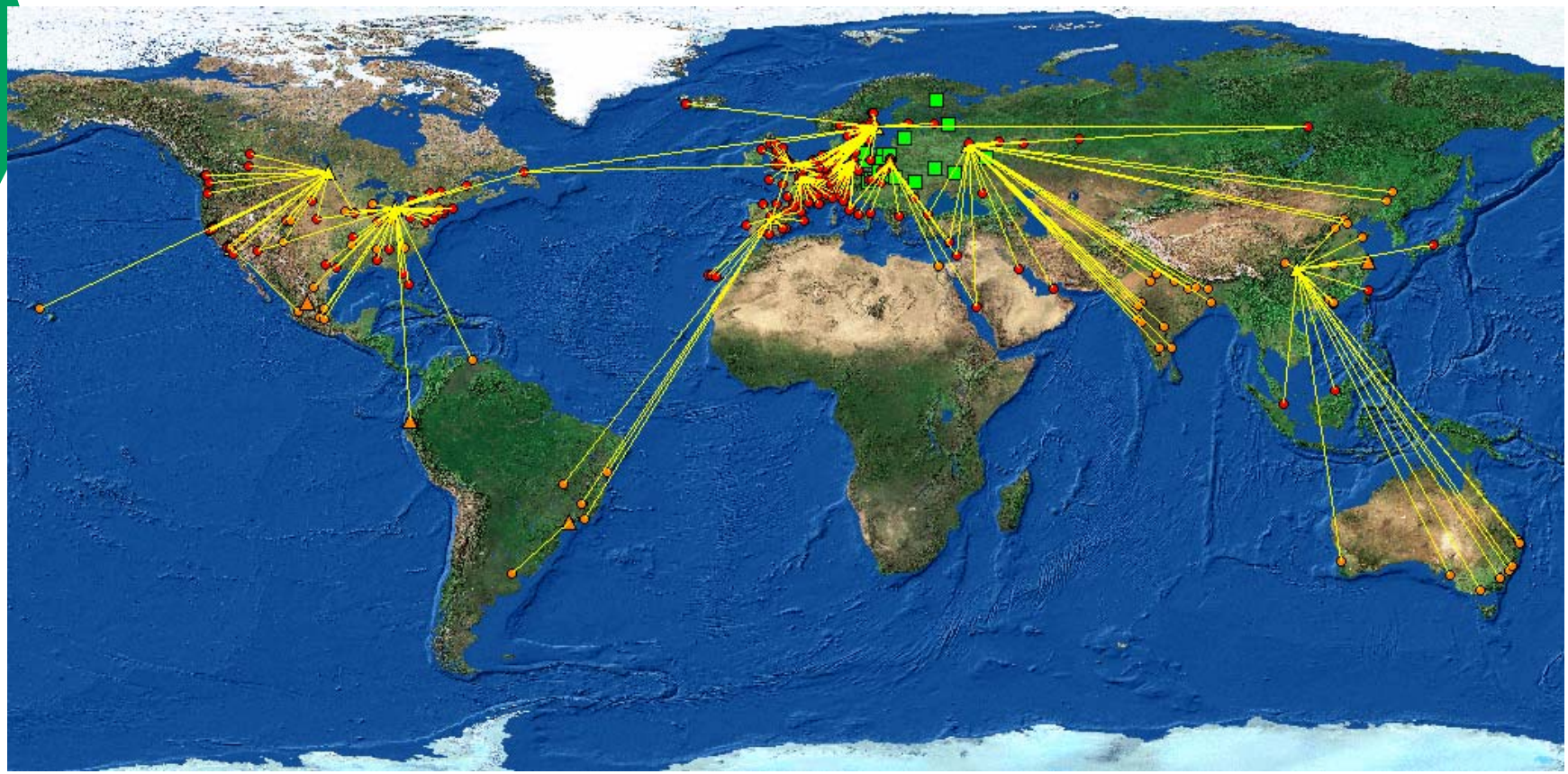
Measuring and Reducing Emissions from the Supply Chain



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The SmartWay Vision for Green Supply Chain

- Minimizing CO2 production in global supply chains is a prime determinant in freight transportation decisions

- Full transparency exists in freight management carbon decision-making

- SmartWay carriers are enabled with better benchmarking tools

- Universal usage of a global database of company emission factors

- "SmartWay" Programs exist in all major industrialized countries

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The Demand

- Demand for Multimodal CO_2 Model from Industry
  - Demand for CO_2 inventory (footprint)
  - Some interest in NOx and PM
  - Also demand for efficiency measurement & optimization
- Stakeholders are asking EPA to take lead role
  - Desire for a Federal program
  - Desire for multi-modal program
  - Desire for a consistent, global methodology
- Climate is High Profile now
  - Industry needs to quickly inventory, benchmark, and achieve improvements
  - Energy security and energy prices underscore urgency

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The SmartWay Response

- Emissions
  - Current systems use industry average emission rates
  - SmartWay Supply Chain will be able to present data at the company level
    - Allow more refined inventories
    - Allow comparisons between providers
    - Allow for mode and provider Optimization
- Methods
  - Multiple systems currently exist
  - SmartWay will provide a consistent methodology, means of collection, and storage of data:
  - Globally accessible database
- Software
  - Current systems use stand-alone software
  - SmartWay Supply Chain will integrate into existing software
    - Also provide a stand-alone version

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The Results- Driven

- Drives Optimization
  - As shippers participate and encourage carrier participation:
    - Drives optimization in the carrier industry as carriers respond to the new transparency and competition
    - Increases shipper participation as other shippers strive to catch up with industry leaders who are using more efficient carriers
  - Increased participation creates a globally self reinforcing loop of participation and optimization

- Drives the Public Policy Debate

- Drives Technology Development
  - Mode and company comparisons will foster new fuel saving technologies

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Part 3

Evaluating Partner Performance

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Objective

- We want Partner feedback on new ways for EPA to evaluate truck carrier and shipper performance
- Our main goals for the new method:
  - Provide more accurate information to carriers to enable better performance management; focus on actual performance instead of surrogates.
  - Respond to demand from shippers for more granular, emissions-based data related to carrier performance, to enable carbon footprint analyses.
  - Reduce administrative burdens for Partners & EPA.

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Overview

- Purpose of Evaluating Partner Performance

- Benchmarking Truck Carrier Performance:
  - The Ideal World
  - Current SmartWay Approach
  - Lessons Learned
  - Early Ideas on Future SmartWay Approach
    - Implications for Partnership Requirements, Logo Use, and Award Eligibility
    - Evaluating Shipper Performance

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What do we mean by…

- "performance"?
  - Delivering goods with fewer CO_2 emissions
    - Fuel consumption is a robust measure of CO_2 emissions

- "evaluating"?
  - EPA and shipper identification of carriers that can ship goods with comparatively low CO_2 emissions
  - EPA identification of shippers who deliver their goods with comparatively low CO_2 emissions
  - Carrier assessment of their CO_2 performance
    - from year-to-year
    - towards achieving a goal
    - compared to other SmartWay Partners, and/or
    - compared to overall industry.

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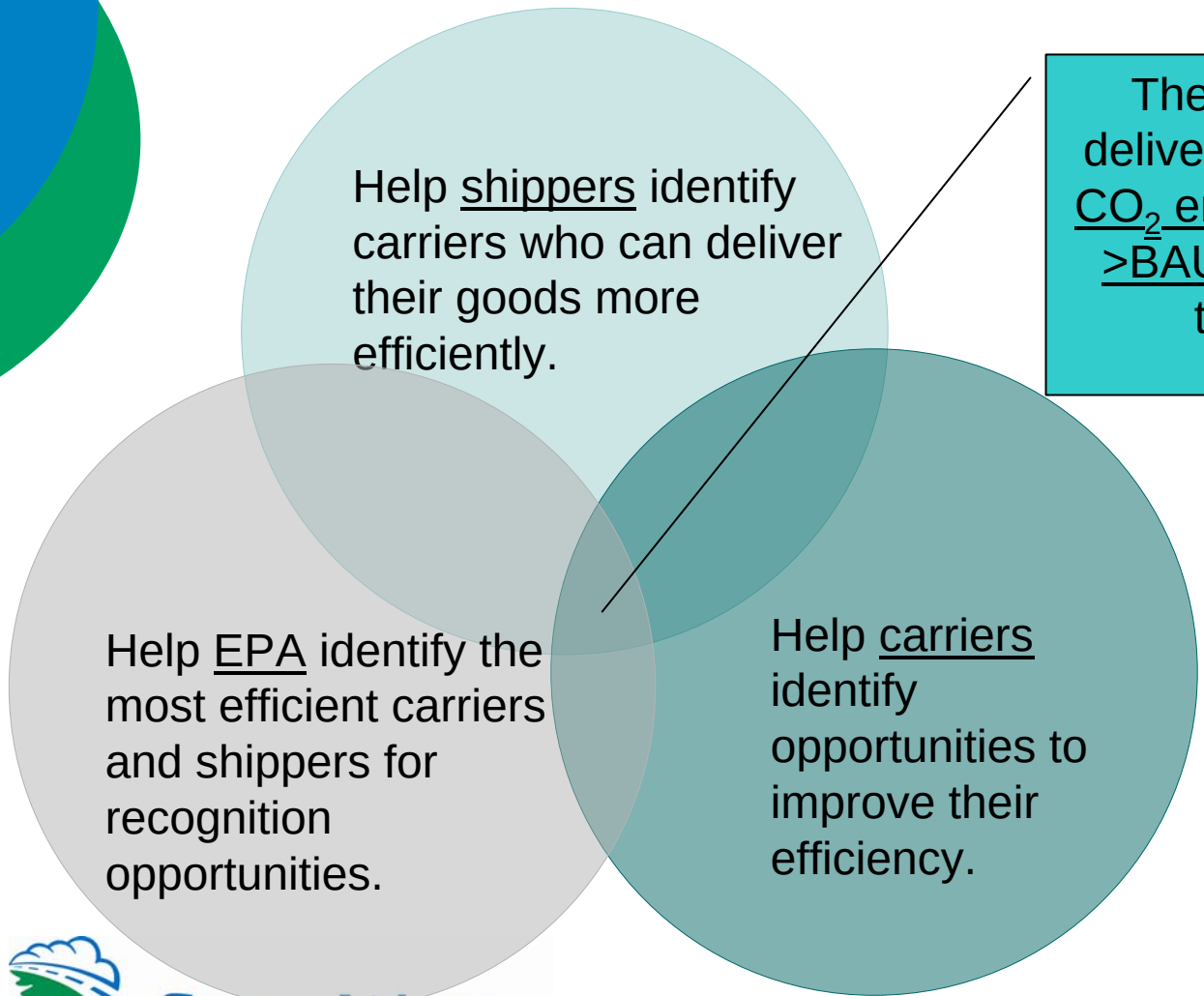
What is the purpose of evaluating carrier performance?



The ultimate objective: delivering goods with fewer CO_2 emissions by achieving >BAU performance in the trucking industry

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What is a good measure of truck carrier performance? (1)

- Taking a snapshot
  - Inventory of emissions
  - Strategies employed and expected CO_2 savings
  - Efficiency metrics (e.g. gCO_2/ton-mile)

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What is a good measure of truck carrier performance? (2)

- Tracking improvement over time
  - Absolute or % reduction in emissions
  - Additional strategies employed and expected CO_2 savings
  - Absolute or % improvement in efficiency metrics (e.g. gCO_2/ton-mile)

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What is a good measure of truck carrier performance? (3)

- **Benchmarking** performance among competitors
  - Absolute or % reduction in absolute emissions
  - Expected efficiency from deployment of strategies
  - Efficiency metrics (e.g. gCO_2/ton-mile)

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Approaches to Benchmarking Carrier Performance

- Ideal World
- Current SmartWay Approach
- Lessons Learned
- Future SmartWay Approach?
  - How will this impact Shipper requirements and scoring system?

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In an ideal world….

- Shippers would know the exact CO_2 impact of shipping their package from their warehouse to their customer with a specific carrier

10 kg CO_2

5 kg CO_2

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In an ideal world….

- Carriers would know how their CO_2 performance stacks up to other carriers…
  - if all the other carriers were operating under the same conditions (i.e. delivering the same types of goods, on the same road conditions, etc.). [“Normalize”]
- Carriers could use this information to:
  - set and achieve realistic goals for fuel efficiency
  - inform business strategy and maintain competitiveness

My facility is among the top 25% of facilities in the country for energy performance!

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In an ideal world...

what data would we want to collect to benchmark carrier performance?

- CO_2 per package, controlling for every variable other than "efficiency" practices
  - Package weight, volume, and distance traveled
  - Road grades/terrain
  - Ambient temperature and humidity; extreme weather
  - Unavoidable congestion
  - Speed profiles (e.g. urban pick-up-and-delivery vs. long-haul)
- Bonus information:
  - technologies and operational strategies employed

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Reality Check

- We need to minimize administrative burden and focus on data that is:
  - easy for carriers to observe
  - easy for carriers to track and report
  - easy for EPA to evaluate
  - useful for shipper carbon inventory and optimization
  - an important determinant of performance

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Current SmartWay Approach
Step 1

- EPA makes informed assumptions about expected fuel savings from specific strategies.
  - EPA evaluates alternative assumptions and additional strategies on a case-by-case basis.

Strategies Included in the FLEET Model ***Idle Reduction, Aerodynamics, Tires, Speed Management, Truck/Engine Upgrades***			
Direct-Fire Heater	Cab roof fairing	Trailer Tails	Speed management
Auxiliary Power Unit	Cab roof deflector	Aero profile cab	Weight reduction by truck class
Truck-Stop Electrification	Cab side fairing	Nose cone	Large capacity trailers
Driver Tag Teams	Cab front air dam front bumper	Single-wide tires	Hybrid engines
Double Drivers	Cab aerodynamic mirrors	Automatic tire inflation	*NOx reflashing*
Engine Shutdown	Trailer gap 44-36	Low friction engine lubricant	*PM, NOx after-treatment devices*
Aero profile tractor	Trailer gap 35 " or less	Low friction drive train lubricant	
Cab-over-engine tractor	Trailer side skirts	Direct-drive truck	
Integrated cab roof fairing	Flatbed trailer tarps	Single vs. double axle	

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Current SmartWay Approach
Step 2

- Carriers report the number of strategies they employ in their fleets.
  - Carriers also report other data e.g. fuel consumption, average payload, miles travelled annually, but EPA does not use this data to determine eligibility for label or carriers' "shipper index factor"

☑ Idling Control Strategies

Show Video Tutorial

Please enter the # of HOURS each strategy was used to eliminate idling:

SmartWay Truck Idling Control Strategies

		Combination Trucks		Single Unit Trucks		Default Idling Hours	Fuel Savings
		Short Haul	Long Haul	Short Haul	Long Haul		
Direct Fired Heater	Diesel					Short Haul	
	Gasoline					2	
	Alternative Fuel					Long Haul	
Auxiliary Power Unit	Diesel					8	
	Gasoline						
	Alternative Fuel						
Truck Stop Electrification	Diesel						
	Gasoline						
	Alternative Fuel						
Driver Tag Teams	Diesel						
	Gasoline						
	Alternative Fuel						
Double	Diesel						
	Gasoline						

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Current SmartWay Approach
Step 3

- EPA calculates carrier "CO_2 efficiency score" based on % reduction in fuel consumption (compared to a very basic baseline truck*) we expect from the strategies that the carrier has employed.

- EPA combines CO_2 efficiency score with NO_x and PM efficiency scores to develop a "SmartWay score" for the carrier through this weighted equation:

$$\text{SmartWay Score} = CO_2/40 + NO_x/80 + PM/80$$

*Long-nosed truck with no aerodynamic additions hauling a 48' trailer with normal tires running at 70 mph.

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Current SmartWay Approach
Step 4

- EPA assigns each carrier a shipper index factor, “SIF”, based on their SmartWay score. EPA posts a list of each carrier’s SIF score on the SmartWay website.

SmartWay Score	SIF Score
0	0
.01 - .74	.75
.75 - .99	1.00
1.00 +	1.25

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Current SmartWay Approach
Program "Perks" Based on SIF Score

- Carriers with a 1.25 SIF can use the SmartWay logo.
- Shipper scores are based on how much business they do with SmartWay carriers and the SmartWay carriers' scores.
- Shippers with a score >0.5 can use the SmartWay logo.

Provider	SCAC Code	Provider's Total Mileage with Fleet (miles)	Provider's Total Weight w/ Fleet (tons)	Custom Metric	# of Trips	SIF Score for Provider	Score based on Miles 0.00
						0.00	0.00
						0.00	0.00
						0.00	0.00
						0.00	0.00
						0.00	0.00
						0.00	0.00
						0.00	0.00
						0.00	0.00
						0.00	0.00
						0.00	0.00
						0.00	0.00
						0.00	0.00
						0.00	0.00

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Lessons Learned

- We need to streamline the process.
  - Part 3 (strategy-specific analysis) of the FLEET model is the biggest administrative burden for carriers and EPA, and the most difficult component to keep up-to-date.
- We should evaluate carrier performance on actual performance rather than expected performance from strategies employed.
  - We may be missing key aspects of a company's performance with the current SmartWay approach.
  - Shippers are increasingly interested in more granular, transparent, emissions-based data on carriers.
- We need to continue to raise the bar to ensure continued improvement in freight industry performance.

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Future SmartWay Approach

- Is there a better way EPA can evaluate carrier performance so that we can deliver:
  - more accurate information to carriers to enable better carrier performance management?
  - more granular, emissions-based data related to carrier performance to enable better shipper management?
  - a reduction in administrative overhead for carriers and EPA?
  - a methodology that could potentially be replicated throughout the supply chain to other modes?

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Potential Example of Future SmartWay Approach: Carrier Performance Evaluation

- Benchmark carriers by actual performance metrics
  - **gCO_2 / mile** and gCO_2/average payload-mile available now
  - gCO_2/ton-mile, gCO_2/TEU-mile, etc. available in the future

- Emissions efficiency metrics could be publicly reported:
  - on an individual carrier basis
  - in bins, similar to the current SIF system (based on % ranking, standard deviation, etc.) – *transparency issue*
  - segmented by carrier type – *sample size issue*

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Breakouts of Current SmartWay Data *(gCO_2/mile)*

System 1
A-E Std Deviation

Grade	EF
A	1,163.73
B	1,465.50
C	1,703.38
D	2,007.87
E	2,842.91

System 2
A-F Std deviation

Grade	EF
A	972.40
B	1,413.88
C	1,631.89
D	1,828.00
E	2,142.34
F	3,317.49

System 3
10 Bin

Grade	EF
1	1,271.72
2	1,522.03
3	1,593.60
4	1,651.06
5	1,688.79
6	1,722.27
7	1,771.09
8	1,823.70
9	1,932.25
10	2,160.86

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Potential Example of Future SmartWay Approach: Public Reporting

2007 CO_2 Data (updated as of July 28, 2008)

	g/mile	*g/ton-mile**	*g/TEU*	*g/ft³*	*g/mile % ranking***	*g/ton-mile* % ranking*	*Detailed List of Strategies*	*Action Plan*
Partner A	1200	290	NA	NA	90%	71%	No	No
Partner B	NA	NA	NA	NA	3rd Quartile	NA	Yes	Yes
Partner C	1500	167	NA	NA	62%	94%	No	No

*some Partners report actual fleet ton-miles, while other Partners only report total fleet mileage and average payload

**All companies scoring >75 are eligible to use the SmartWay logo.

Example created using a Quartile ranking system.

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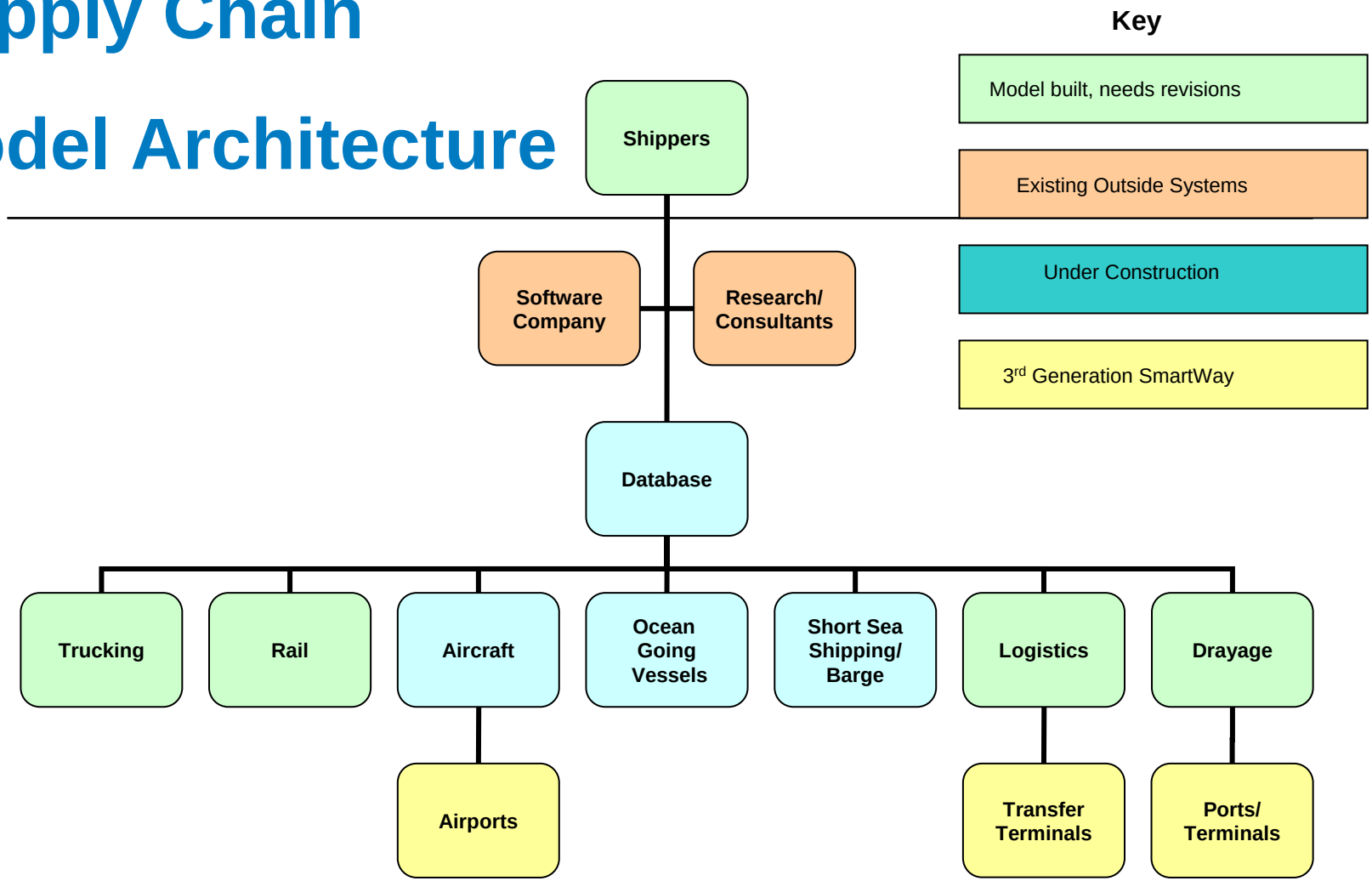
Supply Chain Model Architecture



- Modular Construction: Carrier modules feed emissions data to a database that is accessed by shippers, software companies, and consultants

- CO2, NOx, and PM capable

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Example of Model Outputs

Part 1-A
Basic FUEL USAGE

ONROAD	Tailpipe CO2	Tailpipe CH4	Fuel Life Cycle CO2	Fuel Life Cycle CH4	System Lifecycle CO2	System Lifecycle CH4	Reactivity CO2	Reactivity CH4	National Security Score % Domestic	National Security Score Global Source	National Security Score Alt Fuel
Diesel											
BioDiesel											
Gasoline											
Ethanol											
CNG (lbs)											
CNG (ft3)											
LPG											
LNG											
Other											

OCEAN, SSS, Barge	Tailpipe CO2	Tailpipe CH4	Fuel Life Cycle CO2	Fuel Life Cycle CH4	System Lifecycle CO2	System Lifecycle CH4	Reactivity CO2	Reactivity CH4	National Security Score % Domestic	National Security Score Global Source	National Security Score Alt Fuel
Diesel #2											
Diesel #3											
Diesel #4											
Diesel #5											
Diesel #6											
Low Sulfur Diesel (PPM range=)											
Low Sulfur Diesel (PPM range=)											
Low Sulfur Diesel (PPM range=)											
Biodiesel											
Gasoline											
Ethanol											
LPG											
LNG											
Other											

AIR	Tailpipe CO2	Tailpipe CH4	Fuel Life Cycle CO2	Fuel Life Cycle CH4	System Lifecycle CO2	System Lifecycle CH4	Reactivity CO2	Reactivity CH4	National Security Score % Domestic	National Security Score Global Source	National Security Score Alt Fuel
100/130											
100LL											
82UL											
80/87											
JET A											
JET A-1											
JET B											
Air Diesel											

Tailpipe

Life Cycles

Infrastructure Life Cycles

Reactivity

National Security

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Potential Example of Future SmartWay Approach: Carrier Partnership Requirements

- Carrier partners sign agreement with EPA committing to:
  - improve the environmental performance of their fleet.
  - submit "basic" annual data e.g. gallons, miles, ton-miles (avg. payload as a surrogate), number of trips, volume of freight, and bare minimum info to evaluate PM and NO_x.
  - agree to an EPA or third party audit of data (via random selection).

- *Optionally* carrier partners can:
  - allow EPA to publish some or all of their emissions performance statistics including g/mile, g/ton-mile, and benchmark ranking among SWT Carriers. SmartWay will increasingly incentivize this option.
  - develop and submit to EPA a 3-year goal, action plan, and/or annual statistics on the number and type of strategies employed (Part 3 FLEET).
  - promote the Partnership.

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Potential Example of Future SmartWay Approach: Logo Use

- Partners are eligible for the SmartWay logo when they:
  - perform in the top SmartWay tier of CO_2 emissions performance,
    - >*Possible to include NOx or PM criteria…*
  - allow EPA to share their emissions data publicly,
  - are free from data quality violations for the past 5 years,
  - sign and agree to all logo use guidelines, and
  - submit all data on time each year.

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Potential Examples of Future SmartWay Approach: Shipper Performance Evaluation

- New factors to integrate into program and/or score
  - New performance scores based on new metrics from carriers
  - Public display of shipper scores similar to carriers
  - Level of emissions reductions from freight facility operations
    - Loading dock operations (incl. waiting room for drivers to reduce idling)
    - Onsite mobile sources
    - Corporate passenger vehicle fleet
  - Partnership with other EPA programs e.g. Energy Star, Green Suppliers Network, Performance Track, etc.
  - Package weight and size reductions
  - Avoidance of congestion, empty-hauling/back-hauling
    - Expanded delivery hours
  - Shifting to less GHG-intensive modes (e.g. airplane to ship)
    - *Expand on existing truck-rail intermodal tool*

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Potential Examples of Future SmartWay Approach: Shipper Partnership Requirements

- Shipper partners sign agreement with EPA committing to:
  - Ship (or receive) enough freight with SmartWay carriers to qualify for a "0.50" score
    - Score would be based on amount of shipment and carriers' CO_2 performance.
      - Non-SmartWay carriers would be assigned CO_2 metric lower than the lowest ranked carrier bin.
  - Use the SmartWay 2.0 Multi-modal Supply Chain model when it comes online (2009).
  - Agree to random audit of data.
  - Track other common shipper metrics (possibly scored) such as:
    - Packaging savings
    - Load optimization savings
    - Backhaul, reverse logistics savings
    - Other innovative savings

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Potential Example of Future SmartWay Approach: Shipper Logo Use

- Shipper partners are eligible for the SmartWay logo when:
  - the weighted average CO_2 performance of all their carriers is in the top tier of all carriers' CO_2 performance,
  - they have not had any data quality violations within the past 5 years, and
  - they provide summary accounting of results from other best practices.
    - *e.g. goals, action plans, and statistics on the number and type of strategies employed beyond shipping with SmartWay carriers.*

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Potential Example of Future SmartWay Approach: Awards program and Partner recognition

- SmartWay Excellence awards criteria fully transparent to Partners:
  - Partners see where their new performance scores compare to a spectrum of their peers
  - Partners see the threshold above which top tier Partners will receive award
  - Partners can project added efforts needed to improve scores to reach award status
  - Award threshold adjusted yearly to ensure continuous improvement
  - Supplemental award points (fully transparent) accorded for supporting activities such as advertising, partnership promotional activities, etc.

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Proposed Timeline

- Early 2009 (March-April)
  - Shipper Model
  - Truck Carrier Model
  - Rail Carrier model
- Mid 2009 (July-Aug)
  - Database System
  - Air and Maritime models
  - Logistics Model
  - Drayage Model
  - Logo Use requirements
- Late 2009 (October-November)
  - Integrated system
  - Awards Criteria

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