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Using Wireless Technology to Manage and Optimize Government Fleets

Saving Money, Generating Revenues, and Increasing Safety

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A Frost & Sullivan White Paper

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INTRODUCTION

In the United States of America, there currently exist 50 state governments, more than 3,000 county governments, and more than 30,000 city, township, and village governing groups. Add in federal-level departments and agencies, and it is easy to visualize the vast number of official vehicles that governing bodies launch out onto the road each day to see to the needs of the American public.

These hundreds of thousands of vehicles—including police patrol cars, garbage trucks, fire engines, municipal buses and trains, etc.—have their day-to-day mission-critical responsibilities to satisfy. However, they also present new opportunities to save money, increase public and employee safety, help the environment, and even generate incremental revenue. Wireless machine-to-machine (M2M) technology is a rapidly evolving category of mobile solutions that can be used to enhance existing fleet capabilities and bring new, cutting-edge functionality and features into play.

In the government sector, high-potential users of today's M2M "connected" solutions include:

- **Public Safety vehicles**—police cruisers, fire engines, ambulances
- **Public Transportation vehicles**—buses, trains
- **Local Municipal Services vehicles**—snow plows, waste removal trucks, inspection vehicles, etc.
- **Federal Services vehicles**—both military and non-military/civilian fleets that include postal trucks, light to heavy trucks, buses, passenger vehicles, vans, etc.

New wireless and M2M developments require a shift in thinking. Ever more powerful data networks and mobile devices are combining with increasingly creative software solutions to help governments at every level—federal, state and local—better manage and optimize their fleets. Today's wireless fleet solutions are more affordable, easier to use, and quicker to deploy. These products and technologies can provide timely, tangible results and real, hard-dollar ROI (return on investment). They deserve a serious look.

THE 21ST CENTURY CHALLENGES FACED BY GOVERNMENT FLEETS

Government agencies depend on government fleets. At the local, state and federal levels, fleets of vehicles are utilized to maintain safety, provide municipal services, and transport the general public from place to place. The sheer variety of vehicle types that must be managed and maintained is noteworthy—ranging from patrol cars to buses, fire trucks to snow plows, garbage trucks to trains.

No matter the vehicle type, government entities are in a constant struggle to address five major fleet-oriented issues:

Saving Money—In this continued era of shrinking revenues and squeezed budgets, a key objective across departments is to reduce operating costs. Federal budgets are under close scrutiny, resulting in declining or shifting support to state and local governments. This, in turn, has caused deep cuts at the state, city, and township levels.

Government transportation vehicles provide an opportunity to save money. For those departments that manage a fleet of government vehicles—no matter the size—potential areas of expense savings include:

- **Increasing employee/driver productivity**—i.e., getting more done during the work day
- **Reducing vehicle repair requirements**—by avoiding premature wear-and-tear, and by timely scheduling of tire rotation, oil changes, and other regular servicing procedures
- **Decreasing fuel usage**—especially with today's erratic diesel and gas prices

Generating Revenue—Closely tied to the need for expense reduction is the need for stronger revenue generation. Municipal budgets are in dire shape, and creative thinking is needed to create new revenue streams that do not put additional burdens on a recession-weary citizenry.

Mitigating Risk—Reckless driving can jeopardize the safety of the driver, any passengers, and bystanders. Deploying solutions that reduce accidents and injuries can translate directly into lower insurance premiums.

Increasing Transparency—The smartphone-savvy public is demanding more information from its government entities, and it wants this information easily accessible and easy to understand. Bus and train schedules, including real-time ETAs, are an example of the kind of public information that people now want available on both public and personal mobile displays.

Helping the Environment—Executive Order 13514 requires federal agencies to regularly report on their progress toward reducing greenhouse gas (GHG) emissions and fuel consumption. Solutions that track this type of information can help with compliance efforts.

Government agencies that can address these five fleet challenges—cost control, revenue generation, enhanced safety, information transparency, and improved environmental impact—will be best positioned to effectively and efficiently serve the public.

HOW MOBILE TECHNOLOGY CAN HELP

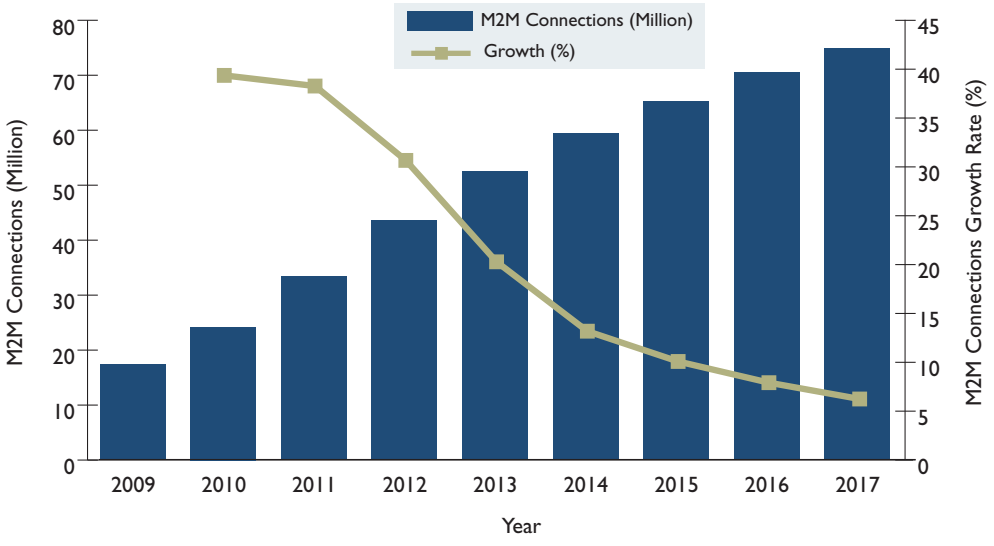
Today's mobile technology can help government fleets make the planet greener, enhance transparency, increase revenues, and reduce expense and risk. Three wireless components—machine-to-machine (M2M) solutions, mobile devices and mobile data networks—can be combined to provide real benefits at affordable price points.

Wireless technology has become more powerful and even more integrated. New solutions are enabling new connections among vehicles, officers, responders, operators, back-end systems, and other agencies.

M2M Solutions

Machine-to-machine communication refers to digital wireless communication between an endpoint and a back-end system that is initiated with or without human intervention. Total cellular M2M connections in the United States are expected to increase from 24.2 million in 2010 to 74.8 million in 2017. Transportation and telematics M2M solutions constitute the bulk of those connections—approximately 40 percent throughout the Frost & Sullivan forecast period.

Cellular M2M Communications Market: Total Connection Forecasts (U.S.), 2009-2017



Note: All figures are rounded; the base year is 2010. Source: Frost & Sullivan

Advanced mobile solutions for public safety, public transport, and federal and municipal services purposes begin with traditional fleet management M2M applications—and then expand to encompass a wide array of additional, creative services.

Today's fleet management offerings are designed and priced to be used by all sizes and types of fleets. These solutions work on the ground and back at HQ to provide real-time data, along with focused analyses and reports. Current machine-to-machine capabilities include:

- **Vehicle Location**—Embedded GPS functionality tracks worker location on both a real-time and historical basis, and typically refreshes this information every 15 minutes (or more often, if needed). Geo-fencing defines a virtual geographic area and emits an alert if boundaries are crossed. Both of these capabilities can be used to ensure drivers are working efficiently throughout the day, to enable optimal utilization of resources and personnel, and to track drivers for personal safety purposes. In addition, emergency response teams can use GPS tracking for dispatch purposes, assigning tasks in real time to the most optimally-located vehicles.

- **Vehicle Diagnostics**—In-vehicle devices collect a wide range of diagnostic data, including information on tire pressure, engine idling, speeding, RPMs, odometer readings, mileage, and fuel efficiency. These data can be summarized and retrieved in report form and can act as an early warning system regarding vehicle maintenance needs and excessive fuel consumption. For example, one hour of engine idling equates to one gallon of fuel consumed and 19.4 pounds of CO_2 belched into the air.

- **Driver Performance Analytics**—Devices can also collect information on individual driver performance, such as speeding, hard braking, acceleration, and swerving. All of these bad driving behaviors can impose premature wear-and-tear expense on a vehicle. They can also jeopardize the safety of passengers and bystanders. Timely reports allow management to nip these dangers in the bud.

- **Compliance Tracking and Analysis**—In addition, for government interstate vehicles that are under the jurisdiction of regulations such as Hours of Service or CSA, software solutions exist that can transmit all required data from the wireless device to a Web-based report. These optional software packages not only drastically reduce paperwork for the driver, they also increase the accuracy of the compliance data being communicated.

Fleet management capabilities are just the beginning. Mobile vehicle connectivity—working with 3G, 4G, and Wi-Fi networks and various hardware components—is enabling the development of new solutions that connect people with relevant, valuable information in quick, targeted ways. For example:

- **Public Safety**—Using new software apps and a secure VPN right in the patrol car, HQ and the police officer can quickly exchange mission-critical data such as mug shots, mobile fingerprinting, e-tickets, and database records. Secure, rapid information exchange increases both efficiency and safety.

- **Public Transportation**—Wireless digital signage displays customized content and messaging to bus, train, and subway passengers. Real-time displays can include transit information, safety updates, news and weather feeds, and entertainment features. Accompanying advertisements generate a new revenue stream.

- **Local Municipal Services**—Dynamic video streaming can extend information webcasts to truck and vehicle drivers during the workday. This efficiently disseminates information and removes the need for drivers to spend unproductive time back at branch or HQ locations. GPS capabilities track the real-time location of municipal vehicles, providing evidence in customer claims cases and enabling efficient dispatch processes. On-board sensors make it possible for waste collection departments to accurately bill customers for weight overages.

- **Federal Services**—Federal justice agencies have requirements similar to those of their state and local counterparts, including being able to quickly access critical information from shared databases such as NCIC (National Crime Information Center), DMV (Division of Motor Vehicles), and others. This also holds true for federal fire and interior agencies. Federal fleets can also benefit from the increased efficiency and safety impacts of on-board M2M sensors and technology.

Powerful Wireless Data Networks

Now ubiquitous **3G data networks** are capable of retrieving more complex information (moving maps, higher-resolution graphics, etc.) and are an important piece of the improved technology landscape that supports mobile applications. High-bandwidth applications on the spectrally efficient 3G and 4G networks can be supported without straining overall network performance.

4G networks—with even higher data throughput— are now becoming a reality as wireless carriers create and build out this new generation of infrastructure. 4G promises to pull together premium capabilities such as IP-based video, location, and presence. These powerful broadband networks can easily upload large files of data and provide high-definition digital video surveillance.

One example of the benefits of greater data throughput is the ability to view detailed maps that may be resident on a centralized GIS (Geographic Information System). The information can be viewed and shared by multiple responders in real time, thus improving the effectiveness of response in a large forest fire, for example. Information can be viewed and shared on any number of devices—from desktop and laptop computers to handheld PDAs and smartphones. This ability to have a "common operating picture" can minimize the negative impact of large emergency events.

Vehicle Area Networks turn any government vehicle into a mobile wireless hub. Whether it's a patrol car, a bus, an ambulance, or a Forest Service Command vehicle, these networks use in-vehicle Wi-Fi and devices to provide secure, remote data exchange. Mobile applications are integrated with existing back-end systems and instantaneously relay everything from fingerprint scans to wireless e-citations. High-quality VPNs allow safe, secure connectivity and support a range of devices and peripherals.

NEXT-GENERATION MOBILE DEVICES

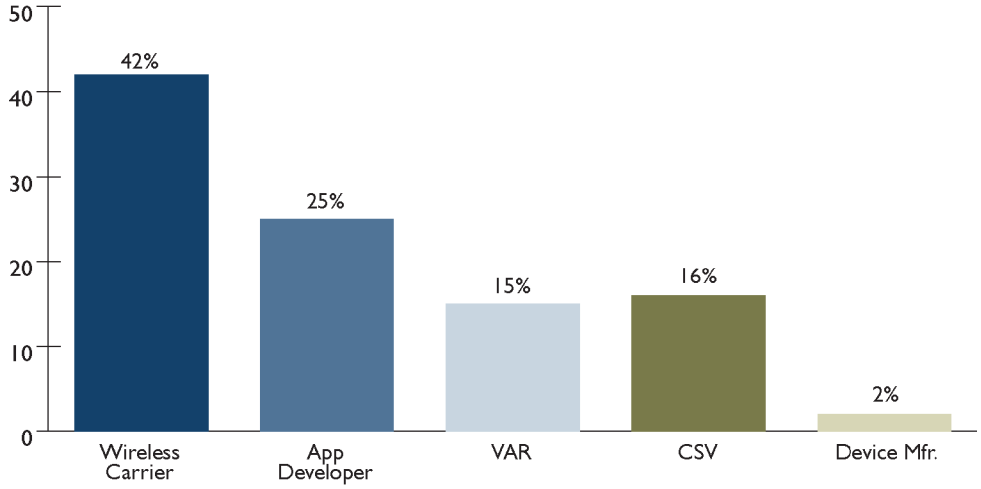
A wide range of mobile hardware types is utilized to support fleet solutions in the government sector. These can include electronic on-board recorders (EOBRs), rugged notebooks, tablets and handheld devices, in-vehicle modems and sensors, and even everyday smartphones.

Mobile devices continue to become more powerful and more user-friendly, while at the same time satisfying demanding certification requirements. Manufacturers of M2M connectivity modules and devices can invest a significant amount of time and money into passing various certifications (FCC, PTCRB, CTIA, and individual wireless carrier guidelines) before their products are approved for use on a wireless network.

SELECTING A MOBILE SOLUTIONS PARTNER

Choosing the correct mobility partner, or partners, is critical to implementing the correct mobility solution. Government departments have a wide range of potential mobility partners at the ready. And research reveals that four partner types are particularly attractive when fleet-oriented solutions are being considered.

Next-Gen Fleet Management Users: Current Solution Partner



Source: Frost & Sullivan 2010 Mobile Enterprise Applications Survey. N=200 U.S. mobile and wireless decision-makers.

Today's wireless carrier is especially preferred and by all sizes of enterprises and organizations. The software application vendor remains a traditional favorite. VARs and corporate software vendors have also become more involved in this sector and have each staked out market shares in the 15-percent range. Even the individual mobile device manufacturer can act as the lead in pulling together the necessary players to address an organization's needs.

Criteria to consider when selecting a partner would include:

Breadth and depth of solution portfolio—One size most definitely does not fit all when it comes to government communications requirements. The size of the customer's budget, the technological literacy of impacted personnel (including IT), and data and reporting requirements are specific to the department in need. M2M solutions such as fleet management services require informed decisions regarding hardware connectivity mechanisms, the wireless network partner, etc. A best-in-class partner is typically a full-service M2M solution provider that can offer design and deployment experience, a selection of alternatives, and a complete wireless system designed for simple deployment and management.

Pricing model and flexibility—The major cost components of an M2M connected solution are the application software, the mobile hardware components and peripherals, wireless network connectivity, and any required professional services (typically customization and/or back-end integration work). Deployments can be priced on an annual license basis or according to the SaaS (Software as a Service) price model. The hosted SaaS delivery model charges on a per-device, per-month basis, which enables the company to avoid capex spending—hence, making the mobile solution a more affordable and practical investment.

However, even with a hosted SaaS arrangement in place, department heads can balk at the incremental, upfront expense of purchasing or upgrading hardware (handheld or in-vehicle) and of purchasing professional customization and integration services. These entities should look for a partner that is willing to work with other vendors to make the initial required investment more palatable by building some of these additional expenses into the monthly fee, waiving certain upfront costs, and/or offering discounts in return for volume or term commitments.

Vertical-specific expertise—Given the unique characteristics and needs of government agencies and departments, a deep and thorough knowledge of information and communications requirements is an absolute necessity. A vendor should not be allowed to force-fit an under-featured, horizontal solution onto a government fleet vehicle.

Industry partnerships—In the U.S. mobile and wireless sector, top-tier partners can add substantial value and expedite deployments. Customers should expect easy access to the following types of support: needs analysis, ROI analysis, process mapping, solution

configuration/integration/customization, employee training, and implementation management. The ability to assemble an expert team across hardware, software, and service providers in the wireless and M2M ecosystem is preferable.

Geographic reach—The geographic coverage of the government entity—whether it's local, state, or national—will dictate requirements here.

Post-deployment support—Mobile solutions are only effective if they are operating properly and dependably. A single source for managed care and support across all of the solution's elements should be required. The more savvy providers will also work closely (and directly) with customers during the initial post-deployment period in order to minimize and address any initial launch difficulties.

Using these selection criteria to choose a mobility partner can positively influence the ability to reduce costs, increase productivity, and enhance driver, passenger, and bystander safety.

THE SPRINT ADVANTAGE: CONNECTED VEHICLE SOLUTIONS

Sprint has been a trusted partner in the government sector for years—assessing potential communications products, identifying top-tier partners, and assembling a broad solution portfolio. With its high-quality wireless 3G and 4G data networks serving as a platform, Sprint works with industry experts to create and support solutions that optimize safety, cost savings, information transparency, green initiatives, and even new revenue creation. In a still very fragmented market, Sprint functions as a single source for high-value fleet services.

Fleet Management—Sprint M2M solutions wirelessly connect an increasing array of electronic devices. Current Sprint fleet management solutions range from basic vehicle tracking services to sophisticated telematics capabilities. Application partners have been thoroughly vetted and include vendors TeleNav®, Trimble, Xata®, and Xora™. Depending on a customer's specific needs, these software apps can automate regulatory compliance data collection, pinpoint the location of vehicles in real time, provide engine diagnostics, create geo-fences and alerts, and reassign drivers and jobs on the go.

Vehicle Area Networks—In addition to traditional fleet solutions, Sprint partners with emerging solution providers such as Feeney Wireless to deliver new and innovative in-vehicle capabilities that can have immediate application in government agencies. For example, the Feeney Wireless Cellular Internet Routing Appliance (CIRA)™ with integrated 3G, router, Wi-Fi access point and GPS connects a variety of peripheral equipment (fingerprint devices, ticket printers, etc.) in and around a government vehicle, while transmitting the data to a central campus or branch location in real time. Transforming a patrol car or other government vehicle into a mobile access point, these types of solutions decrease

the need for time-consuming paperwork, increase individual productivity, and enhance public safety by providing quick access to critical information.

Secure VPNs—Sprint Data Link℠ service provides secure private wireless connectivity between mobile field devices and a centralized server.

Wireless Digital Signage—Public transportation vehicles offer the opportunity to provide timely information and entertainment to passengers, while also raising advertising revenues. Sprint works with its partners to deploy wireless digital signage solutions in buses, trains, and subway systems. Wireless digital signage electronically displays customized content and messaging, including news, weather, transit info, and safety directions. Because it utilizes mobile broadband connectivity, this version of digital signage eliminates the cost and maintenance issues inherent to its wireline counterpart.

In addition to offering end-to-end full-service solutions, Sprint recognizes the cost pressures that fleets are under and has made affordability a key priority. A broad range of price points allows departments and agencies to choose the investment level that works best for their unique situation and needs. For example, Sprint makes a determined effort to help interstate fleets comply with government regulations without going broke. Case in point: The April 2010 FMCSA rule on electronic on-board recorders specifically cited the Turnpike/Sprint EOBR solution as the most cost-effective way to satisfy HOS regulations.[1]

Additionally, per-vehicle/per-month pricing is available on many of Sprint's fleet management solutions, and these charges can be included directly on the customer's monthly Sprint bill.

Sprint's fleet expertise, its powerful networks, and advanced partnerships combine to provide government fleets with the ability to:

- Save money
- Generate new revenues
- Enhance safety
- Help the environment
- Increase the availability and transparency of information to the public

To learn more about how mobility solutions can help your government fleet become a 21st century "connected" transportation success, please visit www.sprint.com/m2m or www.sprint.com/slg.

[1] 1 "Electronic On-Board Recorders for Hours-of-Service Compliance; Final Rule"; U.S. Department of Transportation, Federal Motor Carrier Safety Administration, Federal Register, April 5, 2010.

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