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ITS Saves the World

by Peter Goldin

Despite the challenges, intelligent transportation systems are poised for global expansion as both developed and developing countries embrace ITS technologies.

TO THOSE OF US WHO SEE CAMERAS ON THE HIGHWAYS OR utilize open road tolling, it may seem that ITS is the de facto approach to transportation control and improvement, however, much of the world is just starting to catch on. Most of the ITS deployments to date have been in developed nations — especially the US, Canada, Japan and Western Europe — although we are starting to see significant ITS programs in developing countries. As economies, populations and urban infrastructures expand, and developing nations experience the growing pains of traffic congestion, ITS is positioned to become an essential and ubiquitous technology worldwide.

Historically, the main drivers behind the adoption of ITS technology have been similar across the globe — increased safety, mitigating traffic congestion, and more efficient movement of goods to support economies — but environmental protection is quickly becoming a top driver as well, especially as governments put more “green” legislation in place.

Even though the drivers behind ITS adoption are common around the world, Scott Belcher, president of ITS America, points out how ITS addresses unique societal needs. For example, the US and Canada have implemented cross-border ITS solutions to speed commerce and simplify tourism between the two countries; in Germany, real-time traffic information helps private and commercial travelers avoid congestion and traffic incidents on the Autobahn; in France, ITS navigation system maps include the locations of electric vehicle charging stations; and in the UK, GPS and traffic cameras are used for enforcement and automotive insurance premium determination.

Getting on the Same Wave Length

Each country has its own agenda which drives ITS expansion, but if the world can get on the same wave length and work together, this would streamline the worldwide adoption of ITS.

“Global expansion of ITS will be driven by a combination of national and sometimes local needs for transport system improvements coupled with the inventiveness of academia and industrial

firms to come up with creative solutions,” explains Belcher. “Cooperation among governments and trade associations to make available avenues for knowledge exchange and relationship building can go a long way to speed the process.”

Possibly one of the best hopes for global convergence on ITS is the ITS World Congress, an annual event supported by ITS America and other national and regional ITS groups around the world.

“The ITS World Congress is an absolutely vital element in the global expansion of ITS,” Belcher says. “It gives the host countries chances to show off the brightest and best in ITS research, development and implementation. It gives participating industrial companies opportunities to demonstrate — and hopefully sell — their latest new technologies and developments. It gives politicians, legislative leaders, academics and private sector executives numerous opportunities to exchange ideas, establish contacts and further cement bonds.”

Regional organizations that reach across national borders can also have an important impact on the future of ITS. For example, in December 2008, the European Commission established the ITS Action Plan to speed up market penetration of ITS applications and services in Europe by coordinating ITS initiatives across the continent.

One of the most significant barriers to the global expansion of ITS, however, is the fact that the world does not share the same technology standards. Possibly the ITS World Congress and organizations like the European Commission will facilitate universal standards, which most industry experts agree would streamline the global adoption of ITS technology.

“The world needs to get on one standard,” notes Randy Iwasaki, chief deputy director of the California Department of Transportation (Caltrans). “The best way to maximize the effort with the most amount of competition would be to have the same standard.”

“ITS technology needs truly global standards in terms of system interoperability,” agrees Jason Barnes, editor of UK-based ITS International magazine. “Whether it

is the NTCIP or ISO or CEN standards, that is up for debate, but one thing that absolutely does not need to happen is all these developing countries ending up with bespoke standards and systems. That is a real obstacle to economic growth and development. Harmonization is a key here. Cooperation is absolutely vital.”

In addition to universal standardization, there remain several challenges to worldwide ITS deployment, such as privacy issues, which have slowed down the widespread implementation of some ITS technologies. CCTV for example, when used by the government to identify drivers, is seen by portions of the public as an invasion of privacy. Tracking of vehicle movement via transponders or cell phones is another emerging application of ITS technology that is questioned by some as an infringement on rights to privacy.

“I think it is getting better,” Caltrans’ Iwasaki assures. “When we first started deploying CCTV cameras on our highways, we had to promise not to store the images. Today, however, we have open road tolling that takes a picture of the driver’s face and license plates, and the public accepts it. I think people are starting to realize the value of the efficiency.”

Iwasaki also points out that the younger generation is much more accustomed to sharing personal information via the Internet, so the “Big Brother” issue may become even less important in the future.

Recent technological advancements that enable the anonymization of cellular phone data is another step toward breaking down the privacy barrier. Open road tolling will always require the identification of the user, however, so governments still have the responsibility to put robust safeguards in place to protect privacy, and to educate the public on the privacy issues and the value of ITS.

Giving Developing Nations a Hand

The developed nations have clearly embraced ITS technology, and its expansion is a foregone conclusion. So when considering the global expansion of ITS technology, the real question is about the developing nations.

“There is not a country in the world that is not trying to improve its transport infrastructure,” Belcher explains. “Even the poorest nations are undertaking rudimentary road improvements in order to more efficiently move relief supplies from one location to another. The only things that might hold a nation back from implementing ITS technologies are the maturity of its infrastructure and the availability of funds.”

Developing Asian countries with explosive growth — such as China and India — are seen as the prime candidates for large scale ITS deployments. These countries are undergoing massive urbanization, and their populations have surpassed the capabilities of their transportation infrastructure. This is where ITS can make a serious impact.

Developing nations are undoubtedly migrating toward greater adoption of ITS technologies, prompting the question: Is it the obligation of developed nations to help them in this quest?

“I think the developed countries have to show the way,” says Barnes of ITS International. “The developed nations as a whole should demonstrate best practice and share that intellectual property with developing countries for altruistic reasons.”

Nations are already cooperating to some extent, helping each other develop and implement ITS technologies more quickly and avoid duplication of research, according to Belcher. For example, the US, Europe and China have a number of bilateral agreements that support the exchange of research results and standards information.

“China welcomes foreigners’ ITS technologies because it gets quick application of needed transport improvements while also achieving a high degree of technology transfer to its own firms and professionals,” Belcher adds.

The humanitarian argument is a good one, but there is also an economic advantage for developed countries, who sell the ITS technology, to increase their markets dramatically by selling to potentially colossal customers like China and India.

“Not only is there a market opportunity for developed nations to provide those technologies — whether it is under license,

joint venture, strategic alliance or straightforward sales — to the developing nations,” says Carl Kuhnke, executive director of ITS Canada. “But it is in our interest as developed nations to ensure industrializing nations have those technologies, because if they deploy them, regardless of who they are buying them from, their economies will do better.”

Kuhnke points out that if traffic, people and goods move more effectively in a country, the economy grows stronger and becomes a larger potential market for a myriad of goods from developed nations, not only ITS products. These economic advantages may turn out to be a strong force for ITS expansion across the developing world.

Innovation Driving ITS

As more companies are leveraging their technologies in the transportation market, the result is more ITS innovation, which is a key driver behind the spread of ITS technology. Advances in GPS, cellular telephony, cameras and other consumer electronics can be leveraged to create entirely new applications from an ITS perspective.

For example, the ability to track cell phone locations has opened up a whole new capability to monitor traffic flow and deliver that data back to the traveling public, all without the need for additional infrastructure. This capability alone can increase the geographic extent of ITS coverage across a much broader area, including regions that could not be cost-effectively covered before.

CMOS (complementary metal-oxide semiconductor) chip set solutions serve as another example of how innovation in consumer electronics can drive ITS development. The same technology used for cell phone cameras has reached a point where it can be utilized as a video monitoring device. Small and energy efficient, CMOS chip sets are also less expensive than other camera options, reducing R&D costs, enabling huge leaps in the ITS field, and allowing the development of ITS products that would otherwise not be feasible.

Advancement in foundational ITS technologies, like detection, will have a substantial impact on the global expansion

of ITS as well. Detection technologies of the future can be employed to determine the contents of a truck, for regulatory or security purposes, so the vehicle does not have to slow down at border crossings, or ITS systems may identify pedestrians from detection based at intersections or on board vehicles, to increase safety.

In terms of employing advanced technologies, ironically developing nations might be at an advantage because they are starting fresh and can jump right to the latest technologies.

“We in the developed world went through the pain of developing all our technology as analog, and now we are looking for digital upgrades,” Barnes explains.



plains. “Developing nations have the good fortune to be able to skip straight to digital.”

“China has plans for a vast national motorway network that, when completed, will rival the US Interstate Highway System and the German Autobahn for breadth and reach,” Belcher adds. “The Chinese government is building ITS into these roads from the start, in the same way that it leapfrogged in telephone communication, skipping ‘twister pair’ entirely to jump straight into cellular.”

The Bottom Line

In the end, the obvious challenge to ITS deployment is funding. There never seems to be enough money to go around, and shifting priorities make it difficult to gain sufficient funds for ITS.

“Surprisingly, the current economic recession is actually becoming something of a booster for ITS technology implementation, especially for traffic management and control,” Belcher says. “Many govern-

ments are kicking off economic stimulus programs, most of which include some form of transport infrastructure expansion or improvement. ITS is valued by the agencies that are managing the actual construction work, so we’re likely to see an uptick in new ITS installations as stimulus funding is distributed. Already, some companies in the traffic management business are reporting increases in new orders.”

Riding this wave, some ITS equipment manufacturers are introducing new lower price-point products specifically targeting stimulus funding. This can significantly increase the expansion of ITS deployment, enabling some technologies to be deployed in areas and countries where it was never

Advancement in foundational ITS technologies will have a substantial impact on the global expansion of ITS.

economically feasible before. In addition, leveraging innovations from consumer electronics industries can make ITS more cost-effective.

On one hand, the global expansion of ITS comes down to the ability to afford to deploy ITS technology. But for both developed and developing nations, ultimately it is cheaper to add intelligence to a road, and make the existing infrastructure more efficient, than it is to increase lane capacity or build new roads altogether. This makes a strong case for ITS technology. ■

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