

WIRELESS BROADBAND LIVES!

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Fast, secure, wide area, wireless broadband is finally starting to arrive in the United States. The arrival of this fast connectivity will spur renewed growth in 'mobile enterprise' type technologies, especially vertical markets with far flung personnel and connectivity needs such as EMS.

Since the early to mid 1990s we've been promised ubiquitous anywhere, anytime broadband connectivity. Many public safety agencies have struggled through the 1990s with the Cellular Digital Packet Data (CDPD) systems that peaked at a very slow 19.2Kbps and operated in the latent space on the 900 MHz cellular phone networks. CDPD was reliable, but man was it slow. CDPD caught on and worked well with many law enforcement applications allowing officers to access various data systems remotely from their vehicles. The CDPD technology was also popular with many service, utility, and delivery type companies. CDPD never caught on with the fire and EMS sectors like it did with law enforcement. The cellular industry has turned off all but a few CDPD systems and they aren't taking new subscribers to CDPD.

Since 2000 a much faster technology has been available from Verizon and Sprint known as single carrier radio transmission technology (1xRTT) that has throughput speeds bursting to 144Kbps and averaging 70 to 80 Kbps. 1xRTT

operates in the 1900 MHz spectrum and utilizes a transmission technology known as code division / multiple access or CDMA. The 1xRTT technology provides a large footprint with the service working nearly anywhere one can find a Sprint or Verizon signal. 1xRTT also provides a very secure method of data transmission that offers several enhancements over the older CDPD standards. I've used my SprintPCS wireless card in my notebook and PocketPC from border to border and coast to coast for the past two years and I've been very impressed with the speed, and security. Seldom do I find myself without a signal in normal travels in metropolitan areas and along Interstate highways. Only in very remote, rural areas have I not found a signal. I frequently use my SprintPCS card while staying at hotels or in convention centers, even when these locations have high speed Internet services. I do this for two reasons, first, for normal activities the 1xRTT system is fast enough, secondly, the 1xRTT technology gives me a secure connection directly to the Internet, and it is not a shared network like a hotel DSL system. (I will write an article on shared public network security issues soon) Sprint and Verizon have similar price plans in place with metered plans in the \$30 through \$70 range. Sprint and Verizon offer unlimited use plans for \$80/month.

In 2004 things have gotten more interesting and exciting. Verizon has put a new higher speed system in place in San Diego and Washington called EvDO which stands for 'evolution digitally optimized.' This EvDO technology bursts at speeds of 1.5Mbps and averages 300 to 600Kbps. The EvDO system operates in the same 1900 MHz spectrum that the 1xRTT system do. EvDO is also very secure

and offers the user a single, non-shared connection to the Internet. Verizon should have many more cities online by the time you read this. Verizon plans to have the EvDO service covering their entire coverage area by the end of 2005. Sprint also is planning to roll out a service similar to Verizon's EvDO to replace their 1xRTT system but Sprint hasn't indicated a timeframe yet.

I've had the opportunity to try the Verizon EvDO system in San Diego and Washington. It is quite nice and obviously faster than the 1xRTT systems. The main things that make the speed difference jump out is listening to or watching streaming media, transferring files, or establishing a virtual private network (VPN) to a remote host. Verizon is pricing their EvDO system at the same 1xRTT rates, basically \$80 per month for unlimited access.

I've been anxiously awaiting the faster systems to be deployed and I was surprised to learn that Nextel was entering the high speed wireless data market with technology from Flarion. Nextel decided to beta test their new system in the Raleigh-Durham-Chapel Hill area of North Carolina this past winter and spring. I've been using the Nextel system here locally and without question it is the fastest system I've tried to date. The Nextel system bursts at 3Mbps and runs normally at 1.5Mbps, essentially a T1 line or cable modem to your notebook anywhere in the coverage area. Nextel is also experimenting with firewalling and antivirus protection for users on the system, something Sprint and Verizon don't currently offer. Nextel is offering the system to public subscribers now in the central NC area. I'm closely watching to see if there is much impact on throughput as more subscribers join. Nextel is offering several pricing plans with

throttled bandwidth the lower end plans. Like Sprint and Verizon the Nextel unlimited plan is \$80 per month.

What does all of this mean for EMS? Well I believe the functionality we've been promised since the 1990s is finally here. High speed wireless connectivity will allow EMS systems to develop very dynamic, secure, mobile data and voice systems. I expect to see automated vehicle location systems (AVL), voice over IP radio integration, dispatch data, patient data, and photographic images all built around this technology and available as a multifaceted communication network within the next five years or so. Vehicles will have the high speed wireless connection to the Internet, then perhaps the vehicles will then contain a wi-fi access point allowing the PCs, PDAs, and biomedical gear on the truck to all communicate wirelessly and securely in a sort of vehicle area network or VAN. From the patient's side a medic could use a wireless PDA to relay through the vehicle securely to the hospital data system to retrieve the patient's medical records, perhaps to compare 12 lead EKG baselines. Likewise, the same technology could allow the medic to talk securely to the ED physician or to stream live video of something unusual. These thoughts just scratch the surface of what can be accomplished. With the prices dropping and the bandwidth increasing I encourage you to keep an eye on this fast moving technology and learn what is available in your area.

I welcome your comments, criticisms, feedback, and ideas. You may contact me at ejems@cpcstech.com

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