Mobile data on a budget

Three companies come together to increase police in-car capability and reduce costs

by Tom Rataj

The introduction of mobile data terminals back in the mid-1980s was a huge step forward in allowing police officers access to information in the field. They no longer needed to interrupt an already busy dispatcher with "just" a plate or identity check and could now access large amounts of information at any time.

This new access also greatly increased the number of checks officers could do because of its self-serve nature. It allowed trolling for stolen autos, suspended drivers and ne'er-do-wells regardless of how busy the voice-radio system was or how strongly the officers' intuitive senses tingled.

Car-to-car messaging also allowed officers to communicate privately amongst themselves without being overheard by the dispatcher, the road-sergeant or citizens (and criminals) eavesdropping on voice radio transmissions. This offered a number of tactical and operational advantages but also got a few officers in hot-water for sending inappropriate messages.

Remember, this all came in the days before cell phones were affordable or readily available to everyone.

Thankfully the dumb mobile data terminals soon gave way to real computers such as the Panasonic Toughbook laptops (*panasonic. ca*), which arrived in the early 1990s. They introduced actual processing power in the field and added the ability to access in-house records management systems (RMS) and prepare and submit reports electronically.

Global Positioning System (GPS) mapping and automatic vehicle location (AVL) technology add-ons followed in the 2000s, further leveraging the mobile data equipment and the increasing operational efficiencies that it offered.

Expenses

Supporting mobile data and related technologies unfortunately introduced complex and expensive infrastructure, both in the car and back at HQ.

Prior to the arrival of now widespread high-speed cell data technology, implementing mobile data required constructing expensive private wireless data networks, which often had coverage issues that caused dead-spots.

Implementing and operating mobile data services and equipment in police vehicles typically involves substantial capital and operating costs. Rugged computers designed to survive three or more years in our harsh climate and the rough and tumble environment of a police vehicle are expensive.

Protecting hardware against theft or damage, while still keeping it ergonomically placed and out of air-bag deployment zones, also add to the costs.

Despite the numerous advantages of mobile data for front-line policing, the costs associated with buying and operating the systems often make them too expensive for many smaller police agencies, who may also lack the in-house experts required to implement and operate them.

Mobile Innovations

Fortunately, Niagara Falls, Ontario based Mobile Innovations (*www.mobinnoco.com*) will soon offer a substantially cheaper solution. Its existing Blackberry smartphone based policing products has been used for several years in Canada, the UK and Australia by some 17,000 users, giving it extensive experience in the field. In the Canadian implementation officers have access to CPIC and the Niche RMS products.

The company's "Mobile Police Assist" product line is being enhanced with the addition of Blackberry Playbook tablet as the in-vehicle display for data from the Blackberry smartphone. Custom applications also allow it to operate the vehicle's emergency lighting and other systems. The Chatham-Kent Police Service (*www.ckpolice.com*) in Southwestern Ontario currently has deployed two field-test versions of the prototype.

The off-the-shelf components make this system affordable. While not rugged to military specifications, the tablet and phone are both relatively cheap and can be readily replaced at local retailers. The entire upfront hardware costs (including mounting and connecting components) is under $2,000, well within the budget of even a small agency with only a few cars. Compare this to upwards of $10,000 for a rugged laptop or mobile computer system and it's a real bargain.

Two Dodge Charger prototype demo-

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vehicles were demonstrated and well received at last year's OACP and CACP annual conferences and on-tour across Canada.

The prototype systems consist of a 16GB Blackberry Playbook tablet and smartphone for the cellular data connection, a pre-production Bluetooth keyboard, an E-Seek M250 2D card reader for reading driver's licences, a Brother PocketJet printer for e-ticket printing and a smart-hub mini-server to connect all the components together and make it all work.

D&R Electronics (*www.dandrelectronics. com*) of Bolton, Ontario worked with Mobile Innovations to design and build a customised mounting system designed specifically for the prototype units. D&R also has many years of experience in designing and building custom mounting systems.

The mount is designed so that the Playbook can be removed from the vehicle and taken into scenes to allow investigations and report writing. The bracket holds it securely to the dashboard but still allows adjusting it up to 35 degrees horizontally and 40 degrees vertically so officers can easily orient it to a comfortable position toward themselves (and away from the guy in bracelets in the back seat).

The keyboard mount has two articulation points, allowing the keyboard to be positioned more conveniently for either driver or passenger, and includes a LED light to illuminate it (it is not backlit).

The parts

The Playbook is a 178mm (7") tablet computer launched by Research in Motion in April 2011. With a crisp and bright HD 1024x600 LCD display in a 16:9 aspect ratio (think big-screen TV proportions), it makes a great little in-car display that doesn't block vehicle heating/cooling controls or stereos as larger displays do.

Operating on RIM's exclusive secure QNX operating system and powered by a 1GHz dual-core (two processors on one chip) processor, it has 1GB of system memory and 16, 32 or 64GB of user memory depending on the model. Even at the regular retail list price of $499 for the entry-level 16GB version, the Playbook is substantially cheaper than replacing only the screen portion on a rugged laptop or mobile computer.

Although the Playbook can operate for six or more hours on battery alone, this setup has it connected to a charger while in the dashboard mount so the battery is always topped up. It is enclosed in an Otterbox (*www.otterbox.com*) case to protect it from bumps and bruises.

The prototype version is connected through a USB smart-hub, essentially a mini computer server that hosts all the connected equipment. The smart-hub runs Angstrom, a version of Linux designed for embedded systems, and the custom programs that make everything work together are written in the open-source Python programming language. In place of a hard drive

the system works off a MicroSD card.

The prototype is pre-configured with three screen brightness settings: dim, office and sunlight, allowing the level to be customised for ambient lighting conditions. An optional negative image night-mode setting is being investigated to further improve low light usability.

The RIM designed pre-production Bluetooth keyboard allows fast entry of large amount of text. The final production version of this keyboard was expected to be released last month.

One of the major advantages of using mobile data systems is the ability to electronically capture driver's licence data to conduct checks and prepare tickets. The E-Seek (www.e-seek.com) M250 2D card reader can read data on both the magnetic stripe and linear 2D bar codes found on most drivers' licences, health cards and other government issued ID cards.

Electronic tickets are prepared from the data captured from the driver's licence (eliminating transposition errors) and printed with an optional Brother (www.brother.ca) PocketJet thermal mobile printer. It prints tickets on a roll of paper that has a 500 - 8Ω X 11" sheet equivalent page capacity.

While the Playbook is the core of the system, all data transmission is through a Blackberry smartphone over public cellular data networks ñ both an advantage and a disadvantage. The two devices are wirelessly connected over a Bluetooth connection which is secured against eavesdropping by Blackberry's state-of-the-art security protocols and encryption, allowing either or both to be removed from the car and used at a scene.

With public mobile cell data, agencies

simply need to purchase blocks and negotiate priority access agreements so that they always have a reserved portion of bandwidth, regardless of how busy the networks become. The provider is entirely responsible for the system, relieving the police service from this burden.

Some police agencies might be uncomfortable with this arrangement because they are not entirely in control of a critical part of their infrastructure. Generally, users have unlimited bulk voice and data plans for their Blackberry smartphones, so data costs are not prohibitively expensive. An added advantage is that users also automatically have voice communications.

Think of the cell data side in terms of car-leasing; the costs are fixed and every few years you get a new car (or in this case a data system) without the worries of replacing it outright once it gets old.

Since GPS is a native feature on Blackberry smartphones it can also be used to assist officers in finding their way. Because the Playbook is much larger than even the largest standalone GPS or built-in vehicle navigation unit it provides much better mapping functionality.

Future additions to this system include in-car camera hardware and software and voice dictation software.

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