UK Perspective on Transport and Intelligent Mobility

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Transport KTN

18th January 2012
Overview

1. Introduction to the Transport KTN
2. UK Transport – an economic driver
3. Intelligent Mobility
Transport KTN - Mission

- To support the development of integrated, efficient & sustainable transport systems, by bringing together independent but interrelated organisations to stimulate innovation through knowledge transfer.
Integrated & Efficient Transport systems

End-to-end Journey
Supporting modal choice
Raising awareness amongst
The broad stakeholder community

Technology Innovation
Facilitating and supporting innovation in areas of common interest across the transport sectors
Identify, inform, facilitate, support, develop

Funding awareness
Raise awareness of mechanisms and opportunities, both UK and European

Technology Development

- ICT
- Materials
- Sensors
- Nano Tech
- Aerospace
- Chemistry
- Academia

Stakeholder awareness

- Energy Providers
- Infrastructure
- Local Authorities
- Operators
- End users
- Financial

Road
Rail
Marine
Transport Challenges

- 7500km of EU highways are blocked by traffic jams each day.
- Congestion adds 6% to the EU fuel bill and increases pollution
- Transport accounts for 25% of the UK’s CO$_2$ emissions
UK Congestion compared to other countries

<table>
<thead>
<tr>
<th>Country</th>
<th>Percent of links congested</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sweden</td>
<td>50</td>
</tr>
<tr>
<td>Luxembourg</td>
<td>55</td>
</tr>
<tr>
<td>Finland</td>
<td>60</td>
</tr>
<tr>
<td>Denmark</td>
<td>65</td>
</tr>
<tr>
<td>Greece</td>
<td>70</td>
</tr>
<tr>
<td>Austria</td>
<td>75</td>
</tr>
<tr>
<td>France</td>
<td>80</td>
</tr>
<tr>
<td>Belgium</td>
<td>85</td>
</tr>
<tr>
<td>Portugal</td>
<td>90</td>
</tr>
<tr>
<td>Germany</td>
<td>95</td>
</tr>
<tr>
<td>Italy</td>
<td>100</td>
</tr>
<tr>
<td>Irish Republic</td>
<td>50</td>
</tr>
<tr>
<td>Netherlands</td>
<td>55</td>
</tr>
<tr>
<td>Spain</td>
<td>60</td>
</tr>
<tr>
<td>UK</td>
<td>65</td>
</tr>
</tbody>
</table>

Legend:
- Less than 1 hour
- 1 hour or more

Percent of links congested
UK Transport Impacts

UK Government statistics:
• Excess delay is costing our urban economies £11 billion per annum
• Carbon emissions impose costs to society of up to £4 billion per annum
• Cost to public health are up to £25 billion through physical inactivity, air quality and noise.

[Source: Cabinet Office strategy unit et al 2009]
# UK Business relying on transport

## UK businesses relying on transport (businesses selected for illustration)

<table>
<thead>
<tr>
<th>Sector</th>
<th>Year</th>
<th>GDP %</th>
<th>Employment</th>
<th>Economic Cont</th>
</tr>
</thead>
<tbody>
<tr>
<td>Logistics</td>
<td>2006</td>
<td>10.0</td>
<td>745000</td>
<td>£132bn</td>
</tr>
<tr>
<td>Rail</td>
<td>2010</td>
<td>5.9</td>
<td>248000</td>
<td>£6bn</td>
</tr>
<tr>
<td>Automotive</td>
<td>2009</td>
<td>2.4</td>
<td>700000</td>
<td>£8.5bn</td>
</tr>
<tr>
<td>Tourism</td>
<td>2008</td>
<td>3.6</td>
<td>1800000</td>
<td>£114bn</td>
</tr>
<tr>
<td>Retail</td>
<td>2011</td>
<td>8.0</td>
<td>3000000</td>
<td>£312bn</td>
</tr>
<tr>
<td>Marine</td>
<td>2011</td>
<td>5.0</td>
<td>90000</td>
<td>£3.5bn</td>
</tr>
<tr>
<td>Food &amp; Drink</td>
<td>2009</td>
<td>4.0</td>
<td>105000</td>
<td>£9.9bn</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td><strong>585.9bn</strong></td>
<td></td>
</tr>
</tbody>
</table>
UK Road Traffic - Future Growth Trend
Surface based transport: Technology Innovation areas

Each sector has developed a road map which identifies its own key technologies that are important to the sector remaining competitive and providing global leadership.

Each sector has used different words to describe the key technologies: sticky technologies; game changers; products/services.
Key Technologies/Opportunities

Automotive

- Sticky Technologies
- Internal Combustion Engines
- Energy Storage and Energy Management
- Intelligent Transport Systems
- Lightweight vehicle and powertrain structures
- Electric machines and power electronics

Rail

- Game Changers
- Enabling Innovation
- Next generation traffic management
- Energy strategy
- Whole system reliability
- Data and communications

Marine

- Products / Services
- I-Ship
- Exportable naval vessels
- Maritime consultancy
- Offshore deployment vessels
- Lean support services
- Anti fouling, low friction coatings
- Clean ballast
- Green propulsion
- Ergonomics

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### Surface based transport: Common Challenge areas

Examining the range of key technologies it is possible to group a number of these into three cross-cutting impact areas, which are listed below:

<table>
<thead>
<tr>
<th>Energy Efficiency</th>
<th>Intelligent Mobility</th>
<th>Light-weighting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy Storage and management</td>
<td>Intelligent transport systems</td>
<td>Lightweight vehicle &amp; powertrain structures</td>
</tr>
<tr>
<td>Energy strategy</td>
<td>Next generation traffic management</td>
<td>Reduced energy requirements</td>
</tr>
<tr>
<td>Internal combustion engines</td>
<td>Data &amp; communications</td>
<td></td>
</tr>
<tr>
<td>Green propulsion</td>
<td>I-Ship</td>
<td></td>
</tr>
<tr>
<td>Low friction coatings</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alternative fuels</td>
<td></td>
<td></td>
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Intelligent Mobility – Making it a Commercial Reality – 11th Nov 2011

Intelligent Mobility
An Automotive Industry Perspective

John Miles
Chairman, Automotive Council Working Group on Intelligent Mobility

Intelligent Mobility
A UK plc Opportunity

George Gillespie
Chief Executive
MIRA LTD

Smarter Thinking.

Research Projects in Traffic Health and Environment

Academic-industry-local authority partnership working as a regional research cluster.
Introduction of space and advanced ICT technologies to transport and intelligent mobility issues.
Two examples:
ITRAQ-ESA
THE ISSUE EC Framework 7
Professor Alan Web/ November 11 2011

NSL

Intelligent Mobility - Making it a commercial reality

Enabling Info-mobility applications

Mark Dumville
General Manager, Nottingham Scientific Limited
Leicester, 11 November 2011

Intelligent mobility – the rail perspective

Jason Webb
Head of Online, NRE

National Rail Enquiries

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Intelligent Mobility – what do we mean?

- "Mobility" is consumed primarily by the travelling public and freight
- "Mobility" is provided through a wide supplier community including:
  - Transport infrastructure providers
  - Transport infrastructure managers
  - Telecoms providers
  - Network equipment providers
  - Mobile data device manufacturers
  - Content suppliers
  - Vehicle manufacturers
  - Emerging technology providers

In this broad community lies both challenge and opportunity

✗ A disparate group of wildly different business communities that struggle to communicate and deliver integrated solutions to individuals, companies, authorities and governments
✓ A vast global market for joined up thinking and “intelligent” solutions

Smarter Thinking.
Intelligent Mobility – Making it a Commercial Reality - Workshop output

WORKSHOP REPORT
INTELLIGENT MOBILITY
A COMMERCIAL REALITY

Bringing intelligence to transport

CONCLUSION
The Intelligent Mobility event, and the subsequent workshops, arose from the need to create an develop the market for intelligent mobility with the discussions confirming that currently the market is not sufficiently developed. The key business issues from the first edition of the workshop were in fact the same, but seen from the end of the lens, thinker innovation was threatened that the industry should take a coordinated view of what is needed to enable a clear and consistent message to be given to government to enable supporting action to be taken.

The Transport KTN will support the development of the coordinated view by bringing relevant stakeholders together again in January 2013. This will involve the mapping out of specific activities needed to be undertaken to progress to a market opportunity and to create a message that will be responsible for claiming the coordinated view.

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Intelligent Mobility – Commercial Reality - Workshop Conclusion

• The Intelligent Mobility event, and the subsequent workshops, arose from the need to create and develop the market for Intelligent Mobility, with the discussions confirming that currently the market is not sufficiently developed.

• The key conclusion was that the industry should take a coordinated view of what is needed to enable a clear and consistent message to be given to government to enable supporting action to be taken.
Follow on steps:

In direct response to the workshop and to aid the development of this coordinated view the KTN is considering aspects and key questions, which the industry need to address. The resulting document will be used to help set the agenda and link with a number of activities to progress this important issue.
Intelligent Mobility: Two perspectives

• **Innovation Opportunities**
  - Modern technology allows the capture, distribution and exploitation of ever larger amounts of data and information. This information has the potential to be exploited across conventional transport structures and to open up new ways of improving the efficiency and effectiveness of travel, both personal and freight.

• **Economic Necessity**
  - The functioning of the UK economy. There is a need to plan for a level of travel demand significantly elevated from today’s levels. National population will grow by 10M over the next 15 years. On the basis of current or foreseeable investment plans, infrastructure capacity will not expand to meet this demand. We therefore need to be able to achieve more with less.
Intelligent Mobility –
Key features to be considered

• The scope of Intelligent Mobility
  – Opportunity and Economic necessity models

• Data
  – Data – Information – Knowledge - Value

• Intelligent Mobility as a consumer of technologies
  – Intelligent Mobility needs to benefit from technology trends and opportunity, but it will not create fundamental technologies.

• Collaboration
  – Diverse stakeholders

• Business Models
  – As a service rather than simply infrastructure, Intelligent Mobility will bring about a different sort of relationship between provider and end-user

• Transport as a utility
Intelligent Mobility - Challenges

• Stimulating private sector investment
• Market horizons and complexity
• The role of Government
• Progression from academia and through the valley of death

‘the key to intelligent mobility lies in the interconnections which can be made between a range of different industries and technologies’

Source: The Automotive Council in their forthcoming Intelligent Mobility: A National Need report
Co-ordinated activities supported by the KTN to progress Intelligent Mobility

Transport Integration Beyond ITS
To Support the Technology Strategy Board in considering current and future mobility trends, their impact in the UK, and future growth potential

Transport System of Systems Study
Daniel Jonas
Head of Innovation

Plan Design Enable

Transports Systems and Integration Technology and Innovation Centre
Demonstrating the benefits of a Transport Systems and Integration Technology Innovation Centre in the United Kingdom

ARUP

FROST & SULLIVAN

ATKINS

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The T-TIC’s vision can be expressed in terms of its ultimate role of generating significant and lasting benefits to its partners and the UK, playing a key enabler and accelerator role in pan-transport innovation.
Possible Catapult Activities

- Transport information systems (Data → Information → Knowledge → Value)
- People and freight journey assistance systems (journey planning, ticketing, in-transit journey advice, freight logistics)
- Better interconnection between traffic management systems
- Economic modeling and planning systems for provision/use of mixed mode transport systems
- Ownership vs Use business models and solutions
- Virtual testing and simulation
- Intermodal transfer and seamless journey systems
- Modal convergence technologies
- Condition based remote asset health monitoring diagnosis/ prognostic systems (reliability management)
- Infrastructure design optimisation – including whole life cost/benefit analysis
- Infrastructure integrity / security
- Traffic management and control systems (including multi modal disruption management)
- Connected vehicles and V2I / V2V / I2V
- Transport demand management systems (Passenger / freight flow management)
- Positioning/ tracking systems
Intelligent Mobility – rather than Transport

• *Intelligent Mobility* - the ability of people and goods to move freely and easily taking into account varying situations and experience.

• *Transport* - A system or means of conveying people or goods from place to place by means of a vehicle, aircraft, or ship.
Why Intelligent Mobility?

• By changing our thinking from transport to mobility we develop a different mind set around the issues. The movement of people and goods, freely and easily requires a system in which congestion is not an issue, a system in which the mode is not important, but the overall journey is, a system in which seamless, uninterrupted journeys are the norm.

• Delivering this ultimately lies in the interconnections that can be made between the range of stakeholders, industries, technologies and processes. By coming together synergies are realised, markets aggregated and barriers are overcome.
Thank You