

# Field-Force Management: What's New for the Mobile Workforce?

How the maturation of location tracking can increase efficiency.

BY GREG KNEUER

To realize the enterprise benefits of field-force management, utility executives and managers should pay keen attention to:

- Advancements in real-time location tracking;
- Fully extending mobile workforce management (MWM) in the enterprise;
- Back-end connectivity with enterprise-wide systems; and
- Security of mobile applications.

### Advancements in Real-Time Location Tracking

A key area for corporate enterprise growth is real-time management of field-force resources and assets, enabling better response to customers. Since the U.S. Department of Defense made its Global Positioning System (GPS) standard positioning service available and free of direct charges for civil users worldwide in 1995, real-time/location-aware applications have exploded in the mainstream

marketplace. Market research data predicts that the location-based services market—including GPS, General Packet Radio Service, Universal Mobile Telecommunication System, Automatic Vehicle Location, Street Level Routing, and Mobile Mapping—will hit close to \$5 billion by 2010 (*see sidebar*). Tracking, navigation, and mobile hardware, designed to increase the efficiency of field-force operations, are a growing trend and are fast maturing.

Electric, gas, and water utility distribution companies can find as much as 90 minutes of additional time each day per field-force employee, and increase their productivity by 15 to 25 percent, by taking advantage of real-time location tracking technology. Such savings for a utility with 250 to 500 field workers would yield an additional \$5 million to \$10 million to the bottom line. The magnitude of savings decreases as the number of field-force employees is lowered; however, the overall percent of productivity savings remains very similar.

## FINDING THEIR PLACE

These real-time location-tracking technologies are reaching maturity, promising increased field-force efficiency.

**Global Positioning System:** GPS is a satellite-based radio navigation system, initially developed in the early 1960s and operated by the Department of Defense since then. GPS consists of three segments: the satellite constellation, ground control network, and user equipment.

**General Packet Radio Service:** GPRS, based on GSM, is a continuous packet data service. It uses the existing network infrastructure but is being marketed as delivering ISDN-type speeds. Rather than sending a continuous stream of data over a permanent connection, GPRS's packet switching system uses only the network when there is data to be sent.

**Universal Mobile Telecommunication System:** UMTS is the so-called "3rd-generation technology." It aims to offer higher-bandwidth packet-based transmission of text, voice, video, and multimedia needed to support data-intensive applications. Once UMTS is fully implemented, computer and phone users can be connected constantly to the Internet and have access to a consistent set of services worldwide.

**Automatic Vehicle Location:** AVL is a computer-based vehicle tracking system. For a given fleet, the actual real-time position of each vehicle is determined and relayed to a control center. Actual position determination and relay techniques vary, depending on the needs of the fleet system and the technologies employed.

**Street Level Routing:** SLR sequences and routes work assignments, and ensures that field personnel have the most efficient work schedule possible. SLR optimizes field personnel work order sequence, provides accurate turn-by-turn driving directions, and calculates accurate arrival times for use by dispatchers and call takers.

**Mobile Mapping:** A full-featured GIS map component for mobile devices, handhelds, PCs and other type computers.—GK

### Fully Extending MWM in The Enterprise

Mobile technology is used predominately for service-type work, and often for emergency response. Reaping the full benefits of mobilizing the workforce involves extending MWM to all field-related activities that can include maintenance, inspections, design, and construction, as well as the service order and emergency work. An enterprise-wide mobile system automatically will acquire work orders from all work request generation sources, including enterprise resource planning (ERP), customer information systems/customer relationship management (CIS/CRM), outage management/trouble ticketing, work management and enterprise asset management, and other work request generation systems.

Many utilities still are using various

# MOBILE WORKFORCE MANAGEMENT

The mobile environment can be defined simply as the ability to track the progress of all mobile resources in real-time and assign the right work orders to the right resources, with the right equipment, in the right location, at the right time. At the most basic level, mobile workforce management (MWM) solutions allow mobile workers in the field to:

- Be routed most efficiently;
- Remotely access and update centralized information;
- Capture/record field data on a computing device;
- Transfer electronic data through wireless connectivity; and
- Solve customer problems on the spot.

Field-force automation takes advantage of the latest advances in mobile devices, handheld PCs, wireless communications, and a suite of MWM software applications to maximize the potential of a utility's workforce. MWM includes automated scheduling and resource optimization, routing and workflow management tools, and positioning and e-maps, combined with real-time communications among the operations center, back-office systems, and the mobile workforce.

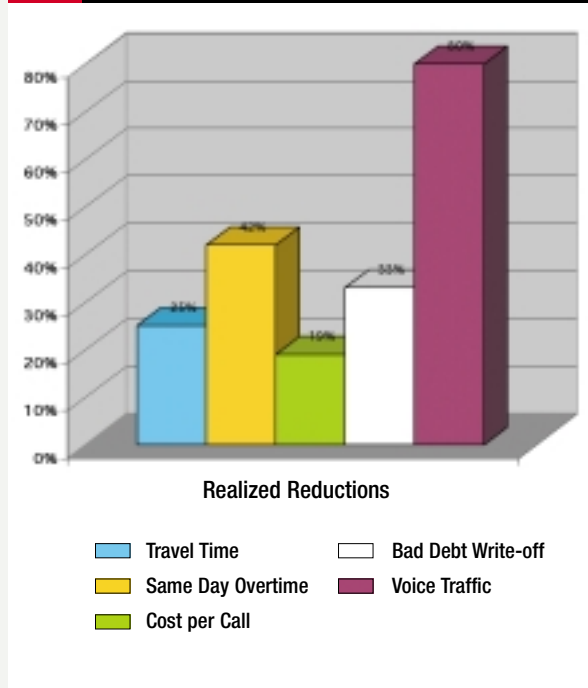
Electric, gas, and water utility transmission and distribution compa-

nies can realize significant benefits through optimizing utilization of field-force management and MWM technology (see Figures 1 and 2).

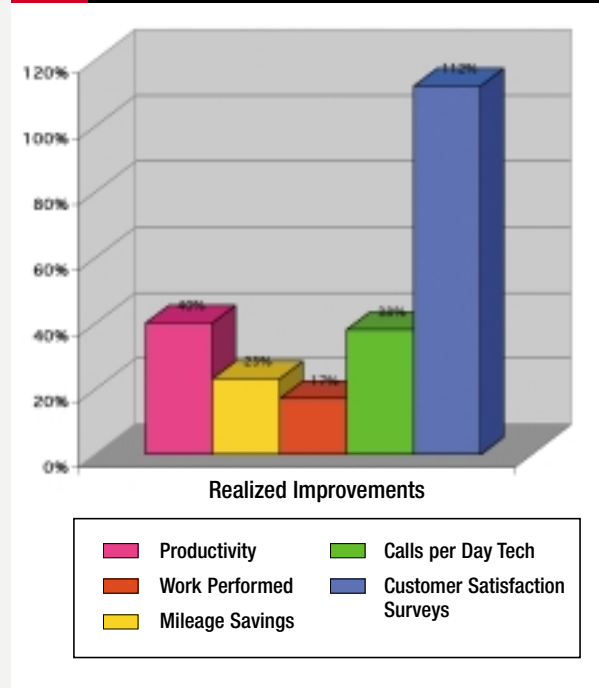
Productivity of field crews can be increased by approximately 40 percent as a result of real-time dispatching and routing, quick location of problems, crew access to maps and facilities from anywhere, and elimination of paperwork and office visits. Today's mobile technologies allow field crews to receive and update detailed work-order information electronically instead of having to communicate with a dispatcher, thereby eliminating the "voice traffic" issues associated with two-way radio and cell phone-based systems. Reduction of voice traffic allows for consolidation of multiple dispatch centers.

MWM and real-time communications also can lead to dramatic improvements in customer satisfaction related to service work and trouble calls. These systems have been shown to reduce a utility's bad debt write-off by facilitating damage documentation and claims. For example, when third-party construction damage occurs to electric underground equipment, the utility may not get accurate records required to make a damage claim. Having a mobile device in the field improves the likelihood and ease of obtaining correct and accurate information to quickly initiate a damage claim.—GK

**FIG. 1** MOBILE WORKFORCE MANAGEMENT REDUCTIONS



**FIG. 2** MOBILE WORKFORCE MANAGEMENT GAINS



Note: Charts reflect a composite of gains and reductions achieved by multiple utilities.

forms of paper in conjunction with their mobile systems. This increases labor effort and decreases data integrity. Fully extending MWM across the enterprise means automating all paper forms with simple pull-down menus

that cover all field-related work. Today's "smart systems" anticipate the type of work and resources required, and provide the user with the corresponding mobile interface and tools.

## Back-End Connectivity With Enterprise-Wide Systems

To fully extend MWM in the enterprise, the mobile applications must be tied to the utility's various enterprise systems. Mobile system applications include mes-

saging, dispatch and scheduling, and work-order status and reporting. The mobile system is accessed by wired and wireless devices through a presentation interface that ensures ease of viewing and access. The mobile system is integrated with the utility's key enterprise systems, providing a real-time flow of information both to the mobile workforce and from the mobile workforce.

### Security of Mobile Applications

Security is a top priority anytime sensitive information is being exchanged over networks. Wireless networks have

their own data-encryption facilities, but only over the individual networks.

Internet-based services do not facilitate security functions. To provide secure and reliable services requires an end-to-end integration. Wireless Transport Layer Security (WTLS) for Wireless Application Protocol (WAP) provides client and server authentication, and allows for encryption between a handheld device and the WAP gateway.

For mobile workforce management systems to add value for both management and field personnel, they must be convenient and easy to use. A user

friendly application allows the utility to take maximum advantage of the unique features of mobile devices so users can access any type of information needed to perform and close-out assigned work.

Companies that take advantage of mobile technology advancements and extend these mobile systems across their enterprise will achieve efficiencies and flexibilities that enable them to better compete in their markets. **E**

*Greg Kneuer is principal consultant at Enspira Solutions Inc. Contact him at 303-641-2589.*

## Barriers

*(Cont. from p. 41)*

- through all of the usual feasibility/SIS/facilities studies before it knows the full cost of providing capacity and energy services to its customer. This could take several years.
5. *PJM Interconnection LLC*, Docket No. ER06-456-000, Filing Letter at 5-6, Tariff Revs. at 1 (filed Jan. 5, 2006). PJM proposes to designate the "sink" end of these projects as "load" areas. PJM did acknowledge that its filing does not address whether such costs ultimately should be paid by the project, by the project's transmission customers, or by PJM market participants that deliver power to the project's point of withdrawal.
  6. PJM's FAQs on Neptune indicate PJM's intention allow is to Neptune's customers to opt for network integration service into Neptune, or point-to-point service. See Question 38: "b. Transmission service from the source(s) in PJM to the HVDC terminal in PJM. The transmission customer can choose either point-to-point transmission service or network transmission service, depending on their respective circumstances. See response to 44 below regarding those circumstances under which network service may be used to serve external load." Question 44 asks, "Which type of service (Network vs. Firm PTP) would be applicable in the case where an entity enters into a call option arrangement under a defined indexed value with a generator in PJM, thereby providing that entity with the ability to procure energy from the bulk power market during lower cost hours and/or when the

unit is unavailable?" The answers are shown as "A. A customer can use network service for external load that is included as PJM network load. In this case, the customer must designate network resources to support the load. A customer must use firm point-to-point service for load that is excluded from PJM network load. Section 31.3 of the OATT, Network Load Not Physically Interconnected with the Transmission Provider, states: This section applies to both initial designation pursuant to Section 31.1 and the subsequent addition of new Network Load not physically interconnected with the Transmission Provider. To the extent that the Network Customer desires to obtain transmission service for a load outside the Transmission Provider's Transmission System, the Network Customer shall have the option of (1) electing to include the entire load as Network Load for all purposes under Part III of the Tariff and designating Network Resources in connection with such additional Network Load, or (2) excluding that entire load from its Network Load and purchasing Point-To-Point Transmission Service under Part II of the Tariff. To the extent that the Network Customer gives notice of its intent to add a new Network Load as part of its Network Load pursuant to this section the request must be made through a modification of service pursuant to a new Application." The FAQs may be found at <http://www.pjm.com/planning/downloads/rtep-trans-neptune-faqs.pdf>.

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**Joseph Paparello**

**Advertising Sales**

**Tel: 703-847-7759**

*paparello@pur.com*

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8229 Boone Blvd, Suite 400, Vienna, VA 22182