In this issue, I thought I’d change the format of the investigation somewhat to bring you the highlights of a new report my colleagues John McCarthy and Rebecca Tommey have put together called *From Transport to Mobility: Introducing Multi-Modal Transport* in which they investigate the creation of a seamless multi-modal response to user needs. You can read the 36-page paper at our website.

Intelligent Mobility will transform the transport sector and has an estimated global market of £900 billion by 2025 (Transport System Catapult study). Intelligent Mobility is focused on connecting people, places and goods across all modes of transport. Unlike standard approaches to date, it is not ‘vehicle’ or mode-focused, but looks at the system as a whole, and examines demand and utilisation from a total journey perspective. Most importantly, it puts the user at the centre, providing a personalised travel experience.

*Connected and Autonomous Vehicles* are a hot topic across the globe. The UK is investing £100 million from 2016-2020 to ensure the country is at the forefront of this technology. Connected and Autonomous Vehicles will provide significant benefits to the UK from a reduction in congestion levels and accidents to increasing accessibility. They also play a fundamental role in delivering Mobility as a Service.

From fully driverless to self-parking, to traffic jam assist capability, connected and autonomous vehicles offer a range of services and business models that can improve how the network functions and how we live our lives.

Mobility as a Service is transforming the user’s journey by delivering transport as a service instead of a function to facilitate travel. Transport is currently a range of modes and systems all operating in silos. Mobility as a service is focused on breaking down those silos.

Journey Management plays a fundamental role in delivering Intelligent Mobility and provides the foundations for Mobility as a Service. Journey Management is about creating a seamless multi-modal travel experience while also providing the network operators with a range of data generated by the...
users enabling them to understand how the network is operating and requirements of their customers. Journey Management enables users to undertake any multi modal journey, include personalisation to their journey options and have trust in the information they are being provided.

The network is creaking, the challenges are growing, the demands of the customers are increasing. We cannot afford to stand still and throw money at old solutions.

WHO BENEFITS?

We all should. If the network is dynamic, intelligent and personal then the service benefits the user and the network manager alike. The aim is to make technology work for all of us.

We must be brave and take the first step. Fear of failure should not be the death knell of innovation. We must create experiments and proof of concepts that grow organically supported by a robust strategic framework.

Journey Management is about connecting people, services and information together in real time. Journey Management is more than just transport, it links to other services such as health and education and includes a seamless payment method which covers all modes. In short, Journey Management is about connecting the right information to the right person at the right time. A positive customer experience is key to developing and maintaining market growth. The travelling public look for ease and reliability of travel between A and B, and a cost efficient system in place to facilitate their choices. Intelligent Mobility looks to connect people, places and goods across all modes of transport, and as such, Journey Management is fundamental in delivering this.

Journey Management looks to provide a behaviour led approach to technology deployment, rather than being technology led. Outcomes are driven by customers’ behaviours and requirements instead of by the technology developments. The market is changing and transport providers, authorities and cities will play a new role going forward, providing services that can be tailor-made to the individual.

Journey Management is characterised by:

1. **Customer Experience** A real understanding of the needs, preferences and behaviours of people and businesses.
2. **Data to Information** Effective exploitation of ubiquitous data (everyday data).
3. **Innovation** Capitalising on advances in technology in areas such as the Internet of Things (a network of objects embedded with electronics so they can collect and exchange data), sensors and autonomous systems.
4. **Network Optimisation** Transport networks operating freely and reliably at optimal capacity with seamless interchange between different modes.
5. **New Business Models** A vibrant commercial market continually encouraging business innovation and applying experience from beyond the transport world.
6. **Mobile Interoperable Dynamic Ticketing** A seamless ticketing system which is available anytime and anywhere.

So let’s look at these in a little more detail:

**CUSTOMER EXPERIENCE**

1. **Customer needs** - Understanding the customers requirements.
2. **Information** - Providing the right information at the right time. This enables the user to make an informed decision to reduce travel, reroute, retime, remode or continue their usual journey.
3. **Timely** - Regular updates before and during the journey.
4. **Sharing** - Two way sharing of information to improve the network and user experience.
DATA TO INFORMATION TO INTELLIGENCE
1. Single source of Truth – Bringing actionable data together and making sense of it all.
2. Trusted Information – The customer must BELIEVE what they are being told.
3. Reliable - 100% accuracy at all times. This is about BRAND recognition.
4. Resilient – When things go wrong on the network, the intelligence the customer gets is more important than ever.
5. Accessible – Any device, any location, any person - these are the basic requirements of use.

INNOVATION
1. Future Proof – Understand where legacy equipment fits and more importantly, where it does not.
2. Architecture – Define a modular approach to design, creating building blocks of capability that can be linked together.
3. Agile – Solutions must be capable of adapting to the new technologies and services that become available.
4. Interoperable – Standards and interface requirements must be clear and unambiguous.
5. Organisation – Sometimes it’s not just about the technology, as the organisation itself must be innovative.

NETWORK OPTIMISATION FUNDAMENTALS
1. Balance – Manage the push and pull of the various users against the capacity of the network so that a trusted steady state is created.
2. Trust – Where customers and network operators trust the information they receive - this is about fostering positive relationships.
3. System – A system of systems approach is needed, where the groups of capability and technology are linked together and perform at a system level.
4. Dynamic – The network must be agile and responsive to meet the changing needs of the population. It must look to predict, manage and anticipate demand at a second by second rate.
5. Resilient – The system needs to operate as efficiently as possible to optimise capacity.
6. Multi-modal – Mobility is about all modes, and the operators must work together to achieve a seamless multi model system.

NEW BUSINESS MODEL FUNDAMENTALS
1. Opportunity – It is a disruptive time where the future is unknown. Time to consider how new market space is impacted and revenue created.
2. Services – Online, on demand, revenue generating services for direct consumption must be part of the mobility solution.
3. Engagement – The ability to reach out to the customer across a multitude of platforms to question, listen and learn from their actions and provide for their needs.
4. Collaboration – The ecosystem is massive. No single company can provide a solution. Engagement, both culturally and business wise, is needed to encourage a collaborative system.

TICKETING FUNDAMENTALS
1. Access – A sustainable solution using technology that is understood and enjoyed by the travelling public.
2. Interoperable – One ticket for all transport networks.
3. Personal – Link your mobility options to incentives that are right for you. This can be selecting the fastest route, least changes, quietest route or even being rewarded for deciding not to travel at all.
4. Shared Economy – Exploit new routes to market for the payment of services linked to mobility choices across the whole supply chain.

The current problem with Transport is that none of the options is really integrated. This means that different users with differing requirements are battling against each other, the reduced road space, the limited parking options, the crowded buses, the emissions levels and the busy street furniture on a daily basis. We accept these as problems but little is being done in a coordinated and strategic way to address them.

We face a number of challenges today and unfortunately it isn’t getting any easier. Cities are growing, rural communities are battling to remain relevant, and transport, the backbone of the economy is shuddering under...
the pressure being applied.

Smart Ticketing has been attempted by many individuals, yet users cannot use one ticket for all their journeys across the UK! What about Journey Planners – have they made a measurable impact in the reduction of congestion or stress for journeys? Yes, they have made some improvements to users’ journeys. However significant improvements and benefits are yet to be seen.

Journey Planners do provide some very useful information, but in general they struggle with multi modal journeys, real time updates and payment methods. Numerous journey planners are often very difficult to navigate and require a lot of input from the user.

They often feel like the first dish of a three-course menu, except the other dishes - comfort, freedom, payment mechanisms and real time updates and choices are never served up. This results in an overall negative customer experience.

Similarly most existing systems / journey planners are not personalised to the user so only generate generic travel options.

For example a user might prefer to drive to a different station if their child is at school in the area/ parking is cheaper or other reasons. Yet a traditional Journey planner will only provide generic options for the user which restricts the users’ journey options.

**WHAT CAN WE DO ABOUT THIS?**

The solution is to deliver personalised journey options and make the system work for all of us. The system needs to understand the needs of the user and the network operator.

**CAN WE EXPLOIT TECHNOLOGY?**

Yes, if we do it in the right way. We live in a digital age, information is now available at the touch of a button or a voice command.

Transport has begun to take advantage of this but that is causing more problems. There are so many different versions of the truth about your journey that users jump from one app to a website to another app to try and see what the right information might be.

**CAN WE SOLVE THIS ISSUE?**

Yes, the solution is an integrated network system with data sharing which provides one source of truth that the user can trust. This is a very difficult outcome to achieve as there are numerous companies across the UK which all operate in silos e.g rail and bus operators. We need the system to work as one, enabling the user to undertake a seamless journey on one ticket, one payment system and one information platform. London’s Oyster and contact-less payment system enables one payment mechanism for travel within London. This has transformed travel within London however it lacks the ability to provide one source of truth, as the validity of information about delays and incidents is different depending on which website/app you are using. A single source of truth means bringing all the data and information that currently exists and linking it all together in a reliable, sensible and consistent way.

**CREATING A GLIDE PATH TO MOBILITY**

To enable the transition to a mobility based provision of services, there are 5 key considerations:

The successful running of a vibrant transport network is made up of a number of complex and different parameters. In fact, the ecosystem, which combines customers, behaviours, technology and operations together in a seamless and optimised way is at the heart of what is being proposed.

No longer is it sufficient to deploy technology for technology’s sake. New...
approaches are vital in order to proactively engage and collaborate with the customer and their needs and engage with them in a meaningful fashion. The psychology for change and the behaviours that underpin this, both real time and predictive in nature, need to be explored in order to implement effective behaviour change. It is also important to recognise that the customers using the network have different requirements and that all customers of the Network need to be catered for, including vulnerable users.

It is key that once behaviours are understood and quality information provided to the customer, that an ongoing framework for sharing and exchange is established, further developing the relationship between information provider and user, as both parties benefit from knowledge transfer.

There must be an ecosystem, or multi-stakeholder engagement platform, that supports the successful deployment of mobility based solutions. For this to be achieved it cannot be done in isolation and the government must define at a national level what is required for a sustainable solution to take shape: one that links a number of companies with competing offers together. The UK can establish itself as market leader by developing a targeted operating model for engagement that protects and optimises the various market offerings. The government should assume the role of an enabler. This operating model must define the engagement across parties as well as the technical requirements, such as data flow and security, necessary for implementation.

Journey Management is a data rich world. With the growth in connected and autonomous vehicles as well as the increase of mobile based devices, huge volumes of data will be created in order to drive new market offerings. Highways England, Department for Transport and cities have access to a huge amount of existing data. However, to capitalise on this, it must be made clear what the roles of the institutions are going to be and how the organisation, the technology, and the data can be linked together in the most innovative and robust way possible. The UK can be a world leader in establishing a market focused independent data exchange role that allows for data from all providers to be handled in an anonymous way that drives value creation as well as network optimisation.

Until a decade ago, the majority of the world’s data was produced by scientific, industrial, and administrative sources. Today, most data is generated from the daily activities of millions of people around the world, through simple actions such as messaging friends on social media or shopping online.

From both a network operator and customer experience perspective, the next evolutionary step in the provision of data is converting it into something that is available at the right time, readily useable and digestible. With this explosion in data, how can we work to make sure that information and choices are at the heart of travel solutions? With the different numbers of providers working in this space, it is essential that there is ‘one source of truth’, and that this is trusted, acted upon and engaged with across the customer’s journey.

As companies transform to digital, there is a massive increase in data. No one knows the commercial value of the data and there is currently no tool to help link the data available in-house to the market requirements short and long term. Similar to data and apps, there are multiple types of tickets and numerous platforms to purchase tickets. This often confuses the customer and makes a multi modal journey more difficult to complete.

**Lee’s Summary**

I hope you found this change of approach to the investigation useful, we will be reverting to the previous format in the next edition but I thought it important to further stimulate the debate on journeys, that are user focused and seamless across all modes. We are seeing early shifts in some quarters towards Mobility as a Service and there is certainly a lot spoken about but we are yet to see large scale solutions come to market, I am keen to understand what the burning platform for journey management and vision Mobility as a Service to be realised. John and Rebecca set out six characteristics for journey management:

- Customer Experience
- Data to Information
- Innovation
- Network Optimisation
- New Business Models
- Mobile Interoperable Dynamic Ticketing

I would welcome your thoughts on these characteristics, are they the right ones, what is missing, what can we learn globally from each other? Please continue the debate at: https://www.linkedin.com/groups/8382671

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