

KEEP ON MOVING

We take it for granted that we can just jump in our car and go wherever we please. However, due to increasing levels of congestion, it is becoming increasingly difficult to predict how long this journey will take. Even the policy makers acknowledge that the incessant demand for mobility is unsustainable and that congestion needs to be tackled by making more intelligent use of existing capacity. Building more roads and other transport links just isn't the solution. This realisation has forced the transport industry to review its existing networks and look for alternative, more cost-effective solutions. Technology is widely seen as key to addressing these challenges and managing the future demands placed on our transport systems. However, considering the costs, timescales and roll-out of any new system into the transport infrastructure, there needs to be more of a managed approach to integration.

Technology opens up many new and exciting opportunities, whether this is through the application of innovative solutions from other industry sectors or the novel use of technologies specifically developed for transport. The signs are good, as the sector is starting to realise the benefits technologies can bring and the travelling public wants to be better informed

about travel conditions and journey options. To illustrate, increasing numbers of individuals are buying satellite navigation devices to help plan their journeys and revise their route in the event of an incident, which is modifying behaviours and travel patterns. In some parts of the UK (e.g. London and surrounding areas) the take-up of 'sat-nav' is substantial. This sends out a clear message – the public is hungry for information, is keen to use it and, encouragingly, is willing to pay for it. The transport sector is already responding to this customer demand. For example, the UK's Highways Agency has recently launched their Traffic Radio, where travellers can get the latest traffic news through digital radio and online.

The transport sector must, however, keep the application of technology in proper perspective; it cannot satisfy all customer demands or keep pace with all technology advances. Instead the sector must adopt an approach that embraces the new, where there is value to be gained, and makes the best possible use of what is out there already, enabling tighter control of costs, delivery timescales and scope.

Maintaining control of the many factors that see timescales slip, scope creep and costs increase is fraught with difficulties

and past experience shows how hard this is for a sector where infrastructure costs are inherently high, and where the returns on investment can be uncertain and slow. There are many well-publicised infrastructure development projects, such as the UK's West Coast Route Modernisation project to upgrade intercity passenger services, where the industry has struggled to deliver on time and keep costs under control.

Across the transport sector many legacy systems are still in use and this further complicates investment decisions. It can be difficult to justify taking equipment out of service and hence new systems are often required to interface with old technology from the off, increasing the cost burden of installation. For example, the UK's National Roads Telecommunications Services (NRTS) is being rolled out across the road network to upgrade and extend telecommunications services. A significant outlay will be required to interface NRTS with existing equipment, just to maintain current services.

More value can be gained by using existing systems across the transport sector in novel ways through the selective employment of technologies from other industry sectors. These innovative approaches to



applying technology offer the means to bridge the gap between what our existing infrastructure is capable of delivering today and what customers require of our transport systems in the future. This is not advocating alternative technologies for their own sake, but it is recognising that there is considerable potential for improving travellers' experience through the targeted application of more leading-edge technologies than are used today. The transport sector can gain advantage from other industry sectors that have successfully invested in new technologies, by adopting 'proven' technology solutions from them and integrating these into the existing transport technology environment. I've highlighted a few examples:

- **Sensor Fusion** is a technique where the information from more than one sensor is combined to derive additional information that would not be available from each sensor independently. For example, the fusion of radar and video imagery offers the ability to both locate and identify objects reliably. The technique has been used in medical applications and the automotive sector.
- **Decision Support** is an automated system, which is deployed in Air Traffic Control environments. It takes in large volumes of data and assists the operator to make tactical decisions. This technology

is especially useful for offering up alternative strategies and actions to an operator dealing with a complex situation.

- **Impulse Radar Technology**, as developed for the automotive industry, is better suited than conventional radar (i.e. Doppler) technologies for vehicle tracking and profiling applications, such as identifying when lane drift has occurred in high density traffic.
- **Localised, dedicated wireless data communications**, developed primarily for the consumer IT market, offer two-way communications with very high throughput rates ideal for vehicle-to-vehicle and vehicle-to-infrastructure communications. Potential applications include electronic signs and signals selectively transmitting information to the driver.
- **Bayesian Inference** has been used in medical applications (e.g. DNA sequencing traces for extending read length) to extract maximum information. It offers opportunities for enhancing the information available to transport service providers in poor data quality environments.

The remaining piece of the jigsaw is the end user. Technical solutions have to be

designed, developed and rolled out in close collaboration with end users, if they are to be successful.

This means that technology providers must understand user requirements and operational needs and how these influence solutions. At the design stage, user requirements must be captured and the prioritisation criteria defined, with a view to producing an agreed, ranked set of essential and desirable requirements. When developing technology solutions to satisfy user requirements, regular consultation with end users is crucial: this will ensure that their interests are uppermost when important design choices are made. During rollout there will be a period of 'bedding in' and a strong level of user engagement continues to be important to ensure user acceptance.

Unlike many other industries, transport is not looking to technology purely for differentiation or competitive advantage. Instead the sector is turning to faster, smarter, intuitive and more innovative technology to solve its problems and help prepare the transport sector for whatever the 21st century demands of it. Whilst the route to high-tech transport is full of challenges and obstacles, the government is keen to invest and consumers are keen to adopt, providing a very attractive landscape indeed. Liz.Orme@CambridgeConsultants.com

