As a civil engineering graduate, former computer programming enthusiast, website builder and someone with fond memories of the BBC’s ‘Tomorrow’s World’, I am no stranger to the achievements of science and technology and what they have to offer society. Science and technology have been and continue to be a key support for the transport sector itself – especially in relation to the development of transport infrastructure and the vehicles that use it and to the management of traffic to make most efficient use of available capacity. Indeed, the field of ‘intelligent transport systems’ has evolved to bring to bear on our transport challenges the possibilities that science and technology have to offer. It is possible for vehicles to be designed in ways that can make them increasingly safe, increasingly fuel-efficient and increasingly capable of communicating with the infrastructure and with each other to allow efficient operations. Increasingly, science and technology present us with ways to inform and guide travellers in their travel choices and the undertaking of journeys. Further still, the unfolding of the information age has furnished society with unprecedented opportunities for communication between people and for doing business and participating in activities without the need to travel.

So – do science and technology hold the key to progress in a new era in which not only are our politicians anxious for transport to support economic vitality but also concerned about its contribution to climate change? The danger is in assuming that science and technology are the solution as distinct from recognising that they are part of the solution. In fact, to a large extent the solution lies in human behaviour and the decisions made by our politicians and by us as members of the public going about our everyday lives. Technology is a facilitator of change but change itself is dictated by the choices we make – about where to live and work; about where, when, how and how much to travel.

One of my concerns is that we can be at risk of anthropomorphising technology – ie. ascribing to it human-like qualities. The term ‘intelligent’ is a prime case in point. An ‘intelligent transport system’ is not ‘intelligent’ just because it is technologically sophisticated. Intelligence comes from how it operates and is used in such a way as to positively support society.

In 2005/06 I was involved in the government’s Foresight Programme that took a look at the future of transport and at the notion of intelligence. The project brought together scientists and technologists and social scientists. It concluded that there were four levels of intelligence that we must address if we are to robustly prepare ourselves for the unknowns of the future (and I quote here from the study’s report):

■ Intelligent design, minimising the need to move, through urban design, efficient integration and management of public transport and local production;
■ A system that can provide intelligence, with sensors and data mining providing information to support the decisions of individuals and service providers;
■ Infrastructure that is intelligent, processing the mass of information we collect and adapting in real-time to provide the most effective services;
■ Intelligent use of the system where people modify their behaviours to use infrastructure in a sustainable way.

These points underline the fact that intelligence is a marriage between technology and human behaviour. In terms of research and development, I might venture to suggest that this marriage has been rather one-sided – technology has been the focus. However, there are strong
and encouraging signs that research funding bodies now recognise that attention to human behaviour is equally important if the marriage is to work.

Let me take a field within intelligent transport systems research and development in which I have been involved to give some more specific insight – namely, travel information systems.

‘Technology is a facilitator of change but change itself is dictated by the choices we make – about where to live and work; about where, when, how and how much to travel.’

In the last 10 years, in the wake of the invention of the web and the mainstreaming of the internet within society, we have seen a growing number of travel information systems available, all intending to inform, influence and support the travel decisions people make. My impression is that until very recently human behaviour was rather poorly understood. The logic seemed to be as follows: people make decisions when they travel and the better informed they are, the better the decisions they can make; in turn by providing more and better information, use of information will increase and travel decisions will get better – in ways that benefit the individual and the system as a whole. In short, we can leave it to the technologists: build it and the people will come. This logic may be reasonable but it is incomplete.

More recently, research from the spheres of social psychology and behavioural science has been providing redress. What emerges is that most people, most of the time are making familiar routine journeys to the extent that their behaviour has become habitual – decision-making is unconscious. People’s tendency to seek information in other contexts can be governed by notions of satisfying and regret; people are often looking to make travel decisions that are good enough rather than optimal, i.e. ‘satisfactory’; and the effort of seeking information and re-appraising their choices is only likely to be gone to if they fear they may regret a more hasty decision in hindsight.

There is also emerging evidence of social co-operation and social imitation; people share information with each other and are also looking for shortcuts to making satisfactory choices – one shortcut being to copy the choices made by others around them. As the field of travel information systems begins to take this on board, the need for (more) market research becomes apparent – a need to understand the customer. The challenge then becomes one of how to ensure very clearly that when people need information, it is made available in such a way as to be easily found, useful and usable. There is also a reminder that the decisions of policy-makers are important in terms of a holistic treatment of transport. Ways are needed to encourage people to review their travel choices; this may be through pricing signals, education or the targeting of life stages/events when people are more naturally inclined to re-appraise their behaviour. Travel information systems then become seen as enablers of behaviour change as opposed to being misinterpreted as the creators of behaviour change.

By embracing a need to understand and account for human behaviour, we position ourselves for a more realistic assessment of what science and technology can bring about. Research of a few years ago looked at the pitfalls of technological projections in transport. Two of the pitfalls were to assume new for old substitution and that the pool of social practices would remain unaltered. This is evident in terms of the phenomenon of virtual mobility – the ability to participate in activities and communications without the need to travel, thanks to the internet (eg. teleworking, teleshopping, telebanking, social networking). One might logically assume that virtual mobility can substitute for physical mobility (new for old). However, in our own research we found that what appears to be happening (though this can still only be a highly simplified interpretation of what is a changing reality) is that people are supplementing their physical mobility with virtual mobility and in so doing are enriching their level of social participation (their pool of social practice is changing). It is in an area such as this where market intervention by government may well be called for in some way. Economic activity in the knowledge economy is primarily about accessibility not mobility; as such, there is a need to consider whether pricing signals to ration(alise) physical travel (perhaps as we are presently seeing, without intervention, with fuel price increases) might encourage more virtual mobility whilst not harming economic activity.

For the marriage of science and technology and human behaviour to work in practice we need strong governance as a broker. Herein may lie the greatest challenge – policymakers have to take steps to encourage behaviour change that science and technology can then support – but such steps must confront the uncomfortable reality that people are also voters and that whilst they are adaptable to change, they are also sensitive and resistant to it.