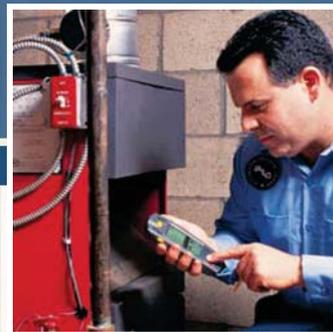# FROST & SULLIVAN

The ROI of GPS for Mobile Field Workers

1. THE CHALLENGE: MANAGING MOBILE FIELD WORKERS

Today's field service workers are everywhere. They can be found working out of their vehicles throughout our cities, suburbs, and rural areas. Whether the field employee is a driver doing pick-up and delivery, a repair tech who is handling a long list of service calls, or even a home health care worker dealing with housebound patients throughout the day, their interactions with customers can have far-reaching consequences. They act as a key customer-facing representative for a number of North American industries, including Utilities, Construction, Manufacturing, Home Health Care, Transportation and Logistics, Public Safety, and HVAC.

While the individual field worker's tasks may vary, the market pressures on this sector as a whole provide equal opportunity torment. Service-related costs are increasing. Customers are ratcheting up their demands for quick response and stellar results. Competition comes from all directions. Skilled field service technicians are retiring. Government compliance requirements are intensifying.

In this challenging environment, your company still has to meet it SLA commitments, optimize Time-to-First-Fix, satisfy federal regulations, and reduce costs. And many companies expect to accomplish all of this while essentially working blindfolded.

Let's consider the business-as-usual scenario: Out in the field, there is typically very little management visibility into individual worker activity. At best, the field worker is tethered by back-and-forth text messaging or periodic cell phone/radio contact with the dispatcher. But the worker is essentially self-reporting – providing management and dispatch with a sketchy view of who is where at any particular point in time.

This situation isn't ideal. And it isn't adequately serving the needs of the worker, the client, or your company. The consequences of maintaining this disconnect can be dramatic and include reduced service quality, stalled-out productivity levels, unabated costs, and unhappy customers.

So how do we make your on-the-go workers more connected, responsive, and productive?

2. MOBILE FIELD WORKFORCE MANAGEMENT AND INTEGRATED GPS

The lack of real-time visibility into field worker activity is directly addressed by today's Field Workforce Management solution, a potent combination of GPS and wireless mobile technologies. Field Workforce Management evolved from FCC mandates that established a national E911 system serving both wireline and wireless telecom users. These mandates required U.S. mobile operators to invest billions of dollars into building an infrastructure that provided real-time location data to emergency responders whenever a cell phone user dialed 911.

Needless to say, it didn't take too long for our wireless carriers to recognize the commercial potential of this public sector locationing capability. Earlier business applications had focused on tracking fleet trucks; however, these used expensive in-vehicle, hard-mounted systems that depended on satellites, required dedicated servers, and were priced on a licensing basis. Only the largest companies could afford to build and operate these sophisticated and high-priced truck-tracking solutions.

Fortunately for everyone else, the E911 mandates shepherded in a new generation of solutions that were handset-based and significantly less expensive. GPS-enabled mobile handheld computers and smartphones, web-based tracking systems that are operable on almost any PC, and per-month hosted pricing on the software have opened up GPS-based workforce management solutions to all sizes of businesses and to a much wider assortment of vertical industries.

Enterprise-grade GPS means more than "dots on a map" or finding individual addresses. Locationing capabilities for today's business must deliver a clear ROI and, at the same time, be useful and practical for the field technician. The capabilities of these next-generation workforce management solutions speak directly to the performance pressures existing in the Field Services sector:

- **Worker tracking, locating, and monitoring:** The individual field services worker can be located in real time with updates at pre-determined intervals. Location refresh intervals are typically five to fifteen minutes; however, one-minute and even 15-second refreshes are available from some vendors.

- **Geofencing and exception alerts:** With geofencing, administrators can receive alerts whenever a worker enters or leaves a pre-defined area or travel corridor.

- **Mapping and navigation:** Instead of paging through paper maps and map books, workers can rapidly access up-to-date maps and turn-by-turn driving instructions on their handhelds – helping the driver reach target sites quickly and reduce valuable time being spent on administrative tasks.

- **Real-time content:** Local weather alerts, today's gas prices, and developing traffic conditions are just a few examples of real-time information that help field employees efficiently maneuver through the work day.

- **Labor/time tracking:** Wireless timecards let the field worker remotely clock in and out of work shifts right on their devices, and GPS tagging adds value by verifying the whereabouts of an employee when they punch in and out. Job arrival, departure, and dwell times go on record.

- **Scheduling and dispatch:** Knowing where a particular worker is – and how far along on an assignment he or she is – allows the dispatcher to quickly reassign or reschedule jobs based upon worker availability, skill set, and work-order priority. Route optimization software can automate this process for service and delivery vehicles and minimize the amount of miles driven. Dispatch personnel can easily monitor conditions throughout the day and provide customers with up-to-date ETA as activities unfold.

- **Data collection:** With a field workforce management solution in the palm of their hands, field workers are able to collect multiple forms of data in the field, enter this information directly into their handhelds, and transmit it real-time to a central location – eliminating time-consuming paper-based processes. Information capture can include barcode scanning, electronic signatures, image or photo capture, debit/credit payment, and electronic forms that can be customized to replicate a company's regular paper forms. And geo-tagging provides another layer of information to all of these capture methods.

Field workforce management solutions can extend your company's business-critical ERP, CRM, and SFA systems to automate and location-tag previously-manual field operations such as order entry, trouble ticketing, dispatching, and inventory management.

The goal of all of these capabilities is to provide a more efficient and accurate two-way information exchange that helps companies lower costs, increase worker productivity, and improve customer relations.

## 3. THE EVOLVING MARKET FOR GPS-ENABLED FIELD SERVICE SOLUTIONS

Field workforce management solutions have gained significant traction during the past two years as technologies have improved and as companies increasingly recognize the need for real-time oversight and mobile worker visibility.

A number of trends have emerged around this solution category – all pointing to continued enhancements in capabilities, pricing, and support:

- Manufacturers continue to increase the power, ruggedness, and user-friendliness of their mobile devices.

- The hosted, per-user/per-month pricing model continues to gain sway – especially in this challenging economy where capital expenditures are a non-starter.

- Integration with back-office corporate software (payroll, dispatching, CRM, billing) is becoming easier and more standardized.

- Service and support are now viewed as more than hand-holding during initial deployment, with ongoing 24/7 customer support as a given and SLAs becoming more common.

- Packaging and pricing is also becoming more standardized, with good-better-best tiered offers and alignment on monthly software price points.

Together, these trends point to a solution category that offers clear value-add to any company with mobile workers providing services in the field.

By the year 2014, Frost & Sullivan expects well over five million U.S. field service workers to be using a location-enabled workforce management solution on their mobile handhelds. A survey of North American IT decision-makers conducted during First Quarter 2009 reveals that a majority of respondents already view this type of application as a business enabler. Two-thirds of the companies surveyed characterized field workforce management solutions as Very Necessary (34%) or Somewhat Necessary (32%) in helping to meet their company's business goals – i.e., improving worker productivity, increasing customer satisfaction, and/or decreasing expenses, etc.
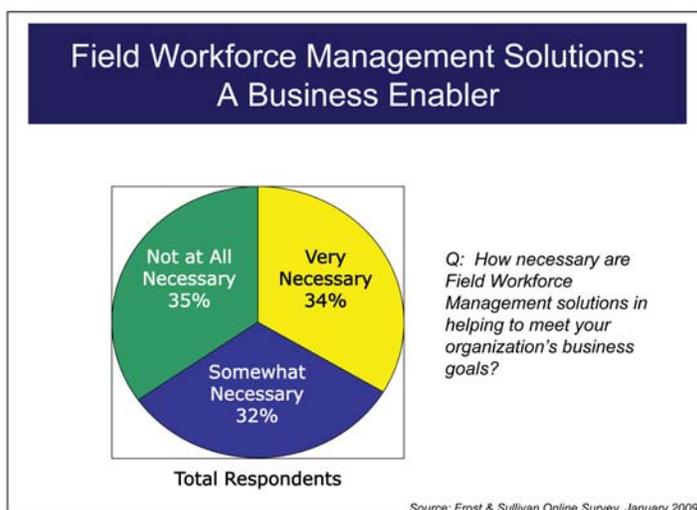
This high level of perceived need is reflected in respondents' current deployment plans. The solution is already on many companies' technology roadmap, with 44% of all respondents having already experienced some level of deployment and another 19% planning to introduce this solution for the first time sometime within the next two to three years.
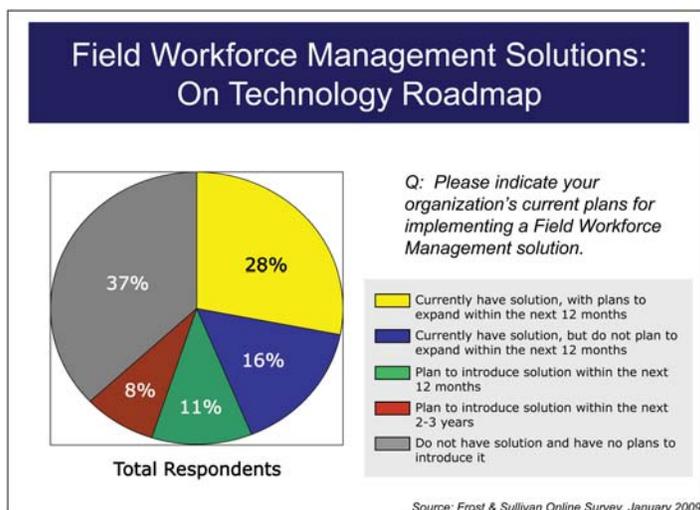
What stands in the way of implementation for those remaining companies that have field service employees? Frost & Sullivan's research identifies five barriers to purchase:

Fears about the current economy: The current economic climate is still exerting a strong dampening effect on company spending – and this negative influence extends directly into the IT department's wireless strategies and budgets. A new field workforce management solution may require new mobile devices or professional integration/customization work. Many of today's businesses fear that type of upfront expense may be prohibitive. They feel trapped in a holding pattern, waiting for the economy to recover before initiating new or expanding existing mobile field-based solutions. What they may not realize is that mobile devices are becoming less costly and can often be treated as an operations expense by bundling the hardware with the application software and charging a monthly per-user rate.

Limited customer awareness: There's still a certain lack of customer awareness regarding the benefits of this service. Field workforce management services are not advertised nationally. Rather, the vendors and carriers are creating awareness on an industry-by-industry basis. So, we see strong awareness in the Transportation and Logistics, Utilities, and Construction sectors – and growing awareness in the Home Health Care, Manufacturing, Public Safety, and Higher Education industries. Hand-in-hand with limited marketing is the wireless carriers' somewhat haphazard ability to sell more sophisticated mobile applications. Their high-level data specialists are more comfortable than the carrier's general account managers with this solution category, but these specialists are still in the process of increasing their level of expertise around specific vertical needs.

Challenges with back-office integration: Integrating the information on the mobile computing device back into a company's corporate software systems – whether these be payroll, CRM, dispatch, etc. – is an area of deep concern for a number of companies. They are worried about the expense and about possible day-to-day business upheaval. The older the back-office system, the stronger the heartburn. However, application developers and carriers are partnering with corporate software vendors to help neutralize this area of unease. Back-office integration is becoming less onerous and expensive as today's solutions become more standardized. And, for small and mid-sized companies, workforce management applications are increasingly providing out-of-the-box integration with the more popular corporate software products.

Security concerns: With a significant amount of corporate and customer data being exchanged throughout the day between the field worker's mobile handheld and company back-end systems, many point to data security concerns as a key adoption barrier. Mobile application providers are attacking this head-on by designing platforms that manage a range of mobile security issues.

Employee resistance: Employee unease about personal privacy can also act as a deterrent, although these worries are becoming more muted in certain industries. Many companies neutralize this issue by emphasizing the security and navigation benefits of the solution. A second area of difficulty can be simple resistance to new technology. An aging workforce can be opposed to yet another round of technical training and perceived complication.

These are typical customer concerns for this stage in the product adoption process. The market for field workforce management solutions has moved beyond basic infrastructure and legitimacy issues. It is now experiencing a steadily growing customer base and the challenge of refining solutions to more directly address minute-to-minute realities out in the field.

What is driving deployment of these solutions? The answer is a mix of hard-dollar customer benefits, improvements in technology, and value recognition on the part of major mobile industry players:

- **More affordable and functional ruggedized devices:** Mobile workers in the field need mobile handheld devices that are rugged, lightweight, and easy to use. Already-rugged mobile computing devices are becoming smaller, more intuitive, and more capability-rich. Newer models now act as an all-in-one device and include full cell phone functionality, GPS, high-resolution cameras, robust processors, WAN radios, and large, bright display screens – in addition to the plethora of ongoing capabilities for data capture such as barcode scanning, RFID, debit/credit card payment, and signature capture. Today's high-speed 3G networks can retrieve more complex information, such as 3D moving maps or technical schematics. An equal emphasis is being given to designing devices and user interfaces that are easy for the more technophobic worker to use.

- **Support from major mobile industry stakeholders:** The wireless carriers are leveraging their massive subscriber bases and marketing firepower to act as a key distribution channel. They need to compensate for declining wireless voice revenue-per-user by promoting wireless data applications such as field workforce management solutions. Working with the wireless carriers and other channels, a dynamic ecosystem of software partners offers everything from pre-packaged SaaS (Software as a Service) solutions to development platform tool sets for an enterprise's in-house development team. Corporate software vendors – Oracle, ADP, SAP, Intuit – are recognizing that mobility is a natural line extension opportunity. And GPS providers are working closely with device manufacturers to design powerful enterprise applications.

- **Fast, hard-dollar ROI:** During the past few years, customer pilots and deployments have proven out reduced overtime and labor costs, additional service call opportunities, increased job completion rates, shorter and more accurate billing processes, lower fuel costs, and significantly less paperwork. These are the kind of results that gain the attention of both CIOs and CFOs.

Frost & Sullivan

4. QUANTIFYING THE IMPACT OF GPS

The return-on-investment benefits of mobile field service solutions rest heavily on the utilization of GPS to better locate, track and manage the field workers and their tasks. This locationing capability is interwoven among the solution components. Key GPS applications include: navigation for improved on-time performance, bread crumbing, geofencing, location verification, route optimization, transaction validation by location for Proof of Delivery and other activity, and geo-tagging of wireless timecards.

A Motorola survey of U.S. transportation companies uncovered valuable detail around the benefits of using GPS on mobile devices. Those companies that had actual experience using locationing reported a variety of positive impacts. Decreased travel downtime (53%), more accountable employees (26%), and outright elimination of employee overtime (7%) were the three major outcomes.
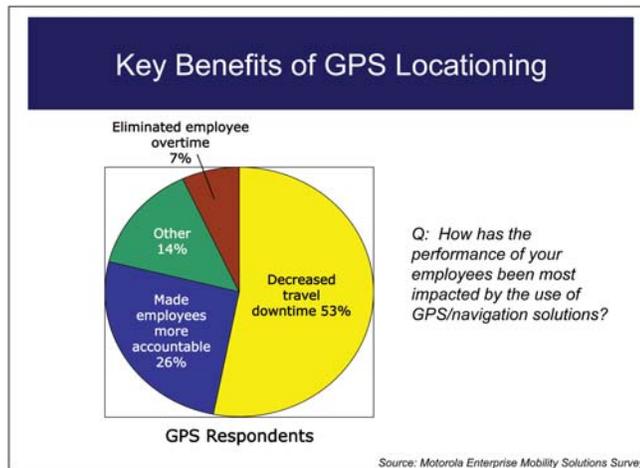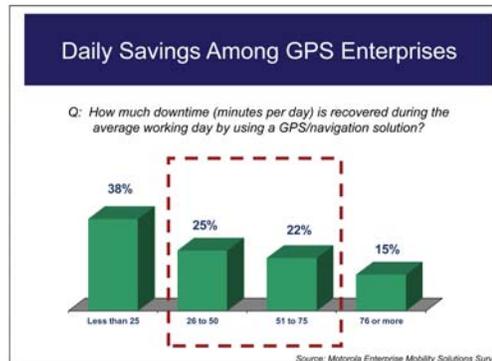

Deep drill into the impact of just one GPS-enabled capability – navigation – and an eye-opening ROI story is revealed. In the Motorola survey, companies that were not using a GPS navigation service were asked to identify how often in the past month their drivers had difficulty locating a new stop or new client. More than nine in ten businesses admitted to difficulties, with almost 20% stating that their drivers had trouble finding new stops one or more times a day.
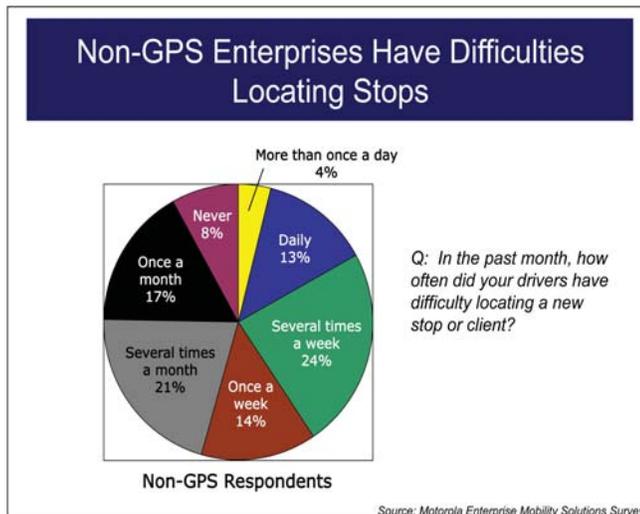
Respondent companies that had experience using a GPS service quantified both the fuel savings and employee productivity benefits of the navigation capability:
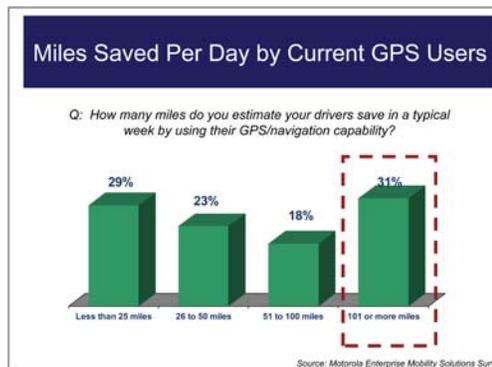
Employee Downtime:
When asked how much employee downtime was recovered during the average working day by using a GPS navigation solution, 47% of these businesses reported 26 to 75 minutes recovered. Another 15% of the respondents reported 76 or more minutes of downtime avoided per day. On average, locationing is recovering 54 minutes of employee time per day.

Daily Savings Among GPS Enterprises

Q: How much downtime (minutes per day) is recovered during the average working day by using a GPS/navigation solution?

Less than 25	26 to 50	51 to 75	76 or more
38%	25%	22%	15%

Source: Motorola Enterprise Mobility Solutions Survey

Miles Saved:
In addition, 31% of companies estimated that their drivers are saving 101 or more miles per week by using their GPS navigation capability. In fact, the companies' average estimate was 231.2 miles saved on a weekly basis. This reduction in mileage directly impacts both fuel cost and vehicle wear and tear.

Miles Saved Per Day by Current GPS Users

Q: How many miles do you estimate your drivers save in a typical week by using their GPS/navigation capability?

Less than 25 miles	26 to 50 miles	51 to 100 miles	101 or more miles
29%	23%	18%	31%

Source: Motorola Enterprise Mobility Solutions Survey

Recovering 54 worker minutes per day can result in an annual labor savings of over $5,000 per employee. Saving 231 driver miles per week can net a company over $50,000 in annual fuel savings. Customer case studies that bear out high hard-dollar ROI results are plentiful. The typical success story reveals multiple expense reduction impacts and the added attraction of enhanced customer satisfaction:

SATELLITE TV INSTALLER BOOSTS PRODUCTIVITY

Situation
- Satellite TV installation company has set a "four installs a day" objective for its field workers.
- Typical installation takes 1.5 hours. Workers are limited to an eight-hour day, and can only work during daylight hours.
- Current on-time completion rate is 64%.

Challenge
- Inefficient routes traveled by both installers and QC/QA inspectors were adding costly time to each call.

Solution
- Motorola MC75 handheld mobile computing device – with GPS. Partnered with GeoMicro.

Results
- Cost savings – Reduced travel times by 6-8 minutes per installation (24-32 minutes per day), resulting in decreased transportation costs of $13.75/day. Potential gas savings calculated at over $500,000 per year.
- **Increased productivity** – Successful on-time completion rate improved from 64% to 87%. Overtime reduced by 28%. QC/QA inspector productivity increased by 32%.

Reduced inventory shrinkage, expedited cash flow, and increased employee safety are additional benefits:

HVAC FIRM REDUCES LABOR AND VEHICLE COSTS

<u>Situation</u>
• Shumate Mechanical, an Atlanta-based HVAC company, operates 200 vehicles in rural, metropolitan, and Appalachian Mountain areas.
• Dispatch process is entirely manual, with each technician visiting between three and ten sites per day.

<u>Challenge</u>
• Reduce fuel costs, inventory variance, and labor expense. Automate route tasks. Grow revenue with the same number of revenue-generating resources in the field.

<u>Solution</u>
• Motorola MC70 handheld mobile computing device with GPS. Partnered with Discrete Wireless and OpenStream's mobile Field Force solution.

<u>Results</u>
• **Lowered inventory costs** -- Inventory variance decreased from thousands of dollars to just hundreds, by utilizing bar-coded inventory, the MC70 scanning capabilities, and inventory re-order points to track, cost and replenish inventory.
• **Increased employee efficiency** -- Labor expense was reduced by 12% with ability to track technician efficiency on a job-by-job basis.
• **Vehicle savings** -- Automated dispatch resulted in savings of $3,000 per vehicle per year.
• **Increased safety** – Company is aware of each technician's whereabouts in the case of emergencies.
• **Improved cost tracking** – Cost and availability of labor and parts are updated from the back office on a daily basis.
• **Expedited cash flow** – The ability to execute any form of payment in front of the customer puts the customer at ease and reduces the time (saving 5-10 days) required to get the cash into the bank.

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5. DEVICES ARE KEY TO SOLUTION SUCCESS

Field workforce solutions produce a rapid return on investment by providing users with an array of high-impact capabilities – all designed to help field service employees better manage and implement their workaday tasks. The devices that best support these solutions are ruggedized, intuitive, and packed with state-of-the-art technology.

It is no exaggeration to state that the value of the workforce management application is closely intertwined with, and especially dependent upon, the quality of the device that delivers it. Today's field workforce management solutions require a multi-function, robust, rugged device that can integrate with and support mission-critical backend systems such as payroll, CRM, SFA, dispatch, etc. These devices must incorporate GPS, image capture, barcode scanning, bluetooth capabilities, touch screen, and even RFID reading in some cases. All of this can be a tall order, since this capability-rich device must also be easy to use, easy to carry around, robust enough to survive drops and challenging environments, and have a battery that lasts throughout the day.

Device candidates tend to fall into three buckets: Laptops/tablets, smartphones, and handheld mobile computers. Out in the field, a handheld device has several benefits over notebooks and tablets. A primary advantage is true mobility -- allowing the worker to

utilize the device in hand in any setting – while notebooks are more cumbersome and must typically be mounted or positioned on a hard surface to be used. Other handheld benefits include:

- Lighter weight
- Shorter boot times
- Voice functionality
- Bluetooth printing and headsets
- Camera
- Vivid outdoor touch screen displays
- Significantly longer battery life
- Integrated data capture, such as barcode and/or RFID scanning
- Durability

In the handheld arena, smartphones are an option; however, while today's smartphones have become more intelligent and functional during the past year, most are ill-suited for the wear-and-tear of field service work and do not offer the integrated data-capture options that are also a critical element of a full solution.

Handheld mobile computers are built to survive and thrive in the field service environment. Recognizing the unique challenges of field workers, today's enterprise-grade mobile computing devices deliver rugged form factors and a graduated set of capabilities based upon the organization's and the field workers' needs:

- **Rugged durability**: Out in the field, away from HQ, device reliability is paramount. Mobile computing devices are designed and tested to make them as impervious to physical damage and environmental conditions as possible. Altogether, an industrial rugged design effort can deliver a lifespan two to three times that of a smartphone. This translates directly into cost savings. While smartphones may cost less upfront, their failure rate can make them significantly more expensive over a five-year span.

**Mobile Computers
Ruggedized Construction**

- Unibody housing improves structural stability
- Enhanced shock absorption protects sensitive internal electronics in case the device is dropped.
- Patented I/O connector (the point of interface with chargers, cradles, and other accessories) reduces the loss of connectivity when heavy vibrations are present.
- IP54 sealing and multiple impact tests ensure dependable operation even in the face of everyday drops and spills.

- **Robust features and functionality:** The portfolio of features and capabilities offered by best-of-breed mobile computing devices includes powerful microprocessors, A-GPS locationing, high-resolution cameras with autofocus and flash, multiple keyboard options, 1D and 2D barcode scanning, mobile payment devices, and WWAN/WPAN/WLAN connectivity. Even the display screens are made brighter than those of laptops and smartphones, making it easier for workers to read and input information under challenging conditions. These features are incorporated into an assortment of device models that are designed to address the spectrum of field worker and enterprise needs.

6. SUMMARY

Current users of field workforce management solutions are experiencing immediate and positive KPI (key performance indicator) impacts. The high, hard-dollar ROI of these GPS-enabled services results primarily from expense savings -- reduced overtime and labor costs, decreased insurance premiums, lower fuel usage, and less paperwork. These handheld-based solutions also positively impact the revenue-generation side of a company's ledger by carving out time for additional service calls and increasing billing accuracy. Additionally, GPS-based field workforce management capabilities can help to resolve customer issues more quickly, improve employee safety, and position your company as a user of cutting-edge technology.

All of these benefits depend upon the quality of the solution software and the mobile device that delivers it. When evaluating a potential device partner, your needs analysis should clearly define your company's requirements in the following areas:

- Level of device ruggedness
- Specific functionality (signature capture, mobile payment, barcode scanning, etc.)
- Wireless network connectivity/coverage
- Maintenance support plan
- Pricing

Savvy companies bring their field workers into their device evaluation process by providing hands-on trials in the field and asking for honest feedback on usability.

When evaluating various mobile device manufacturers, Frost & Sullivan recommends considering Motorola's rugged, feature-rich line of handheld mobile computing devices. Motorola backs up its product family with a history of innovation, deep industry expertise, and world-class partnerships. Current customers point to the company's staying power, its ability to provide end-to-end solutions, and its excellent support and service plans.

"Motorola has provided me with the device ruggedness and functionality my company needs out in the field. But beyond that, this company provides great day-to-day support. And I know Motorola will be around to help us as technology changes and our business needs evolve."

*--- **Shumate Mechanical***
Duluth, GA

More information on field workforce management solutions and Motorola's portfolio of mobile computing devices can be found here: www.motorola.com/enterprise.

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Colombo

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Dhaka

Dubai

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