

## **Enhanced Wireless 9-1-1 Milestone Accomplished on Canada's East Coast**

*By Mike Myette*

The Province of Nova Scotia, located on the East Coast of Canada, has moved one step closer to Province-wide implementation of enhanced wireless 9-1-1. In January 2000, MTT Mobility completed the implementation of a province-wide ESRD (Emergency Service Routing Digits) call path routing process for wireless 9-1-1 traffic. Using ESRD, more than 2000 wireless 9-1-1 calls per month from Mobility customers are being selectively routed directly to seven provincial 9-1-1 PSAPs. In addition to the benefits of selective routing to PSAP of jurisdiction, the ESRD process has enabled the telephone company to automatically display the civic address of the original cellular tower to the 9-1-1 call taker.

Enhanced 9-1-1 service has always been about “enhanced” ability to quickly and promptly determine a caller's location. With traditional enhanced 9-1-1 wireline service, a 9-1-1 call taker can quickly and reliably determine the location of a caller without the necessity of time consuming verbal questioning. Through efforts like the one in Nova Scotia, the “gap” that exists between the public safety benefits of wireline versus wireless 9-1-1 is shrinking, and wireless subscribers are reaping the benefits.

The land area of Nova Scotia covers more than 50,000 square kilometres (20,000 square miles). More than 80 percent of this area is rural in nature. Prior to implementation of ESRD routing, 9-1-1 calls from all wireless carriers were processed through “telephone operator intercept.” The digits 9-1-1 were passed to the PSTN (public switched telephone network) and dedicated trunks were then used to route all wireless 9-1-1 calls to operators at Maritime Tel & Tel, the provider of 9-1-1 services to the province. Using dedicated trunks to TOPS permits the opportunity to selectively display the calls and to prioritise them in the operator queue. The TOPS (telephone operator services) operator answered the call, verbally questioned the caller in order to determine his or her approximate location and then manually routed the caller to the PSAP of jurisdiction. The size of the search area which the TOPS operator had to start from included the entire province, composed of 18 counties, hundreds of communities and literally thousands of roads.

For the TOPS operator, finding a cellular caller in an area the size of the Province is akin to finding a needle in the proverbial haystack. Assuming the worst case scenario, in which a caller has limited geographic knowledge of the province, or worse is unable to accurately describe their location, there was significant risk of routing the call to the incorrect PSAP. Furthermore, such a query could require several minutes of questioning at a time when seconds count. Despite the best efforts of the TOPS operators, 9-1-1 wireless calls were frequently routed to incorrect answering points due to misinformation from the caller, similar sounding communities, similar sounding road names, and highways which cross several answering point boundaries. This potential for error has now been eliminated, because through ESRD routing, traffic can be automatically selectively routed to the correct PSAP of jurisdiction, based on cell tower address.

Without ESRD routing, the task of the 9-1-1 operator of ultimately locating the caller, was only slightly less daunting than that of a TOPS operator. This is because each of the seven 9-1-1 answering points cover a large geographic area. The PSAP jurisdictions range in size from less than 1,000 square kilometres (390 square miles) in urban areas to more than 16,000 square kilometres (6,250 square miles) in rural areas. Simply put, without the benefits of ESRD routing, the caller's location could still frequently only be reliably presumed to lie somewhere within an area that might be as large as 16,000 square kilometres (6,250 square miles). With ESRD routing, since the name of the cell tower can now be automatically displayed, the size of the search area for a given caller is reduced even further, down to the signal “foot print” of an individual cellular tower.

By referring to cell tower boundary maps at the PSAP, the 9-1-1 call takers can quickly and reliably confine their search for the caller to within plus or minus 3,000 square kilometres (1,170 square miles). While the successful determination of a final location is still dependent on querying the caller and on geographic knowledge, the potential search area is now much smaller, having been reduced by as much as 95 percent when compared to the TOPS method of routing calls.

One significant added benefit of eliminating the telephone operator intercept step in favour of ESRD routing is shortened overall call processing time for 9-1-1 wireless calls. Recent preliminary tests indicate that with ESRD routing, the time between dialling of 9-1-1 and arrival of the call at the answering point is less than 15 seconds, versus up to a minute and a half—or even longer—with the telephone operator assisted method of routing these calls. Call takers consistently report significantly reduced caller frustration, better overall information quality and improved call processing times as a result of direct routing to the PSAP.

There is an overwhelming consensus among telephone company officials and PSAP staff that ESRD call path routing of wireless 9-1-1 traffic provides a significant improvement in public safety over the TOPS operator intercept. For 9-1-1 jurisdictions in which this improved routing can be accomplished, it is highly recommended as an important first step towards wireless E9-1-1.

Notwithstanding the benefits of ESRD call path routing that are discussed above, it is clear from our experiences thus far that this method of routing wireless calls is still far from being the final solution to the 9-1-1 wireless location dilemma. Indeed, ESRD routing has introduced some problems to the PSAPs that did not exist previously. The TOPS operators received reasonably large numbers of 9-1-1 wireless calls that could reliably be classed as nuisance in nature. It was not the routine practice of the TOPS operators to pass such calls to the PSAPs. With the move to direct routing of wireless 9-1-1 calls directly to the PSAPs, the total volume of non-emergency calls received at the PSAPs has risen. More troubling for the 9-1-1 call takers however, are the frequency of “false auto dial” calls, in which 9-1-1 has been pre-programmed into the cellular phone and the auto dial feature has been activated by accident without the knowledge of the caller. Call takers report frequent occurrences of these “no voice” wireless calls in which background noise can be heard but the call taker is unable to speak with a caller and hence cannot confirm whether an emergency exists. The practice among call takers has been to listen to the call long enough to make a judgement determination that no emergency exists and then

disconnect from the call. Frequently, however, the signal from the cellular phone re-establishes a connection to the PSAP and it is not unusual for the same nuisance call to reconnect with the PSAP several times. In cases where there has been suspicion of an emergency, call takers can, after notifying emergency agencies, use a rather lengthy process through the wireless carrier's security division to attempt to get a call back number for the cell phone.

In conclusion, while it is clear that ESRD routing provides an inherently safer and more efficient method for routing of wireless 9-1-1 traffic, there are still shortfalls, as described above, which can only best be resolved by implementation of Phase I (call-back number) and Phase II (location) wireless solutions. Planning is now underway to deliver a Phase I trial for customers of MTT Mobility in Nova Scotia during the second quarter of 2000.

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