networkfleet™
DRIVING BUSINESS

OPTIMIZING FLEET MAINTENANCE WITH WIRELESS VEHICLE MANAGEMENT

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Overview

For fleet managers, nothing is more important than keeping vehicles running and productive. Maintaining vehicles, including repair, upkeep and downtime, can have a huge impact on a fleet's bottom line. A proactive, preventive maintenance program can help fleet managers keep vehicle repair costs and downtime to a minimum.

Unfortunately, many fleets simply take a reactive approach to vehicle maintenance. In a widely distributed fleet, that could mean costly repairs, not to mention vehicle downtime. Fleet managers need to be able to monitor and collect data on the "health" of their vehicles to fix problems early and reduce costs.

Reducing Vehicle Maintenance Costs

Scheduled Maintenance

Regularly scheduled maintenance is the most effective way to minimize vehicle downtime. Even simple maintenance like regular oil changes can help reduce engine wear and make the vehicle run cooler and last longer, according to the AAA.[1] Setting preventative maintenance schedules requires knowing the type of vehicle, the usage (mileage, hours, operating environment), Original Equipment Manufacturer (OEM) warranty, recall status, and regulatory requirements. In addition, it is beneficial to know the types of diagnostic problems that typically occur with different vehicle types.

Vehicle Performance

Information on individual vehicle performance on the road is vital to reduce maintenance costs. For example, when trucks are traveling in high heat and steep grades; monitoring the temperature of the engine, the air intake temperature, and oil pressure can help fleet managers gauge engine performance. Having access to statistics on vehicle diagnostics over time is also important to determine if a vehicle is performing optimally.

Fuel Economy

Vehicles operate more efficiently when they are well maintained. Therefore, improving vehicle performance through preventative maintenance can improve fuel economy. Monitoring unauthorized vehicle use, excessive speeding, MPG and idling can also greatly reduce fuel usage. Repairing a vehicle that is out of tune can improve its gas mileage by an average of 4 percent.[2] Furthermore, fixing a serious maintenance problem, such as a faulty oxygen sensor, can improve your mileage by as much as 40 percent.

Monitoring Engine Performance with Networkfleet® Wireless Vehicle Management System

What is Networkfleet?

Imagine receiving instant notification by email when a vehicle has a transmission malfunction or engine problem so it can be repaired quickly. Combine that with the ability to track the exact location and speed of each of vehicle 24/7 from anywhere in the world. That is the power of the Networkfleet wireless vehicle management system.

Fleet managers can log on and view specific vehicle data such as current location, fuel consumption, mileage, speed and idle-time; 24/7 through a secure, easy-to-use web application.

Networkfleet gives fleet managers the power to access near real-time productivity and efficiency information on virtually every aspect of their fleet operations via the Internet. Networkfleet's in-vehicle device collects and wirelessly transmits data directly from a vehicle's engine computer and from a global positioning system (GPS). Fleet managers can log on and view specific vehicle data such as current location, fuel consumption, mileage, speed and idle-time; 24/7 through a secure, easy-to-use web application. Emissions can also be monitored wirelessly, eliminating the need to bring vehicles to a smog check facility (California only).

At the same time, Networkfleet's patented remote diagnostic capabilities notify fleet managers via email when an exception occurs within the fleet, such as when a vehicle has exceeded a speed threshold or the check engine light is illuminated. By identifying issues early, Networkfleet allows fleet managers to proactively fix vehicle problems before they escalate into larger issues. This keeps vehicles running and in production.

Figure 1:
Networkfleet in-vehicle device

How Networkfleet Wireless Vehicle Management Streamlines Fleet Maintenance

I. Lowering Vehicle Downtime

A. Unauthorized or unnecessary driving wear and tear costs

According to Consumer Reports, wear and tear often accounts for nearly $0.25 per mile.[4] Any unauthorized or unnecessary vehicle use can contribute to vehicle wear and tear. Fleet managers can use Networkfleet to verify daily route and stop locations. By analyzing driving patterns and optimizing routes, the system can help reduce unnecessary vehicle use.

Figure 2: Networkfleet Odd Hours Report

Report Overview	
Violation Window	10:00 PM - 05:00 AM
Report Time Period	09/11/2006 - 09/18/2006
Selected Vehicle	All Vehicles

Export Data — Export this report data to a Microsoft Excel spreadsheet.

Printer Friendly — View this report in a printable format.

This report was created on: 10/06/06 09:32 AM.

Odd Hours Report for SERVICE 311

Tuesday, September 12, 2006

	Time	Location Address
Violation begin time:	09/12/06 11:20 PM	4546 Cape May Ave San Diego, CA 92107-2328 US
Violation end time:	No key off event detected.	N/A

Odd Hours Report for SERVICE 323

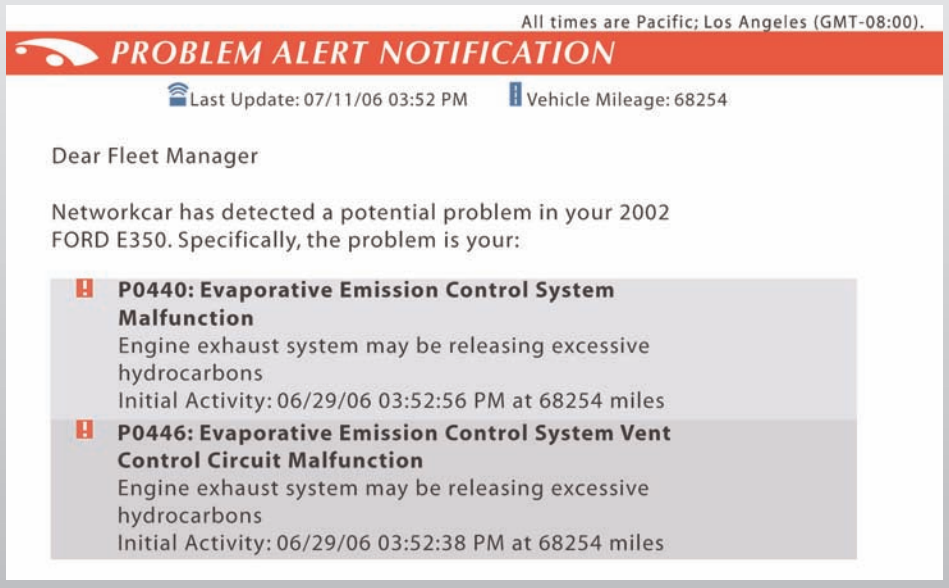
Saturday, September 16, 2006

	Time	Location Address
Violation begin time:	09/16/06 12:45 AM	783 Cruz Ave San Diego, CA 92107-3323 US
Violation end time:	09/16/06 01:27 AM *	Closest Landmark: Pac 493 Niagara San Diego, CA 92107-3118 US

B. Diagnostic Trouble Code Alerts

Typically, managers wait days or even weeks for drivers to report that a vehicle's check engine light is on. Networkfleet automatically notifies fleet managers by e-mail immediately and reports a diagnostic trouble code (DTC). Networkfleet provides the precise DTC and a description identifying the specific nature of the problem. This allows technicians to begin their analysis immediately instead of spending time trying to determine what is wrong.

Figure 3: Networkfleet Diagnostic Trouble Code Email



By identifying issues early, Networkfleet allows fleet managers to proactively fix vehicle problems before they escalate into larger issues. Fleet managers with relatively new vehicles can minimize repair expenses by taking advantage of vehicle warranties.

Networkfleet has collected DTCs from thousands of vehicles in fleets across the U.S. Analyzing aggregate Networkfleet data shows that 47 percent of diagnostic trouble codes for light/medium duty (OBD-II) vehicles were related to Emissions issues and 24 percent were related to Fuel Consumption issues.

Top Individual Diagnostic Trouble Codes Collected by Networkfleet

- #1 Light Vehicle DTC (P0300) is related to cylinder misfires. Misfires can be indicative of poor maintenance or of a faulty or worn ignition system.
- #2 Light Vehicle DTC (P0171) indicates that the air to fuel mixture is suboptimal. This could be indicative of a faulty O2 sensor or a faulty/worn fuel pump.
- #3 Light Vehicle DTC (P0420) indicates that there may be a problem with the vehicle catalyst and it should probably be replaced.

"We've found an extra bonus in the fact that Networkfleet will immediately email us a message should something go wrong with the vehicle, like a misfire or hard start. With that information, we can determine if a vehicle should be brought in for repairs before it breaks down. Preventing a vehicle from breaking down on the road saves us a great deal of time and money." Tony Spitek, Fleet Division Manager, City of Napa.

C. Scheduled Maintenance Alerts

Networkfleet provides daily odometer updates and notifies users by email when vehicles have reached predetermined maintenance intervals. Fleet managers can easily establish custom maintenance alert schedules and receive emails when vehicles are due for maintenance based on mileage or other criteria. These schedules enable timely regular maintenance and repairs that extend vehicle life and increase vehicle resale value.

"Our service provider knows exactly when our vehicles are due for scheduled maintenance and they let us know which vehicles to bring in. They can spot vehicle problems at an early stage, which helps us maximize our warranties. By repairing problems immediately, we also reduce long-term repair costs. Networkfleet helps us keep our vehicles in top condition so we rarely run into a situation where we don't have the fleet assets we need to meet our workload." Jerry Herrington, fleet supervisor for Coast Plumbing.

If a vehicle goes out of compliance, the fleet manager receives an email and has 45 days to fix the problem. Fleets using this feature are exempt from having to get smog checks or pay smog certifications.

D. Idle-time Data

Excessive vehicle idling leads to increased fuel expenses and engine wear. On heavy duty vehicles, 0.82 gallons of gas are consumed for every hour of idle-time.[5] Fleet managers utilizing Networkfleet can monitor idle-time by vehicle to determine which vehicles exceed a certain idle threshold such as 15 percent. Fleet managers can also run a report to compare idle-time as well as fuel consumed between similarly operated vehicles.

E. Remote Smog Check

With Networkfleet, vehicle emissions are continually monitored through a wireless network. Networkfleet has a contract with the State of California to allow fleet customers to enroll in a free, remote smog check service. There is no need to have vehicles physically inspected as long as they are running cleanly.

If a vehicle goes out of compliance, the fleet manager receives an email and has 45 days to fix the problem. Fleets using this feature are exempt from having to get smog checks or pay smog certifications. This eliminates fees and reduces vehicle/driver downtime.

"We save thousands of dollars each year using the remote smog check service. This includes the cost of the smog certification and the lost time and revenue from a vehicle when time has to be set aside to get a smog test done." Tom Elliott, fleet manager, Cloud 9 Shuttle.

II. Improve Maintenance Accuracy

A. Automatic odometer readings

For a distributed fleet, accurate odometer readings are usually a manual, error-prone process when mileage is collected at the fuel pump. Networkfleet automates this process by calculating mileage using data from the vehicle's engine computer. This eliminates the necessity to physically audit vehicle odometer information, which can be labor-intensive and time consuming.

Access to accurate mileage information is essential to a good preventive maintenance program. In addition, mileage information can be exported into existing fleet management systems using Networkfleet's data integration services.

"Without Networkfleet, we might have had to hire an additional technician to maintain our fleet. Now, a single fleet maintenance specialist can monitor the status of all vehicles from a single website. We expect to see a savings of over $24,000 in labor costs from the use of this system over the next year. Plus, it's great not have to manage all those paper records."
Mike Harding, Operations Director, O.C. Communications, Inc.

Figure 4: Networkfleet Online OEM Recall Notices

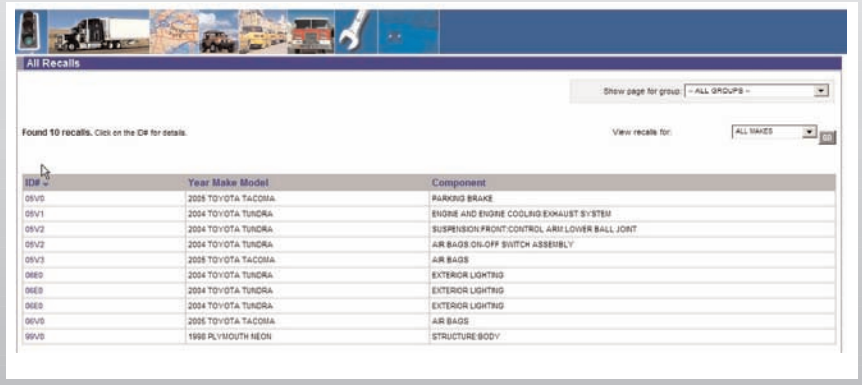
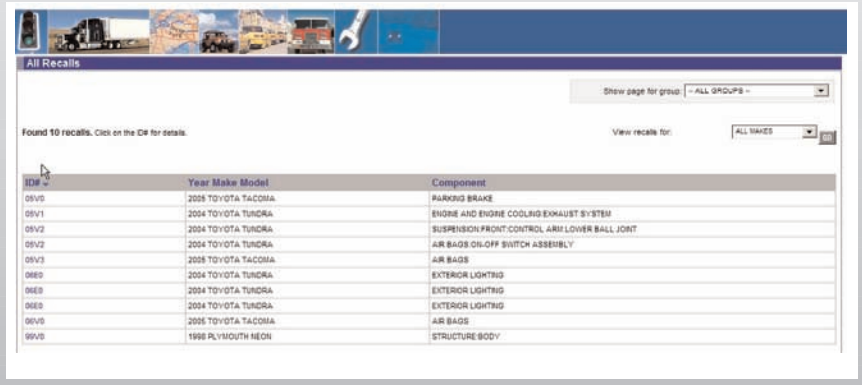


Figure 5: Networkfleet Service Record History



B. Automatic recall notices

Recalls can cause vehicle downtime and maintenance problems. If a vehicle manufacturer is found by the National Highway and Traffic Safety Administration (NHTSA) to be responsible for a serious defect, an auto recall is issued. An auto recall requires the manufacturer to send an official notice to owners of the vehicles found to be defective. More often than not, only a portion of the production run of a certain make, model, and year vehicle is affected by an auto recall. Fourteen percent of all vehicles on the road have been recalled at least once to correct either a safety defect or noncompliance with a particular safety standard.[6]

Online recall notices from Networkfleet give fleets important safety information much faster than postal mail notices from the manufacturer. This allows fleets to make repairs immediately, increase safety and beat the rush at their service provider.

C. Maintenance history online

Networkfleet can help fleets receive a higher resale value for their vehicles by providing a complete online service history, eliminating the need to maintain paper records. In addition, service records can be quickly and easily entered online through the Networkfleet website.

Mini Case Study – Roto-Rooter

Hoffman Southwest, the largest Roto Rooter franchisee in the country, selected Networkfleet to provide both GPS location and diagnostic information for its fleet of 400 field technicians. The company increased its annual profits by more than $200,000 by being able to make more service calls and reduce overtime costs.

Using Networkfleet, Hoffman was able to improve its fleet vehicle maintenance and purchasing by analyzing the frequency of diagnostic trouble codes on various makes/models. Networkfleet instantly alerts Hoffman fleet managers if there is a diagnostic problem with a vehicle. This allows Hoffman to proactively address problem vehicles.

Prior to implementing Networkfleet, the company experienced high repair bills associated with blown engines and other vehicle problems where earlier recognition and maintenance of the vehicle could have reduced or even eliminated the resulting repair cost. During the first eight months of using the system, more than 30 percent of vehicles had diagnostic trouble code alerts. Hoffman now tracks this trouble code data, which allows them to proactively repair vehicles and helps them make better decisions on future vehicle purchases.

For more information about optimizing fleet maintenance with Networkfleet, call 1-866-227-7323 or visit www.networkfleet.com.

1 "Keep Your Car Running with Regular Maintenance." AAA. October 2006 http://www.aaacalif.com/auto/maintain/car_care_details.asp

2 N.D. "Keeping Your Car in Shape." EERE.October 2006, from http://www.fueleconomy.gov/feg/maintain.shtml.

3 N.D. "Keeping Your Car in Shape." EERE.October 2006, from http://www.fueleconomy.gov/feg/maintain.shtml.

4 February 2004. "Leasing Tips: The wrong Decision Can Cost You Money" Consumer Reports. October 2006, from http://www.consumerreports.org.

5 October 2002. "Study of Exhaust Emissions from Idling Heavy-Duty Diesel Trucks and Commercially Available Idle-Reducing Devices." U.S. Environmental protection Agency. October 2006, from http:www.epa.gov/smartway/idlingimpacts.htm.

6 McDonald, Kevin, M. August 16, 2006. "Is it time to end vehicle safety recalls?" The Detroit News Online. October 2006, from http://www.detnews.com.