

## Stakeholder Consultation on Transport & Innovation

18 February 2010

OECD Headquarter, Paris

### SUMMARY AND ANALYSIS OF STAKEHOLDER CONTRIBUTIONS

#### Introduction

The International Transport Forum has consulted with the Forum-accredited international and stakeholder organisations to identify priority issues relating to Innovation in Transport.

A survey questionnaire was conducted to discern key issues and understand the effect of innovation for the broader transport sector, individual modes and inter-modality. Over 30 organisations provided input. In addition, input was also provided at a consultation meeting with international partner organisations in Paris on February 18<sup>th</sup>, 2010.

The input received spanned all transport modes. The following is a summary of the input and outlines the role of, drivers of and barriers to of innovation, as well as the role of governments as expected by industry. An annex to this summary outlines some innovations available or under development within the transport sector, as reported during the questionnaire.

The following information represents the views put forward by partner organisations, and should not be interpreted to reflect the views of the International Transport Forum or its Member Countries.

#### Role of innovation

Innovation has a broad role in the transport sector. Technological improvements that create better performance, efficiencies and effectiveness are readily identified. Yet, the consultation also highlighted the equal importance of innovation in procurement practices, policy development and application, organisational processes, procedures, and training.

Overall, innovation was described as a driving force to improve quality, and achieve environmental, employment and economic goals, for organisations and society.

A range of expected benefits for users and society resulting from innovation in transport included:

- reduced and more reliable travel times
- operational efficiency for operators and users (ticketing, payment collection, etc.)
- easier and more efficient planning of trips/shipment
- improved level of sustainability and density of supply due to integrated planning
- lower environmental impact for society, reduced traffic noise

- less energy cost to operators and/or taxpayers
- optimal use of transport assets, better use of the capacity of the available infrastructure
- reduced number of accidents, fewer fatalities and injuries
- enhanced accessibility and walkability
- facilitated cross-border traffic management
- informed decision-making and willingness to invest in long term transport solutions
- longer lasting infrastructure, reduced closures, improved all-weather performance of networks
- increased use of recycled material
- seamless connections between modes, enhanced collaboration between supply chain actors
- improved regulatory and procurement requirements that foster and promote innovation
- more highly skilled human resources (e.g. training), with a view to safer and more productive workplaces.

*Respondent quote*

“Cooperative systems, in which the vehicles communicate with each other and the infrastructure, have the potential to greatly increase the quality and reliability of information available about the vehicles, their location and the road environment, enabling improved and new services for the road users”.

## Drivers of innovation

A mix of market conditions – such as competition, client pressure and contractual demands, change in economic conditions, as well as targets and regulatory initiatives set by governments – are generally agreed to have spurred the emergence of new technologies, services and products.

Competition is one of the main driving factors. Manufacturers have long understood that, in order to survive in a highly competitive market, they must continuously innovate and provide new, safer, cleaner transportation systems, while maintaining affordability and profitability targets. For instance, the gradual opening of the European railway market has seen a substantial change in the relationship between railway operators and suppliers over the last 20 years. Rail operators tend to differentiate themselves from competitors through the use of specific rolling stock, leading to an increased demand for innovation from industry suppliers. Competition across the modes has also spurred on innovation: River Information Systems were developed largely to give confidence to freight owners that inland waterborne transport is a viable alternative to road haulage.

*Respondent quote*

“A general innovation does NOT mean innovation within each subsector. The market and the regulators must recognise that the speed of innovation varies in the different sectors and this is an issue to be resolved if innovation in general is to appear under real market conditions”.

Commercial innovation is also stimulated by end-user demand and the need for providers to introduce new integrated and intermodal services at lower cost. Examples abound of how the client stands to gain from innovation. For international freight movements, the vast majority of ships are already operating to a very high standard, and service level is a major criterion of choice amongst customers who generally take for granted that their cargoes will be delivered safely and on time. Demand for Intelligent Speed Adaptation is partly the result of drivers wishing to avoid speed fines and reduce fuel expenditure. In order to limit their exposure to further increases in oil prices, road hauliers have an incentive in introducing technologies that improve the fuel efficiency of their fleets, as well as driver training techniques (e.g.: financial reward for “eco-drivers”).

End user demand is also influenced by demographic trends, such as ageing populations, urbanisation and human migration, which are also seen as drivers for innovation. Rail and public transport operators are adapting to increases in population and urban sprawl, as well as greater awareness and expectations by customers for climate protection measures.

The environmental agenda, has been and continues to be a powerful driver of innovation. Global commitment by governments and supranational bodies to curbing GHGs or reducing road fatalities are acknowledged to have a determining impact on industry's drive to lower its carbon footprint and devise safer alternatives. It is generally agreed that governments have a responsibility to establish the adequate legal and fiscal frameworks to facilitate and increase investment in cost-effective innovation.

*Respondent quote*

"Innovations have emerged as a response to regulatory pressures as new environmental risks are identified, by the industry itself or as a result of research or impetus provided by environmental policy makers and NGOs."

Attention was drawn by several respondents to the importance of maintaining public research and development funding as well as alternative funding sources to support demonstration pilot projects, case studies, and expansion of services to provide for user demand. Well-publicised demonstrations are perceived as a powerful instrument to bridge the gap between research results and deployment, while also convincing authorities and end users of the benefits and economic justification of introducing innovation.

It is essential to introduce all salient business issues at an early stage in the Research and Development process in order to enhance opportunities for market introduction at a later stage.

*Respondent quote:*

"The mobilisation of alternative funding sources enables the provision of more and better...transport."

## Barriers to innovation

Commonly raised barriers to innovation include investment costs (related to technology and skills development), inadequate innovation policy for transport (including transfer of policies between sectors), institutional and cross-border coordination, indifferent perceptions of innovation in transport by users (workplace users and end users), and data protection and liability matters.

Investment costs are not always balanced by benefits in the foreseeable future. Customers do not always embrace innovations when they become available, as they perceive that the cost outweighs the added value for them. Road safety applications, such as ABS brakes, were put forward as an example (see below).

*Quote*

"ABS took 30 years to deploy...while very advantageous it was not readily adopted by consumers. Electronic stability control is another current example."

Moreover, long product life cycles push back break-even points even further into the future: the typical lifespan of rail assets can extend to 40 years for rolling stock and up to a century for infrastructure. At worst, sophisticated vehicles act as a deterrent for clients to renew their fleets of vehicles and obsolete technology is kept even longer in use. The problem is compounded by low profit margins across the sector and the fact that, for road transport, industry is mainly comprised

of small to medium-sized companies, with relatively few big corporate players that can fund the large research and development budgets that are needed.

*Quote*

“The average rate of return for an airline is approximately 3%, for ground handling it is 1%. These are well below investment grade stocks.”

Another challenge for innovation is differing requirements for acceptance and certification procedures in various member states, often as a result of historical national differences in terms of technologies and processes. The lack of harmonisation, not just in performance levels, but in the test procedures themselves can act as additional obstacles for manufacturers present in different regions of the world. In-vehicle advanced systems (collision avoidance, adaptive cruise control, etc.) use radar frequencies which are often not harmonised at the international level, such that the same systems must be redesigned or retuned when they are to be put on the market in different countries/regions.

Several respondents pointed out that regulation does not always manage to keep pace with innovation, which can cause problems of certification and deployment on the market. As a case in point, the achievement of an EU-wide standardised real-time traffic and travel information service is unlikely to come to fruition as long as European institutions fail to focus on prescribing minimum interoperability requirements for all services. Another facet of the same problem comes from the suppliers themselves: poor integration within the logistic chains leads to diverging technology choices which are independently developed from any standard by vendors with no incentive in creating ‘open-source’ solutions for the industry. This leads to fragmentation within the supply chain.

“Old fashioned thinking” was mentioned by several respondents as a further hindrance to innovation. Various modes have pointed out that their image within the general public was at odds with their sustainability record and the ongoing technological progress and innovation within their sector. Cooperation between transport modes was also deemed inadequate in many cases. In the field of Intelligent Transport Systems, implementation is still fragmented due to lack of visibility by the larger public, unknown positive impacts on the transportation system as a whole and the “technology” label attached to it, which makes it less attractive for politicians to promote.

Finally the role of public procurement practices in support of innovation needs to be highlighted. Innovative engineering concepts and new technologies can be more expensive, and public bidding procedures often neglect innovative products and techniques, opting instead for price as the main differentiator.

Incoherent pricing schemes were also noted as a barrier to innovation. For example, pricing that is not seen as consistent with policy goals across the modes was seen an impediment to true intermodality.

*Respondent quote*

“Many traffic engineers educated 10-30 years ago still think that urban space must be considered primarily as carriageways for vehicles, and that it is acceptable to leave the leftovers and some picturesque old-towns for the walking population.”

Human Factors — Operator capabilities and skills development are often not effectively considered during the development and implementation of technological innovations. This can result in safety, security and workforce availability issues in the long term. Training in the workplace needs to be brought on par to keep employees abreast of innovations in technology.

Additionally, as companies worldwide concentrate on their core businesses, crucial knowledge of transport and freight operations is being lost through the outsourcing of logistics services. While economies of scale are achieved, the resulting “de-skilling” of the workforce within industry clients could result in a knowledge gap that is detrimental to innovation

Liability and Data protection: A specific point arose in relation to the handling of data (notably personal data) required by a growing number of in-vehicle applications. Security of data along the supply chain is an issue that must be addressed in order to protect commercial confidentiality. These issues can be a major barrier to wide market penetration of some technologies if citizens’ rights and companies’ commercial interests are not shown to be fully protected. Other respondents felt that liability issues were often not sufficiently considered before technological applications are deployed, with the result that deployment is then hindered or prevented.

Slow pace of technology transfer was seen as a problem, across jurisdictions within countries and across borders, as well as across different sectors (i.e. from military sector to transport sector).

In general, there is a perceived unwillingness to share innovations/new technologies, often because the innovator is fearful of losing a competitive edge.

## Regulatory impact

Regulatory conditions may work both ways: good market or regulatory conditions may spur innovations, but the contrary may apply when the appropriate conditions are not present.

Among recent cases of regulation that were deemed conducive to innovation:

- Several binding European Directives, such as those dealing with railway interoperability [2007/32/EC], infrastructure safety management [2008/96/EC], interoperability of electronic road tolls systems [2004/52/EC], harmonised River Information Services [2005/44/EC], and buses [2001/85/EC].
- The European SESAR and the NextGen Air Traffic Management modernisation programmes.
- IMO’s International Safety Management (ISM) Code requiring shipping companies to embrace the concept of “continuous improvement”, with regard to both safety and environmental performance.
- WCO’s SAFE Framework of Standards to Secure and Facilitate Global Trade.
- Climate change legislation in Australia and New Zealand requiring “climate change statements” for each single project, which has spurred the development of tools to assess and monitor GHG emissions.

By contrast, a number of regulatory pitfalls were cited:

- Unrealistic targets: if the market perceives that the goalposts are being moved back, operators may be tempted to delay orders until more technically reliable solutions are available, as a result of which more polluting technologies remain in use.
- Over-prescriptive regulation: when regulations are design-restrictive, forcing particular designs, technologies, security parameters or financial rules, they tend to hinder innovation. Regulations must set performance levels, leaving the choice to the manufacturers how they want to meet a given level.
- Knee-jerk regulation: serious incidents tend to trigger to immediate political responses that may overlook the technical complexities of an issue.

- Regional regulation vs. global challenges: some respondents felt that attempts to deal with global challenges through regional programmes can divert attention from world-wide efforts.
- Unbalanced regulation: regulation to globally address issues could create or exacerbate unlevel playing fields across modes.

### Suggested role of government in transport innovation

There was an indication from stakeholders in general that the role of governments in relation to transport innovation was to provide a structured legal and regulatory framework. Governments should foster innovation by industry through setting performance-based standards that most importantly set out a stable and predictable framework. It was suggested that such frameworks would enable industry to take up the challenge of innovating to achieve requirements within the framework. Any regulations set would need to allow sub-sectors to work in collaboration to be able to organise transport operations that achieve optimal use of assets and infrastructure, for example car-pooling, bicycle-sharing, use of electric vehicles, etc.

It was noted that in some Member Countries, efforts for inter-modal collaboration conflict with anti-competition policies, which hinder developments in this area.

Governments are urged to look at opportunities for innovation at border crossings. While transport may be progressing thanks to technological innovation, administrative issues such as visas remain a problem at borders for international road transport drivers. The single window approach has potential for development. Can governments be more innovative in their approach to this?

The general public perception is that transport is seen as more of a 'problem' than a 'solution'. Industry is also seeking support from governments in raising public awareness about the important role of transport, and promoting the level of transport innovation.

Clear guidance from governments is needed. At the moment objectives are either too short to be implemented, or else too long that they can be ignored. Industry expects governments to make long-term goals and commitments to create a sense of policy and possibly legislative stability. Transport sector industries can then respond and innovate to achieve these requirements in applying resources and investment in focused areas.

### Initiatives to foster innovation

The questionnaire particularly highlighted a range of initiatives that currently exist to foster innovation. Different modes have developed comprehensive medium and long-term technology outlook strategies, often as a result of cooperation between public and private sector stakeholders.

At the European Union level, research and development efforts are mainly supported by the means of the 7th Framework Programme for Research, Technological Development and Demonstration (FP7) covering the period 2007-2013. Its Transport component amounts to EUR 4.1 billion divided between Aeronautics and Air Transport, Sustainable Surface Transport and Satellite Navigation. The aim of FP7 research in the field of transport is to develop safer, greener and smarter transport modes in Europe. This programme is designed to favour cooperative research gathering partners amongst the 27 Member States and the Associated Countries.

Examples of industry clusters include ERRAC (The European Rail Research Advisory Council), ERTRAC (The European Road Transport Research Advisory Council) the ECTP (European Construction Technology Platform) and the European Fuel Cells and Hydrogen Joint Technology Initiative, which have all developed long term visions and associated roadmaps defining the framework for future R&D innovation. Fragmentation is overcome through the full representation of sector stakeholders, including manufacturers, operators, infrastructure managers, the European Commission, EU member states and academics.

Other mode-specific initiatives quoted by respondents include “ships and navigation of the future”, a medium term reference scenario for inland shipping, the “South Europe Atlantic High Speed Link Project” (SEA HSL), and IATA's "Simplifying the Business" programme which seeks to accelerate change in the way the air transport industry operates.

Within connected sectors, the World Customs Organisation's “C21” strategy document provides a framework for future thinking within customs administrations. It describes the key elements of customs best practices in the future. The strategy is made up of a cutting-edge list of important building blocks for enhancing customs operations, trade facilitation, and trade-related transport.

### **Forum Expectations**

The Forum is perceived as an excellent platform to raise attention to practical initiatives carried out within the sector to improve efficiency and sustainability and increase social, political and economic acceptance of new concepts of mobility.

Stakeholders have voiced their expectation that the International Transport Forum 2010 will lead to a renewed global commitment to keep innovation on the political agenda, strengthen global cooperation in R&D and facilitate the emergence of action plans in priority thematic areas:

- In the field of safety, addressing the barriers to implementing technologies with the greatest life-saving potential linked to two great risks in road traffic: alcohol and speed.
- In the field of environmental protection, discussing an action plan at the political level on carbon neutral transport growth.

The Forum offers an opportunity to:

- highlight the need for a market-oriented regulatory framework that gives incentives for innovation and encourages policy-makers at the national and local levels to champion the deployment of innovative transport solutions;
- discover and examine practical solutions across suppliers, operators and policy-makers; and
- provide governments with an opportunity to reflect on how they can take a holistic approach to transport.

Lastly, through its global outreach and multimodal outlook, the Forum offers a fertile ground for connected thinking associating economic sectors and other regions of the world. The international dimension of transport in addressing all of the grand challenges facing global society, including food supplies and other challenges specific to developing economies, needs to be recognised and addressed.

## Annex A - Innovation available or under development

Innovation assumes distinct forms and covers different technological realities depending on the mode of transport considered. It is possible however to analyse the most cited technological advances according to the perceived benefit.

Innovation	Mode*	Benefit					Time to market
		Technologically More efficient	Safer	Energy efficient	Cleaner Quieter	Better service	
Next generation ATM Systems	Aviation	X		X		X	>2020
e-tickets / self-service	Aviation					X	Available
Runway Excursion Risk Reduction	Aviation		X				Available
River Information Systems	Inland Waterway	X					<2015
Optimised hull design	Inland Waterway			X			>2015
eLearning to enhance skills	Inland Waterway	X					Available
ERTMS	Rail	X	X			X	>2015
Interoperable systems	Rail	X					>2015
Open space interiors	Rail					X	>2020
Regenerative braking	Rail			X			>2015
Low-emission diesel engines	Rail			X			>2015
Energy efficient rail systems	Rail			X			>2015
Driverless local rail operation	Rail	X					Available
RFID	Rail	X					Available
Safety training	Rail	X	X				Available
Alternative fuels (synth, bio, fuel cells)	Rail/Road	X		X	X		>2020
CVIS	Road	X	X				>2015
ADAS / ISA / eCall	Road		X				>2015
Alcolocks	Road		X				<2015
New passive safety systems	Road		X				<2015
Electronic Tolling	Road	X					Available
Intelligent routing	Road	X	X				>2015
Truck Modular System	Road	X					Available
Digital maps	Road	X	X				Available
New pavement design & recycling	Road		X	X	X		Available
Innovative asset maintenance	Road & Rail	X					Available
Real time info and intermodal ticketing	Road/ Rail	X		X			Some available now with more <2015
Low-emission city zones	Road				X		Available
Integrated cargo tracking	Road & Shipping		X				>2015
Ballast water management	Shipping				X		<2015
Identification / Tracking Systems	Shipping		X			X	Available
Goal based ship design	Shipping		X				>2015
GPS / GALILEO -based services	All modes	X				X	>2015
Lightweight materials	All modes			X			>2020
Hybrid / electric vehicles	All modes			X			>2020
Engine technology	All modes			X			Available
Integrated passenger travel	All modes	X				X	> 2015
Integrated supply chains	All modes	X				X	> 2015
Pedestrian-centred infrastructure	Non-motorised					X	Available

Note: This table indicates which modes of transport have cited a particular innovation and is not a definitive statement on its potential scope of application

## STAKEHOLDER SURVEY ON INNOVATION IN TRANSPORT

### List of respondents

**ACEA** – European Automobile Manufacturers Association

**ASECAP** - European Association of Tolled Motorways

**CCNR** – Central Commission for Navigation on the Rhine

**CER** – Community of European Railway and Infrastructure Companies

**CLECAT / FIATA** – European and International Federation of Freight Forwarders Associations

**EBU** – European Barge Union

**EC** – European Commission

**EIM** – European Rail Infrastructure Managers

**ERTICO** – ITS Europe

**ESC** – European Shippers' Council

**ETSC** – European Transport Safety Council

### **EUROCITIES**

**FEHRL** – Forum of European Highway Research Laboratories

**IATA** - International Air Transport Association

**ICS** – International Chamber of Shipping

**IFP** – International Federation of Pedestrians

**IRF** – International Road Federation

**IRU** – International Road Transport Union

**OICA** – International Organization of Motor Vehicle Manufacturers

**PIANC** – International Navigation Association

**PIARC** – World Road Association

**POLIS** – European Cities and Regions Networking for Innovative Transport Solutions

**UIC** – International Union of Railways

**UITP** – International Association of Public Transport

**UNIFE** – The European Rail Industry

**WCO** – World Customs Organization

## ORGANISATIONS PARTICIPATING IN THE STAKEHOLDER SESSION

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18 February 2010

OECD Headquarters, Paris

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