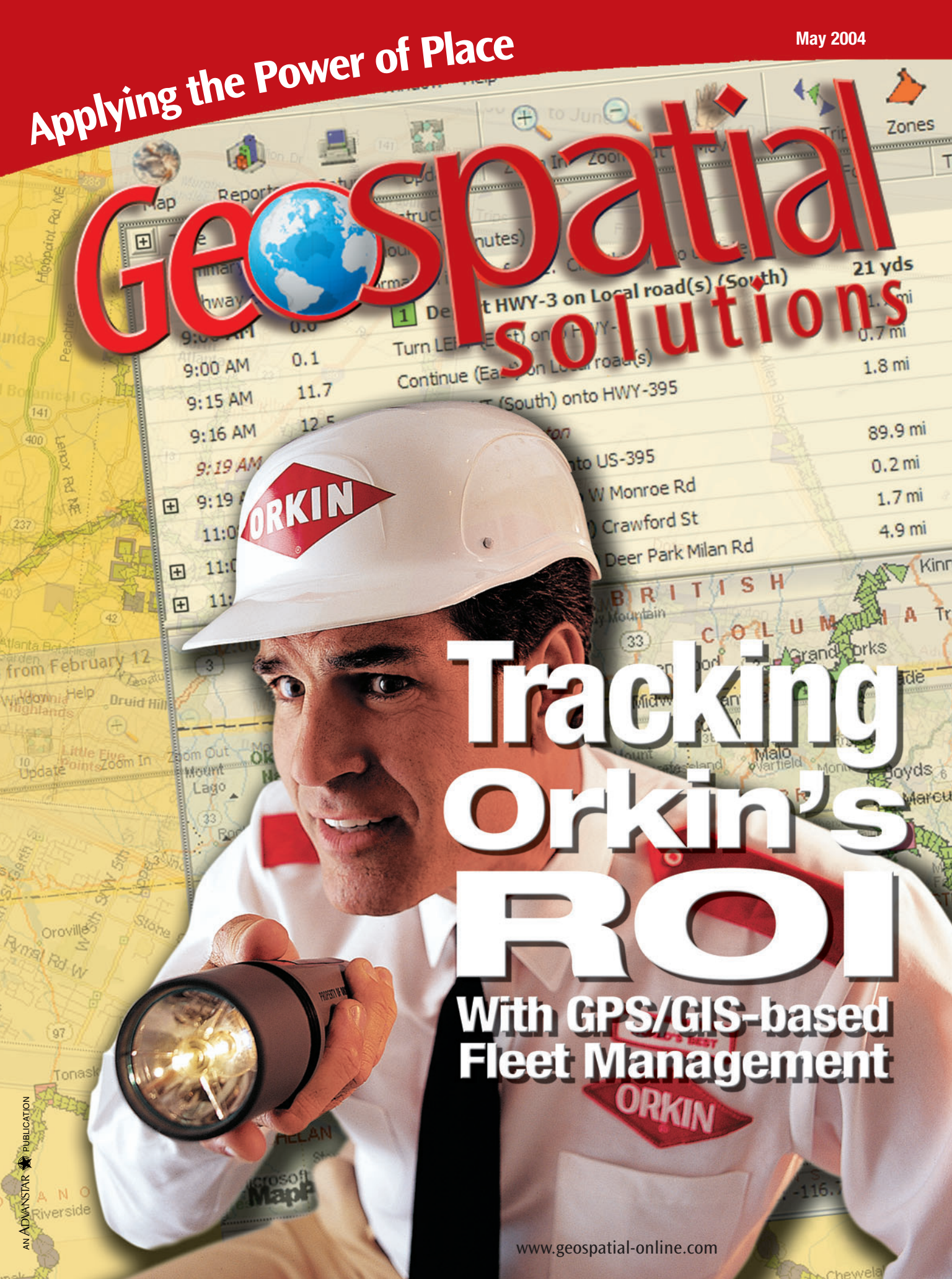
Applying the Power of Place

May 2004

# Geospatial solutions




# Tracking Orkin's ROI

## With GPS/GIS-based Fleet Management

www.geospatial-online.com

AN ADVANSTAR PUBLICATION


# Tracking Orkin's Bottom Line

Background courtesy of GEOTAB, photo from Orkin, Inc.

Scottie Barnes and Heather Gooch

## GPS-based fleet tracking is helping Orkin to more effectively dispatch pests and multiply profits.

With a fleet of 5,500 trucks logging 150 million miles each year, Orkin Inc. was certain that better fleet management could significantly impact its bottom line. So in 1999, the company began experimenting with GPS tracking in three of its branches. Since that time, Orkin parent company Rollins, Inc. has spent $4 million on GPS hardware and software. That investment has already begun to pay dividends, and with a GPS-based fleet management program now being rolled out across the entire company, Orkin stands to reap even more rewards.

Largely as a result of the GPS monitoring and Orkin's driver certification programs, workers compensation claims (a majority of which are related to driving) have dropped 32 percent since 2001, resulting in an annual savings of more than $1 million. Physical damage claims to vehicles dropped 21 percent during the same period, saving another $500,000. In addition, auto liability claims plunged 35 percent, for a savings of more than $2 million. Mike Gibney, Orkin's director of claims and loss control, notes the company's accident frequency ratio has been slashed from 13.3 accidents per million miles driven in 1997 to about 7.7 accidents per million in 2003.

"We've also gone from 12,000 casualty [insurance] claims in 1997 to right at 5,000 claims at the end of 2003," adds Gibney. "It's been a phenomenal decrease."

In addition to enhancing its bottom line, fleet tracking is helping the company in other ways.

**Preventing Accidents.** Orkin wanted to prevent service vehicle–related accidents that could injure employees or others. Identification of poor driving habits before a ticket, accident, or fatality occurs can save employees not just their jobs, but possibly their lives. The speed watcher function within the GPS tracking system is encouraging drivers to slow down (see "Take it Easy, Lead Foot!" sidebar).

**Assuring Quality**. Fleet tracking provides management with evidence that technicians are performing their jobs responsibly. Not only can management see that Orkin employees are driving properly and responsibly, they can also verify that technicians spent adequate time on a customer's service and ensure that services aren't altogether skipped. In the past, if a customer claimed he or she was not serviced, it was that person's word against the technician's. With GPS, the amount of time a technician spends at any location cannot be disputed (see "Tracking Data Makes the Case" sidebar).

**Improving Maintenance.** Beyond driver skills, the

*Scottie Barnes* is editor in chief of *Geospatial Solutions* and *GeoIntelligence*. *Heather Gooch* is managing editor of *Pest Control*.

new tracking system uses its GPS odometer feature to alert managers when 3,000 miles have passed between oil changes or 10,000 miles since transmission checks and so forth. Such functionality should help Orkin get more miles from its vehicle fleet.

With these goals and accomplishments in mind, Orkin has just completed the first of three phases of its companywide rollout. Though a complex infrastructure supports Orkin's fleet-tracking capabilities, for the drivers, it's as easy as turning the key.

## How Orkin Tracks Its Fleet

The onboard components of Orkin's fleet-tracking system are designed to record and transmit data about a vehicle without requiring driver interaction. The in-vehicle system comprises a touch key, a touch-key housing, an onboard processor, and a GPS antenna.

**Starting Up.** Each Orkin field technician is issued a unique key. The key contains a memory chip that not only identifies the driver, but also stores trip information on the tamperproof (essentially a miniature black-box device) key. As the technician begins his or her day, he or she simply inserts the touch key into the touch-key housing to initialize the tracking system. (Though Orkin has not chosen to deploy this option thus far, it could program vehicles such that they will not start unless an authorized touch key is inserted.)

**The Interface.** Mounted on the dashboard near the driver's seat, the touch-key housing is the communication interface between the technician's touch key and the onboard processing unit. The housing is connected to the onboard computer by way of a wiring harness. Because each technician's key is uniquely identified, this configuration enables Orkin to track the activities of either vehicles or drivers, regardless of which vehicle a technician is assigned on a given day.

**Data Processing.** Installed in the dashboard, the onboard computing device not only communicates with the driver touch key by way of the housing, but also processes the GPS signals, which it acquires by way of a small GPS antenna. The unit is 12/24-volt compatible, eliminating the need for a voltage converter in 24-volt operating trucks. It records such information as position, time, vehicle speed, ignition tampering, and data from four auxiliary inputs. Orkin, for instance, uses one auxiliary input to monitor ignition and another to monitor seatbelt use, leaving two inputs open for future auxiliary data collection if Orkin desires.

**Signal Acquisition.** GPS signals are acquired by way of a 2 × 2-inch active (amplified for better signal acquisition) GPS patch antenna. The antenna is mounted inside the windshield to make it less vulnerable to destruction from external forces when the vehicle is unattended.

**Recording on the Go.** Once the technician inserts the touch key and commences his or her appointed rounds, the onboard processing unit begins acquiring GPS positions once per second. Based on change in the heading, speed, or position, the onboard unit determines whether or not to log the vehicle's position. For example, if the vehicle is traveling at a constant speed in a straight line, the system may only log the position every 16 seconds. When the vehicle begins to turn, however, and is changing heading or speed, the unit records positions every second. If the measured speed drops below 20 miles per hour but the vehicle is still moving, the unit starts to measure and record what is called "traffic idle time." After the vehicle is stationary for 60 seconds, it measures what is called "stop idle time." The patent-pending algorithm that enables this functionality is designed to maximize the use of onboard memory and storage space.

Throughout the day, the onboard processor logs positions and headings as dictated by the algorithm and sends data to the touch key by way of the housing interface. At the end of the day, the tech-

The onboard tracking system is installed in about one hour (top). The driver activates the system by inserting a uniquely identified key, which stores trip data on a memory chip.

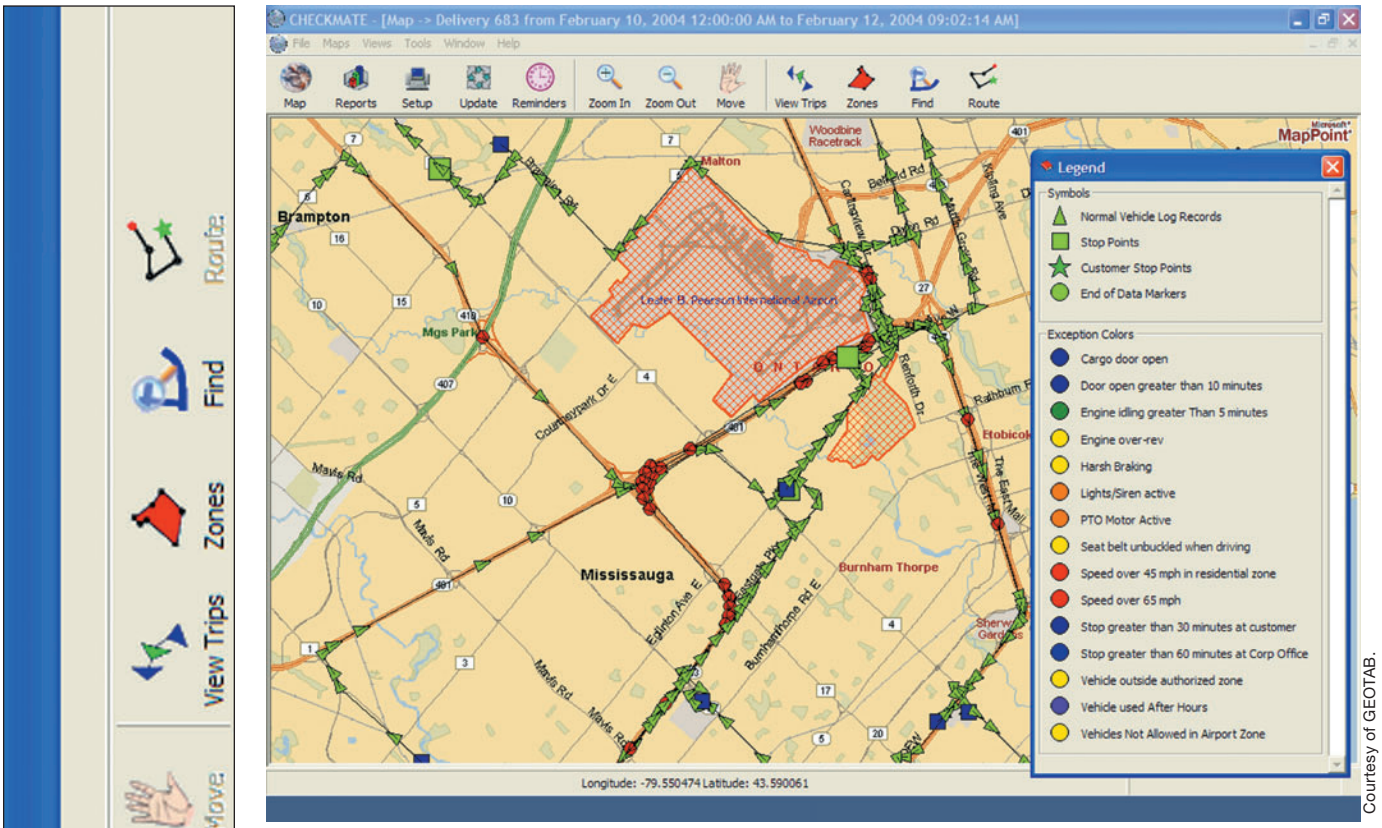
The onboard processor uses a patent-pending algorithm to optimize GPS logging frequency by monitoring vehicle speed, heading, and elapsed time.

GPS signals are acquired once per second by way of an active patch antenna mounted inside the windshield.

Inset graphics by GEOTAB.


Courtesy of Orkin, Inc.

While a technician works at a customer address, the system logs visit time, providing invaluable documentation in the event of a service dispute.




Courtesy of GEOTAB.

**FIGURE 1** Here, an exception zone in which the driver is not to travel, is indicated by red hatch marks. The driver's trip data are laid onto a basemap and color coded according to pre-set rules pertaining to speed and other operating factors.

nician returns to the branch office. To download trip data, he or she then inserts the key into a USB driver connected to a PC in the branch office.

### Client–Server Configuration

When the driver inserts his or her key, the vehicle trip data are automatically downloaded to the branch office computer, or client. The encrypted data are then sent across Orkin's wide-area network by way of 64K lines to a database server in the company's Atlanta headquarters. On the SQL server, the trip data are then placed in the database and an "exception processor" searches for operational violations based on a previously defined set of rules. Violations are flagged in the database and reported back to the branch manager. The entire download and processing procedure takes about two minutes. The client and the server side each play an important role in the overall process.

**Client Side.** Though rules about speeding and other driver behavior are standard across the company, geographic rules are generally created on the client side. Branch managers or other qualified users employ a proprietary mapping software and map database — along with the fleet-tracking program's functionality — to define zones or geographic regions relevant to their local business, and build rules relating to those zones.

For instance, managers can set up geofences to create area zones in which vehicles are not allowed or in

## Take It Easy, Lead Foot!

In addition to saving the company money, Orkin believes the fleet-tracking program has prevented serious injuries by encouraging employees to drive more safely. For example, when employees speed, they know their action is being monitored and that any incident of driving more than 90 miles per hour will result in automatic termination, as will a second incident — on a rolling, one-year basis — of driving faster than 80 miles per hour, or a third instance of driving faster than 70. Orkin's corporate policy is arguably the most stringent in the industry.

"When we first rolled GPS out, we used to see about 3,800 instances of speeding more than 70 miles per hour," Gibney recalls. "Now you'll maybe see 200 incidents per month. People are definitely slowing down."

Naturally, GPS is not the only loss control program contributing to these statistics. The Driver Certification Policy, prehire physicals, modified duty, and improved field communication cannot be overlooked. Still, the termination rate since installing the tracking system has dropped to 0.2 percent in 2003, as compared with 10 percent of the workforce in 1996.

which they may only operate within very specific parameters. To accomplish this, the user mouse clicks around the perimeter of the desired zone until the borders are closed. Rather than simple round or square buffer zones, users can draw freehand polygons over irregularly shaped areas to precisely match sales territories, properties, or areas within a property (see Figure 1). Users can create exception rules to these zones. The most common rules are excess stop time in a zone, use of vehicle in or out of assigned zone, excess speed inside zones, excess engine idling inside zones, and use of auxiliary equipment inside zones (see Figure 2).

In addition, program managers can create customer zones by importing customer list data from a spreadsheet formatted with name and street address, or by using geo-coded customer data based on name and latitude/longitude. If street addresses are used, the fleet-tracking software interfaces with the mapping software to locate the addresses, and then draws them on a map of customer zones.

Customer zone creation enables managers to verify customer visits and provide proof of technician activity (time spent at a customer address), if necessary. When a customer point on the map is double clicked, further information appears in an attribute box. Such data can include the date, time, driver, vehicle, speed, stop time, trip distance, and readings from auxiliary sensors. If this point is at a customer location, the customer name is also listed.

In addition to creating rules and tracking driver activity, this client-side functionality enables branch managers to oversee sales territories and marketing efforts for their region.

**Server Side.** On the server, each technician's track is compared against these rules — as well as standard companywide rule sets — to look for deviations. When the server identifies violations, it notifies branch managers. But because the system provides password-protected access for branch, region, division, and national management personnel, all levels of management can also generate reports, in spreadsheet or html format, about vehicles and drivers (see Figures 3 and 4).

## Tracking Data Makes the Case

Here are just two examples of Orkin's case for GPS.

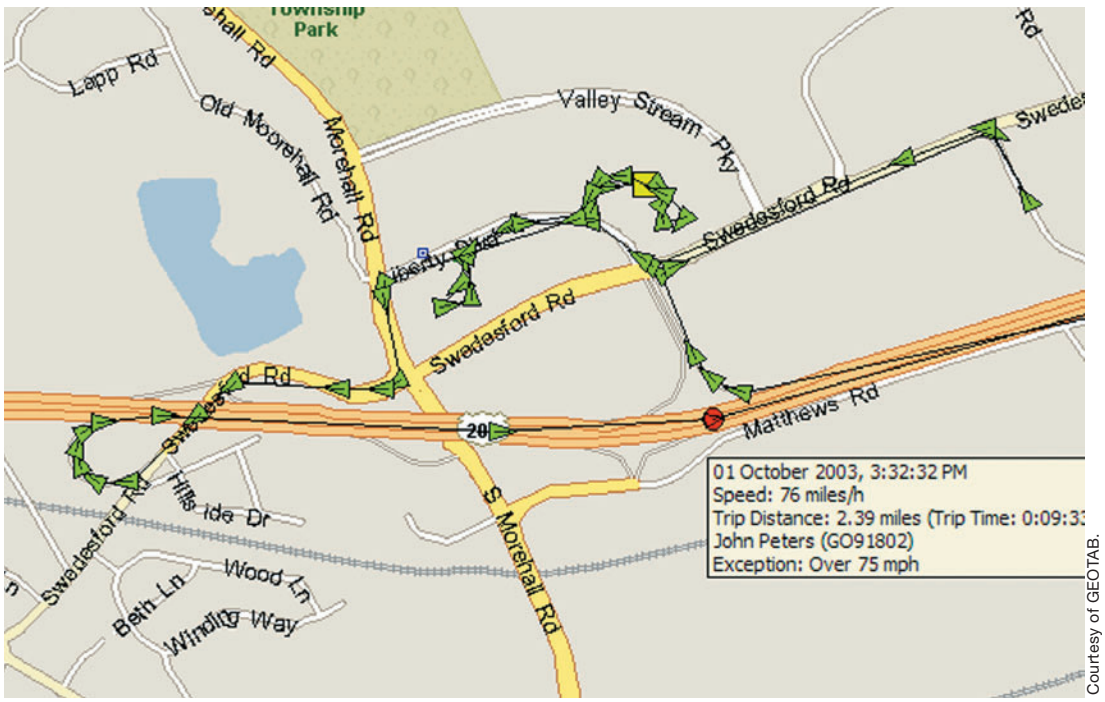
■ A driver from Orkin's Tulsa, Oklahoma, branch was involved in an accident. Although the other vehicle had pulled out in front of his truck, the Orkin employee was charged with the accident because the officers investigating the accident said the driver was speeding. According to the officers' calculations, the Orkin truck was traveling in excess of 60 miles per hour.

Courtesy of Orkin, Inc.

When Orkin's Tulsa dispatcher downloaded the GPS data, it showed a recorded speed at the time of the accident to be 48 miles per hour. The company delivered this information to the police chief, who accepted the GPS record as being more accurate than the police officers' subjective calculations.

■ At another branch, a customer had a history of calling in to complain that the Orkin technician had not serviced her house, even though the driver had left a proper service ticket. In the past, the office had waived her fees, not wanting to lose her as a customer.

After the GPS was in place, the customer called to make the same claim. She said that she had been home on the day in question and the technician never came to perform her service. When the branch manager checked the GPS records, he found that the technician had indeed been to the house, where he spent 31 minutes. When the customer was confronted with this evidence, she admitted that the real reason she had disputed the service was because she was having financial problems and had hoped that Orkin would once again waive her fee. Instead, the company worked out a payment plan with the customer.




Courtesy of GEOTAB.

**FIGURE 2** A dialog box atop the map reveals an exception, or an instance in which a driver has violated a pre-set rule about speed.

File Edit View Insert Format Tools Data Window Help — Type a question for help

U12

| | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | RISK MANAGEMENT REPORT | | | | | | | | | | | | | | | | | | | | | |
| 2 | REPORT PERIOD: 5/25/2003 TO 5/31/2003 11:59:59 PM | | | | | | | | | | | | | | | | | | | | | |
| 3 | DIVISIONAL SUMMARY (ALL REGIONS) | | | | | | | | | | | | | | | | | | | | | |
| 4 | Region | Max mph | | | Ave. Speed | Stop Length (Mins) | | | | | | Idling Over | Idling Time | After Hours | Tamper | Vehicle | Avg. Idling | Avg. Idling | Vehicle After | Vehicle Tamper | Total | Total |
| 5 | | > 70 | >= 80 | >= 90 | (mph) | <10 | >10 | >20 | >30 | >40 | >50 | 5 minutes | (d:h:m:s) | Use (Trips) | Signs | Count | > 5 mins. | Time | Hours | Signs | miles | Stops |
| 6 | East | 17 | 0 | 0 | 23 | 350 | 88 | 22 | 21 | 8 | 112 | 82 | 0:12:29:24 | 12 | 0 | 10 | 8 | 0:01:14:56 | 1 | 0 | 1,855 | 601 |
| 7 | Metro | 48 | 5 | 0 | 18 | 513 | 206 | 103 | 78 | 32 | 303 | 76 | 1:10:34:18 | 55 | 0 | 34 | 2 | 0:01:01:01 | 2 | 0 | 3,898 | 1,235 |
| 8 | North | 15 | 1 | 0 | 19 | 909 | 274 | 139 | 73 | 43 | 298 | 100 | 0:21:31:44 | 78 | 0 | 29 | 3 | 0:00:44:33 | 3 | 0 | 4,380 | 1,736 |
| 9 | West | 7 | 0 | 0 | 18 | 210 | 80 | 52 | 33 | 29 | 107 | 122 | 1:09:00:31 | 71 | 0 | 15 | 8 | 0:02:12:02 | 5 | 0 | 1,841 | 511 |
| 10 | SouthWest | 0 | 0 | 0 | 31 | 23 | 16 | 4 | 4 | 2 | 10 | 6 | 0:02:07:44 | 14 | 0 | 6 | 1 | 0:00:21:17 | 2 | 0 | 1,579 | 59 |

Geotab Risk Management Report

Ready

Courtesy of GEOTAB.

**FIGURE 3** The Risk Management Report summarizes risk and productivity driving occurrences that, if not addressed, could lead to higher operating costs for fleets. Such occurrences include after-hours use, engine idling, speeding, and harsh braking.

File Edit View Insert Format Tools Data Window Help — Type a question for help

A1 — TRIPS LIST

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | TRIPS LIST | | | | | | | | | | | |
| 2 | REPORT PERIOD: 2/10/2004 TO 2/10/2004 11:59:59 PM | | | | | | | | | | | |
| 3 | REPORT VIEW: Idle Alert for 10 minutes and over; Speed Alert for 70 mph and over | | | | | | | | | | | |
| 4 | Driver | Vehicle | Departure Time | Driving Time | Arrival Time | Location | Trip | Stopped Time | Ave. Speed | Max. Speed | Odometer | Idling |
| 5 | | | | (d:h:m:s) | | | miles | (d:h:m:s) | mph | mph | miles | (d:h:m:s) |
| 6 | GARY JONES | | | | | | | | | | | |
| 7 | Tuesday | | | | | | | | | | | |
| 8 | Gary Jones | Delivery 656 | 2004-02-10 07:56:10 | 0:00:21:55 | 2004-02-10 08:18:05 | Office: Demo Corporation | 8.8 | 0:00:06:45 | 34 | 69 | 2354 | 0:00:00:00 |
| 9 | Gary Jones | Delivery 656 | 2004-02-10 08:24:50 | 0:00:39:36 | 2004-02-10 09:04:26 | Customer: RS Corp | 40.1 | 0:00:08:18 | 52 | 75 | 2394 | 0:00:00:00 |
| 10 | Gary Jones | Delivery 656 | 2004-02-10 09:12:44 | 0:00:20:41 | 2004-02-10 09:33:25 | Customer: TUV Corp | 8.6 | 0:01:36:49 | 28 | 52 | 2403 | 0:00:00:00 |
| 11 | Gary Jones | Delivery 656 | 2004-02-10 11:10:14 | 0:00:02:37 | 2004-02-10 11:12:51 | 694 RR-8, Cambridge ON | 0.1 | 0:00:08:07 | 11 | 16 | 2403 | 0:00:00:00 |
| 12 | Gary Jones | Delivery 656 | 2004-02-10 11:20:58 | 0:00:03:12 | 2004-02-10 11:24:10 | 292 RR-8, Cambridge ON | 0.7 | 0:00:48:16 | 11 | 32 | 2403 | 0:00:11:11 |
| 13 | Gary Jones | Delivery 656 | 2004-02-10 12:12:26 | 0:00:43:39 | 2004-02-10 12:56:05 | 2521 Trond Crescent, Mississauga ON | 38.7 | 0:00:17:18 | 47 | 85 | 2442 | 0:00:00:00 |
| 14 | Gary Jones | Delivery 656 | 2004-02-10 13:13:23 | 0:00:17:24 | 2004-02-10 13:30:47 | 2527 N Sheridan Way, Mississauga ON | 8.6 | 0:01:59:52 | 32 | 54 | 2451 | 0:00:00:00 |

Courtesy of GEOTAB.

**FIGURE 4** By using the tracking system's Trip List Report, an Orkin Branch Manager can view each trip and its distance and time driven. When comparing that same trip using the mapping program's routing feature, the manager can identify deviations in time and distance. The result is a fuel and working–hours savings for field employees.

## A Swarm of Benefits

With the fleet-tracking system already installed in 1,000 vehicles in 80 regional offices, Orkin's benefits are quickly multiplying. And even as the company continues with the second and third phases, which involve installing the system in 300 more branch offices during the next two years, it is already embarking on a new project to employ the fleet-tracking system's routing functionality to save even more money.

"There aren't a whole lot of companies who have cut worker and customerclaims frequency by 60 percent and cut their claims dollars in excess of 40 percent," says Gibney. "The economics behind the system make us a more vibrant and healthy company."

## Manufacturers

**GEOTAB** (www.geotab.com) supplies **Orkin, Inc.** with its fleet-tracking hardware and software, with in-vehicle installation provided by local GEOTAB affiliate **Global Resource Group** (www.grginc.us). The client-side software also runs on **Microsoft** (www.microsoft.com) MapPoint 2004, using both its mapping data and functionality, and Microsoft Excel for customizable reports.

©Reprinted from GEOSPATIAL SOLUTIONS, MAY 2004 AN ADVANSTAR PUBLICATION Printed in U.S.A.