

THE INTELLIGENT JOURNEY

PUTTING THE JIGSAW TOGETHER



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Laying out the jigsaw pieces

We, at Cambridge Consultants and Arthur D. Little, recently hosted our bi-annual transport workshop in November 2005. Themed around 'the Intelligent Journey', we invited decision-makers, opinion formers and experts from the transport industry to Castle Ashby in Northampton, UK. The aim of the workshop was to identify how we – the transport industry in its widest sense – can bring the various pieces of today's transport jigsaw together to form a complete picture – the Intelligent Journey.

The Intelligent Journey can be defined as the process of getting from one place, say home, to another, say work, in the most efficient manner. This may, of course, include a myriad of issues, such as which transport mode to use – the car, public transport or simply to walk – as well as 'impact' factors such as cost, stress, safety and the environmental footprint. Giving Government and/or the individual the means of making this decision is where the intelligence comes to the journey.

The workshop was different from many similar industry-based events. We deliberately invited a well-balanced cross-section of stakeholders in the Intelligent Journey, including a number of players not usually involved in such events. They included policy representatives, public and private road operators, automotive suppliers, roadside equipment suppliers, telematics service providers, and communications companies. Above all, everyone there was a transport user and customer too. We would like to thank all participants for their time, candour and willingness to provide new ideas.

David Jamieson, former Minister for Roads, set the scene for this event with a thought provoking after-dinner speech the evening before the main workshop. David pointed out the change in government thinking, away from specifying the solution to specifying the outcome wanted. In anticipation of the morning's discussion, David shared many interesting stories of how even transport users' needs often are in conflict with each other, a point we explore in more detail in this summary of the event.

The following day's workshop considered two key aspects of the Intelligent Journey:

- The morning looked at what the traveller wants, who the stakeholders are, and how they could come together into a sustained eco-system that delivers the Intelligent Journey.
- The afternoon looked at key technology areas being touted as solutions to facilitate the Intelligent Journey and discussed how much of an enabler these technologies really will be.

The day revolved around these central issues, but was not at all constrained by them. Having such a wide range of people and experiences, as well as people with fresh perspectives on old problems, meant we built up many new ideas – which we want to sow as seeds for the future.

Key conclusions

The participants made it clear that while the jigsaw is not yet complete, the overall picture is emerging. However, as often with a jigsaw, some pieces stand out but their relationship to the other pieces is not clear yet. The main conclusions were:

1. Throughout the day, it became increasingly clear that there is a need to instil in travellers – our customers – a new attitude to travel. The group wants them to actively own their journey – by planning and thinking about its impact – before they set out. We want them to no longer act only when they join the back of a motorway queue or a bus is late. Instead, we need to create a new way of thinking about travel – as part of a joined up lifestyle. This is starting to happen in public transport and freight but making it happen for all modes of transport has benefits for society, for individuals and for industry. The group identified seven key ways of achieving this outcome.
2. As a group, we identified that to make the Intelligent Journey a reality, many stakeholders would need to join in a complete picture. While they share some priorities, their aims and views differ significantly in other areas. Hence, Government has an essential role to play in creating the policies and frameworks in which the Intelligent Journey happens. Only in this way can this disparate group become an integrated ecosystem.
3. We identified that the policy issues need to be resolved before we can solve the technology issues. Nonetheless, the mobile phone – as both a technology and a business model – seems to work well for the Intelligent Journey. However, how this part of the jigsaw connects to the other parts still needs refining.

The need to take customers on the journey

What do customers really want?

The participants felt that, as an industry, we still do not really know what our travelling customers want. This conclusion is not surprising, since the customers do not always have a clear idea yet of what they want. In an era of rapid change, sometimes the most obscure uses of technology actually create a need that was not recognised. For example, texting via SMS did not look a very good idea on paper, yet the explosion of this form of communication clearly proves otherwise.

What is clear is that customers neither know nor care about the institutional and technical barriers that prevent truly seamless services. Their trips do not start or end at motorway junctions or involve just one rail operator – they want to know about their entire trip. Joining up across these seams is a clear need of many users.

When the M6 toll route originally opened, the operators anticipated that it would be used by travellers to shorten the time of the journey.

The reality is somewhat different. Because the route is faster and more predictable, drivers perceive that it 'buys them time' – time they often then use – for a break at the M6 Toll's service area.

How can we capture and sell this concept to other travellers – that by planning Intelligent Journeys they can regain control?

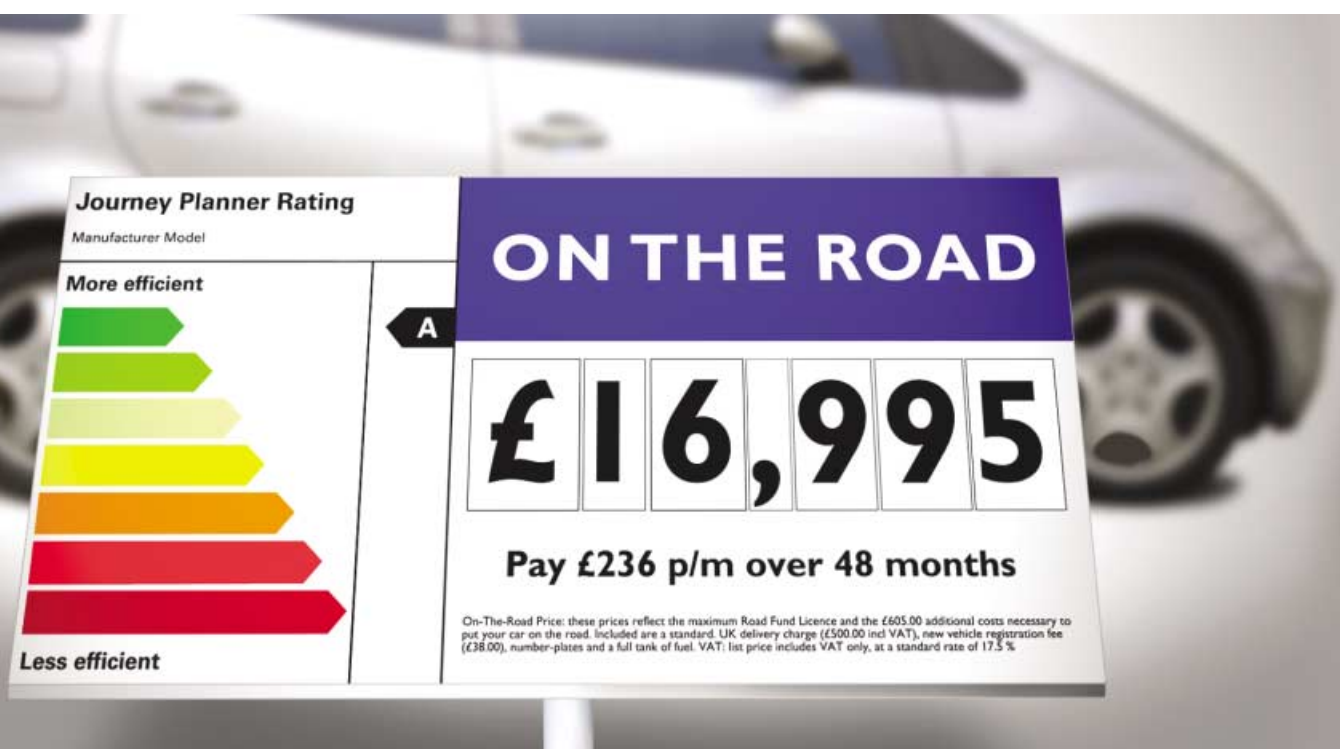
Often travellers say they want the quickest route from A to B, but evidence, such as that from the M6 toll, suggests otherwise. What they really seem to want is to be in control of their time and travel – to be more comfortable and to reduce unwanted stress. Yet often their only contact with travel information is as they see congestion in front of them or have a delayed bus or train. As a group, we saw the need for a fundamental change in attitude – to where people plan journeys intelligently as a matter of course and where technology aids by providing a range of services customers want.

Shared priorities

Transport policy reflects this need for reliable journeys and informed travellers – needs that are common to customers, industry and policy makers. Yet looking at other needs also shows shared priorities. Policy makers want to avoid social exclusion, whilst service providers want wide markets. All want the services to be sustainable in the long term.

Equally, more and more people are becoming aware of the impact climate change is having and how this may affect them and their children. They are aware of the impact of many consumer goods on the environment – for example, through active labelling – whilst they remain unaware of the impact of their travel choices. The group felt there were great opportunities to raise people’s awareness of the impact of individual trips on the environment – as we show later.

Customers clearly want safe journeys – as do operators and policy makers. Many customers are now buying new cars based on their safety performance, as indicated by Euro NCap ratings. However, can this go further? Can we also rate vehicles on safety and the reliability of the technology added to help journey planning – and can we rate trips on their environmental impact, safety and reliability?



■ In future, cars could have a journey planning rating that would help consumers choose their car.

Will it ever work?

The workshops explored in some depth if this change in attitude can happen – but reflected that attitudes do change over time – with drink driving and adoption of unleaded petrol being good examples. Users will need the benefits actively selling to them with a real customer driven approach – the technology must simply support the service.

We looked at several key issues affecting how we can deliver this change. These include removing the perception of ‘big brother tracking’ that any form of location service now entails, and the ability of customers to understand and cost the full impact of their journey. The business cases for freight and passenger transport use of technology is becoming much clearer, but individual travellers will need convincing. However, there are signs – for example through sales of navigation devices – that travellers are becoming more aware.

However, simply having better navigation for vehicle drivers is not enough – we need to challenge the attitude to travel, its timing and its mode. The group concluded that we could best achieve this step change through educating young people about making Intelligent Journeys. This is because they will be comfortable with technology, have less fixed opinions and a growing awareness of their environment. We, as a community, need to catch them before they are wedded to the ‘mobile lounge’ that vehicles have started to become.



- Government needs to promote the use of intelligent journey planners to the public.

Eco-systems and the role of central government

While our participants clearly identified shared priorities, they also identified that in some cases differences were inevitable. There are the obvious conflicts between car makers, who sell a vision of unencumbered driving, and network operators, who want to control driving in order to smooth traffic flow. Less obvious are institutional barriers that make the Intelligent Journey difficult to achieve. Given the way organisations are set-up today they tend to be concerned with the impact on their network, be they at national, local authority or even rail franchise level. It is often at the boundaries that issues can arise.

The role of central government in this change is vital. As one industry delegate put it: "if Government tells us the rules, between us we'll work out a way to make money." The workshop felt that Government can and should:

- **Legislate** – to protect safety, privacy and quality, and also to create opportunities
- **Set standards** – both in terms of technical standards and targets
- **Build frameworks** – allowing the private sector to invest with understood and mitigated risks, and to work across the seams that annoy travellers
- **Act as a catalyst** – to bring partners together or pilot new ideas
- **Liaise with institutional stakeholders** – to gain consensus
- **Review progress pragmatically** – to ensure direction
- **Plan overall strategies for the future** – and promote them

However, central government should not be responsible for delivery. In particular, Government should not define the technologies needed. Instead, it needs to 'go with the technology flow'. It has tried to define the technology needs in the past in a rapidly developing arena that, once delivered, were already out of date. So any legislation needs to be technology agnostic.

We looked carefully at where Government should keep out – allowing the private sector to do what it does best. These were in areas of customer delivery, rapid deployment but above all in dealing with personal data and individual's finances. Many people are happy for banks and even mobile phone companies to access data about them they would never want Government to see.

The 'magnificent seven'

The team brainstormed many ideas for delivering the journey. These are the seven the group would like to see developed further.

1. The driving test becomes the 'Journey Test'. As part of the theory test, candidates would answer questions on how to decide whether to use the car or other modes, taking the time and route of travel into account. In short, how to plan an Intelligent Journey.
2. All 13 year olds should receive as a birthday present from Government, a year's free access to a multimodal trip planning service like Transport Direct but branded and with added features focussed on them. They would gain access to the service through their mobile phone - which might be provided as part of the bundle to avoid social exclusion. This would encourage them to use the Internet to plan intelligent travel, well before they start to get hooked on driving. It would offer many commercial opportunities for added services above this basic core, for continuing the services past 14 and for safety and security too. A pilot could be run at the ITS World Congress 2006 in London.
3. Marketing reliable travel through planning – as a way of allowing the individual to take control of the journey. This reflects the M6 Toll tea break example, using the time individuals used to have to allow for unexpected problems for whatever they want – from a tea break to more time at home.

4. Allow pay-as-you-go insurance to offer a discount to users for having their speed monitored – this may or may not be speed limit related. Users would see the discount they get for limiting themselves to driving on motorways at, for example, always less than 100, 110, 120 kph, in the same way as if they took an excess. By self-selection this avoids big brother issues and promotes slower driving, yet leaves the decision to the individual.
5. Using the journey planning service allied to GPS/Galileo position/speed tracking to award 'Foot Powered Miles' for those travelling by foot or cycle to school/work. These could be redeemed against other travel options.
6. Having a standard connector for all new vehicles that allows the user's mobile phone/PDA to link to the vehicle's identity, continually powered and safely secured. This link from the individual to the vehicle is likely to be fundamental to effective 'pay-as-you-go' services and ease of use. It also reduces the time to deploy technology in vehicle, allows retrospective fitting and such practicalities as hire cars.
7. Showing the impact of a proposed trip on the wider environment – in terms of carbon use, safety and congestion – to highlight alternatives and impacts to users, especially young people.

BA already shows users of their website the Carbon impact of any flight, for example, a return flight to Adelaide adds 3.68 tonnes of CO2 per person travelled. Journey planners should show the environmental impact of route options and different modes.

How will technology help our journey?

The group then turned their attention to how well new technologies would support the Intelligent Journey. Could these be the missing pieces of the jigsaw?

One size fits all?

A key question in the context of the Intelligent Journey is whether a single on-board unit can provide all services to all vehicles. Today, central government and various industry players are examining many services. Examples include the introduction of universal road user charging in the UK, accident notification throughout the European Union or lorry platooning to improve the capacity of the road.

Our participants felt that there were too many different stakeholders and different requirements for industry to be able to agree a specification for such a universal on-board unit. Government could take a lead here, but that would then be Government prescribing a technical solution instead of just a need. Therefore, in reality, it was likely that vehicles would in the future have multiple units. The mobile phone or PDA may yet become this universal on-board unit. This is because mobile phone costs continue to decrease dramatically, while the technology provided within them is starting to include location services.

Pay-As-You-Go road user charging?

One idea particularly attractive to Government is road user-charging, which builds on the ubiquity of mobile phones. Ideally, Government would like road-user charging to be as simple as using 'pay-as-you-go' phones have become. Many customers have no other means to pay – having no bank account or credit worthiness. In addition, as long as Government gets the correct revenue they have no desire to know people's movements, bank details or other information.

It was felt that the mobile phone provided a good business model and hence mechanism for charging, as:

- It is already in widespread use and services could be simply bolted on
- It has a solid service infrastructure
- Its billing systems deal with many small complex transactions – even roaming between competitors – and are trusted by users
- Handsets have an approval process for safety and quality
- Phones are no longer just 'phones' – they frequently add new facilities and so can be the basis for software, not hardware, based services

However, the group saw that using mobile phones for payment of charging was just one step. With suitable controls, they could also enable public transport payment, hiring cars, collecting 'foot powered miles' or personal concierge services.



- *Government would like road user charging to be as simple as 'pay-as-you-go' mobile phones.*

As the day drew to a close, the group explored a variety of service providers and market models; at the simplest level the phone could provide electronic fee collection services. At the most complex level, the phone becomes a government-endorsed electronic purse that people use for car hire or purchase, rail, phone and electronic fare collection on a single bill.

All of the issues uncovered by this model are not technology but policy issues. For example, for a mobile phone company to run this service, they would want to generate revenue. However, as this revenue collection system would be in the hands of private operators, government would either have to accept a reduction in the revenue it received, or would have to increase road charges, which would be unpopular.

One delegate pointed out that in Hong Kong the public transit/smart card can also be used to purchase goods and services in shops. Imagine using your phone to pay both for the central London congestion charge, and the fuel you need at the start of your journey.

The need for road side equipment

Companies such as BMW are actively pursuing existing vehicle sensors to provide more information about road conditions. They expect that vehicles will provide the information to other vehicles. At the same time, road operators have been heavily investing in technology at the roadside. The question arises whether the long-term future will see roadside equipment reducing while the vehicles become mobile sensor platforms.

With representatives from both the automotive industry and the roadside equipment manufacturers, we were expecting a heated debate. However, there was consensus that over a ten-year period the in-vehicle systems would replace significant amounts of the current roadside infrastructure, but with enforcement being a key roadside system.

Video game versus zimmer-frame

There are many examples today of poor design in travel planning, vehicle and roadside technology causing information overload for road users. With an ageing population, the risk of overloading users will only increase.

However, these issues are addressable through good design. Many participants mentioned today's mobile phones. While a modern phone has more options and computing power than an early PC, the user interface makes commonly used operations easy to find. By contrast, infrequently used options are several menus down.

Another participant mentioned that Vodafone has launched a mobile phone specifically for the elderly with large buttons and very few options beyond making a call. The group suggested that in future, people might buy cars with an 'oldie' option. This would include features designed for the older driver in areas such as suspension and controls.

We felt that using mobile phones as a key interface for the Intelligent Journey is a good way to go. This provides a user interface that is familiar to all.

Where next?

A key factor in developing the ideas highlighted in this report was the mix of people who attended the workshop. We deliberately chose an inclusive approach to our delegate list. We now offer this report so that others, both those that attended and those that did not, can take these joint ideas forward – for the good of industry and society as a whole. Please feel free to distribute this report to your business partners, governing bodies and customers. You can obtain additional copies through both the Cambridge Consultants and Arthur D. Little websites.

We also realise that this is just the start – we welcome your feedback on the report, as we hope that at least some of the ideas may be catalysts for change. Please feel free to come back to us, the authors, with your comments and suggestions. We are especially keen to develop ideas that we can showcase at the ITS World Congress.

Arthur D. Little and Cambridge Consultants would again like to thank those who gave their time and ideas so freely. At the next event, we hope that we will be able to complete even more of the jigsaw.

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