Session Summaries

Seamless Transport: Making Connections
2-4 May 2012, Leipzig
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Urban Connectivity: Improving the Door-to-Door Journey

Wednesday, 2 May, 11:30 – 13:30

The core challenge in providing seamless urban mobility is overcoming the mismatch between the way in which citizens approach their urban trips – as single, end-to-end journeys – and the way in which authorities plan and allocate resources to separate transport networks. Participants in this session discussed new approaches, models and initiatives that are bridging the gap between how citizens seem to prefer to travel in cities and how transport operators and authorities deliver services to meet this demand.

Seamless urban travel

Rosina Howe-Teo noted that whilst almost every trip starts and ends with walking, and most trips involve one or several other modes, transport is rarely organised along the lines of one single, seamless, door-to-door transport trip. Arguably, cars and two-wheelers (and the roads on which they run) most closely approach the “seamless transport” ideal, which helps to explain their compelling and enduring attraction. However, the car or motorcycle first approach to urban mobility has reached its limits in many areas.

Panellists stressed that people seem to want choices but too often policy has favoured only a few modes. That, Sue Zielinski says “is like God telling us: heart, lung or pituitary gland – choose one. I don’t know about you but I want all three and I want them working together seamlessly.”

Keep it simple

Walking or operating a car or a two-wheeler in an urban environment imposes cognitive requirements but these are relatively predictable single-tasks and don’t require scheduling or payment considerations. Crossing a city using many modes multiplies this cognitive load considerably. In many cities, numerous travel options are available to citizens but their combined use is rarely as convenient as simply driving a car or other single mode use. Wilhelm Lindenberg cautioned that “seamlessness” doesn’t stop at the door-to-door trip, it extends up- and downstream to trip planning and invoicing. Payment systems and schedule information, he says, should be bundled with physical transport services if the service is to be as compelling as the car. The key is to simplify things for the user and to ensure that back-office complexity never poses impediments for the traveller. This requires creating new habits for authorities and operators. Initiatives, such as the HANNOVERmobil card (see box) are one answer to improving seamless travel. Such initiatives seek to lighten the burden of multi-modal travel by providing a single-window service.
The key unresolved question, Lindenberg asked, is who will become the service aggregator – the “Amazon.com” – of mobility and what new structures and partnerships are necessary for this vision to be achieved? Funding models for such distributed mobility services are just emerging but in many cases they involve complex negotiations – for example, the HANNOVERmobil card required an agreement with several thousand individual taxi operators. In the end, stated Serge Amabile, all of the complex interactions between operators, IT systems and authorities must allow travellers to answer a very simple question “How do I conveniently get from point A to point B?” This is the philosophy that drove the design of the Autolib e-car sharing system introduced in Paris (see box).

**HANNOVERmobil**

Initiated in 1994, the HANNOVERmobil card is an integrated mobility service card that allows access to, and payment for, public transport, regional and national rail, car- and bike-sharing and taxis. The card also covers baggage delivery and some urban logistics services (e.g. milk and grocery delivery). Services are invoiced jointly in a monthly “mobility” bill. [www.hannovermobil.de](http://www.hannovermobil.de)

**Autolib**

Autolib’ is a station-based electric car-sharing service allowing users to pick up and drop off cars at any of the system’s stations for short-term use. As of May 2012, subscribers have access to 1700 self-service electric cars (3000 at full deployment) docked at 1000 stations in Paris and 45 surrounding communities. The service was inaugurated in December 2011 and is operated under a public service delegation concession, currently granted to the Bolloré group. [www.autolib.fr](http://www.autolib.fr)

New technology or talking together: What matters most?

Sue Zielinski stressed her belief that “achieving seamless transport is not essentially a technology issue, it requires moving minds as much as moving people.” The means for seamless transport – common ticketing, combined payment, coordinated scheduling, cross-mode reservations and even developing co-located exchange facilities – all exist today. Operators and authorities, however, generally have little incentive or experience in working together to offer a single cross-modal transport service package for travellers. “There are a wide range of existing technical solutions that are never attempted” said Lindenberg, “you need a real political vision and leadership to get them implemented.”

In the future, mobility in urban areas may well be provided by hybrid, individual-collective transport systems that will be quite different than the car and public transport systems that currently dominate. Speakers raised the possibility that a “third-way” may already be emerging that capitalises on extensive information technology infrastructure and mobile, location-aware platforms of smartphones and in- or on-vehicle communication devices. Bicycle sharing systems, especially when they are integrated with other mobility services, are one emerging signal of this trend towards ubiquitous but shared individual mobility. They also highlight the contribution of bicycles to efficient urban mobility.

Innovative services, new actors

Serge Amabile described how station-based car sharing fits into the aspirations of urban dwellers: “Owning a car can be a hassle, especially for young professionals living in city centres, Autolib’ and other car-sharing systems give them a more flexible option that increases their choices without tying them down with a car.” He notes that many of Autolib’s clients use the service because of its convenience, especially concerning parking, not necessarily for its environmental merits. Such “partial ownership” models incentivise users to select the best-adapted transport mode for their immediate trip-related needs.

Innovation for seamless transport can also come from exploring new linkages with services that already exist. Sue Zielinski stressed that “there is no need to wait for systems we don’t yet have, we can start with what is on the ground and move from there.” Tweaking existing services, such as Singapore’s peak hour express “premium buses” can provide new options that otherwise might be overlooked by looking only at new systems.
Professor Tetsuo Akiyama of Hokusai University also noted that equity needs to be built into seamlessness. That means ensuring that new services do not exclude segments of the population due to income, age or impairments and that existing systems need to be adapted for use by all these groups.

Big data, Open data: Innovation multipliers

“Seamless transport is about applications and applications need data” Howe-Teo reminded the audience. Daily travel generates massive amounts of data relating to traffic, flows, locations and services that, for first time in history, are logged into exploitable but often unconnected data sets. The capacity to mine “big data” to deliver insights and, more importantly, new travel information services is rapidly developing yet many data owners are reluctant to release their data. This is understandable since such data does not come free of costs and can also be used as the basis for revenue-generating services.

At the same time, there is a growing trend for public authorities to provide open access to public data sets. Singapore’s LTA adopted this approach when launching its one-stop travel information website (www.mytransport.sg). Opening access to its “treasure trove” of real-time traffic and public transport data has, according to Howe-Teo unleashed a much greater range of creativity than could have ever been mustered in-house by the LTA. Within three months, over 150 applications for data access had been produced and third-party developers had quickly rolled out a number of highly successful commercial applications allowing travellers to navigate Singapore’s roads, public transport networks and taxi services. Cost savings, in the sense that commercial providers have now taken over application development from LTA, have resulted and the quality of smart phone applications has increased.

What infrastructure matters?

Panellists noted that travellers value reliability and quality of service over all else – simply connecting or providing better information about inadequate transport services will not win them over. Better to ensure that the range of mobility options fits user’s expectations. Frequent or ubiquitous access to services allows users to forget about schedules and individual mobility options and helps users to escape from crowding at peak hours. This level of quality, however, requires sometimes significant levels of investment on the part of transport operators, the private sector and authorities.

Physical proximity matters, pointed out Professor Akiyama and reducing physical separations between modes at interchanges should be a priority when building new, or retrofitting existing, stations. As an example, “cheek-to-cheek” interchanges where buses and rail or different rail modes are separated only by a common quay greatly facilitate transfers. Seamlessness also concerns those travellers that have physical impairments that impact their mobility. Designing interchanges for older or mobility-impaired travellers by incorporating “universal design” approaches ultimately enhances mobility for all.

What role for transport authorities?

The discussion highlighted that perhaps authorities should step away from the production of mobility and more towards the management of mobility, ensuring that system performance across modes and across the city meets societal expectations and goals. This means setting the right performance objectives and monitoring progress but also ensuring the role of “link-tank” bringing together mobility service providers under a common framework and set of expectations. Central to creating a mobility market in this way is the need to ensure that authorities are not blocking innovation with ill-adapted regulatory structures that constrain the offer of services. Authorities have a central role in creating an environment that encourages novel approaches and this will require a change in institutional culture for many agencies.

Implementation speed is also a concern as mobility entrepreneurs often operate in a much more agile environment under tight overheads and project horizons. Serge Amabile told the audience that “the private sector is ready to provide innovative and creative solutions but needs rapid and predictable decisions on the part of public authorities”. Nevertheless, where such leadership is lacking action is still possible noted Sue Zielinski citing examples of pilot projects in Chennai that preceded government policies to support integrated transport.

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Growth in population, increased urbanisation and living standards are the main trends that will shape the living conditions of the future. According to UN and world Bank forecasts, 70% of the world’s population will be living in cities by 2050. The economy of tomorrow will be characterised by competing megacities where goods delivery will be a major challenge. Panelists in this session identified the keys to meeting this challenge.

City logistics

City logistics will become an increasingly key issue in maintaining sustainable cities and logistics providers will have to be proactive, developing intelligent options. Many research initiatives have already underlined the most pertinent questions: finding solutions that optimise freight flows and that reduce GHG emissions, noise and congestion from urban freight traffic. Electrification has emerged as a viable innovation, although on a relatively small scale up to now, but promises to play a part in future urban freight solutions. From recent experience, no single, stand-alone solution seems appropriate: City logistics master plans with tailor-made solutions to local constraints must be established. In this context, it is difficult to find universal win-win situations. In order to build a viable business model, strong relationships among different partners are needed. Collaboration among competing partners, though difficult to achieve, is essential. A leadership vision is key in achieving this process.

New concepts for city deliveries

A rethinking of logistical structure is fundamental argued Wim Bens. Just-in-time delivery with the elimination of warehousing and the growth of home delivery services have both led to an increase in the number and flow of vehicles on the streets. Collaboration among logistics providers and smart use of IT promises to facilitate “cargo bundling”, with different supply chains sharing distribution systems in metropolitan areas. Bens pointed to the low rate of capacity utilisation of urban freight vehicles calling for some rationalisation in the use of vehicles with the potential for major savings. Incentives for making smarter use of infrastructure through, for example, congestion charging as in the case of London, can help drive this kind of rationalisation and achieve greater efficiency.

Petra Kiwitt of DHL saw the future for freight transport in cities as “hybrid, electric and multimodal”, underlining a strong need for innovative schemes to develop these future models now. She added that logistics operators such as Deutsche Post DHL monitor their costs and fleet emissions and are in constant search of operational and technological improvements to reduce their environmental footprint. Such logistics companies are central to developing and proving solutions.

The increasing demand for cycle-based urban delivery systems was highlighted by Manfred Neun. The economic perspective for cycling and e-cycle delivery systems is relatively bright: cargo cycles may ensure freight deliveries into city centres at low cost and competition to achieve reliable goods transport in city centres may strengthen the prospects.
for cycle-freight. These are systems that require low initial investment with little or no contribution to congestion, noise and greenhouse gas emissions, oriented to quality, flexible services. This is where the economic and sociological dimensions can coincide with a potential source of new, entrepreneurial community employment. Bicycles contribute a flexible solution to the liveability of cities. Even if urban freight traffic represents a small proportion of the overall greenhouse gas emissions from the transport sector, the potential savings in emissions through bicycle use are valuable.

The panel also underscored the potential for use of inland waterways to distribute freight in cities served by navigable waterways. Volumes currently transported are modest but inland waterways already play a useful role with regard to building materials, where transport costs are a major consideration in relation to weight. But consumer goods may also be brought into city distribution centres by inland waterways in special containers. Hans Van Der Werf cited Monoprix in Paris as a successful example of a major freight customer maximising this potential.

Creating a framework for urban freight transport

The panel emphasised that though there are a diversity of approaches to improved freight delivery, developing a framework for sustainable urban freight transport within which individual schemes can be considered and monitored is important. Without such a framework, the range of initiatives on offer and proposed to public authorities can be daunting and impossible to manage. A framework is needed to establish some order of priority. City-wide mobility plans, used now in many jurisdictions, need to consider freight as well as passenger mobility. Michael Browne stressed that although this may sound rather obvious and simple it is not so easy to implement. Fundamentally, more transparency and visibility are needed concerning the costs of delivering freight in urban areas, requiring research specific to local contexts.

Many solutions may be envisaged but often there is a lack of information and data to assess different schemes or proposals. A great number of actors and stakeholders are involved, and due to the complexity of cities, ideas for one city centre cannot easily be transferred to another.

In developing frameworks and getting ideas implemented, strong leadership from city officials is required. Eminent personalities and high-level politicians may be able to unlock difficult situations where private-private and private-public partnerships are the key to successful schemes. The panel underscored several reasons for the challenges and difficulties involved:

- There are numerous actors/stakeholders (from both the public and private sectors). This in turn leads to complicated trade-offs where it may be hard to find solutions where everyone wins.
- Despite much good work there is often a shortage of data on urban freight, which is required for detailed planning and transparent decision-making.
- The complexity of cities in terms of urban form and activity patterns. As a result it can be difficult to transfer a successful scheme from one place to another without significant adaptation. Scale gains can be hard to achieve.

Creating decision-making structures

In attempting to find a way forward, it is essential that city authorities define a means to engage with the many stakeholders involved in planning processes where there are implications for urban freight. The approach needs to be both ‘top down’ and ‘bottom up’. So it is essential that the strategic decision-making level in the city takes freight seriously and that local associations and companies, trade associations and others contribute to planning.

City planning needs to take account of the decision-makers at several levels. City authorities need to find ways to engage...
with the operators and listen to their concerns while finding the means to encourage innovation and improvements, whether through regulatory initiatives or tax incentives. Receivers – retail shops, bars, restaurants, offices etc – need to better understand their importance in determining the logistics patterns that give rise to transport activity in the city.

At present, many receivers are passive in the urban supply chain and see little opportunity to change the way they work. More should be done to show the art of the possible with respect to ‘out of hours’ delivery and planning for deliveries. Cities are highly complex systems and the need for partnerships is evident – but partnerships can take time to develop and they require care and nurturing. Partnerships also need ‘champions’ or leaders and it is thus essential that urban freight attracts attention at the highest levels in order to create new forms of dialogue and unlock previously set patterns that have prevented change and improvement.

An example in London was described by Michael Browne, spurred by preparations for the 2012 Olympic Games. There will be a major impact on day-to-day urban freight transport. Transport for London (TfL) holds strategic responsibility for London’s road network and transport system. It has built on the existing London Freight Plan to respond to the challenge and in a number of key presentations, TfL Commissioner Peter Hendy has emphasised how seriously TfL takes the challenge of freight transport. This has already influenced the nature and detail of discussions about freight transport operations, and will change freight planning both during the Games period and beyond.

In the panel’s opinion, the way ahead is to avoid the temptation to search for single solutions, accept complexity and concentrate on leadership, and focus on the process and structure of dialogue to build a framework for making better decisions about urban freight. Optimisation can be seen on different levels.

**Consequences of the economic crisis on city logistics**

The panel and members of the audience underlined that the economic crisis has resulted in a scarcity of resources and initiatives for improvements to city logistics. There is a risk that environmental impacts may be seen to be of secondary importance. But less demand and less traffic may also lead to more willingness to cooperate among actors and to exploring ways of optimising the different flows.
Seamless transport is a powerful and ambitious strategic vision for the future of our transport systems. This session considered the broad perspective of transport and how establishing policy and institutional frameworks, as well as continued co-operation among all levels of government and across industry sectors can engender inter-governmental and private sector co-operation and define the roadmap towards seamless transport.

Seamless transport in all modes and for all parts of society

Osamu Yoshida, Senior Vice-Minister of Japan and representative of the Japanese Presidency, gave the opening remarks highlighting the importance of the International Transport Forum through its coverage of member countries and transport modes. The Forum plays a central role in the transport community, especially in terms of policy dialogue and international co-operation. Mr. Yoshida shared national experiences and issues surrounding seamlessness in Japan while calling for international co-operation in order to successfully face such challenges of both national and international dimensions. For Japan, he emphasised the rural and urban dimensions of transport and the importance of creating connectivity between these regions. Genuine seamlessness is vital for the smooth transport of people, raw materials and products and in this way is central for economic growth. Often it is intercity transport that is the missing link of transport systems. The ageing of society is also a major challenge that will need to be addressed in terms of mobility and social participation in both developed and developing countries. Pricing policy, especially, should accommodate the different financial means and transport needs of different demographic groups. Transport systems should be viewed as a whole. Financial capabilities should be well-aligned with institutions that are experienced in carrying out operations. Seamlessness is especially important for Japan in the aviation sector because of its geography. This has called for the government to negotiate open-sky policies with other states to bring in private sector participation and to find ways to ensure that the aviation system is disaster resistant.

Seamless transport is important in all regions of the world

Representing the host country of the Summit, Peter Ramsauer, Germany’s Federal Minister, Transport, Building and Urban Development, highlighted the challenges different regions of the world are facing in achieving seamlessness in transport. For developed countries it is about making existing systems more efficient and in developing countries it is about creating systems to cope with rapidly growing demand. This in itself presents opportunities for developing countries to establish well-functioning systems with a long-term perspective of serving their citizens. There are natural hinderances...
to the construction of transport systems in terms of finance, geography and speed of travel. Smart investment choices can allow systems to become safer and more reliable providers of mobility. The provision of more infrastructure may not solve all problems faced by networks today. More information on user profiles and better information management are needed to better understand consumer behaviour and allow to provide better services. For example, seamlessness is also about putting to use the rail sector more effectively by proper integration in transport networks. In the case of Germany, hub development has contributed greatly to seamlessness by allowing freight volumes to increase strongly.

Seamless service saves time, money and the environment

Catharina Elmsäter-Svärd, Minister of Infrastructure of Sweden, pointed out that one of the main advantages of seamlessness is saving time, and time is something that we lack. This means that a minimisation of transfer times and a provision of high-quality mobility from door-to-door is akin to a minimisation of the cost function of travel.

Integrated transport systems can become viable competitors to private transport and are at the same time better for the environment by emitting less carbon per passenger or tonne moved. In order for this to be achieved, public transport systems and the infrastructure itself needs to open up to competition and be deregulated. As of 2012 passenger rail traffic is fully deregulated by legislation in Sweden, a result of healthy co-operation between public and private actors.

As CEO of Italy’s new deregulated high speed rail service, Giuseppe Sciaronne shared his personal experiences of making connections in transport work. Connections are the fundamental rules of seamlessness. Careful co-ordination and the possibility of different modes of transport playing out their own comparative advantage means achieving more efficient mobility. There are four main levels of connections to be considered when striving towards seamlessness.

The first level is connections in infrastructure which should be created in order to minimise transport times between modes.

The second level is connections management which should intend to minimise waiting times. The third level is about tariff connections which should foster the use of many transport modes with one single ticket. Lastly, there is the information and technology connection level, which should take advantage of high-level of wireless technology. National operators need to work according to regulations that must be, as far as possible, co-ordinated at a regional level.

Seamless transport for trade and growth

Georgia’s Minister of Economy and Sustainable Development Vera Kobalia, shared her country’s experience of rapidly integrating into world markets by realising the important role that transport has played in this. Access to larger markets and a range of new business opportunities can be especially important for small countries. Close international co-operation with neighbouring countries is necessary to make international transport systems work as a whole.

A recently introduced rail line going through Azerbaijan, Georgia and Turkey has promoted the integration of these regions and created opportunities for economic interaction. The availability of real time information on the transport activity of both passengers and freight and high-quality IT services can allow smoother operations at borders, ports and airports and allow for more efficient time management. They can also be used to create transparency.

Koji Miyahara, Chairman of NYK Line, Japan pointed out that one of the very best utilisations of IT services is enhancing connectivity in the transport sector. It can allow for better global management of inventories of goods through precise information on the location of containers to allow in-time preparation of ports and infrastructure. Smoother operation of supply chains will allow to reap the gains of free trade.
It is however equally important to invest in the education of engineers and technical graduates as well as in the skills of general employees, as they are crucial to the proper functioning of physical infrastructure.

A key point highlighted by several speakers is that international co-operation is vital to overcoming challenges to seamless transport. This is true for international network systems but also important in relation to sharing national experiences and addressing the challenges of international transport through policy dialogue. Each connection point in a network is a seam that requires careful management.

Hinderances to seamlessness such as piracy at sea have necessarily to be addressed in an international context as stakeholders in the smooth operation of global transport lines are diverse, and impacts are felt globally.

Repercussions from disruptions to supply chains can affect global markets, as recently witnessed after the earthquakes in Japan. This highlights the need for international co-operation.

Seamless transport in itself is also a way to work around such disasters and to speed up recovery. The contributions of seamless transport to the economy are diverse. The recently established container rail link for the transport of auto-parts between Leipzig, Germany and Shenyang, China, cuts transport times down to 23 days, half of the time taken by the maritime link. This is a good example of how co-operating in building international networks can bring advantages to economic activity.

Lower cross-border barriers have effects on the re-organisation of markets and employment and can be important in promoting economic development. Nationally and regionally, more seamless transport systems can promote growth and infrastructure investment undertaken now is key to achieving growth tomorrow. Making transport more seamless and networks more efficient is also critical to adhering to targets for moderating energy consumption and CO2 emissions if these are not to curb mobility growth, which is essential to economic performance. In short, transport systems must advance from patchworks to networks and supply chains need to become supply streams.

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Innovation in information technologies has brought about change in the use of public transport, for example regarding information provision, fare payment models and reduction of waiting and boarding times. This session examined the innovations in public transport markets from both a supply and demand perspective and identified the policy interventions necessary to promote the application of information technologies.

Global application of interoperable e-ticketing

E-ticketing is the most successful application of information and communication technologies in the public transport sector. More and more cities around the globe are introducing e-ticketing services, and people usually found this a revolution in convenience compared to conventional paper ticketing. Chile’s Minister Pedro Pablo Errázuriz Domínguez noted that in surveys of attitudes to the initial stage of reform of public transport in Santiago “people responded that smart card operations were very popular and so far the only satisfactory change perceived.”

Wide application of e-ticketing naturally demands interoperability not only between transport modes within cities but ultimately across the nation and also internationally. Some smart card operators in Asian cities including Seoul, Hong Kong, and Singapore have been developing a common payment scheme for several years, aiming to issue a single card for multiple cities. However, this innovative international cooperation has not been easy to implement as the participating parties each have incentives to keep their own payment protocols in a new standard.

Nonetheless, it appears very likely that an interoperable e-ticketing scheme for public transport between Seoul and Hong Kong will be available soon, using NFC (Near Field Communication) technology in smart phones. This technology has the advantage of being able to accommodate different payment protocols, and thus avoids significant change in the existing e-ticketing systems. By the end of this year, Seoul’s citizens should be able to pay for the bus in Hong Kong using their own smartphones, and vice versa. Youngwook Park believes that “it is better to integrate multiple and diverse payment protocols into the one single payment system rather than making one single standard that every stakeholder must follow” based on his experience with the difficulties of drawing up agreements between different operators.

Post-payment systems

A new approach to e-ticketing is now turning pre-payment systems into bank account based post-payment systems. This combines ease of identification of payments for the operator with user convenience. Users do not have to charge money onto this kind of smart card before using buses or metros but pay fares with a personal credit card. This has been made possible by the introduction of credit cards for low value transactions by some of the major retail banks. Some Asian cities like Seoul have already introduced this system and travellers responding to surveys usually prefer this system to traditional pre-payment cards. Transport for London plans to introduce this user-friendly payment system shortly.
The Future of Travel: e-Ticketing, Smart Phones, Data Sharing

One of the big advantages of a post-payment system is that it can facilitate global application of e-ticketing since credit cards are already being used globally and the risks of fraudulent smart card operation can be transferred from public transport operators to banks. Agreements have to be negotiated between the issuing bank and the transport operators but banks are much more adept at making such agreements than public transport operators. John Verity, Chief Advisor of ITSO reported that “some key organisations in Europe have already started to take an action to develop a unified smart ticketing system that can incorporate post-payment system.”

Simplicity and accessibility are key

Simplicity is important to users as technologies advance rapidly. People naturally have difficulty using complicated applications on their smart phones, and this is particularly the case for e-ticketing and travel information provision. The environment for using these systems on the move is difficult with noise and distraction, time pressure and sometimes erratic reception. Applications must be simple to use and to understand. Switching will not take place if the new payment system is more complicated than paper tickets. Thom Brenner says that “when it comes to the e-ticketing with mobile phones, just keep it as simple as using paper tickets. Travel information in mobile phones also needs to be as simple as the arrival/departure information board in train stations.”

Travel information needs to be accessible in a variety of ways including via simple SMS texts, mobile web browsers, Twitter, etc., as Mitsuo Higashi underlined, noting that “what travellers want is timely notice of delays, accidents, and alternative routes and modes regardless of operator.” Today, the Train Information Centre in Tokyo provides real-time train information service from different operators by internet, SMS texts, information boards, and on-board information signs in trains.

 Costs and privacy issues

Real-time data transaction on smart phones often entails high costs especially when roaming charges apply, which can reduce the public accessibility of travel information. For this reason, some background information such as maps and transport networks can be downloaded in advance, free of charge, to minimise the size of data transaction.

Sharing transport data requires some exposure to issues of privacy. Smart phone and smart card operators need to know where people are and what specific modes they use to produce travel information based on tracking users. Scott Belcher remarked that “making private information available is unavoidable to some extent in order to enjoy the benefits of data sharing but technology is also evolving to protect privacy better than ever before.”

Governments need to take the lead

Government has played important roles in making e-ticketing possible, beginning with fundamental research in public research laboratories on the technologies brought to market by the private sector. Governments have had a crucial role to play in creating the partnerships for the revenue and data sharing agreements that underpin most current e-ticketing and information systems. It is difficult for private companies and even government owned transport operators to enter into agreements that involve pooling revenues.

Governments need to take the lead in brokering agreements and at times making participation in seamless ticketing and information systems a condition of public transport concessions. Government is also best placed to see the value of common technical standards and actively broker conflicts of interest between various stakeholders, although industry ultimately has to show leadership here. Concerning the new post-payment cards, governments may need to work together internationally to take a catalytic role in ensuring that the banks make arrangements to cover liabilities for using their cards on as broad a range of public transport systems as possible, in towns large and small, for the convenience of travellers and for the benefit of all their public transport systems.

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Globalisation has seen the emergence of business models that build on new opportunities to develop comparative advantages. Technological advances and investments in infrastructure have lowered transport costs and increased average transport speeds. With the opening of new markets and the closer harmonisation of economic models worldwide, trade has become more complex, developing into a constant flow of goods in what has been called the global supply chain. The panellists in this session discussed their views on how supply chains are changing and on the critical factors for sustaining economic growth.

Global supply chains and transport networks form the backbone of the world economy, fuelling trade, consumption and economic growth. They are, more than ever, characterised by just-in-time production. Time has become a critical factor as timely delivery of components has replaced traditional stock-holding. Broadening trade links have brought greater volumes of goods, moving further and in an increasingly complex and interdependent way.

While providing opportunities for increasing productivity, the greater industrial interconnection of the global economy has also created faster channels for the propagation of adverse external shocks. A specific feature of the trade fall during the 2007-2008 crisis was the globally-synchronised nature of the trade collapse. The global reach of supply chains means that any impact on each production stage is multiplied. International supply chains and advanced information technologies also imply that producers in different regions react to changes in market conditions rapidly, wherever they occur. The complexities of today’s economic environment and expanding global supply chains mandate new guidelines for performance. Volatile global market conditions and customer demand variability require optimal supply chain configurations to synchronise supply and demand.

Slow supply chains create problems

Governments recognise the strategic importance of effective supply chains to economic growth. This is reflected in the priority attached to investment in key transport infrastructure by many governments even in times of severe financial stress. And APEC Ministers, for example, have endorsed a 10% over-arching target for improvement in international goods transport in terms of time, cost and reliability by 2015.

In response to volatility in oil prices, slack demand and increasing pressure for greenhouse gas emission reductions, many shipping lines have reduced the operating speeds of their vessels (a practice called slow steaming).

The Panel

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Minister for Infrastructure, Sweden

Oral Erdoğan
Advisor to the Minister of Transport, Maritime Affairs and Communications, Turkey

Jeff Langenfeld
Vice-President, International Logistics, Walmart, USA

Peter van Laarhoven
Director Corporate Development, Schiphol Group, Netherlands
As Ron Widdows put it “the big, ugly thing in the middle of the supply chain is slowing down.” This has resulted in companies facing challenges with long-term implications for the logistics business. The biggest impact is on the inability to deliver goods on time. Inventory levels are also affected because when companies cannot get parts in time, more (costly) stocks are held in compensation. Poor information on delays compounds the problem for cargo owners facing uncertain delivery schedules.

Companies and logistics managers need to adapt their operations either through changing the way they operate or by building in buffer stocks of components and finished goods. Companies also need to adapt their logistic operations through active supply chain management schemes.

Reliability carries and premium

The changing patterns of global trade have increased the importance of schedules – and of keeping to those schedules, putting a premium on transport reliability. In addition to speed, predictability is the key issue for the supply chain. In the words of Jeff Langenfeld, “we like speed but spend most of our time making the supply chain predictable.”

Any delay may have ripple-effects or snowballing effects, affecting other activities or stages in the logistics chain. While logistics chains are built in such a way as to reduce their vulnerability to individual events, delays in individual consignments can still reverberate through the chain. Because the transport task is part of a chain, a break in any part of it is a break in the entire chain. An assembled television set with only 99 of its 100 components is an incomplete product that can be neither shipped nor sold.

Port and hinterland connections

The rapid expansion of trade has led to fast growth of throughput in many ports. Hinterland connections are increasingly central to the competitiveness of ports and the overall efficiency of the supply chain.

High quality road, rail and inland shipping links greatly extend the reach of ports. Investing in these intermodal connections is therefore important. High volume connections offer the possibility of locating key services – warehousing and even customs processing – away from constrained waterfronts to so called dry ports. Effective competition and coordinated access to essential port facilities, particularly for rail operators, is critical to coping with increasing volumes of international trade.

While a lot of emphasis was put on intermodal connectivity at ports, the panellists also focused on improving intermodal connections across metropolitan areas for delivering goods for the customers – often the final leg of the global supply chain – which is critical to overall supply chain efficiency. Oral Erdoğan stressed that “port systems should be integrated in line with master plan for the regions.” All this has to provide a seamless transport service, with Minister Elmsäter-Svärd remarking that “people don’t ask how goods got to the store, they want good service.”

Choosing the low hanging fruit

A key policy challenge is to create incentive structures that encourage cost-effective solutions – the option that delivers a given level of supply chain improvement for the lowest cost. The objective is to ensure that option is chosen ahead of the less effective options, regardless of whether the responsibility for adopting the option lies with the network provider or the network user. Indeed, improvements can be delivered by both users and network providers. It should not be presumed that the infrastructure (or service) provider/government always has to be the source of enhancements. The low-hanging fruit of cost-effective supply chain improvements may come from network users.
That said, supply chains operate across countries and modes. Governments can enhance connectivity across borders, regions, industries and modes by providing necessary harmonisation and standardisation. Land-side solutions include infrastructure development and government regulation to speed up flows, including customs procedures and information flows. High quality infrastructure greatly extends the reach of ports and improves connections. Central Government can help by making decisions on strategic investments for key links. In emerging economies, such as Turkey and India, governments have been investing heavily in improving the hinterland connectivity and improving supply chains but where transport systems are already well developed Minister Elmsäter-Svärd stressed that “before building new infrastructure, we need to make sure the existing infrastructure works as it was meant to.”

The role of information

Different tools exist for delivering information to users of the network enabling them to mitigate the adverse effects of poor predictability. Providing information can be a cost-effective way to improve supply chain performance. There is need for better information on the movement of goods through supply chains. With better information, the supply chains become smarter and more dynamic. Increasing availability of data about the location of goods at different phases of the supply chain is an opportunity that can significantly improve performance. Transparent data is also critical to reducing the carbon footprint of transport operations.

Governments can assist in developing open information systems, such as the Neutral Logistics Information Platform in the Netherlands. This system provides data between customers and transport operators and is based on existing port community systems. In the future, all businesses and government authorities will be able to communicate between each other in a standardised way via this platform.

For information to be disseminated, firms must choose to provide information. Firms choose to provide information only if it is in their business interest. If it is not in their business interest, they will opt out unless required to report by government. However, if one can identify and standardise a set of key indicators that drive industry and investment decisions, there is likely to be less concern about the possible misuse of commercially sensitive company specific data required to generate these indicators.

Need for a platform for stakeholders

Governments are faced with an increasingly complex challenge in managing risk across global supply chain and transport networks. The political, economic and security implications of regulating in a complex environment have necessitated new approaches for public-private collaboration.

There is a gap between academic research and industrial practice. One of the ways to bridge that gap is to put industry in the lead for defining future research agenda, as done in the Logistics Top Institute in the Netherlands. This type of a platform is useful also for discussing what are the most cost effective solutions to enhance supply chain connectivity and reliability and who – government, shippers, transport companies, others – is responsible for implementation.

The panellists made a plea for all stakeholders (government, industry, and academia) to work together at all levels to improve supply chain performance and to identify priority research issues, with a growing recognition that logistics is a top priority transport policy concern.

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Facilitating Global Trade: Connectivity Across Borders

International trade drives economic development, creates jobs and improves quality of life, and transport is essentially the backbone of this exchange. In today’s globalised economy, the flow of goods and people across borders continues to increase. Well-connected and efficient transport systems and networks facilitate reliable and seamless transport, increase cross border trade and foster prosperity.

Lengthy Border Crossing Times

Despite their importance to efficient trade, border crossings remain a problem for transport. While there has been steady progress in simplifying procedures to reduce border crossing times and associated costs, border delays are still very high in most parts of the world.

Following the 11 September 2001 attacks, measures to increase transport security were tightened around the world. In this context, security at border crossings was enhanced, and controls have become increasingly stringent. While trade volumes have continued to grow during this time, so has congestion and delays at borders, often impeding cross-border trade. On average, a one-day delay in transit reduces trade by over one percent. Losses from the delays worldwide are huge, according to Andreas Kopp of The World Bank: a ten-day delay reduces national income on average by 1.25%.

According to Minister Denis Lebel of Canada, “... In the days immediately following the terrorist attacks of September 11, 2001, our (Canada-USA) inter-connected trade and transportation network was challenged. There was a thickening at the border. And the implications were severe. Cargo trucks were backed up for dozens of kilometres for days at our major border crossings. Congestion and delays posed serious threats to our economy. Security concerns on either side of the border resulted in a tightening of controls, while at the same time, trade volumes continued to grow.”

Pere Padrosa, the president of the PADROSA Grup pointed out that 40% of road transport time on the Silk Road is lost because of long waiting times at borders. In addition, Deputy Minister of Transport of Lithuania Raimvydas Vastakas noted that it is not uncommon for trucks to wait a week to cross the borders between Lithuania and Russia. These delays significantly increase operating costs. Moreover, longer waiting times at borders also present safety and security risks for drivers and goods.

Reasons

Protectionism is one of the reasons leading to long border delays. Swiss Minister of Transport Doris Leuthard underlined...
that the economic downturn is one of the reasons for the increasing border delays currently observed: in times of economic slowdown, countries may retreat to a more protectionist stance, promoting to a lesser degree open cross-border flows and imposing protectionist measures on their local markets. It may also be perceived that open borders between developed and developing countries are not “interesting”; since they may promote unfair competition to industries and labour markets.

Lack of coordination among different national agencies is another reason for border delays. Very often, each agency or department pursues its goals independently of the others. While the Ministry of Transport’s role is, for example, to improve the physical aspects of transport networks as well as the regulatory environment to facilitate fast and efficient movement of people and goods, Customs or the Interior Ministry which normally oversees immigration matters and national security, have different objectives and responsibilities. Bridging different administrative functions to ensure fast and seamless border control definitely requires strong political will from all sides.

Lack of coordination and incoherent procedures between neighbouring countries or regionally is another contributor to cross border delays. Regional cooperation, including joint or juxtaposed border controls, remains crucial for improving the efficiency and effectiveness of border crossings.

Often different administrations do not talk to each other. They need to cooperate closely as well as consult non-governmental actors and industry” emphasised Deputy Minister Kamen Kitchev from Bulgaria. “Good cooperation between neighbours is crucial for success” he added, referring to recent successful investments in border infrastructure between Turkey and Bulgaria.

K.L. Thapar pointed out that in many developing countries, artificially created borders between historically interconnected areas contribute to poverty and increase security risks at the border area. The “attempted” controls imposed on borders are bundled with long and complicated administrative procedures. This leads to huge volumes of informal trade across borders, which in turn fosters corruption and crime in border areas.

Moving forward
Simplification of procedures to reduce border delays requires strong political will. According to Doris Leuthard, “economic interest” is the strongest argument for politicians to support measures promoting more-efficient border crossings.

Mr. Denis Lebel presented the Canada-USA example as part of the discussion on “moving forward”. Two of the world’s largest trading nations have started an initiative to upgrade borders physical infrastructure, streamline procedures and supply chains, and improve security integration by means of targeted investment and strategic use of technology. The Beyond the Border Action Plan focuses on four key areas:

1. Addressing threats early
2. Facilitating trade, economic growth and jobs
3. Building on successful cross-border law enforcement programs
4. Enhancing cross-border critical and cyber infrastructure

As a complement, the Action Plan on Regulatory Cooperation has been launched attempting to align regulatory approaches in areas such as agricultural and food, transport and environment (http://actionplan.gc.ca/eng/feature.asp?pageId=337). This will lead to better regulatory harmonisation and help to reduce border barriers and lower costs. But it is worth stressing that sometimes “… we are adding layers and layers of regulations in the name of harmonisation”, said Mr. K.L. Thapar. Precisely to avoid this from happening, Denis Lebel commented on the Canadian example of “one new regulation introduced, one regulation scrapped.”
Whilst decision-makers and government authorities must redefine their policies at borders to reduce delays and improve efficiency, traders and transport service providers share an equal responsibility in reducing border delays on the ground by complying with existing rules and regulations. Most customs authorities apply risk management practices instead of 100 per cent controls in order to reduce border delays. The stringency of control depends very much on traders and transporters’ compliance. “If the traders comply more, then customs can loosen” was the message from Mr. Gaozhang Zhu, Compliance and Facilitation director of the WCO.
Macroeconomic conditions have greatly deteriorated since 2008 and prospects for growth with them. Many policymakers face the dilemma of having to reduce debt while also needing to invest in their country’s long-term growth potential. Transport facilitates economic growth, and the more so when it is seamless and highly efficient. Debate in this session focused on how the sector’s potential to drive sustainable economic recovery can be best harnessed.

The scene for debate was set by Angel Gurría, Secretary-General of the OECD. In his opening speech Gurría pointed out how promoting seamless transport contributes to much needed economic recovery in times when the scope for traditional monetary and fiscal policy is very limited. The most direct and critical contribution of seamless transport to growth is through trade. Global value chains underscore the importance of transport services for which we must promote openness. Seamless supply chains would greatly benefit from removing obstacles at borders. A 10% increase in global trade would be achieved if only we could improve customs and security procedures to best in class regionally. This would represent an additional 400 billion dollars in global GDP.

Thinking seamless can also help to foster growth in a more sustainable, greener way. According to the International Transport Forum’s Transport Outlook, global passenger transport volumes are set to increase by a factor of 2 to 2.5 by 2050. Freight volumes could rise threefold. Action is needed to contain the negative side-effects of that evolution, including environmental and health damage and effects on climate change. Technology is key to reducing emissions but technology alone will not do the job. Adopting a seamless transport paradigm helps establish more balanced and – with the right policy steer – less carbon-intensive mobility systems.

Seamless transport for greener growth

Policies to foster seamlessness sometimes are more a matter of institutional reform than of allocating large amounts of resources. This does not make them easier to attain, but it does raise their appeal as resource constraints tighten. There is, for example, ample evidence that efforts to reform the regulatory environment in transport can make a vital difference in terms of the sector’s cost-effectiveness and its capacity to innovate and respond to consumer demand.

Improving planning and coordination among levels of governments and across line ministries is crucial for providing more effectively connected transport modes and more seamless transport services. Policy integration and coordination is a prerequisite for seamless transport and for putting transport on a green growth path. Lastly, thinking seamless and adopting a transport system view helps make smart investment choices with large pay-offs at modest cost, that would be harder to identify in more traditional mode-based approaches to transport decision-making.
The situation in Ireland after 2008 illustrates points raised in Angel Gurria’s keynote rather starkly. Minister Leo Varadkar started from the observation that there is very little public money to invest in transport, and that private funding has dried up as well. This has induced an attitude shift towards smarter transport policy, with a focus on maintaining what exists and focusing on low cost improvements, including integrated ticketing, installing wifi in public transport, better information, etc. These are exactly the types of improvements that the seamlessness perspective encourages, and they mainly improve service quality in public transport and in that way contribute to a more balanced mobility system as well as – conceivably – a more sustainable one.

A similar connection between going seamless and the crisis context is observed in the USA. Ms Susan Kurland noted how the USA is embarking upon a more intermodal approach towards transport policy and transport funding, instead of the prevailing context where modes have their own financing streams, in order to achieve the broad policy goal of more integrated and sustainable communities. The American Recovery and Reinvestment Act of 2009 is a post-crisis stimulus measure, but also rewards innovative, multimodal and multijurisdictional initiatives, thus aiming to contribute to better integrated policy and better integrated transport systems. The USA is also leveraging technology to increase the productivity of transport infrastructure, e.g by encouraging the introduction of Intelligent Transport Systems and the NextGen navigation system in aviation.

Adopting these technological improvements often necessitates an overhaul of governance and organisational structures, a key feature of going seamless. With regard to sustainability, the focus on liveable communities and efforts like increased stringency of CAFE standards show that going green is not abandoned as a policy goal despite more difficult macroeconomic circumstances.

The need for continued investment in transport to ensure future growth and the need to go green are at the core of the UK transport policy strategy. As Minister Norman Baker said, in the current economic context the UK cannot afford not to invest in transport. For this reason, transport investments will go through despite considerable cutbacks in public spending overall. But the decision to maintain key projects is not the entire story. In addition, there is an increased cost-awareness, and here too the seamlessness view helps identify high value for money investment opportunities. Furthermore, the UK Government is making a concerted effort to attract private investors to the transport sector. The Memorandum of Understanding between UK pension funds and the Government is one important example, as it helps overcome the fragmentation among pension funds that has limited their ability to consider transport investment opportunities.

**Overhaul of governance**

There are strong efforts to reduce the transport sector’s Greenhouse Gas emissions. Meeting the large demand for rail, by reopening lines or increasing capacity, improves service and mitigates emission growth. Tax advantages for electric vehicles also contribute to climate change targets, and boost UK industry competitiveness. These examples illustrate the ambition to boost growth and go green, instead of trading-off these goals.

The condition of the Chinese economy differs strongly from that of most OECD economies, with public finance constraints notably less tight. China has responded to the 2008 shock with strong stimulus measures, not least in the transport sector. Vice-Minister Zenglin Feng pointed to a need for investment in connectivity that remains elevated, particularly in rural regions, suggesting that risks of overinvestment or investing too soon, in the sense of making uneconomical investments for stimulus reasons alone, are limited. In Vice-Minister Feng’s view, there is in China no trade-off between stimulus, long-run growth policy and rational investment choices in transport.

Whereas investment needs in rural areas relate mainly to connectivity, the focus in urban areas shifts towards system integration and optimisation, with increasing attention...
to safety, environmental impacts, energy demand and congestion. China’s twelfth 5-year plan, covering the period 2011-2015, adopts an integrated planning perspective to ensure the development of a seamless and balanced transport system.

Towards integrated systems

Switzerland’s transport system is an example of integration and high quality, and its transport policy stands out through its coherence, guided by a long-term vision that has sustainability at its core. Federal Councillor Leuthard stressed the need to continue along this path, even if budgetary pressures make it harder. Introducing a long term strategy into policy requires protecting transport funds from annual changes that may be caused by political and business cycles. This is not only for sustainability reasons – maintaining high quality infrastructure is a key element of Switzerland’s international competitiveness.

The need for coherence and stability was confirmed by Rüdiger Grube, who sees Deutsche Bahn not so much as a supplier of rail transport but as a provider of mobility and logistics services. Mobility and logistics are not a matter of a single mode but of an integrated system. The more seamless, the better that system. The economic crisis is accelerating the shift towards an integrated system approach because it rewards efforts to improve performance at low cost. This shift is indispensable if the sector is to reduce its carbon footprint, and public sector execution (not just commitment) is needed to clean up transport’s act – at present transport emissions are increasing whereas those of other sectors are in decline. The merits of integration are clearly showcased by the Japanese railways.

Yoshiyuki Kasai explained how in serving a large and ever increasing demand, the Tokaido Shinkansen high-speed rail network is fully integrated with urban rail services and metro operations, so as to maximise system output. The seamless approach permeates the entire system design, which includes fully standardised rolling stock in order to save on costs and increase system performance, easy to understand train timetables, high frequencies, and punctuality to keep users’ schedule delay costs low and avoidance of mixed operation of trains of different speeds. Rising demand for high quality services will be met by the Maglev train, which will allow considerable time savings for example halving the time for the Tokyo-Osaka connection.

Transport infrastructure can be paid for from tax revenue, raised through taxes with narrow or broad tax bases and from general or dedicated sources, or it can be paid for from user charges. Transforming funds into the right flows – financing – can be done privately or publicly. Scarcity of public funds has heightened the attention for private sector financing, and as seen above, the post-2008 economic context has intensified efforts to increase private sector involvement in some countries, including the United Kingdom. Lord Gus Macdonald shared his view that combined public and private funding is the recipe for success: investment needs are huge, the private sector has funds to place, and its reluctance to place it in transport can be overcome. Enthusiasm about the feasibility and the desirability of increased private sector financing is not universal, partly because circumstances differ among countries and partly because of different appreciations of the advantages and drawbacks of private sector involvement.

Who funds and who finances?

Rüdiger Grube pointed out that strong political and public sector support is crucial to convince private sector investors, because without it the risk is too high given the technical and political characteristics of transport infrastructure. At present, rates of return are generally too low for private investors to accept the regulatory weight observed in transport. Ms Leuthard observed that guaranteeing sufficient returns for private investors will lead to higher prices for users. As long as the public sector can forego a financial return and focus on less tangible socio-economic returns, public sector financing is the more appealing option.

Minister Varadkar shared the Irish experience, where private financing is not only more costly than public financing but also the supply of private financing has dried up. Mr Kasai expressed reservation regarding the widespread feasibility of public-private partnerships. Private operation does work in Japan, although the transition out of public funding and financing was very difficult. That it works is at least partly because privatisation allowed establishing a long-run strategy horizon in management, a feature indispensable for success in the transport sector given asset lifetimes. Scarcity of tax revenues might also raise attention for the introduction of user charges or tolls. However, public support for tolls remains low in many places, including in Ireland. And Vice-Minister Feng noted a new Chinese policy initiative to phase out tolls on public expressways.

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Investing in Connectivity: Where, Why, When, How?

Thursday, 3 May, 11:45 – 13:15

Transport volumes are expected to increase significantly during the coming decades. The International Transport Forum’s 2012 Transport Outlook estimates that passenger mobility will grow by a factor of 2.5 to 3.5 outside the OECD. In the OECD mobility is expected to be about 30% higher in 2050 than in 2010. Population and per capita income growth are the driving factors, outpacing the mitigating potential of urbanisation. Current infrastructure levels will not be sufficient to handle such mobility needs. Participants in this session debated priorities for investment in connectivity and balancing investment needs against the overall need for fiscal responsibility in the economic crisis.

Gateway ports and airports, and links allowing freight to move smoothly to hinterlands, play an increasingly important role in the economy and the significance of large urban areas as highly productive centres of economic activity is growing with globalisation. Global trade and travel have put some parts of the transport system, particularly in these urban areas, under severe strain and investment is a key part of the response. Investing in connectivity then means that key terminal and gateway infrastructure is built in the right place and right time to adequately cater for current and future transport needs.

Investment decisions should be thought of in terms of mobility systems rather than modes and modal networks. Indeed, seamless transport systems are highly interconnected. The degree of connectivity depends on physical, managerial and institutional characteristics of the system. At the modal level, efficient networks connect places and allocate transport flows with just enough capacity to ensure a balance between ensuring smooth flows and avoiding excessive outlays in infrastructure. Interconnections between modes require well-placed and well-designed switching points. Transport systems are also increasingly integrated with energy and communications systems, adding another layer of complexity to their design and management.

Strategic infrastructure

Smart investment in connectivity strikes a balance between providing high-quality service and keeping investment and operational costs under control. This is a common goal, but the path to more connectivity depends on local circumstances, including the current state of the transport system, its governance structure, and framework conditions such as the level of economic development and funding options.

Decisions on transport infrastructure investments hence need to be taken with a view on providing mobility and required service level over the life-cycle of the infrastructure in order to ensure value for money.

The Panel

Anthony Albanese
Minister of Infrastructure and Transport, Australia

Michael Clausecker
Management Board Member, Bombardier Transportation, Germany

Peter Hendy
Commissioner, Transport for London, UK

Koji Kuroda
President, Japan Expressway Company Limited, Japan
There is an important role for national governments, both in establishing governance and market frameworks and being engaged in long-term planning processes, particularly where new infrastructure to support connectivity is of a significant scale.

The challenge of increasing urbanisation

Peter Hendy underscored that “efficient and planned management of transport is critical for survival of cities and their growth.” Transport plays a crucial role in city’s function, connecting people to jobs and training, and providing access for businesses, their clients and suppliers. Investing in connectivity improves quality of life and helps regions to compete for jobs and growth on an international stage.

In building and maintaining transport infrastructure in urban areas value is added to the economy, and not just in the city itself. Indeed, interconnectivity is key to the survival of cities. Urban, regional and long-distance transportation need to be much more integrated with each other in the future and will likely merge. Investment in transport, and the connectivity it creates, drives economic growth and economic difficulties should not therefore be allowed to bring investment to a halt.

Need for mass transit systems

The ongoing urbanisation and development of megacities reinforce the need for mass transit systems as the scope for car-reliant mobility is limited. Challenges are particularly serious in some emerging economies, especially in Asia, where infrastructure needs to be updated but resources are limited and transport solutions based on cars are no longer a viable option as congestion is already major obstacle. Rail, one of the fastest growing markets in the world, has a potential to deliver mobility but will need to provide the connectivity needed by users of the transport system. Smart regulatory solutions, such as congestion charges and regulated access to urban centres for cars are needed to support sustainable growth of cities.

Examples from Singapore, London and Stockholm have proven that urban congestion can be managed in a cost-efficient way.

Planning for future growth of cities requires the development of a comprehensive transport strategy. The public transport system needs to be connected not only within cities but also between cities and with cities’ peripheries. Suburban rail lines inter-connected directly to metro lines, as in Japan, provide users with seamless services par excellence.

Michael Clausecker stressed that “connectivity is the key to increased demand for public transport” and Koji Kuroda, looking at the issue from the opposite side acknowledged that developing “seamless transport systems requires growth to accommodate investment needs.”

Ageing infrastructure

Transport infrastructure is a major national asset representing a very large investment with an average lifetime of more than 50 years. Infrastructure requires continuous attention (in terms of maintenance, operation and development) to counter deterioration, or because of a need for upgrading. However, funding for road maintenance is often postponed, especially when budgets are tight, because a lack of maintenance does not lead to immediate failure of the network. This is entirely counterproductive. The levers for promoting growth are costs and productivity, both of which suffer if the quality of transport infrastructure declines.

Minister Anthony Albanese underlined that “it is not only new infrastructure that matters but getting more out of existing systems.” It is becoming more and more important to make better use of existing capacity and to inter-connect transport modes smoothly and seamlessly. Many countries face the challenge of ageing infrastructure and maintaining the service level of existing infrastructure is critical. It is increasingly clear that investing in connectivity should not only focus on new infrastructure.
Investing in Connectivity:
Where, Why, When, How?

Investment in ICT

The mobility concept is evolving from connectivity as bricks, mortar and steel to include issues of information, communication and seamless management. Integration of transport systems and communication systems helps provide smoother mobility for transport users with easier access to information before and during their journey. Investment should not only be directed at traditional infrastructure but also at modern information technology to facilitate inter-modal travel.

This will also help manage and improve the efficiency of the existing infrastructure. Fast and reliable travel information for public transport enables travellers to plan their travel across transport modes. The introduction of transport smartcards improves seamless connections as passengers can use one card to pay their travel by train, bus and tramway - in the Netherlands across the whole country. India is developing a similar universal system and a new generation of smart bank cards offers prospects of international payment systems at reasonable cost. Good ICT systems also help attract passengers to public transport as an alternative to the car. Minister Albanese concluded that “communication technology is a form of transport infrastructure.”

Public-private partnership

Transport suffers from a “funding gap” between needs and available public funds. The evidence is that this gap will widen as public finances are stretched in the longer term. The private sector also faces stringent constraints in securing funding for transport infrastructure investment and transport services.

Public-private partnerships (PPPs) with pension funds and insurance funds, where interest in relatively low risk long-term returns coincide with the characteristics of transport infrastructure investments, was offered by former UK transport Minister Lord Gus Macdonald, intervening in the debate, as a potential new source of funding. Effective risk management is the key to good PPP design and governments must ensure that there are powerful incentives for efficiency in PPPs through the way that risks are assigned. Many failures of PPPs have occurred where demand risks have not been managed well and Peter Hendy confirmed that “you need to identify risks properly both for public and private sector” for successful transport infrastructure investments.

Maintaining support for investment

As investments have a life-time of more than 30 years, long-term planning is important. The challenge then is to break the nexus between political cycles and investment cycles, and to maintain the support from government, the business community, wider stakeholders and the public for continued investment. Mobilisation of all stakeholders, governments, regions and private sector is the key. Panellists gave a number of examples of how mobilising support from the business community can help to maintain support for continued investments.

Transport for London has actively worked with business to make the case to government for investment in London’s transport system. Peter Hendy stressed that “we need to continually make the case for investment in connectivity” and Minister Albanese agreed that “you need to mobilise support from the business sector to make sure the political battle is won.” In the Netherlands, public-private platforms have been established to bring different stakeholders together and to find an innovative solution to connecting different information systems providing logistics services. Vladimir Yakunin concurred that “mobilisation of all stakeholders, governments, regions and private sectors is a key.”

Seamless governance

Many of the underlying difficulties in meeting infrastructure challenges can be attributed to governance issues that span infrastructure planning, policy, regulation, financing, procurement and management. Indeed, the key to making progress is governance. Good governance at all government levels and internationally in cooperation with the private sector is needed to improve decision making and create incentives to invest in connectivity.

There is a need to think in terms of mobility systems rather than modes and modal networks. For that, integrated governance is critical and this can be established by a political champion (such as in London), an integrated authority (such as the new ministry in the Netherlands) or stronger national government involvement (such as in Russia). Siebe Riedstra commented that “sharing experiences on good governance, during this conference, would prove important in making progress” and Peter Hendy closed by saying that politicians and “Mayors in particular have to have a long-term vision for growth and transport is central to that vision.”

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Electrification is a promising route to low-carbon transport. As the use of electric vehicles (EVs) grows, this new electricity load will need careful management. Although electricity demand for EVs is likely to remain small relative to overall load in most regions for many years to come, it could have a much bigger impact on peak load as motorists seek to recharge their batteries at the end of the working day. Existing electricity systems will need to be reconfigured to meet these needs without increasing reliance on fossil fuels. Debate in this session shed light on how EVs might be integrated into the power supply system for seamless electric mobility.

Electric utilities have begun to deploy “smart grid” technologies to better manage demand. A Smart Grid is an electricity network that uses digital monitoring technologies to efficiently deliver electricity wherever and whenever it is needed. Smart-grid technology can enable EV-charging (grid-to-vehicle, or G2V) load to be shifted to off-peak periods, thereby flattening the daily load curve and significantly reducing both generation and network investment needs. Advanced metering equipment is an essential component, enabling a two-way flow of information and providing customers and utilities with real-time data and enabling customers to schedule charging intelligently.

Smart grids and electric vehicles

In the longer term, there may be potential for smart-grid technology to enable EVs to be used as local, distributed electricity storage devices, feeding electricity stored in their batteries back into the system when needed (vehicle-to-grid, or V2G, supply). This could help to reduce electricity system costs by providing a new means of regulating supply. In this way, EVs could both benefit from and drive forward investment in smart grids. However, there are a number of technical, practical and economic barriers to such development and the session brought together key players to shed light on the critical issues for integrating electric mobility seamlessly into the power supply system.

The way electric vehicle technologies are expected to develop, a vision generally shared by the panellists, was sketched by Patrick Oliva. The current decade will see a diversity of experimentation in e-mobility systems, creating the conditions for the take-off of electric vehicles in the 2020s. Battery technologies are a pivotal issue for road vehicles as batteries are currently expensive. However, all the other EV drive components are potentially much cheaper than their equivalent on a conventional car. The costs of EVs can therefore come down despite high battery costs.

The Panel

Sergio Monteiro
Secretary of State for Public Works, Transport and Communications, Portugal

Pat O’Doherty
CEO, ESB (Electricity Supply Board), Ireland

Patrick Oliva
Senior Vice-President, Strategic Anticipation and Sustainable Development, Michelin, France

Henri Poupard-Lafarge
President, Alstom Transport, France
Commercial scale production of EVs, which has now begun in a number of automobile companies world-wide, should see costs cut rapidly as the full resources of production engineers are applied to making more competitive vehicles. At the same time battery costs are expected to reduce by a third in the next five years and to come down to 2,000 Euros for each 100 km of autonomy in the next decade.

**Low-carbon electricity**

Smart grid technologies that match supply and demand in real time will be needed when EVs take-off. The batteries in EVs offer the potential to store electricity, especially from variable, low-carbon wind and solar power, for supply to the grid or to homes at peak demand. One of the problems with solar and wind power is that supply is intermittent, depending on weather conditions, and not necessarily available when needed most. Storing electricity is generally prohibitively expensive, except in the form of “pumped storage” where mountain reservoirs to hold water pumped uphill in off-peak periods, releasing it to generate hydro-electricity in periods of peak demand. V2G supply offers power companies a rare prospect of additional storage capacity, located moreover close to where electricity is needed.

So, is integrating EVs into smart grids a solution to reducing transport sector CO₂ emissions or a solution to power sector problems with the reliability of low-carbon renewable energy? In practice they go hand in hand.

Vehicle batteries could also serve to make homes and commercial buildings equipped with solar panels and wind turbines more self-sufficient. Independence from the grid is a potential element in marketing strategies for electric vehicles in some regions and as Mr. Yamashita explained, Nissan already sells a version of its mid-range car the Leaf equipped to provide electricity to the home during scheduled power cuts. This feature was developed in response to the electricity supply problems in Japan following the 2011 earthquake and tsunami but could be attractive much more widely.

**Smart visions**

There are two contrasting visions for the development of e-mobility. For Henri Poupart-Lafarge, the model is a centralised, collective system that is standardised continent-wide, to provide seamless interoperability based on long-term public support. This would be something like the model for passenger railways today. After all, railways already provide a near 100% electrified mobility system in many parts of the world.

Other panellists expect to see a diversified set of systems suited to different circumstances, including slow charging EVs, fast charging EVs, battery-swap systems, car-share EVs and also plug-in hybrids to bridge the gap to fully electric vehicles. Pat O’Doherty stressed the importance of competition between systems and looked forward to competition to supply the grid from vehicle batteries between vehicle owners.

New business models need to be developed for EV systems because the benefits and costs accrue to different stakeholders over different time scales. A long-term view is needed so that the upfront investments in charging infrastructure can be made, with public support until use levels increase to commercially viable levels.

Sergio Monteiro stressed that all relevant stakeholders have to be closely involved in setting up e-Mobility systems, saying you cannot just provide charging facilities and expect customers to arrive unless you work with them from the beginning. This is what happened to some extent with Portugal’s Mobi-e project providing charging facilities across the nation’s highways. The infrastructure investment has been made but a lot of work remains to be done to get adequate numbers of users.

**Subsidies or Sales success?**

Nissan is planning on the basis that subsidy cannot be relied on forever explained Mitsuhiko Yamashita. EVs therefore have
to become a commercial proposition. The standard experience in industry is that new vehicle technologies, whether they be airbags or engines, usually take a decade to achieve a halving of the initial costs of production when the technology is first introduced commercially. With volume production there is no reason that the car industry cannot do the same to the cost of an EV. But during these ten years, some public support will be needed.

Electric cars will have to be competitive with conventional vehicles on cost and in every other respect and they will only take off when they are a superior product Mr. Yamashita underlined that “car customers are very realistic – they don’t dream – they always compare cost and value.”

The panellists from the auto and power industries agreed that standardisation of charging systems is essential. Multiple plug types increase costs and cause problems when cars cross borders. There is a role for government in formalising standards and bringing competitors to the table but they concurred that agreement on standards can only be based on industry stakeholders leading the way.

Electricity market structures and regulatory frameworks will need to adapt to facilitate the demonstration and commercial deployment of smart grids, including the specific technologies needed to make G2V and V2G technically and commercially viable. It is vital that regulatory frameworks be adapted to allow tariffs to be set to provide incentives for electricity transmission and distribution companies to invest in appropriate smart-grid technologies, for system operators to take decisions that ensure economically efficient operation of the entire system and for EV owners to optimise G2V and V2G load.

Railways at the heart of e-mobility

Henri Poupart-Lafarge noted that trains already supply power to the grid, with a number of railway companies installing regenerative braking on some of their trainsets. A train can produce 3 megawatts of electricity when braking to feed to the grid. For charging electric cars, direct current (DC) networks will be needed for high-power, fast recharging points. Normal electricity networks use alternating current (AC) but metro systems run on DC and effectively already provide city-wide DC micro-grids. Metro systems and rail stations can therefore relatively easily provide key EV charging facilities, and exactly where they are needed city-wide and for seamless inter-modal passenger transport that includes a leg in an electric car.

In Patrick Oliva’s view “the game-changer for e-mobility will be an intergovernmental decision to halve CO₂ emissions by 2050.” He also underlined the significance of trade deficits from importing oil in driving policy. This will be our next big economic concern as we come out of the current crisis. Mayors will also increasingly find popular support from establishing zero emission cities and green policies more generally.

Sergio Monteiro underlined that a joint economic and environmental perspective is needed in developing both transport and electricity systems, concluding that “it can no longer be a question of either growth or a clean environment”, it has to be both.
The Transport Innovation Talks provided a stage for innovative thinkers and practitioners to present some key insights on what seamless mobility looks like and how it can be delivered.

Sensing Seamlessness

A world increasingly populated by sensing devices that allow unparalleled insight into our cities was described by Carlo Ratti, Director of the SenseAble City Laboratory at the Massachusetts Institute of Technology (MIT). These sensors, embarked for example in cell phones, vehicles and traffic control devices, are not just passive but increasingly can dynamically adjust systems to real time changes. This “sensing-actuating” function provides new insights and opportunities in our relationship with the urban metabolism – our cities not only “talk back” to us, they can also “act back”.

They also tell us unexpected stories. This was the case when MIT tagged several hundred items being disposed of in Seattle’s waste collection system. One month later, many items were still on the move revealing unexpected national and international waste processing flows extending far beyond Seattle.

Another series of projects undertaken by Ratti’s laboratory have sought to capture and exploit very large data sets from cell-phone sensors. New insights into long-distance commuting and daily urban flows have emerged from this work including innovative use of cell phone accelerometer data to automatically match cell phone signals to specific transport modes (walking, cycling, bus/metro or car driving) using motion detection algorithms and cross-referencing real-time public transport and traffic data sets. “Real-time Singapore” takes these technologies to a new level and allows unprecedented insight into the daily transport and energy flows within Singapore and the city-state’s connection to the rest of the world via maritime and air transport.

Bringing it back to individual users and their role in generating transport-improving data, Ratti finished by describing the “Copenhagen wheel” project built around a sensor-enabled bicycle that not only allows users to receive information about its surroundings but to broadcast information to other users on, for example, cycle traffic speeds and street pollution levels.

Movement Data

Martin Austwick picked up on the importance of open and shared data by presenting one of the visualisations he and colleagues at University College London’s Centre for Advanced Spatial Analysis have made using open data on the London shared bicycle fleet released by Transport for London. According to Austwick, this dataset offers new insights into how people use the shared bike scheme and how they travel around the city. He illustrated the types of stories emerging from the data by singing a song describing the day of one hired bicycle as it made its way from user to user across London’s neighbourhoods as its movements were projected on screen.
An Olympic Challenge

Moving on from bike-sharing, Peter Hendy sought to discuss another kind of partaking: sharing the city of London with millions of spectators and athletes during the Olympic summer games of 2012. The London Olympics are both an opportunity for London and a very real challenge as they will be set into a dense urban environment and will generate an additional 3 million trips per day on a saturated network already handling nearly 24 million trips.

These are significant constraints with 30% of road trips and 40% of public transport trips potentially impacted by the influx of spectators and the management of the 175 km Olympic Route network.

Additional impacts are expected for freight traffic and goods delivery services. In response, TFL has undertaken significant infrastructure investment for new metro stations and station upgrades as well as additional transport services, including a third metro peak service.

The bulk of TFL’s response, however, will be an innovative multi-pronged series of actions helping individuals and businesses effectively manage transport demand during the games. TFL has actively engaged businesses to develop contingency planning for ensuring staff commuting and goods distribution. At the same time, a series of campaigns and information resources have been deployed to help travellers get around the city even at the most crowded periods.

The key, according to Hendy, is to ensure that those who can “re-time, reduce, re-route or re-mode” their trips, while TFL manages expectations about travel for those who cannot. The durable transport legacy of the London Olympics, hopes Hendy, will a long-term change in travel behaviour that capitalises on the transport demand management strategies being rolled out for the summer of 2012.

More Sharing

One issue is that while we have seen several IT service providers rapidly emerge from modest beginnings to dominant global positions in just a few years (Google, Facebook, Twitter, etc.), it is not yet clear what shape IT-rich 21st century transport services will take. Citing how a change in the way people access information in the internet age contributed to the recent demise of the printed version of Encyclopaedia Britanica, Miller asked what might change in transport as people adopt new behaviours based on IT technologies. His answer: more sharing, more individual public transport and innovative re-use of existing transport infrastructure.

For example, Miller highlighted the often neglected role that coach travel can play in inter-urban transport. Premium services, on-board Wi-Fi and express schedules have allowed many such services to develop in spite of public policy leading Miller to question why these services, and bus services in general, are often seen as secondary adjuncts in the national mobility mix. In closing, Miller also underscored the importance of open data in providing new insights into how transport is changing and providing early signals to decision-makers on emerging trends.

Innovative Mobility Services

Jaehak Oh wrapped up the session by presenting three projects undertaken by the Korea Transport Institute (KOTI) in support of more seamless transport. Oh prefaced his comments by stressing that “seamless” travel – e.g. adapting infrastructure, operations, fare structures and information in support of more convenient travel – must necessarily
focus on travellers’ needs and expectations rather than on supplier or operator performance criteria. With this understanding, Oh presented work underway to develop integrated IT information services to help users navigate around and access services in transport terminals. These services, centralised via a single operations room, allow real-time information to be delivered to travellers and coordinate the delivery of on-demand travel-related services (e.g. wheelchair delivery, personalised and geo-located taxi reservations, etc.).

The second project presented by Oh seeks to extend the idea of cloud computing to a “cloud” transport system. This system allows personalised access to a broad range of mobility services (car-sharing, bicycle-sharing, public transport, etc.) via a single virtual interface. Highlighting the trend towards “owning less and sharing more”, Oh described how such integrated mobility services fit the aspirations of an emerging share of the population.

Finally, Oh described KOTI’s work to develop a national public transport system extending, connecting and integrating existing public transport networks into a seamless “network of networks”. The backbone of this system is based on hub-and-spoke networks deployed from intercity bus, high speed and other rail terminals. A key hurdle is the negotiation of integrated fares and coordinated schedules with revenue allocation being a fundamental challenge. The “One nation, one transport city” provides an ambitious vision of what seamless transport could mean for an entire nation, according to Oh.

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Transport policy aims to achieve strong connectivity and seamless transport where there is demand. But the economic and social geography that determines demand for mobility differs from the jurisdictional geography that underlies policy-making. This mismatch needs to be addressed and policy aligned with the spatial distribution of mobility to develop connectivity and seamlessness in the right areas. Providing seamless transport between cities or across borders requires co-ordinated responses to technical, institutional and financial issues from a variety of stakeholders. Based on practical case studies from Europe, India and the United States, the session examined how these issues can be addressed across institutional boundaries.

Connectivity in mega-regions

A keynote by Catherine Ross addressed on the challenges of mega-regions and transport connectivity. Large mega-regions with fast-growing urban corridors offer opportunities for enhancing connectivity in the transport sector.

“Mega-region transport planning may generate significant economic, social and mobility benefits with great potential to provide seamless transport”, Ross said.

To achieve these benefits, improved, integrated governance among different authorities and agencies is essential. At the mega-region scale, new governance structures need to be adopted with public and private partnerships and cross-sectoral alliances to pursue a common vision and common interests. In Northern California, for instance, researchers have emphasised adaptive and innovative forms of governance that function alongside existing governing authorities to provide structure and guidance on a greater scale than the single municipality or metropolitan area. Examples of new thinking in mega-region co-operation and co-ordination can also be found in a number of international initiatives, such as the Oresund Committee in Sweden and Denmark.

Connectivity across borders

International cross-border connectivity requires not only adequate transport infrastructure, but also a coherent institutional framework, especially as concerns customs procedures. According to Manoj Singh, “customs facilitation in Europe is the heaven of integration” and much effort is still needed between India and its neighbouring countries. But significant progress has been made recently to better connect the North East of India with Bangladesh, where people share a similar culture and the same need and desire for a smoother exchange of goods and travel for people.
Administrative boundaries at all levels can constitute a barrier to connectivity. “Customers of public transport do not care about administrative boundaries,” said Alain Flausch, and “regional identity can be a positive factor in fostering community support for institutions and projects that enhance regional mobility.” Governance structures that support cross-border transportation must establish a collaborative regional identity and develop multi-layered institutional and governance structures, from national and federal to local level. Effective cross-border collaboration also requires the identification of common metrics and points of agreement on levels of customer service, on finance for projects of common interest and on information technologies to support seamless services. This is a continuous process that needs to be the focus of collaboration.

Collaboration among stakeholders

Strengthened and transparent collaboration between the public and the private sector can accelerate the uptake of innovative technologies to facilitate the travel of customers. As an example, Alain Flausch noted that public transport operators collect huge amounts of information and data on passenger travel habits and needs; sharing this information with private service providers can accelerate the development of innovative tools – such as smartphone applications – which contribute to smoother travel.

John Horsley agreed that co-operation among all levels of authority, and also between public and private sectors, is essential to foster connectivity. He underlined that “smooth traffic flow between Canada and Michigan will become reality only because of true collaboration”, referring to the ongoing construction of the new bridge connecting Detroit in Michigan and Windsor in Ontario – the largest single point of entry to the United States. True collaboration between the governments of the State of Michigan in the United States and the Province of Ontario in Canada ensured successful achievement of this project, which required years of planning and approval by the respective metropolitan planning organisations to reach agreement on design, construction and financing.

Obtaining cooperation means crafting an arrangement that is acceptable to all parties involved. If there is a good transport project, i.e. one for which total benefits are larger than total costs, this is possible in principle. But in practice, arriving at a distribution of net benefits that all parties can agree with can be very hard. This is because the starting point of the negotiations is often very different from such a broadly acceptable outcome, so some parties will need to be convinced to forego some share of benefits. The difficulties of such negotiations explain, at least partly, the lengthy procedures that are common with multi-jurisdictional and multi-stakeholder transport projects.

Long-term vision, strong institutions

Cooperation among all levels of authority – and integration of land use, social, environmental and fiscal policies – are essential to a sustainable regional mobility policy. This requires strong institutions with long-term vision and planning cycles as well as effective leadership. The social and economic geography that shapes demand for mobility shifts more rapidly than governance structures do, and governance structures do not exist for transport’s sake alone.

As a result, there is often a lag between the real mobility or infrastructure needs and actual policies. In some countries, for example, lack of national-level legislation enabling the application and enforcement of paid parking in cities or road pricing is delaying implementation of these demand management policies. So what can be done to address this problem? Practical experience suggests that leadership and strong institutions are crucial to establishing, or at least facilitating, integration of a wide range of interests from different stakeholders. And institutional strength requires legitimacy, which is much easier to obtain if institutions are rooted in regional identities.
One challenge is to agree on a shared vision among the different stakeholders, at national, regional and local level, which may have different cultures and different short-term objectives. With strong institutions, it is possible to introduce long-term planning for transport policy, which is highly desirable given the long lifetimes of the assets involved. With a long-term horizon, it becomes easier to evolve toward more integrated and sustainable mobility, because mobility, land-use, social, and environmental considerations can be jointly considered. Strong institutions also make it easier to access funding and financing, because they introduce stability and clarity of purpose into transport policy, and this reduces risk for private as well as public providers of funds and financing.

Funding seamless regional transport

Developing seamless regional transport requires adequate funding, which cannot be dependent only on national or supra-national funding sources, but also on strong commitment from local institutions.

Sven Morlok reported on the development of the Berlin-Dresden-Prague-Vienna corridor, involving road, rail and waterways development, and which is embedded in the Trans-European Network. This project has required a fully coordinated funding mechanism, with financial support from the European Union, the Federal German government and the governments of the German States along the corridor. Securing funding from the local level can only be achieved through full support of the community. This required in particular thorough consultation — which altered initial plans —, and sound appraisal of long-term impacts of funding with clear indications of the benefits that regional citizens would gain.

In some cases, securing public funding for a major infrastructure project requires years of concertation before reaching a solution for all parties involved. This can delay projects, but without adequate consultation the risks of costly delays in the middle of a project are exacerbated. The question of funding transport systems and the question of how mobility can and should be paid for will be the focus of the International Transport Forum’s Annual Summit in May 2013.