Reducing Greenhouse Gas and Fuel Usage of Commercial Fleets Using Telematics Technologies

- Instead of costly replacement of existing fleets with new environmentally friendly and fuel efficient hybrids, you can significantly cut emission, improve fuel mileage, and cut operating costs by utilizing today's telematics and fleet management solutions for a fraction of the cost replacing vehicles -

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Introduction

The Coalition for Clean and Safe Ports recently released a report on the pollution and hazardous health conditions in the Port of Oakland area from the 2,000 big rigs at the port each day. It recommended the trucking companies serving the port to work with the Port of Oakland to hire and secure less polluting trucks. This recommendation was supported by the Alameda Public Health Department and other groups.[1] These actions, however, are generally opposed by the trucking industry because of the prohibitive costs. A similar proposal is before the Harbor Commission of Los Angeles, which operates that city's port, the busiest in the nation. These are just two examples of many cases, where concerns of emission, fuel, and global warming have increasingly become a top concern in the trucking industry.

Without expensive purchases of fuel efficient and environmental friendly new vehicles, trucking fleets can effectively control and reduce greenhouse emission and operating expenses by managing their operation in the follow three areas using today's telematics and fleet management solutions. Leveraging on wireless communication services, Internet, GPS and client-server computing, fleet management and telematics solutions can accomplish these goals and achieve many cost and environment benefits to fleets both large and small.

In a recent survey and research report[2], Aberdeen Research estimated that companies using fleet technology solutions reported an average improvement of vehicle utilization of 13%, vehicle downtime of 15.4%, operating cost of 10.4%, travel time per job of 14.8%, and worker compliance of 27.8%, and an average savings of operating cost at approximately $1,100 per vehicle per year.

Areas of Improvement and Benefits

There are three general areas of improvement that can bring dramatic results in fuel cost, mileage efficiency and emission reduction with most existing vehicles:

1. Improve vehicle maintenance and operating conditions for optimal overall fuel efficiency and emission levels of fleet vehicles,

[1] Big rigs at Port of Oakland linked to health woes at: **http://www.sfgate.com/cgi-bin/article.cgi?f=/c/a/2007/09/27/BAVBSENGJ.DTL&feed=rss.bayarea**, Thursday, September 27, 2007

[2] Aberdeen Research Report: Service on the Move – Driving Profitability via Fleet Management, March 2007

2. Manage and improve drivers' driving habits and behavior that has proved to be a major factor in fuel efficiency, risks, and overall wear and tear of the vehicles, and
3. Manage mileage and eliminate non-business related driving to reduce overall usage and emission and other environmental and risk impact.

1. Improving vehicle maintenance

US Department of Energy studies recently concluded that up to 20% improvement in fuel economy could be achieved by keeping vehicle properly tuned, checked and by replacing air filters, maintaining proper tire pressure, reducing excess weight, and using recommended grade of motor oil.[3] These practices roughly break down as follows:

- Engine properly tuned - Fuel Economy Benefit: 4%
- Check and replace air filter regularly - Fuel Economy Benefit: up to 10%
- Keep tires properly inflated - Fuel Economy Benefit: 3%
- Use recommended grade of oil - Fuel Economy Benefit: 1-2%
- 47% of the diagnostic trouble codes (DTC) monitored in light/medium vehicles (OBDII) have been attributed to emission problems, 27% related to fuel consumption problems, such as catalyst problem, fuel mix and mis-firing. [4]

By tracking vehicle usage using onboard electronics via the vehicle bus and GPS positioning, and continuously monitoring of fault indicators and operating conditions, fleet management systems track closely operating conditions, fault indicators, maintenance and scheduled services and ensure optimal operating conditions.

2. Managing and improving driver behavior and driving habits

The same study attributed driving habit as a major factor of fuel usage and emission. Overall fuel economy on driver behavior can be up to 33% savings in highway driving and 5% around town by controlling excess speed, rapid acceleration, hard brake, and excess idling: [5]

- Observe speed limits – Fuel Economy Benefit: 7-33%
- Remove excess weight - Fuel Economy Benefit: 1-2% per 100 lb.
- Avoid excess idling – Idling of heavy trucks typically burns one gallon of diesel per hour. Idling generally operates the engine at a much less efficient and far more emission level than normal driving.
- Other good practices including using cruise control to maintain even speed and the use of overdrive to increase mileage.

By tracking, consolidating and analyzing GPS and engine bus data using onboard computers and fleet tracking reports, fleet managers can identify areas of improvement for all employees and pinpoint problematic drivers and driving behavior, and institute improvement education and training.

3. Managing mileage and eliminating non-business related driving

Reducing unnecessary miles, vehicle usage and personal usage of fleet vehicle can result in significant cost, environmental and safety impact.

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[3] From the US Department of Energy : http://www.fueleconomy.gov/feg/maintain.shtml
[4] From NetworkCar press release: http://www.networkcar.com/networkcar/pub/pressrelease050
[5] From the US Department of Energy: : http://www.fueleconomy.gov/feg/driveHabits.shtml

- Consumer Report estimated that wear and tear accounts for $0.25 per mile over all vehicles.
- The Food Marketing Institute (FMI) in 2004 showed a distribution cost per mile of $2.01. This included labor, maintenance, fuel, licenses, insurance, depreciation, taxes, and leases. Adjusted to the over $3.00 a gallon fuel price today from 2004, the cost per mile for food distribution is estimated to be higher than $2.30 today.
- Reducing mileage not only reduces vehicle usage and wear and tear, it can dramatically cut insurance cost. Various estimates supplied by the auto insurance industry:
  - Total cost of accidents is $160,000 per million vehicle miles traveled.
  - Risk exposure estimated at 16 cents per miles or fleets are covered for 16 cents for every mile on the road. Unnecessary miles reduce insurance premium at 16 cents per mile.
  - National Highway Safety Administration (NHTSA) estimates a $0.315 on insurance cost for each mile driven for average fleet vehicles.

GPS tracking and electronic maps, combined with route and work order management, enable fleet managers to better manage and reduce personal and unnecessary miles through:

- Planning and optimized routing for all business and work related driving,
- Tracking and promote and reward worker route compliance, and
- Eliminate personal and unauthorized use and employee abuse.

Innovation and Novelty

Telematics products and GPS-based vehicle tracking solutions and services are widely available today. However, most of the available products have been designed for simple tracking and reporting of vehicle locations, theft prevention, and road-side assistance. The following are key product functionalities are necessary in telematics products to accomplish fuel and emission improvement goals. Many of these have only been available or proven their value recently.

- Managing Both Workers and Vehicles: The solution must separately track vehicles and drivers to be able to pinpoint actions required to address vehicles and drivers. This requires solutions that individually deal with human and machines, as well as the combined actions of drivers and vehicles. Analyses, actions and reports must be specific and accurate in addressing the drivers separately from the vehicles.

- Electronic Map and GIS Tools: Today's mapping tools are far more complete, accurate and feature-rich than they were just a few years ago. Fleet management solutions need to make effective use of map content and mapping engine capabilities for planning and tracking of routes, mileage calculations, points-of-interest references, and geo-fencing of sites, zones, and routes for various stops, workflow and driving events. Navigation tools combined with dynamic route condition reports for weather, traffic and other events can be utilized to further improve time, driving and mileage.