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Sustainable Fleet: Impact of Fleet Safety Management on Sustainability Goals

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Introduction

The environmental impact of transportation operations is a concern to many types of entities. Sustainability initiatives have been undertaken by organizations ranging from corporations and universities to government entities. The goal of this paper will be to explore the impact of vehicle selection, operational practices, and driving practices have on improving fleet sustainability. The positive impact of green fleet practices on sustainability initiatives will be demonstrated through successes achieved by a variety of organizations.

The transportation sector accounts for 28% of total USA greenhouse gas (GHG) emissions, second behind electricity generation (34%). Nearly 97% of the transportation GHG emissions came through direct combustion of fossil fuels, with remainder due to carbon dioxide from electricity for rail and hydro fluorocarbons emitted from vehicle air conditioners and refrigerated transport. Transportation is the largest end-use sector emitting carbon dioxide--the most prevalent greenhouse gas. Organizations ranging from the US Park Service, cities, universities and corporations have developed sustainability plans that include sustainable fleet resolutions.

An update on the EPA SmartWay Transportation Partnership project will be provided. Covenant Transport received the SmartWay Environmental Excellence Award in both 2009 and 2008. An interview with John Arthur Daniel, VP Capacity Development and Karen Hampton, Fleet Analyst from Covenant Transport was conducted to illustrate the successes and challenges with implementing strategies from the SmartWay Transportation Project.

The author is not an expert on sustainability, but she has gathered information that demonstrates how fleet management practices can influence sustainability efforts within an organization.

Key Learning Outcomes:

- Define sustainable fleet management, green fleet, and eco-driving
- Identify key actions to attain sustainability: vehicle selection, alternative fuels, operational practices and driving behaviors
- Provide real-life examples that demonstrate impact of green fleet practices on improving operating costs, reducing energy consumption, and reducing air emissions

Definitions

To begin our journey, it is important to understand three key terms that pertain to fleet sustainability. These include: sustainable fleet management, green fleet, and eco-driving.

- Sustainable Fleet Management: Actively managing your fleet to reduce the impact of your transportation operation on the environment.
- Green Fleet: A "green fleet" is one that optimizes efficiency in many ways--such as, mode of travel, fuel, route planning, fleet operation, and vehicle size. As well, a green fleet increases the use of alternative fuels and sustainable technologies.
- Eco-Driving: Utilizing changes in driving habits to save fuel and reduce greenhouse gas emissions. These changes involve smooth driving habits – no rapid starts or stops, maintaining constant speed, using cruise control, avoiding idling, and route planning to combine trips. Many of these driving habits track with defensive driving principles, which have an added benefit of increasing safety for your driver. Changing fuels or vehicle types to impact sustainability will not meet your expectations until driving behaviors are also addressed.

Vehicle Selection

A critical element in fleet sustainability efforts is vehicle selection. Fleet managers need to determine what vehicles and technologies fit the business's need in order to improve their fleet's environmental footprint. Sustainable Cities Institute offers these "Green Fleet" strategies:

- Vehicle Type Criteria
- Number of passengers to be carried
- Cargo type, amount, & weight
- Travel time vs. park time
- Type of roadway
- Cost over life cycle
- Optimize Fleet Size
- Identify low-mileage vehicles for removal or shared-use
- Assess mileage reimbursement program vs. use of organization-owned vehicles
- Shared vehicle pool
- Limit vehicle take home
- Benefits of fleet reduction--maximizes mileage from individual vehicles, minimizes operating and maintenance costs per vehicle mile traveled, reduces purchase and replacement costs, and should help reduce total GHG emissions

An organization can reduce fuel use by selecting vehicles that are no larger or powerful than is necessary for the job. Commercial fleet managers have options to choose trucks with more efficient engines and lower gross vehicle weights. Hybrid medium to heavy duty trucks are commercially available today; however a drawback to these vehicles is the price. Hybrid trucks typically cost between $23,000 to $45,000 more than traditional trucks. This price difference makes the trucks' payback beyond the time limit for most companies.

Passenger vehicle fleets have many different options to choose from when selecting more fuel efficient vehicles. In 2009, there were over 130 different types of vehicles that averaged more than 30 miles per gallon. Hybrids and alternative-fuel vehicle choices keep increasing. Alternative fuel options include: all electric, ethanol, propane, liquid natural gas, compressed natural gas or biodiesel.

Before choosing a particular type of hybrid, companies like ATT learned which types of alternative-fuel vehicles fit their business application and were more readily available through pilot studies. Now ATT has established a green fleet plan that includes an approximately $215 million investment to replace 7,100 fleet passenger cars with alternative-fuel models. This measure will save 49 million gallons of gasoline over 10 years, according to the Center for Automotive Research.

Operators of commercial vehicles have additional ways to improve fuel economy through idle reduction initiatives, improved aerodynamics, governors to limit speeds, automatic tire inflation systems, single wide-base tires, low viscosity lubricants, and weight reduction through lighter weight components-like aluminum cab frame, clutch housing, wheels and hubs for both tractor and trailers.

A former client, Schwan Food Company, has used liquefied propane gas to power more than 90% of its Schwan's Home Service delivery fleet (more than 5,000 vehicles) since the energy crisis in the 1970's. Propane emits less carbon monoxide and hydrocarbons than traditional fossil fuels, and the engines powered by propane last longer. In 2009, Schwan Food Company identified five key areas to reduce the company's impact on the environment: on the road, waste management, reducing the amount of packaging used, and becoming more efficient with use of water.

The "on-the-road" environmental success stories are shared from Schwan 2009 Sustainability Report. Schwan's Home Service Company wanted to improve fuel efficiency and reduce oil consumption. In 2009, they began investing in new trucks that are 6,000 pounds lighter and deliver a 62.5 percent improvement in fuel economy. These new trucks are being phased in when existing trucks reach the end of their service. In addition, they have switched to synthetic oil in all trucks, which reduces the number of oil changes in a year. This translates into projected savings of 36,000 gallons of oil annually, reduction in more than 16,000 oil filters, and reduction in disposal of more than 150,000 oil containers annually.

Another division of Schwan Food Company is Schwan's Consumer Brands North America, Inc., which delivers Schwan frozen food to retail stores. This division has installed a LEEP Freeze system which eliminates the need for a separate diesel engine to run refrigeration on 40% of its trucks. This system is projected to cut refrigerated fuel consumption by 90% and save the company about $3 million annually.

As you can imagine, determining which technology or vehicle to choose is a daunting task. If you are a commercial vehicle operator, you can join SmartWay Transport Partnership to benchmark your current freight operations, identify technologies, and strategies to reduce carbon emissions, track emissions reductions, and project future improvement.

SmartWay Transport Partnership and Covenant Transport Success Story

EPA launched SmartWay Transport in 2004. It is comprised of partnerships, financial incentives, policy and technical solutions, research and evaluation projects. The SmartWay Transport Partnership offers government/industry collaboration between freight shippers, carriers, and logistics companies to voluntarily achieve improved fuel efficiency and reduce environmental impacts from freight transportation. In 2009, the partnership estimates that it helped eliminate six million tons of CO_2 and conserved more than 540 million gallons of diesel fuel, a savings of at least $1.3 billion a year in fuel costs.

Since 2010, the EPA has been making refinements to the SmartWay assessment tools and is testing the upgrade to "freight logistics and environmental and energy tracking" (FLEET) tool for both carriers and shippers. A second area of focus for SmartWay in 2010 has been investing resources in the finance and technology program. A third focus area in 2010 has been in the area of global freight sustainability initiatives. The SmartWay process is viewed as a model program, and SmartWay tools and methods are being used in a pilot to demonstrate SmartWay platform in Europe. They are also involved with Clean Air Initiative-Asia Center pilot project to retrofit and reduce emissions from trucks operating in Guangdong Province.

I wanted to highlight a success story with a motor carrier that won SmartWay Excellence Awards in 2008 and 2009. This motor carrier is Covenant Transport. An interview was conducted with John Arthur Daniel, VP Capacity Development and Karen Hampton, Fleet Analyst from Covenant Transport to discuss the experiences this motor carrier has had with the SmartWay Transport partnership.

Covenant Transport, Inc. is a truckload for hire and dedicated contract transportation carrier that is headquartered in Chattanooga, TN. It is part of Covenant Transportation Group that includes Covenant Transport, Inc. and Covenant Transport Solutions of Chattanooga, TN, Southern Refrigerated Transport of Texarkana, AR, and Star Transportation of Nashville, TN. The consolidated group operates over 3,100 tractors and 8,000 trailers.

Covenant Transport started with the SmartWay Transport partnership in 2006. Covenant tractors are equipped with aerodynamic packages including integrated cab roof fairings, cab side fairings, and aerodynamic mirrors. These packages contributed to CO_2 savings of 69,568 tons in 2008. All Covenant tractors use low friction engine and drive train lubricant, saving an additional 15,565 tons of CO_2 and nearly 1.5 million gallons of fuel. In 2008, Covenant invested in SmartWay-certified tractors and trailers, installing long term idle reduction technologies and specifying fuel efficient tires-saving an estimated 2 million gallons of fuel. Other strategies have included: 804 trucks with team drivers, Pre-Pass and truck stop electrification. In total, Covenant saved nearly 28 million gallons of fuel and 307,368 tons of CO_2 emissions while a member of SmartWay Transport Partnership.

Nancy Bendickson conducted an interview with John Arthur Daniel (JAD) and Karen Hampton (KH) with Covenant Transport. The section below lists the questions and the Covenant representative response.

Covenant Transport Interview:

1. SmartWay offers a number of carrier strategies to improve environmental footprints. These include: idle reduction, improved aerodynamics, improved freight logistics, automatic tire inflation systems, reducing highway speed, weight reduction, hybrid power train efficiency, and renewable fuels. Which strategies did you focus on and why?

a. JAD: *We chose to focus on idle reduction, aerodynamic packages, Pre-Pass, govern trucks to 65 mph, weight reduction with aluminum wheels on tractors and replacing equipment with Smart-Way certified tractors and trailers. These strategies aligned with Covenant Transport initiatives to optimize fuel economy.*

2. How has SmartWay benefitted Covenant?

a. JAD: *It provides tools that allow a motor carrier to determine return on investment and ability to track effectiveness of a technology or practice. Easy to show value to top management and gain buy-in for capital investment decisions.*

b. JAD: *Internal benefits: gives everyone awareness on the issue, very progressive and innovative way to communicate internally about all that the company is doing to save fuel, gets more press which helps awareness and increases internal support, provides a sense of pride in being a leader with SmartWay Transport partnership.*

c. JAD: *Outside recognition: Gives recognition for investments made that would otherwise be hard to package for customers. Provides validation that Covenant Transport (CT) is at the top for trucking. Helps articulate what CT is doing to control fuel cost/conserve energy-important because customers pay fuel surcharge. Our customers like Walmart and Proctor & Gamble value energy conservation actions taken by the partners they hire.*

3. What were some challenges with SmartWay to Covenant?

a. KH: *Greatest challenges when getting started are determining where to get the information and who has the information. It was a challenge to find the statistics needed for the FLEET tool. With systems in place to track the FLEET data, it is easier to complete the FLEET spreadsheets each year. Each year, data needed for FLEET tool does get modified.* Karen is a fleet analyst who is responsible for tracking data at CT for SmartWay.

4. How have Covenant drivers been involved with SmartWay?

a. JAD: *Our drivers are measured individually for idle time/idle percentage/speeds. The fleet manager intervenes if a driver is out of bounds. CT provided training on how SmartWay works, the type of data needed, and benefits to CT/Customer/Environment. CT provides updates on fuel efficiency and initiatives to the drivers. We needed the support of drivers in order to achieve the success of CT with SmartWay.*

5. Is there continued support for SmartWay within Covenant and what recommendations do you have for a motor carrier just getting started with SmartWay?

a. JAD: *Our top management is fully committed to the SmartWay program. Joey Hogan, President of Covenant Transport stated: "Participation in the program is very valuable and rewarding to our associates and drivers. Through the fleet model spreadsheets, they can see the direct impact (in gallons and CO2 reduction) that technology and procedures they have implemented have had in reducing overall fuel consumption and emissions."*

JAD: *Recommendations for getting started with SmartWay: Just get started- it will help you find current techniques that improve scores and help you identify practices that are good for the bottom line.*

Operational Practices

Operational practices have been used to address sustainability initiatives. These practices include: vehicle inspection and maintenance processes, routing technology, and improving ground network efficiencies through utilizing different modes of transportation – rail vs. truck, telematics that capture data on acceleration, braking, turns, idle time, and speeds.

Proper maintenance of vehicles helps reduce CO_2 emissions; fuel efficiency is affected by improperly inflated tires and degraded motor oil. Drivers must get involved with checking the condition of their vehicles and ensuring that preventive maintenance is completed.

Routing technology is a proven way to determine efficient routes to customers with the least amount of time and miles driven, along with selection of routes that minimize idle times. In 2009, UPS has achieved a 10% aggregate improvement in miles per gallon for the delivery vehicles in the U.S. Domestic Package segment over the decade that began in year 2000. The 2009 UPS Corporate Social Responsibility report states this is due to package routing technology, increasing use of telematics, and commitment to driver training.

Telematics helps drivers become more efficient and helps track vehicle performance. At UPS, telematics-equipped vehicles eliminated more than 13.5 million minutes of idle time which translates into fuel savings of more than 90,000 gallons in 2009.

Driving Behaviors

Driving behaviors need to be considered when establishing sustainable fleet management practices. Eco-driving refers to a set of driving behaviors and techniques that improve fuel economy, save money, reduce greenhouse gas emissions, promote safe driving, and reduce wear and tear on vehicles. These techniques are not new, but really mirror what we have traditionally taught in defensive driving courses. The message is new however in trying to get drivers to take accountability for driving actions that impact sustainability initiatives.

Eco-driving programs offer advice to drivers that help them minimize fuel consumption while driving. Specific advice include items such as: shifting to a higher gear as soon as possible, maintaining steady speeds, anticipating traffic flow, accelerating and decelerating smoothly, and keeping the vehicle in good maintenance (e.g. check tire pressure frequently). Different eco-driving programs in Europe have been found to yield fuel economy improvements on the order of 5 to 15%. Expect to see an expansion of eco-driving courses being offered and studies established to measure the effectiveness of these driver training options in the future.

Conclusion

Sustainable fleet management is of great importance for organizations that have been asked to demonstrate corporate social responsibility. The transportation sector accounts for 28% of greenhouse gas emissions. Rising fuel costs will present a major financial impact to organizations with vehicle operations. Sustainable fleet initiatives impact all types of organizations ranging from corporations to all types of governmental agencies and education institutions.

Research on sustainable fleet management initiatives revealed extensive activity in this area. It is the opinion of the author that green fleet initiatives will increase in importance within fleet safety management. Take action on reducing your fleet's environmental footprint by formalizing your sustainable fleet goals and establishing a team to develop and implement your initiatives.

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