



Seminar Proceedings

April 2014

Catalysing development through transport investment

‘The role of appraisal and decision-making at the national and city-regional levels’



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Seminar Proceedings

Catalysing development through transport investment: The role of appraisal and decision-making at the national and city-regional levels

Date: 10.30-16.30, 6th February 2014

Venue: Brunei Gallery, SOAS, University of London, B202

Bartlett School of Planning

University College London

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Objectives

The Bartlett School of Planning organised a one-day seminar on 6 February 2014, attended by 27 cross-disciplinary participants from local practitioners, policy makers, promoters of key transport schemes, consultants, and academics in the UK to exchange views on three relevant topics, namely 'evaluating wider effects of transport investment', 'institutional arrangement and governance', 'innovative funding systems'. This seminar set out to achieve four objectives:

- To present recent research findings and the key issues they raise
- To facilitate critical debate between cross-disciplinary experts concerning links between transport investment and its development benefits
- To assist further development of research in the relevant fields
- To generate recommendations with regards to:

- Evaluating indirect impacts and decision-making of transport investment
- Developing innovative funding mechanisms and institutional arrangements
- Achieving wider developmental impacts in the long term

The points raised and discussed at the seminar offer important insights into the achievements and limitations of the current system and suggest possible ways for developments in decision-making and research.

Seminar Background

The objectives of public transport investment embrace a wide range of indirect effects – e.g. modal shift, social equity, environmental protection, unblocking urban/regional economic development and regeneration – in addition to the direct effects (time saving, cost reduction, congestion relief, and user benefits). In the UK, from a national perspective, in order to prioritise transport schemes within limited funding resources, the Department for Transport and its predecessors developed a transport appraisal framework (WebTAG¹). Cost Benefit Analysis (CBA) has been used over the past 50 years and played a central role in informing decision-making about transport. Investment choices have largely been based on Benefit-Cost Ratios (BCRs) generated from monetised benefits. However, CBA does not adequately take account of the wider urban and regional economic benefits that new transport links can help to generate, and the role of planning is largely ignored in the decision-making process on transport schemes.

The limits of CBA and the neglect of wider planning objectives in the current decision-making of transport investment have been discussed extensively in both national and local transport

¹ There are variations of appraisal systems in the UK. The WebTAG system is applied in England. The STAG system is used in Scotland.

investment contexts. This matter is of particular concern when a degree of major schemes funding has devolved to a regional level. The UK's HS2 proposal, which has been promoted by the state as a catalyst for rebalancing regional inequality – reducing the north-south divide, has prompted a contentious national debate, including how such a large-scale transport investment can be justified and properly assessed. On a smaller scale, often, due to low BCRs, transport schemes for places which are economically vulnerable fail to establish an economic justification for funding. The current coalition government has planned to devolve centralised decision-making power to local transport bodies (LTBs) from April 2015². This provides a new opportunity to allow decisions on transport investment to be made more locally, in line with local development frameworks. But the one-rule-for-all and money-focused WebTAG approach appears to be a barrier to achieving strategic planning.

Ex-ante analysis/modelling methods, which are confined to a few narrowly defined factors such as travel time, cost, and a number of derived assumptions e.g. productivity, employment, income, have proved deficient in capturing the development benefits of transport investments over time. Ex-post findings have shown that the development impacts tend to vary in kind (land use, employment, etc.) and take place in stages. Even in the context of areas in dire need of social and physical regeneration, it is difficult to demonstrate that projects will be sufficiently transformative to justify their estimated budgets.

Additionally, recent empirical studies, which examined the developmental process in the wake of transport investment, demonstrated that additional supporting factors – e.g. land-use policy and regeneration strategies – are indispensable to achieve wider development effects. For a relatively thriving place, transport is a solution to remove bottlenecks for economic growth and market accessibility, while for a relatively weaker place, transport is an opportunity to stimulate the potential for redevelopment. This distinction involves the issue of winners and losers because transport investment has been recognised as a double-edged sword. It is a necessary but not a sufficient condition for urban/regional development. Transport is not a magic bullet and must have complementary investments in order to succeed. The critical question is whether conducive conditions are in place to make the most of transport investment.

At present, it is evident that a holistic planning perspective incorporating transport investment could be pivotal to achieve a more balanced wider territorial development pattern in the long term, but is lacking in the current system.

² Department for Transport. (2012). *Devolving local major transport schemes: next steps*. London: Department for Transport.

Seminar Programme

The one-day seminar convened in two major parts. The morning sessions were initiated by the co-chairmen, Professor Sir Peter Hall and Professor Peter Jones, followed by a short introduction presented by Professor Peter Hall on the EU SINTROPHER³ project funded by the INTERREG IVB programme. The seminar then received five invited presentations addressing the three main topics, which formed the basis for the discussion in the afternoon sessions.

³ SINTROPHER stands for *Sustainable Tram-based Transport Options for Peripheral European Regions*

Summary of Invited Presentations

The morning sessions featured talks by five invited speakers to present current approaches and recent research findings, from which key issues emerged:

- Tom Worsley (Visiting Fellow, Institute for Transport Studies, University of Leeds) presented 'The DfT's⁴ Approach to Valuing the Impacts of Transport Investment'. He highlighted the main features of the DfT's appraisal method, WebTAG, and indicated that there is a need for promulgation and better explanation of methods and simplification of WebTAG. He suggested that future research programmes need to be three-fold: better grasp of transport impact on productivity and economic geography; updating and improving current values of travel time savings; and better allowance for risk and uncertainty in forecasts and appraisal.
- Dr. Chia-Lin Chen (Research Associate, Bartlett School of Planning, UCL) reported evidence-based empirical findings on the wider impacts of high-

⁴ DfT is the acronym of Department for Transport in the UK.

speed trains (HST) on urban/regional development. Based on a case study of Lille and Nord-Pas-de-Calais (NPDC) and their urban/regional development with the arrival of the TGV-Nord, she showed that inter-regional inequality has been reduced slightly, while intra-regional disparity has critically been tackled through various interventions in addition to HST. This leads to the conclusion that HST is a necessary but not sufficient catalyst on its own; it involved a long-term developmental process with a need to develop a seamless and accessible multi-level transport network, an integrated planning framework, institutional capacity and resources, and deliberate regional intervention.

- Vince Lucas (Former Service Delivery Director, Southeastern Trains and Currently a Transport Consultant, and A Member of South East Local Economic Partnership Local Transport Body) presented 'The Impact of Domestic services on HS1' with the latest empirical findings of Javelin services on HS1 since their inauguration in 2009, highlighting the remarkable success of domestic HST services in spite of the recession and a significant change of perception of Kent as an investment location. However, there has been no visible correlation yet with residents' earnings at the district level. When it comes to economic transformation and benefits, Mr Lucas argued that they should be part of a long-term strategy and not a short-term growth measure.
- Tom Bridges (Chief Economic Development Officer, Leeds City Council) discussed transport investment and wider regional development in Leeds and its city region, including the wider context (economic geography) and development strategies/ schemes/ funding sources. He concluded that as economic restructuring is changing the roles of places, city-regional development in places like Leeds and its city region are essential for the UK. Transport improvements are needed to support regeneration and housing provision and job growth since poor connectivity limits city-regional agglomeration effects. Thus, greater local fundraising powers and appropriate appraisal methods are needed for different schemes with different objectives, instead of a one-size-fits-all approach.
- John Swanson (Associate, Steer Davies Gleave) described how an urban dynamic model had been used to design transport investment programmes in West Yorkshire with the aims of generating employment and improving access to employment for residents of poorer areas with no net increase in CO₂. Compared to a baseline case, holding all transport times and costs as fixed, a scenario of higher transport costs caused by congestion would result in a loss of about 22,000 jobs. This formed a benchmark for employment that could be generated by transport investment. Next, an investment package for a £1 billion West Yorkshire Transport Fund was developed to select 27 schemes out of sixty which were then identified and tested individually. Under this scenario, the whole package was estimated to achieve the following:
 - Generate over 18,000 jobs
 - Create employment opportunities for 15,000 residents
 - Generate £1.2 bn GVA pa
 - Achieve a BCR ratio between 4:1 and 5:1

Mr Swanson concluded that there are lessons to be learned, namely the importance of land use policy, the complex spatial effects that can follow investment, the ability of public transport to reduce congestion, the difficulty of reducing CO₂ emissions when employment activity increases and the creation of relatively small numbers of jobs but with valuable GVA figures. However, the package performed well compared to both the objectives set, and in terms of conventional BCRs.

Discussion

Note:

- In order to encourage openness and the sharing of information, the following discussion proceedings comply with 'Chatham House Rules' to avoid disclosing any participants' names. Views and discussion expressed in the discussion have been reorganised under common subject headings.
- The following contents are presented with a list of proposed questions and all the points made under each topic. The points made are not conclusive but provide valuable insights into the problems of the current system and possible ways forward.

Topic 1: Evaluating wider effects of transport investment

- How could the research findings of ex-post qualitative studies change the way transport schemes have been evaluated?
- Could BCRs properly determine wider effects of transport investment? Is there any other way to better evaluate transport investment?
- In which ways could developmental and regeneration impacts be included in the appraisal process?

The role of BCR and transport objectives

Decision-making on transport investment in the UK has been largely influenced by BCRs through the WebTAG appraisal system. There is a danger that over-reliance on BCRs and their dependence on quantifiable costs and benefits might eliminate potential invaluable proposals. Therefore, there is a need to widen the debate towards the wider objectives that transport investment might achieve and open up and gain public support, rather than appraisal being narrowly confined to BCRs.

In addition, different views exist between central and local government. Local transport authorities in the rest of the UK do not ask the same question as the DfT. They are less interested in BCRs and more so in regeneration, job creation etc. Departmental priorities might also distort analysis from cost or benefit sides. For instance, the productivity benefits of a scheme which generates tax are important to HM Treasury, but this will be missed by just looking at the cost in the BCR. When employment is generated, a large portion of the investment comes back as income tax, thus transport improvements can pay for themselves. In addition, due caution needs to be paid to displacement of tax revenue from one area to another.

The value-of-time assumption and a need to revisit rail travel in the 21st century

Since transport interventions can be perceived as attempts to move goods and people around efficiently, time savings have long been a proxy measure for benefits. However, this assumption does not well reflect the reality and the context. Against a 1960s background when value-of-time calculations were developed to appraise road building, the methodology assumed that car travel is a disutility. The wider background and context have now changed. There is a need to take different transport modes and technology advances into account: due to reducing disutility, how can the varied productive time saving be appraised, such as from car to rail, or crowded rail to a comfortable, wifi-enabled train with a table? In the extreme, slower trains might be appraised as more useful, even though in reality few would use them.

Modelling transformative effects and dramatic changes

One of the objectives of HS2 investment is rebalancing regional inequality, which involves a kind of transformative effects over and above the incremental effects of a railway project. However, the transformative impacts are more difficult to measure than the incremental effects. This difficulty has been emphasised in Hall & Hass-Klau

(1985)⁵. Many participants believe that current methods fail to model this objective since current approaches and tools are geared away from predicting dramatic change and deliver conservative estimates. By setting wider overarching objectives, agreed through greater cross-departmental dialogue and support, more radical outcomes could be achieved. But there is a dilemma: proposing such outcomes might not appear credible, particularly if empirical evidence is not available.

A holistic approach integrated with spatial planning is essential

A huge gulf exists between the current situation and achieving an integrated transport policy. A critical question was raised- what can transport investment do for other sectors? Are wider synergies valued? Some participants strongly expressed the view that all projects should be based around a local spatial plan, since all the infrastructure sectors are linked e.g. laying cables along the HST line, incorporating flood defences etc. A spatial plan is required to frame transport investment. At the moment, the constraints presented by other sectors have not been considered. One participant cited that Birmingham undertook an Integrated Transport Study, which was a good example of joined-up working and looking at all the different services.

Furthermore, whether transport investment can ensure social benefit – i.e. the affordability of public transport in comparison with private cars – is another issue. In the case of Blackpool, where many tourists are from less privileged backgrounds, people will balance public transport costs against motoring in an older car and the associated risk. Therefore, it is essential to make sure these people are not priced out of public transport options.

Similarly, valuing travel time as dominant factors could count against some transport interventions. Can the value of place making be measured? For example, having to walk a long way through a station would count against the BCR as it adds to travel time. However, a developer would see this as a positive, would be thinking of it as 'dwell time', considering how to create shops, pleasant spaces etc.

Leadership and intervention are not quantifiable

Several participants emphasised the importance of leadership to achieve transformative effects. Equally important are Government intervention and financial incentives. Financial incentives to develop in a particular area and the permanence of the intervention will influence whether business comes to the area. For a project

⁵ Hall, P. and C. Hass-Klau (1985). *Can Rail Save the City? The Impacts of Rail Rapid Transit and Pedestrianisation on British and German cities*. London: Gower.

with a lower hurdle CBA of only 1:1, a more policy-led decision making process could favour transport projects if defined as part of a wider transformational effort.

Temporal dimensions are not well understood

Participants widely agreed that the transformation effects involve a long-term development process. In the case of high-speed rail investment, it can take 10 years to see the impacts of HST. For instance, HS1 services in the UK were inaugurated in 2007 but a large-scale development project, 'Paramount' next to Ebbsfleet International station in Kent will not be realised until 2018. On the other hand, there is a window of opportunity from three to four years prior to the HS line opening to three to four years after it, in which to maximise investment opportunities. After that, the HS line will just be considered 'normal'.

Can the current appraisal methods reflect different types of transport schemes?

Wider economic impact methodology is very suited to Crossrail (a city region-wide transport scheme) but perhaps less suited to HS2 which is an inter-regional project.

In order to improve our analyses, new approaches are needed to deal with:

- land use change
- change in economic structure
- productivity in travel
- future prediction
- non-transport factors: disentangle the effects of HST from other effects e.g. improved skills
- the institutional capacity issues that drive decisions into account
- governance issues
- institutional structures

Topic 2: Institutional arrangements and governance

- How could transport investment be exploited to minimise further peripheralisation trends?
- To what extent could local transport investment be tailored to meet local need as LTBs are required to use the Department for Transport's business case guidance and WebTAG framework for making decisions on all schemes?
- What institutional arrangement can achieve inclusive transport investment? If local transport need is beyond the boundary of a single LTB and involves a wider territorial cooperation, is there any mechanism to address this issue?

Current LTB red-tape practices in the UK

Although the Local Transport Bodies (LTBs) were created by the current Coalition Government in 2012 to devolve the decision-making power at the local level, participants widely suggested that the experiences of securing LTB funding proved nightmarish because of excessive red tape in the bidding process for funding, with which LTBs are required to comply, such as the DfT's Transport Business Case guidance and the WebTAG framework. LTBs are required to produce a list of schemes and give justification to their prioritisation but do not cover design and preparation costs. Then they are required to have a business case for each one with a high or very high value-for-money BCR. In line with this rule, transport investment is made to satisfy transport demand and requires justification in terms of jobs and productivity.

A few questions remain unanswered. For instance, is merely grabbing jobs from other places rather than generating new, a good use of public money? Should managing the relative attractiveness of parts of London to realise transport demand and increase capacity be considered to be a good use of public money, since it is well justified by the value-for-money requirement? Participants doubted whether LTBs could exert genuine discretion to meet regional/local transport needs and this was perceived as a missed opportunity.

Additionally, it is questionable: to what extent transport investment is related to projected demands or resilience. Are there any alternative assessments which could compare possible local objectives against others? The existing empirical findings from strategic regeneration case studies indicate that benefits cannot be assessed using mechanistic principles, but must rely on discretion i.e. the onus is on promoters/leaders to prove wider benefits.

The consequence of a centralised state

There is a danger that an over-centralised state could result in a lack of local capacity to make necessary decisions since the mindset may be that this is in the state's role.

Funding competition between transport and other projects

Investment in transport is moving from dedicated pots to being part of one large 'single pot': a single local growth fund which will be devolved to Local Enterprise Partnerships (LEPs) from 2015. The consequence of this policy deserves serious attention if transport schemes need to compete against other priorities. In a situation which needs a combined package (transport, education, and other schemes) for

regeneration to take place, there will be tricky trade-offs because transport will need to compete with other priorities.

Uneven funding distribution and its consequences

Some participants highlighted the highly uneven funding allocation/distribution in the UK. For instance, Greater Manchester gets the same funding from the DfT in a year that London gets in two days. The funding of the so-called 'Boris Bikes' in London equates to the total funding for Greater Manchester although this scheme involved private sponsorship. Thus, there is an urgent need to examine the distributional consequences of the current funding system. Population growth in London is expected to increase enormously i.e. a rise about two million in 20 years, creating a huge challenge to transport capacity.

Fragmentation of planning responsibility at the local level

Another institutional issue is UK's (mainly occurs in England) fragmented planning systems. At present, two local government systems operate in England, namely one-tier unitary authorities and two-tier districts/counties. Transport planning is carried out at county level either by county highway authorities in shire counties or by passenger transport executives (PTEs)/ integrated transport authorities (ITAs) in metropolitan areas, except in the case of shire unitary authorities which have their own transport plans. Economic development is also essentially carried out at county level by LEPs, though some have wider areas. LEPs also have Local Transport Boards, certainly in the metropolitan areas. All land use planning in England outside Greater London is devolved to the numerous district councils which can be highly parochial and nimby. Under the circumstances, integrating spatial planning and transport planning proves rather dysfunctional. Ebbsfleet was used by participants as an example to illustrate why certain developments are not taking off e.g. ineffective governance, and appraisal, and the constraint of a one-size-fits-all approach to planning. The Birmingham Local Transport Body was a good example of managing the integration of LTBs and LEPs with strategic and local aims under an ITA.

Scale of governance: a lack of regional strategic body and a fragmented structure discourage integration

On the other hand, although LEPs/ LTBs may be perceived as acting as devolved Government bodies making local decisions, the scale of governance issue remains unsolved – what is the effective scale for wider urban and regional development? LTBs /LEPs are replacing big regions with smaller functional city regions, which have

been shaped by economic trajectories, transport connectivity etc. Without a regional government, places outside the big city-regions may be neglected.

In the UK, a former mechanism, the Regional Funding Advice and Allocation Process which made 'Regional Funding Allocations', identifying transport schemes at the regional level, was abolished before the regional development agencies (RDAs) themselves disappeared. After the abolition of regional planning structures, as a consequence, it is difficult to address regional strategic challenges and regions are only used for statistical purposes. Regarding city-regional development, taking Greater Manchester as an example, the economic performance has revived since 1998, but the whole North West statistical region has deteriorated economically. The French approach, exemplified by the HST experience in Lille and NPDC, allows both regional and city-regional structures to co-exist, demonstrating the potential to address regional inequality.

Notwithstanding, despite the availability of the *versement transport* (a hypothecated tax) in France as a valuable source for funding local transport, a lack of cooperative governance could lose consensus in transport investment and lead to poor economic performance. Lens, a post-industrial mining town in Northern France, is a good example of this situation⁶. Also Phase 4 of the Valenciennes tramway did not proceed because of the opposition of one commune, St-Saulve, on the route.

⁶ Chen, C.-L. (2013). The Spatial-Economic Impact of High-Speed Trains: Nationally (The UK IC125) and Regionally (A British- French Comparison) School of Planning, The Bartlett Faculty of the Built Environment. London, University College London. PhD Thesis. See page 300-305.

Topic 3: Innovative funding systems

- What lessons could be learnt from ex-post qualitative studies in developing innovative funding mechanisms (both from the public and the private domains) to assist in achieving comprehensive regeneration and development?

Most participants agreed that private sector resources can complement public investment. There is a need to innovate infrastructure investment. Sweden, Hong Kong, Singapore, and the Jubilee Line Extension in London provide innovative funding mechanisms examples that HS2 might reference. A recent large-scale transport investment in the UK, Crossrail, was discussed in more detail.

Crossrail, one of the largest development projects in Europe, is costing £15.9 billion, of which £5 billion were funded by the private sector through the Community Infrastructure Levy (CIL⁷). Crossrail is anticipated to bring an additional £5.5 billion worth of property value with 57,000 new homes and 3.3 million m₂ of new commercial development. However, Crossrail missed some development opportunities because it only had power to acquire land for transport operation (such as construction of the railway), but limited power to acquire wider land, which has limited economic benefits. HS2 will have wider land purchase powers than Crossrail. It is critical to look at the value of opportunities as well as the cost of the construction. However, there is a danger that people relate property development to economic development – this isn't necessarily true.

At the same time, when developing innovative funding mechanisms, indirect/wider consequences need to receive special attention. The M6 toll motorway is an example where incentives worked for private investors but not for transport objectives. Consequent to this scheme, more traffic was generated on alternative routes. Similarly, the Mersey Gateway Bridge is expected to have no net benefit for 15 years. This illustrates the need for 'patient capital' – that's to say long lead times before the money invested begins to generate a return, which is common to many public projects e.g. new towns.

The next key question is emerged among participants: how do we take this intellectual capital to capture these knock-on benefits for other projects? Here are the views from participants.

- In the UK, private investment flows into transport hubs such as ports and airports, but not into networks. Roads and the rail network are essentially in hands of the public sector. Some participant stressed that it could be and was argued that the public sector should not pick up the costs of extending networks to service the growth of private hubs. How can private capital be suitably encouraged to inject into rail transport investment? If ports are

⁷ The Community Infrastructure Levy (CIL) is a planning charge, introduced by the Planning Act 2008 as a tool for local authorities in England and Wales to help deliver infrastructure to support the development of their area. Following the Community Infrastructure Levy Regulations 2010, CIL came into effects on 6 April 2010. Development will be liable for a charge under CIL if a local planning authority has decided to set a charge in its area. Source: <http://www.planningportal.gov.uk/planning/applications/howtoapply/whattosubmit/cil>

accepted, what about major intermodal freight terminals or even large scale shopping centres? It was thus suggested that perhaps that it makes more sense to tax all developers and road users and plough back the revenues as investments.

- A trade-off may arise between public benefits and public costs: polluters should pay e.g. a pay-as-you-go way to fund private funding. A more targeted system for road user charging should be re-examined. 150 years ago, road tolls were taken off as causing excess competition, but users should pay more. Tolls only ceased to be levied on roads because they were facing competition from canals and railways.
- There is a need to develop innovative financing mechanisms: In the case of Ebbsfleet rail station, new infrastructure plus highway provision make development of the associated site prohibitive, especially during and post recession. As part of his 2014 Budget, the Chancellor of the Exchequer George Osborne announced a £200 million budget to set up a development corporation to kick-start a garden city project. If the wider knock-on impacts are taken into account, the initial public investment in the infrastructure will be recouped by government through tax receipt following private investment in offices and other new economic activity.

Next Steps: Directions for policy and research

- What research is needed to further identify and describe the interdependent relationship between transport investment and wider spatial development?
- What policies would be needed to achieve a wider development vision within transport scheme development?

Several key suggestions for next steps had been proposed earlier under each topic discussed. The following points were raised before the end of the seminar.

Overhauling appraisal approaches

Review of international appraisal practice demonstrated that the types of schemes and their developmental impacts have the following features:

- Temporal and cross-sectional impacts on development need time to demonstrate themselves.
- Value uplift: German approaches show a capacity to freeze values and then capture the uplift.
- Distributive impacts of regional economic development are not well known. Is a disaggregated analysis better than one aggregate figure? It is hard to distinguish in appraisal between displacement effects and genuinely new economic activity. Displacement effects shouldn't just be ignored. The Jubilee Line Extension led to displacement from an overheated area of London to a more deprived area (East London) and led to multiplier effects. Jobs in depressed areas have higher value than those that were transferred. The analysis of enterprise zones in the 1980s concluded that half the economic activity generated was new and half was from displacement. But double counting is a problem.

In the UK, it is necessary to consider whether one appraisal system for all models and areas is useful at the local level since current systems have the following drawbacks:

- Current systems are not working for some types of schemes and areas.
- Regeneration 'benefits' are not well developed.
- High-speed Rail's 'transformative' impacts are not included.
- Transport is just part of a long-term development process – what would the appraisal system look like, should this go back to the drawing board?
- Challenges forward:
 - The KPMG report⁸ (2013) attempted to translate evidence into a modelling approach to understand evidence and opportunities.
 - Current assessments of investment at the national level should be genuinely devolved to the local levels, local politicians would prefer to see it happen.

⁸ KPMG (2013). HS2 Regional Economic Impacts London, High-speed two Limited.

- This is also debatable whether current systems address the linked justifiable modal shift and carbon emission reduction issues adequately. Thus, new schemes should be driving this as far as possible.

Integrating planning, examining institutional arrangement and coordinating governance

Institutions can handle implementation of the transformational investment, but there is a lack of appropriate institutions that can deliver integrated transport plans in the UK. Ad-hoc institutions are in place, but need coordinating at the regional level to enable regional prioritisation of transport schemes.

Innovating funding systems

There is space for joint private/public funding to improve access to funding and capture uplifts which occur. These uplifts could be adopted to assist delivery of large regional transport schemes such as the Trans-Pennine route and the Northern Hub.

Further research directions are suggested as follows:

- More methods for disaggregating into more fine-grain local level.
- More research contributing to the value of speed/ time-saving debate.
- More research contributing to the capacity debate.
- More research on indirect benefits.
- More evidence-base empirical studies are needed to assist in robust decision-making.
- Developing modelling tools for designing/planning rail alignments and demonstrating the full range of benefits that will be achieved.
- More research contributing to distinguishing effects: who is actually getting the benefit?

List of Participants

- Sir Peter Hall, Professor of Urban Regeneration and Planning (SINTROPER), UCL
- Peter Jones, Professor of Transport and Sustainable Development (CTS), UCL
- David Penhallurick, Strategic Lead, Cross-Sector Delivery, Infrastructure UK
- Emma Hall, Economic Advisor, HS2 Business Case and Analysis Team, Department for Transport
- Tom Bridges, Chief Economic Development Officer, Leeds City Council
- Vince Lucas, Former Service Delivery Director, Southeastern Trains and currently a Transport Consultant, an member of South East Local Economic Partnership Local Transport Body, Kent County Council
- David Simper, Group Leader (Transport projects), Blackpool Council
- Chris Judge, Economic Analysis manager, Network Rail
- Lauren Hargreaves, Economic Analyst, Network Rail

- Mark Ledbury, Head of Strategy & Analysis, HS2 Ltd
- Sarah Baxter Dobbie, Economic Adviser, HS2 Ltd
- Ian Lindsay, Land and Property Director, Crossrail
- Lewis Atter, Partner in KPMG Global Infrastructure and Projects Group, KPMG
- John Swanson, Associate, Steer Davies Gleave
- Alan Wenban-Smith, Proprietor of consultancy Urban & Regional Policy, Independent Consultant
- Howard S Potter, Board member of TPS & Principal of Scott Potter Associates, Transport Planning Society
- Ian Wray, Visiting Professor, University of Liverpool
- Tom Worsley, Visiting Fellow (ITS), University of Leeds
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- Patrick McAllister, Professor of Real Estate (Bartlett School of Planning), UCL
- Robin Hickman, Senior Lecturer (Bartlett School of Planning), UCL
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