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The future of interurban passenger transport - bringing citizens closer together: Symposium summary and conclusions. 18th International Symposium on Transport Economics and Policy, Madrid, Spain, 16-18 November 2009

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2010

Joint Transport Research Centre

18th INTERNATIONAL SYMPOSIUM

16-18 November 2009, MADRID

11

DISCUSSION PAPERS



International
Transport
Forum

THE FUTURE OF INTERURBAN PASSENGER TRANSPORT - BRINGING CITIZENS CLOSER TOGETHER

SYMPOSIUM SUMMARY AND CONCLUSIONS



International Transport Forum

The International Transport Forum is an inter-governmental body within the OECD family. The Forum is a global platform for transport policy makers and stakeholders. Its objective is to serve political leaders and a larger public in developing a better understanding of the role of transport in economic growth and the role of transport policy in addressing the social and environmental dimensions of sustainable development. The Forum organises a Conference for Ministers and leading figures from civil society each May in Leipzig, Germany.

The members of the Forum are: Albania, Armenia, Australia, Austria, Azerbaijan, Belarus, Belgium, Bosnia-Herzegovina, Bulgaria, Canada, Croatia, the Czech Republic, Denmark, Estonia, Finland, France, FYROM, Georgia, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Korea, Latvia, Liechtenstein, Lithuania, Luxembourg, Malta, Mexico, Moldova, Montenegro, Netherlands, New Zealand, Norway, Poland, Portugal, Romania, Russia, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, Ukraine, the United Kingdom and the United States. The Forum's Secretariat is located in Paris.

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Summary of 18th International Symposium on Transport Economics and Policy,

Madrid, Spain, 16-18 November 2009:

The future for interurban passenger transport – Bringing citizens closer together

1. Introduction

The Symposium brought together leading transport researchers from around the world to explore a range of issues under the general theme of “the future for interurban passenger transport”. A first set of papers investigates what drives demand for interurban passenger transport and infers how it may evolve in the future. The remaining papers investigate transport policy issues that emerge as key challenges from the long-run view on demand: when to invest in high-speed rail, how to regulate to ensure efficient operation, how to assign infrastructure to different types of users (e.g. cars and trucks), what role for information provision, and how to manage environmental impacts. Closing remarks summarized insights from the discussions from an academic and policy-making perspective.

In her opening remarks, Mrs **Concepción Gutierrez del Castillo**, Spanish Secretary of State for Transport, emphasized the importance of sustainability and equity as goals for transport policy, while maintaining its contributions to economic growth. Technological and organisational innovations are required to improve the sector’s efficiency. Investments in high speed trains, single sky agreements, and renewable forms of energy supply are all part of the solution. Many problems require an international approach.

Mr. **Jack Short**, Secretary-General of the International Transport Forum, suggested that, although progress has been made, there remains considerable scope for improvement in the contribution of transportation to economic welfare. Research has proven its value in improving policy in many instances, and continues to be important. In order to increase their impact, researchers need to focus more on implementation issues as this is the key challenge for policy makers in bringing new ideas into practice.

Mr. Short provided a quick overview of Symposium themes. It addresses fundamental questions concerning the shape of future passenger transport and whether current infrastructure and governance policies are appropriate. Big agglomerations are increasingly the motor of economic development. Growth will be stimulated by further agglomeration of economic activity in large cities, and high-quality transport between and inside metropolitan areas facilitates such agglomeration, so contributes to further growth. Deregulation, where it has occurred, has brought economic benefits. There is scope for further liberalisation in many transport markets. Investing in transport is not just a response to growing demand, but can be a force for driving growth if it is well targeted and makes good use of scarce financial resources. For this, improved appraisal is essential, with Cost-Benefit Analysis and Environmental Assessment used strategically to find good solutions across a comprehensive range of potential responses to capacity problems.

Mr. **Richard Thivierge**, Chair of the Joint Transport Research Committee underlined that the Symposium papers address key challenges for future transport policy: when to invest in high-speed rail, how to regulate to ensure efficient operation, how to assign infrastructure to different types of users (e.g. cars and trucks), what role for information provision, and how to manage environmental impacts.

2. The spatial distribution of economic activity and transport: insights from the new economic geography

In his keynote speech, **Jacques Thisse** developed a framework to understand the long run development of demand through insights on the location decisions of firms and workers. For firms, a key trade-off in deciding where to locate is between returns to scale in production and transport costs, the latter being understood broadly as trade costs. Concentrating production in cities allows exploiting scale economies, and is facilitated by declining transport costs. Low transport costs, between and inside cities, contribute to an uneven spatial distribution of production and of income. As economies become richer, taste factors have an increasing impact on location choices. For example, workers' dislike for relocating to cities may induce them not to move, with long commutes or lower growth as a consequence.

Thisse's analysis is quite different from the "fixed location" view that is common in transport economics. It increases awareness that decisions on what transport networks to develop – usually public decisions – have a direct and long-lasting impact on where economic activity will take place and how efficient it will be. This raises some questions for transport project appraisal: are the effects on location choice sufficiently reflected in assessments of infrastructure projects, and how does the framework inform our views on where to focus our efforts (e.g. urban vs. interurban infrastructure)?

Thisse's framework establishes a more direct link between transport and economic development than is present in much of transport economics, but at the same time it considers transport in a narrow sense as it emphasizes transport for trade and for commuting. Yves Crozet's presentation, discussed in Section 3, makes the point that in passenger transport other trip purposes matter as well. Furthermore, in analyzing passenger transport, time spent in transport is a key factor next to monetary outlays. The latter are affected by subsidies, so that any change in funding policies may affect location choices and cities' growth potential.

3. What drives demand for interurban transport?

Yves Crozet pointed out that leisure transport and business travel, and more generally discretionary travel, represent an increasing share of trips. Past trends also reveal that with higher incomes came farther, faster, more frequent, and shorter duration trips. Recently there are signs of saturation of demand in some modes – notably car travel ("the golden age of cars may be over") – in some countries. There is no such saturation in overall mobility as there has been a switch to faster modes including high speed rail and air transport. Associated with this modal shift is a move towards interurban trips, in a network of increasingly complementary cities. The variety of activities that can be accessed increases with faster transport, and with higher incomes the variety of activities consumed rises. With competing demands on the available amount of time, the opportunity cost of activities rises and their duration tends to decline, i.e. there is a trade off between duration and variety in the scheduling of leisure activities.

Will this pattern continue? Saturation could emerge in the sense that there is a limit to how many activities can be squeezed into a fixed time budget, or in the sense that people will come to dislike hectic lifestyles. But these factors are not very likely to curb demand soon. Instead, slower growth may follow from energy and environmental constraints. In the latter case, these constraints need to be

imposed through policy. In many countries, there are measures to steer growing demand away from air travel towards high speed rail, reflecting the view that this is the best compromise between growing demand and environmental requirements. The papers on high speed rail (Section 4) question the wisdom of this approach, as they emphasize that high speed rail makes sense in a limited set of circumstances only.

During the discussion the issue of time spent in intermodal connections was raised. Currently in Europe, time spent in accessing airports and sometimes new high speed railway stations is longer than the core travelling time, by plane for example. This shows the potential for improvements in intermodal access and the importance of the issue of intermodality. Time-resources devoted to security checks at airports have also increased. To the extent such costs cannot be compressed, they will curb the growth in demand for fast transport modes.

David Gillen asks if demand for long distance air travel is likely to grow as it did before the 2008 shock. The answer is that several factors indicate that a more moderate growth path is likely due to less trade-oriented and slower growth for the world economy, higher energy prices, and environmental policy. Recovery is slow and we may be on the verge of a new macro economy, with profound impacts on the transport sector and international air travel in particular. For international air travel, GDP is not the main indicator (whereas it is for domestic air travel). Instead, changes in trade and foreign direct investment drive changes in air passenger kilometres. International air transport, by far the main component of air travel, is closely related to the growth of trade and the likely evolution of tourism (with trade-related traffic representing a declining share of volume but a large share of revenue).

In addition, air travel is stimulated by other factors than growth, notably deregulation and the concurrent changes in supply. These factors boost demand, but as deregulation permeates global markets its stimulating effects will wane over time. There also is a risk that protectionism will slow down movements towards open sky agreements. In sum, demand projections that are based on output mainly, and that implicitly assume growth will rebound to pre-crisis levels, likely overstate future growth. The ICAO, Airbus, and Boeing forecasts fall in this category. The economic swing has been of larger amplitude than previous bubble-bursts, and the fact that it affects a larger part of the world population means that long distance travel will be most affected.

Discussions focused on competition between high speed train and air travel, stressing that competition potentially brings gains in efficiency. Competition stimulates modes to develop in market segments where they have a comparative advantage. High speed rail outperforms conventional rail and the very large air market in a fairly narrow range of segments. Some of these segments rely on complementarities between air and rail, with fast trains providing convenient access to airports. The emergence of low cost airlines strengthens the number of destinations where competition exists and also reduces the number of short and medium distances where high speed rail may be relevant. As will be emphasized below, where access charges for railway infrastructure are very high this deters competition.

4. Assessing high-speed rail projects

Chris Nash pointed out that for new high speed rail lines to be beneficial very high traffic volumes are required, of the order of 9 million passengers per year on average (with variations depending on construction costs), a number not attained in all proposed projects. In markets with

travel times of three hours or less between city centres, high speed rail tends to capture at least 60% of the air plus rail markets.

Yield management means that prices exceed marginal costs. Whether it allows profitable operation, however, depends on access charges, which tend to be high (exceeding marginal cost, sometimes by a factor of 5) in a vertically separated environment. It is questionable from a social point of view if such high access charges make sense, given that they discourage use of very expensive infrastructure. If open access models of competition are accompanied by such charges, they may be outperformed by franchising models of competition.

High speed rail is rarely worth it for higher speed alone but where a new line is required to accommodate growth the marginal cost of higher speed may be low enough to justify the high speed option. The basic case for investment lies in added capacity, and the capacity of a high speed line is vast. The benefits of released capacity in other rail travel and in airports (not so much in roads) need to be accounted for in assessments. Of course, such benefits occur only when there is congestion elsewhere, and alternative ways of expanding capacity need to be considered.

Environmental benefits are not a key argument in high speed rail's favour. The energy intensity of high speed rail is about twice that of conventional rail, an effect partly compensated by higher load factors. High speed rail does not save energy, but may avoid CO₂ emissions if power is produced with low emissions. The limited environmental bonus from high speed rail is further diminished when emissions from the construction phase are included. For example, according to Mr. Crozet, the Dijon – Mulhouse line will need about 12 years of operation to compensate for emissions from construction. Numbers vary strongly across projects given the dependence of emissions on design choices (e.g. tunnels).

Network effects, i.e. volume changes in non-high speed rail parts of the rail network, need to be accounted for and are potentially important. Such network effects tend to be substantially larger where high speed rail shares a general purpose network, compared to the case of dedicated networks (as is dictated by technology in e.g. the case of maglev). Wider economic benefits, e.g. boosting agglomeration economies, are uncertain and vary greatly from project to project.

Katsuhiro Yamaguchi provides a stark example of the finding that the basic economic case for high speed rail is one of very high levels of demand confronted with capacity constraints across modes. His analysis suggests that a maglev train connecting Tokyo, Nagoya and Osaka would be socially beneficial if the Japanese economy grew by 2-3% over the next 65 years. In that case, transport demand would grow so fast that even with the Maglev the volume of air transport would continue to grow. Irrespective of whether these assumptions are realistic, it deserves emphasis that the current maglev project has been proposed by the private high speed rail company running trains on the potential maglev corridor. Its motive could be to move proactively to forestall competition from an alternate publicly funded proposal.

Ginés de Rus follows Nash in stating that not all proposed high speed rail projects pass a cost-benefit test. Furthermore, he points out that public funds are getting scarcer and more money will be needed to repair and upgrade existing infrastructure, highlighting the need for careful project assessment.

In contrast to Nash, de Rus sees merit in the idea that prices should reflect all costs (not just marginal costs) in order to provide correct signals to investors (i.e., in this case, avoid overinvestment). Increased scarcity of public funds could mean more private sector involvement and heavier reliance on user charging to finance infrastructure. De Rus asks what this could mean for high

speed rail fares – and if fares increase, what that means for occupancy rates, which are key in making high speed rail socially beneficial. Careful project assessment also requires considering a reasonable set of alternatives. For example, if high speed rail generates benefits through relieving congestion elsewhere, should it be assumed that no improvements to charges for these other infrastructures are envisaged? In other words, should we go ahead with high speed rail because airport or rail network access is priced inappropriately?

In the face of these remarks, it is difficult to explain the widespread enthusiasm for high speed rail. De Rus points to co-financing arrangements for EU funds as one explanatory factor, with the potential of leveraging national funds with EU money diverting resources from projects that don't qualify for co-financing but show higher returns. This mechanism results in increased subsidies where investment costs are higher and revenues lower. Discussions ensued on what is the funding principle for high speed rail, with stated objectives including European integration and cohesion, concerns not included in standard cost-benefit appraisal. Many experts, however, subscribe to the view that high speed rail is not “beyond” cost-benefit appraisal.

While cost-benefit analysis is deemed to be indispensable, practice is not always satisfactory. In light of Thisse's remarks and given the size of a typical high speed rail project, it is desirable to develop a systematic view on location effects. However, analytical and empirical constraints have prevented this from happening. Advances in this regard could have a considerable payoff. Experts pointed out that such advances don't necessarily mean increased complexity of models used, and expressed a preference for relying on simple models and scenarios in order to guarantee transparency and improve robustness.

5. Governance: how much (de)regulation?

Botond Aba described how fiscal concerns in Hungary tend to be detrimental to the market position of public transport. Individual consumers tend to prefer cars over public transport and public investment in motorways caters to these preferences, leading to a strong modal shift towards cars. Car ownership and use creates an attractive base for generating public revenue. Public transport, while socially beneficial, cannot usually break even financially, meaning it is costly in terms of public funds. Aba contends that the budgetary implications of car and public transport travel drive transport policy, more than transport interests proper. A sustainability-oriented transport policy would require strong public involvement, with a focus on exploiting complementarities between public and private transport, rather than seeing them as competing modes.

Clifford Winston takes an almost diametrically opposed view, asking what the experience with deregulation in various parts of the US transport system tells us about the potential impacts of further deregulation and privatization. He argues that deregulation has delivered substantial benefits, and expects further improvement as the private sector continues adapting to the deregulated environment. Remaining inefficiencies due to poor public policy hamper the realization of the full benefits of deregulation. Where there is strong public involvement, e.g. in public transport and in infrastructure provision, performance declines, innovation is virtually absent, and funding tends to fall short.

Still according to Winston, the way forward is to continue reducing public involvement in the transport sector, through outright privatization of most functions. This will stimulate entry (boosting competition) as well as organizational and technological innovation, which are strongly stifled by regulation. The entry of Megabus in the US, which revived the coach market, can serve as a recent example. In general, any shortcomings of the market are thought to be small in comparison with

government failure, so that deregulation or privatization is recommended even where cost structures may create problems (e.g. highways). Discussion filed to shed light on how private road monopolists would be deterred from rent seeking in the way they set charges for using roads. Adaptation to deregulation is slow and adaptation to privatization is slower. Frustration with the lack of quickly forthcoming benefits creates a threat of re-regulation (especially in times of crisis), implying a continuing distraction of entrepreneurial effort.

Long-distance coach services are an example of successful deregulation in Europe. **Didier van de Velde** shows that countries that adopted licensing approaches have witnessed the emergence of a profitable and competitive industry serving market segments not very well catered for by rail, air or car modes. Substitutability with rail is particularly weak, calling into question the rationale for policies in some countries to discourage coach services in order to protect rail, even if one would think such policies justifiable in principle. At the same time, competitive pressure from car and air as well as from potential entrants is strong enough to maintain competition even when the number of incumbents is small. Van de Velde was careful to point out that the (de-)regulatory model for coach services works well but is not necessarily transferable to other modes (notably rail), given major differences in technology, cost structures, and possibly the structure of demand.

De-regulation has progressed more slowly on Europe's railways. The team from the Universities of **Berlin and Dresden** assessed the merits of three models for market access in European long-distance passenger rail transport, characterised as "Tendered Concessions", the "Monopolistic Network Operator" and the "Open Market". Most empirical experience to date relates to the tendered concessions developed in Great Britain, with their strengths and weaknesses (see *Competitive Tendering of Rail Services*, ECMT/OECD 2007). Open access experience is still in its infancy but appears to be the preferred approach of the European Union for regulating international services, as apparent in Directive 2007/58/EC. This directive requires international services to be open for competition and permits cabotage, that is picking up domestic passengers on intermediate stops between terminals in different countries. Cabotage rights can be denied under EU rules, however, on routes operated by train companies under public service obligations with financial support from government. It is as yet unclear how compatible open access for international services will be with tendered concessions for domestic markets. This could be a problem particularly for networks in a country like the Netherlands where services are interwoven.

The paper includes a discussion of the 9 small scale attempts at entry in Germany, Europe's largest passenger market, over the last 15 years, none involving more than 2 train pairs. Two current cases are potentially more significant. Locomore Rail has announced plans to operate three daily trains from Hamburg to Cologne from August 2010 and has been successful in securing train paths from DB Netz. Keolis, backed by France's SNCF, plans services between Strasbourg, Frankfurt and between Hamburg, and Strasbourg, Frankfurt, Berlin, and Hamburg, comparable to DB InterCity services. Keolis has not yet received a confirmation of the train paths requested, with a decision to be made by the network subsidiary of DB by April 2010.

John Preston concurred that competition for long distance rail services remains relatively limited, noting that on-track competition, where it has occurred, seems to focus on niche markets which the incumbent operator has neglected. At the same time modelling work indicates that if track access charges are based on short run marginal cost, head-on competition may be feasible for densely trafficked routes but not necessarily socially desirable, with a tendency to result in too much service, at too high fares. By contrast, analysis of the niche open access entry in Britain providing direct services to new destinations, based on marginal cost based track access charges, does appear socially desirable. Capacity constraints on the main lines and at key terminals mean that such competition may be limited and there is the wider issue of whether these services are making the best use of limited capacity.

Off track competition in Great Britain has been able to attract sufficient numbers of bidders, has coincided with strong demand growth and can result in large premia being paid to the government. However, such competition is vulnerable to the winner's curse (i.e. in order to win bids have to present optimistic revenue forecasts that make them more likely to fail). The biggest revenue risk relates to GDP and risk sharing mechanisms that link premia / subsidies to GDP could perhaps avoid the worst problems experienced with franchises. Linking payments to GDP could also permit longer franchise periods, better suited to investment in new rolling stock.

Discussions on the papers concluded that the high fixed costs of providing passenger rail services, and especially high speed services, condemns open access competition to a peripheral role. Open access entry is usually only possible where the entrant is required to pay charges for using infrastructure based on marginal, variable or avoidable costs. Seeking a significant contribution to fixed costs is likely to exclude entry. High speed train services are usually charged high track access prices, covering a large part of fixed costs, making open access entry difficult in this market. Conversely if an open access operator paying only marginal costs took a large share of the market, network operations would be financially compromised. Infrastructure charges in Germany reflect these factors in basing prices on marginal costs for train operators that run only a small number of services a day on a route and charging much higher access prices for more frequent services. This structure of charges is partly a result of an regulatory decision that an early schedule of charges that spread fixed costs more evenly was anti-competitive.

It was acknowledged that all approaches to introducing competition into rail passenger markets pose challenging regulatory problems but competition for the market, through concessions, was viewed as more likely to succeed than competition in the market through open access train operations because it offers solutions for covering fixed costs. With either approach to introducing competition, the central importance of a credible and independent regulator was stressed. The need for a strong regulatory lead is particularly important when open access competition is expected to develop in circumstances where management of the infrastructure network is integrated with an existing train operator, for example through a holding company.

6. Assigning infrastructure

Advanced transport systems consist of various modes, some of which use dedicated infrastructure. Increased product differentiation within rail transport has led to dedicated infrastructure for high speed rail. By contrast, nearly all road infrastructure is general purpose and is shared by a very heterogeneous set of users. Could it make sense to assign parts of the road network to particular types of traffic? This issue is investigated in the papers by **Robert Poole** and **Robin Lindsey**, with a focus on car and truck traffic.

Poole observes that many High-Occupancy-Vehicle lanes still are underused, but argues that separate infrastructures can make sense when potential users differ strongly in their value of time. Car-only lanes can be justified in urban contexts where speeds are low, as this allows designing narrower lanes which in turn makes better use of existing rights-of-way and opens perspectives for using new rights-of-way (e.g. drainage channels, power line corridors). Truck-only lanes can be designed for heavy trailer combinations. Lindsey's formal analysis supports the possible case for separation, in the sense that an unregulated equilibrium on a general purpose facility tends to lead to integration, whereas the lowest-cost outcome could require separation because of crash risks or because of strongly differing values of time. Tolls can be used to match the unregulated and lowest-

cost outcome. Lane access restrictions are less effective, however. For example, if cars are banned from one lane but trucks are not, then trucks can use both lanes and this raises costs.

7. Harnessing information technology

Mr. Zimmermann explained that because the telematics market did not develop as expected a high tech initiative was taken in 2006 by the German authorities. The idea is to offer a complete range of information services both for private and public transport. Due to proprietary efforts, various interfaces and protocols had to be developed with algorithms for the transfer of data. Information has to be provided both before and while travelling. Floating data on secondary roads had to be put in place to guarantee that diversion on the secondary network does not lead to a loss of information. There has been some reluctance of public companies to provide data on incidents, but because of the interdependencies among service providers and the bad image associated with the lack of accurate data, the floating data system worked in the end. In this respect, providing information is a self reinforcing mechanism.

The discussion identified several unanswered questions, all of them important for any ITS evaluation: how to measure expected benefits of projects and of ITS in general; what elements might favour a Benefit/Cost ratio larger than 1; how to deal with instability when suggesting alternative routes may create more congestion on the diversion routes than it removes on the main route?

Mr. Tapiador and **Mr. Marti-Henneberg** tackled the problem intermodality in a specific context. As governments invest in high speed rail, railway operators have to ensure access to this new type of services and link it to the railway system of the Nineteenth Century as a starting point. New railway stations also have to be built, often located on the outskirts of cities. In this context the private car (“Kiss and ride”) is the preferred access mode, with taxis playing a very important role on the return journey. This shows that in dealing with accessibility and intermodality a wide range of modes has to be considered. Governments tend to focus on big investments whereas more simple and direct decisions can be quite effective to improve accessibility. At the same time, the authors argue that investments in information technologies may prove to be a very efficient way to strengthen intermodality at low costs.

The latter point provoked questions: to which extent are the costs of implementation of ITS really several orders of magnitude lower than in "hardware" (infrastructure / rolling stock)? Clear insight here is obviously important for deciding what to invest in.

8. Sustainable inter-urban mobility

As noted by De Rus and Nash, advocates of high speed rail investments often place heavy emphasis on environmental benefits, especially when they divert significant shares of air travel. **Per Kågeson** tests this assertion by looking at the relative environmental (principally GHG) impacts of competing inter-urban modes, not at their present level of performance but at one more representative of their impact over the lifetime of high speed rail infrastructure taking 2025 as the baseline. Many factors play a role in this assessment, including the amount of GHGs released during the construction of new infrastructure. Overall, however, it is the speed and resulting energy requirements for high speed rail that dominate the final impact assessment. Kågeson notes that “it is

odd that so much emphasis is placed on high speed in the rail sector when so much focus has been on reducing speed for GHG savings on roads and in the air”.

Does high-speed rail deliver on its claimed environmental benefits? High speed rail can deliver GHG savings, especially when it replaces air travel, but after accounting for generated travel, high energy requirements and the carbon intensity of the marginal electricity used, these benefits are small and expensive. “Standard” passenger rail services may be “good enough” from both an environmental and economic perspective, especially where travel volumes are low and are not expected to grow significantly. These findings are robust across all but the most extreme assumptions so that in most cases it would be incorrect to attribute large-scale GHG benefits to high speed rail.

Much of the debate regarding regulatory approaches to reducing GHG emissions from aviation has focused on the relative merits of a fuel levy versus a trading system but, as Peter Morrell points out, relative legal impediments to action on a global fuel levy and the EU decision to include aviation emissions within the European Trading System (ETS) has focused attention on the mechanics and economics of aviation GHG emissions trading. He points out that, as with other trading approaches, decisions regarding allocation regimes and distortionary impacts are important to understand when assessing overall performance -- not because they have an impact on overall emissions or costs but because they affect carriers differently and this can affect competitive conditions in the industry, which in turn affects emissions.

- Will carriers restructure their operations to avoid long inbound or outbound European flight segments in response to the new European rules? The answer is not straightforward since avoiding EU hubs may entail added fuel and time costs and may not fit with other commercial strategies (e.g. connecting with partner or code-share networks). In the examples Morrell cites, the cost penalty of the ETS charge is more-or-less matched by the fuel cost penalty of non-EU hubbing on the same point-to-point routes.
- Morrell asks how increased fares resulting from the added cost of permits might discourage travel and thus reduce aviation emissions. With 100% pass-through emissions could be 7.5% below what they otherwise would have been in 2020. However, it is not clear that operators would pass on 100% of the added costs. Carriers can use non-ETS routes, cargo and differentiated passenger markets to distribute the ETS burden so that not every fare increases by the costs of CO₂-emissions caused by the flight. As pointed out in discussions, pass-through could also be lower at congested airports where its impact is likely to be a reduction in the landing slot rents accruing to incumbent airlines (OECD/ITF 2009), a view challenged by Morrell as failing to take account of the multi-dimensional outputs of airlines.
- Facing steeply rising abatement costs in aviation and a context where carbon prices will be largely set in the large power and electricity sectors, aviation is unlikely to reduce emissions in absolute terms and only slightly relative to transport volume. It would, however, pay for emission reductions in other ETS sectors by raising the cost of carbon permits. This is simply a reflection of differences in marginal abatement costs between sectors but, as pointed out in the discussion, it does raise the issue of the appropriateness of non-EU operators paying for EU emission reductions.

9. Strategic Environmental Assessment

There is considerable experience in applying strategic environmental assessment (SEA) to transport but, as **Rodrigo Jiliberto** notes, many of the procedures followed are ill adapted to the political decision making environment. A narrow legalistic approach is often used, treating SEA simply as a larger scale version of traditional Environmental Impact Appraisal (EIA). **Maria Partidario** observes that SEA was initially developed as a way to move environmental and social issues upstream in the planning and decision-making process and improve the context for subsequent project EIAs. But she argues that to be effective in changing outcomes, SEA has to cut its links with EIA and become an instrument that occupies a new space in strategic development processes, changing attitudes and establishing a direct role in the decision-making process.

She chose a case study of the selection of the site for a new airport for Lisbon to illustrate how SEA can change outcomes. Success in this case was in part conditioned because the government initiated a new SEA study as a means to achieve closure in an incremental planning process that had led to the selection of a number of unsuitable sites with the results contested by different interest groups. The SEA began by screening the entire region around Lisbon for suitable sites meeting criteria for accessibility, economic development potential and environmental sensitivity. The success of the process was attributed to a clear focus on the decision that needed to be made; not whether a new airport was required but where to locate it and how best to integrate it into the economic and environmental fabric of the region. The assessment was based on seven critical factors acknowledged by policy makers to be most relevant to the decision, and this enabled a much more structured approach to the studies that contributed to the SEA than is typical. Above all success was attributed to communicating clearly with politicians through the choice of indicators presented and the way in which summaries of the analysis undertaken was presented.

10. Final Session

Cristina Narbona Ruiz was the first speaker to intervene in the final session chaired by **Francesc Robusté**. She echoed David Gillen's view that the 2008 crisis is in many respects a rupture, and is accompanied by an environmental crisis. The failure of markets to properly regulate the global economy calls for a new political governance through transparency of information and accountability. A new paradigm is also needed because we are potentially facing some irreversible consequences of climate change. A green growth strategy is essential and it is at the same time a great challenge for politicians even if the economic costs of doing nothing would be higher than the costs of the measures to be implemented. In fact, the later we act, the more costly the measures to be taken will be. We have to gradually eliminate fossil fuel subsidies and move to carbon pricing. Part of the solution is also to move from an economy of ownership to one of service functionality and manage the demand for services. For example, in the transportation sector, public transport can no longer be seen as a second class choice.

Paolo Costa commented on the high-speed rail analyses discussed earlier, explaining that high speed rail was part of the TEN-T programme to improve European integration through connecting the national networks and ensuring interoperability. A technical jump through new high speed rail infrastructure was considered as the only way of strengthening public transport attractiveness while at the same time moving towards a decarbonized economy. Through the network effects and improved interoperability the long run positive return of these investments are undoubtedly positive for Paolo Costa, even if narrower economic assessments suggest negative social returns in some cases.

In response, Chris Nash agreed that profound changes in transport are required to meet sustainability. However, the contribution of high speed rail in achieving European integration is very limited: the demand for such services comes from diversion of conventional trains and other modes, and is altogether not sufficient even with generated traffic to cover costs. Are mega projects such as high speed rail the best way to achieve this European cohesion? Freight transport is also very important and Chris Nash questioned whether in the framework of TEN-T it would not have been wiser to concentrate on investment in freight transport even if HST frees capacity for some more conventional services. The high speed rail system in Europe is characterized by high costs, a low level of interoperability, and technical complexity while at the same a consistent approach to questions such as adequate pricing for the use of infrastructure has still to be found. At this stage, insisting on cost recovery through high access charges is bound to produce socially suboptimal use of available infrastructure.

Francesc Robusté summed up the debate saying that sustainability is also a condition for economic growth and we cannot adopt a business as usual approach for future interurban transport. He added that on various points such as accessibility enhancement, cost benefit analysis, understanding future patterns of mobility, pricing and strategic decision-making the Symposium brought forward looking analysis that should help improve transport policy and transport services.

References

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