traffic
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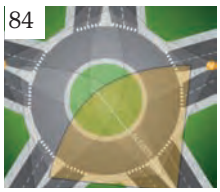

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Foreword

Of all the wonderful things to do in Beijing, sitting in a traffic jam under a thick carpet of smog (which I recall Chinese state media referring to as 'overcast and hazy skies') wouldn't feature too highly. I refer, of course, to the record-breaking traffic jam, which at the time of writing has entered its eleventh day and at one point was over 100km long, extending between Jining in Inner Mongolia and Huai'an in Hebei province, north west of the Chinese capital.

The big trouble in China kicked off with roadworks on the Beijing-Tibet Highway, the congestion from which was exacerbated the following week when a road circling Beijing was closed. You certainly wouldn't want to be in Zhang Minghai's shoes, director of Zhangjiakou city's Traffic Management Bureau. But being stuck in that jam for (according to some reports) four days is no walk in the park either – one truck driver transporting coal didn't even move for five hours! On the flipside, though, the bumper-to-bumper jams provided a number of entrepreneurs with the opportunity to make a quick yen, meandering their way in-between the standstill traffic to hawk their noodles and soft drinks.

Certainly the story has been a source of amusement for much of the world's media, a welcome departure from troubles elsewhere, but you don't have to scratch far beneath the surface to unearth some worrying aspects.

Although the 'monster jam' (as it's been dubbed) was initiated by roadworks, China's roads are chronically overcongested and only heading in one direction, at least until the country's massive road building program can catch up with its gargantuan auto sales, which last year surpassed the USA with 13.6 million vehicles sold. China's roads also suffer an unrelenting pounding from hundreds of thousands of (sometimes illegally) overloaded trucks – especially those on the coal routes from Mongolia to the ports south of Beijing.

Our article on developments in the weigh-in-motion sector (*page 24*) is nothing more than a welcome coincidence, although as Eugene O'Brien, president of the International Society for Weigh-In-Motion, puts it, the enforcement of overloaded trucks in particular could provide a big growth area for WIM suppliers in the future.

It's self-defeating for authorities in China to be spending billions on new infrastructure if it's going to be ripped up in a matter of years by a bombardment of dangerously heavy trucks. But there's a further serious undertone to the intensity of this mobilization. Poorly trained drivers on badly maintained roads equals? You don't have to be a professor to figure that one out…

Anyway, as 10 weeks of gasworks begins right outside my house, causing localized chaos in the process, I will spare a thought for those in China. Fingers crossed, they'll be free from the gridlock by the time our next issue is published...

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A systems engineering process

Improving system-wide safety and increasing mobility is the goal of transportation networks around the world. Whether it is highway, aviation or rail, agencies must often deploy critical communications solutions while maintaining a fully functional network. Today, Harris Corporation is helping transportation customers achieve their goals by working with them to employ the systems engineering process that will overcome this challenge and use emerging communications technologies, such as those being deployed in the ITS arena.

Successfully used in military installations around the world to deploy critical communications systems, Harris's systems engineering process for transportation partners helps users look at existing regional infrastructure and create long-term strategic ITS plans. One of the best resources for developing such a process for a transportation agency is the *International Council on Systems Engineering (INCOSE) Handbook*. The council presents a number of models that when properly executed make deployment of a critical communications network easier. The systems engineering process can be boiled down to a simple phased approach.

Phases of action

The first element (a prephase, if you like) to be tackled is Interfacing with Planning and the Regional Architecture. Phase zero, or the baseline phase, involves Concept Exploration and Benefits Analysis, which calls for a needs assessment and concept selection.

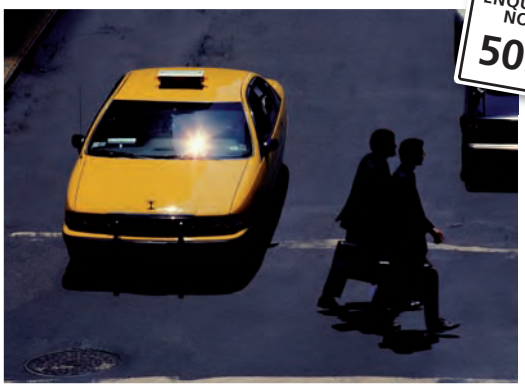
The first phase of systems engineering for ITS is Project Planning and Concept of Operations Development.

Phase two is System Definition and Design, where system requirements, high level and detailed designs of the proposed system are worked out and begin to take shape.

System Development and Implementation is step three and involves much of the software coding, hardware fabrication and unit testing.

Phase four is Validation, Operations and Maintenance, Changes and Upgrades, which includes system validation and acceptance and spans a large portion of the operational lifetime of the ITS system.

The final phase is System Retirement/Replacement.



(Top) **TMCs reap the benefits of improved comms** (Left) **These benefits are also felt at street level**

Need to know?

How a smart approach can help to evolve ITS communications technology

- Communications systems and equipment
- Use in applications from real-time data monitoring of assets to wireless video surveillance
- Enabling TMCs to wirelessly transmit and receive data, stream video of critical infrastructure and collect data from RWIS and tracked passenger vehicles

An example of where a systems engineering approach is most valuable would be through the deployment of a wireless broadband network for a Metropolitan Transit Authority (MTA). The typical MTA has a large geographic footprint, is linked to other agencies, and has buses and trains moving through the region, in doing so making it an ideal anchor tenant/operator for a mobile broadband system. Using the MTA's rolling stock, a DSRC radio can help deliver traffic signal prioritization and real-time traffic updates to the intersections through which it passes. It can also deliver video content from rolling stock to infrastructure and other mobile assets, enabling real-time situational awareness.

To begin the systems engineering process, the MTA would need to completely assess what it wants to achieve with the deployment of a wireless broadband solution. It then needs a full accounting of its current wireless communication assets and the infrastructure used by the regional agencies it services and those it wants to interoperate with. The MTA would then enter into an agreement to implement the broadband solution, construct project goals, and begin working through the technical details.

Today's solutions

In the future, the management of all voice and data applications on a single private network will be made possible by broadband technologies such as Long Term Evolution (LTE). Today, Harris is leveraging LTE and WiMax technologies to enable high-speed wireless broadband capabilities in the 700MHz and 4.9GHz bands for transportation

agencies currently using functions such as data backhaul, video streaming and push-to-talk (PTT) technology.

The landscape for today's narrowband voice and data systems has been affected by federal requirements that make establishing wireless partnerships especially important. The Federal Communications Commission's (FCC) narrowband mandate is requiring many transportation agencies to make modifications to their Land Mobile Radio (LMR) communications systems. The FCC's goal for LMR narrowband modifications will ultimately improve spectrum efficiencies and create new licensable frequencies.

Funding is available through both federal recovery and broadband stimulus grants designed to help agencies meet narrowband guidelines and build a communications platform on widely accepted, standards-based IP technology. Now is an ideal time to look beyond the voice communications needs of agency narrowband radio networks and look further into regional transportation partners that may want to exchange voice and data information.

Future-focused technology

Harris has made it a core mission to be a leading authority in the deployment of ITS that will help make roads safer, more efficient and environmentally responsible. According to the USDOT, in 2008 approximately 37,000 people died and 2.35 million were injured on US roadways in about 5.8 million crashes. Adoption of wireless standards would allow positional data to be communicated instantaneously between vehicles and greatly reduce those numbers. Increased safety isn't the only benefit that wireless ITS is positioned to facilitate. The initiative also looks to reduce the amount of congestion on US roadways, which will ultimately reduce the amount of CO_2 and other pollutants emitted by vehicles. Harris is currently working with customers such as the Pennsylvania Turnpike, Dallas Area Rapid Transit (DART) and others to deploy wireless broadband for applications ranging from electronic signage to wireless video surveillance. It is Harris's belief that ITS technology has far more potential than is currently being realized.

The USDOT is experimenting with ITS technology similar to that currently being deployed by Harris as part of the IntelliDrive initiative and plans to make its decisions on wireless standards after testing is complete in 2013.

Harris has a successful track record of utilizing the systems engineering process for customers on their most critical systems and is positioned to contribute to ITS as standards and technology continue to be developed. The company has also been the prime contractor for the FAA's FTI network and the FICA network for the US Census department. Additionally, Harris companies have deployed a significant number of wireless networks for mass-transit bus and rail systems throughout the USA.

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