Getting the wheels rolling on rural ITS research

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The University of New Brunswick (UNB) had an excellent opportunity recently to conduct intelligence gathering on worldwide innovations in rural ITS through transportation research funded by Transport Canada’s ITS Policy Branch. Background investigation determined that the leaders in this field were the State of Alaska (which hosted the National Rural ITS Conference (NRITS) in 2006) in the North American context, and Finland in the European context.

Alaska provides a good example of where ITS for rural and low-density areas in Canada could be in the near future with a concerted effort. Alaska has invested substantially in its weather and traveller information system (including 511), and has innovative deployments, such as the Whittier Tunnel that uses ITS to allow vehicles and trains to use the tunnel at different times during the day. This is an excellent example of maximizing the use of infrastructure using technology involving two separate transportation modes. Given that many rural areas and smaller metropolitan areas have localized congestion during peak periods, ITS could be used to mitigate this. There are considerable challenges to overcome, however, as even well-proven technologies (such as contraflow lanes) have yet to achieve any kind of widespread adoption in these smaller jurisdictions. A test-bed could be an excellent way to demonstrate new technology and educate potential users.

Over time, the use of wireless technology will be very important to helping improve safety and efficiency for rural and low-density locations. During NRITS 2008, there was a special session devoted to IntelliDrive™. Making the vehicle part of the data collection and sharing processes will be primarily through wireless communications. There are several challenges with IntelliDrive in rural areas (low traffic volumes may make vehicle-to-vehicle communication challenging), but there does not appear to be a test-bed for this technology focused on the rural context.

Looking to the future, Finland is an excellent example of an integrated rural, low-density and urban ITS environment that could be a model for Canada’s rural and low-density areas. Several traffic management centres are located throughout Finland (some in areas as small as 50,000 people) and each one has a specialty, such as border crossing monitoring. These centres also coordinate emergency vehicle responses. In addition, there are many kilometres of weather-dependent variable speed limit signs that respond automatically to conditions, as well as being centrally controlled. There is also a sophisticated national road weather monitoring and information service combined with a winter road maintenance service. VTT, the technical research centre of Finland, is leading the charge on numerous ITS innovations, including rural rail grade crossing safety.

Perhaps the most innovative aspect of Finnish ITS is how they incorporate ideology into their decision-making process. While benefit-cost analysis is a common technique for determining the worthiness of a project, Finland has worked to capture the benefits of ITS that traditionally have been difficult to quantify (traveller information). Under their analysis, the technologies they have deployed provide an appropriate return on investment. Transportation agencies in Canada may struggle with how to quantify the benefits of initiatives such as providing up-to-date traveller information to the public, especially when other countermesures (such as diverting a highway) have such well-documented and evident benefits. This is definitely an area for research.

In terms of next steps for us in Canada, there is considerable opportunity to develop a rural ITS research centre and test-bed that could put Canada on track to become world leaders. UNB has worked with provincial, federal and private sector partners on rural ITS initiatives in the past, and it is hoped that dedicated, long-term funding can become available to get a new research, test-bed and pre-deployment effort off the ground.

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