Supporting Growth through Regional Connectivity

Conference Proceedings
27 February 2014
Brussels

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sintropher

Investing in Opportunities

This project has received European Regional Development Funding through INTERREG IV B.

nwe

INTERREG IVB


Fylde Coast UK
West Flanders BE
Nijmegen-Kleve NL
North Hesse DE
Valenciennes FR

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INTERREG IVB

INTERREG IV B North-West Europe is a financial instrument of the European Union's Cohesion Policy. It funds projects which support transnational cooperation.

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What is Sintropher?

Sintropher is a transnational cooperation project bringing together five regions in North-West Europe.

The project began in 2009 and is due to finish in 2015, with 14 partner agencies in five EU Member States. With a budget of €23m, it is part-financed by the EU INTERREG IVB programme, and involves a series of 36 feasibility evaluations, pilot investment and demonstration projects, as well as comparative analysis of EU best practice. The Lead Partner is University College London.

All of our work is motivated by one overarching aim: to develop sustainable, cost-effective solutions to improve accessibility to, from and within peripheral regions in North-West Europe. As part of this, we have four specific objectives:

1. Promote best possible cost-effective technology-based solutions
2. Assess the appraisal procedure for regional tram systems and improve the business case development process
3. Achieve high-quality, seamless interchange between regional tram systems and regional rail and air hubs
4. Promote and market the benefits of regional tram-based systems to users and stakeholders

We have a particular focus on tram-train systems which allow local trams to run on to national rail networks, pioneered in Karlsruhe and developed in Kassel (Germany), which allow urban tram systems to extend over national rail tracks to serve extensive city regions. Additionally we are looking at high-quality interchanges at key rail or air hubs.

In all, project partners from five demonstration regions in five EU Member States are working together: Valenciennes (France); the Fylde Coast (UK); West Flanders (Belgium); North Hesse (Germany); and Nijmegen-Kleve (The Netherlands). Participants include public transport operators, local authorities, regional management bodies and universities.

Each region has implemented a programme of technical and economic feasibility evaluations for new systems, pilot investment projects, and demonstration projects, all of which is complemented by a set of comparative analyses of EU best practice.

In memoriam

Since the conference took place, our friend and colleague, Professor Sir Peter Hall, Director of the Sintropher project and contributor to these proceedings, sadly died. The ongoing work of Sintropher is dedicated to him.

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The role of transport and connectivity in the economic growth and competitiveness agenda is a critical, but not yet fully developed element in decisions on infrastructure investment.

Introduction

Supporting Growth through Regional Connectivity

The Sintropher project has identified key issues of central importance in understanding the effect and impacts of better regional transport connections, and in creating the innovative, cost-effective frameworks in which they can be successfully designed and delivered.

Improved regional connectivity, quality urban transport networks and convenient interchange with national transport systems are vital factors in enabling regions to flourish.

In parallel, encouraging regional economic growth is a high priority for both politicians and practitioners at all levels, particularly at the current time. But how the role of transport and connectivity effectively interplays with the economic growth and competitiveness agenda is a critical, but not yet fully developed element in decisions on investment in infrastructure. Across Europe, we are moving away from a top-down system of decision-making and funding being granted by central governments. With this change comes a greater focus on local priorities and local accountability for projects and expenditure. In order to be informed, professionals involved with transport planning, economic modelling, urban development and appraisal need to adapt, learn and develop new techniques. Increasingly, questions will relate to the local impacts of investing in a transport infrastructure, as well as the wider, regional impacts of major schemes such as high-speed rail or airport capacity expansion.

How do we recognise the indirect effects of transport investments, both through ex-ante assessments and also directly through some form of capture for any uplift that may occur? How can we successfully effect closer integration with related policy areas such as housing, regeneration and health? And in a policy context of developing localism, how can we make the decision-making process increasingly open and transparent in order to encourage wider stakeholder support and local buy-in to key infrastructure projects?

In practical terms, we face a number of central concerns. The first looks at the issue of interoperation of different modes as opposed to seamless transfer at hubs from one mode to the other. Allied to this is interchange. Here a concept has emerged that we call 'thick versus thin links': 'thick links' with a good, frequent service through large stations, versus 'thin links', including less attractive regional – maybe tram-train – services on lines with poorer frequency.

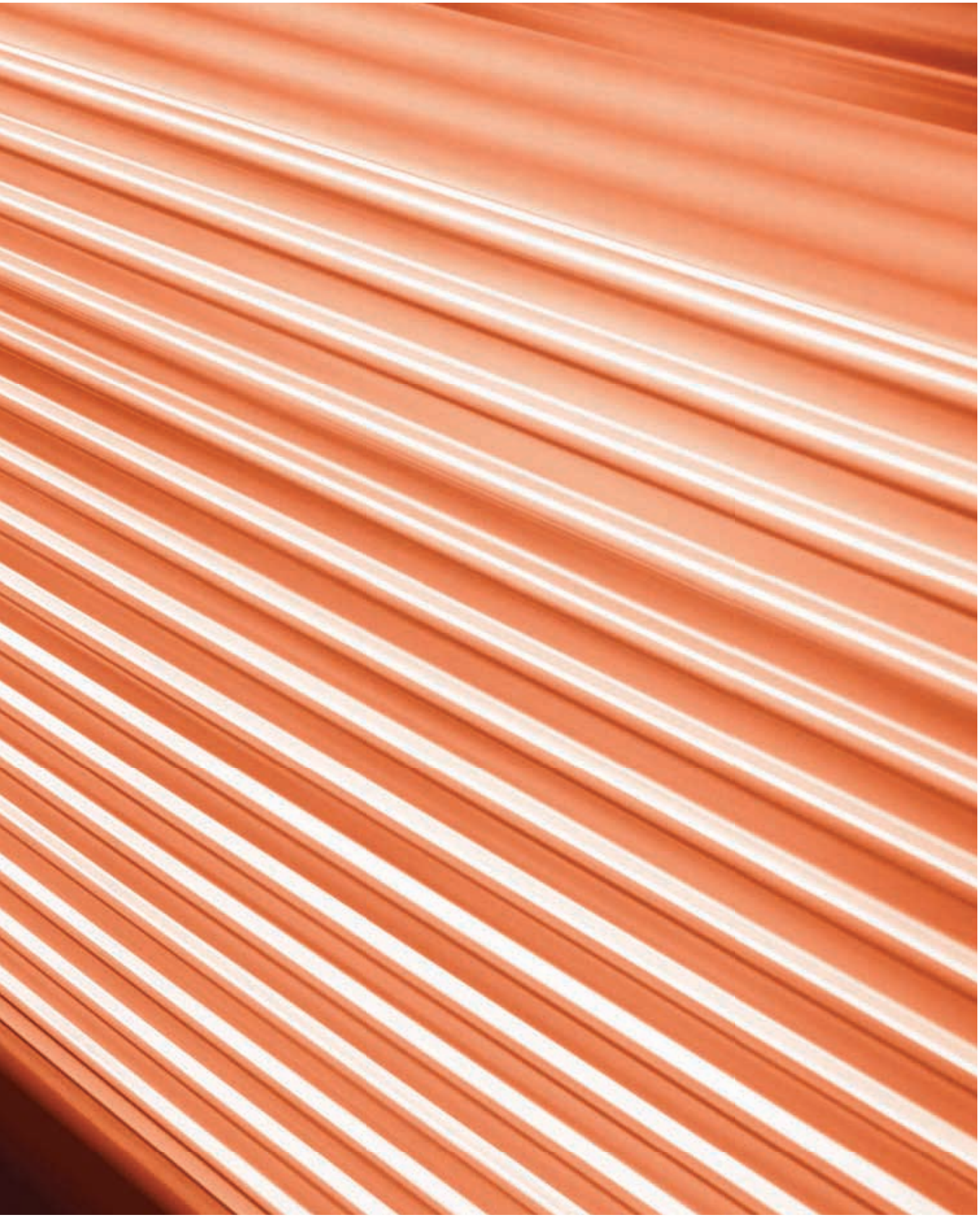
Thirdly there is the potential to trigger regeneration and new development, one of the most important aspects of all. But the real point about these technologies is whether they realise potential in peripheral regions. Fourthly, we are interested in improving and strengthening the business case process – and recognising wider territorial and economic benefits, and in appraisal practices in different EU countries.

The Sintropher project has been considering these issues, and they have helped to inform our conference programme, but they have relevance far beyond our immediate project. So we believe that this conference was therefore both timely and very significant in helping to define an increasingly important area of public policy relating to economic and social development across urban and regional economies.

The following pages present a summary of the day. Session one set the scene in European policy terms, session two looked at the 'art of the possible': what are the opportunities for new technologies and systems in connecting regions and cities better? In session three we wanted to consider how best to identify and capture the benefits of schemes. Session four dealt with putting things into practice, with a focus on finance, governance and decision-making. We concluded by taking stock and taking a glimpse to the future.

For those who took part, we hope that these proceedings will provide a permanent record of what was a very exciting and productive day. For those reading for the first time – policy-makers, project developers and transport operators – we equally hope that it will stimulate your own ideas. We invite you to join in the conversation.

Professor Sir Peter Hall



Session 01
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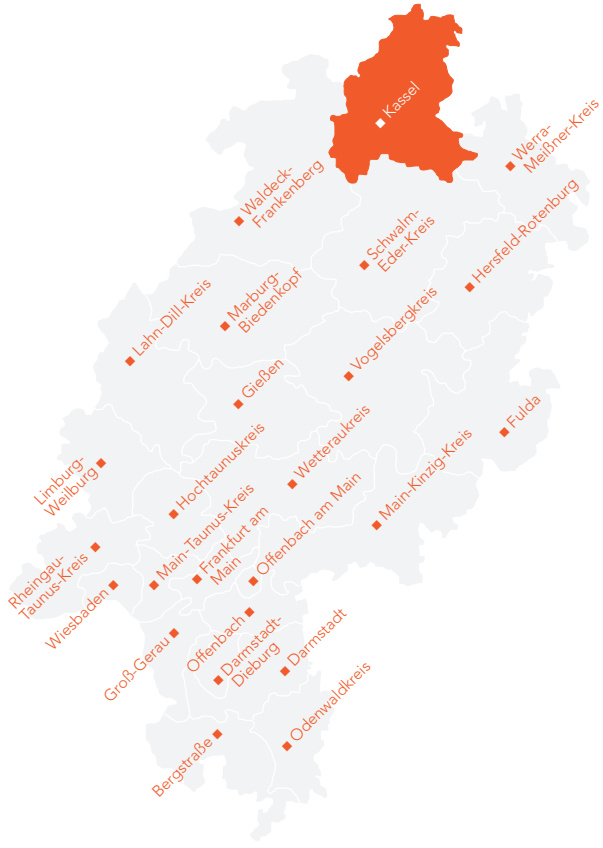
Irrigating the regions

Sintropher has demonstrated the potential of new, lower cost transport technologies across peripheral regions with poor transport connections, with the aim of supporting economic and social development through better connectivity.

Professor **Sir Peter Hall**, University College London, and Sintropher Project Director, outlined the project's key outcomes and their relevance to future practice

Sintropher has been one of the larger INTERREG IVB projects, concerned with peripheral regions and poor transport connections; especially but not exclusively, tram-train. We were keen to promote high quality, low cost transport and interchanges, and to improve and strengthen the business cases for these projects in peripheral regions which often do not score well on conventional cost benefit analysis. Our five case studies are all in peripheral regions; we believe it to be true that as the European high speed rail network develops, so areas outside it may find themselves relatively even more peripheral in relation to the core.

Many of such areas are outside the famous 'EU pentagon', but we also find peripheral regions, including some of ours, in 'holes' in the pentagon. West Flanders (BE), Valenciennes (FR), Nijmegen (NL) and North Hesse (DE) are inside the pentagon but are, for various reasons, peripheral. In the UK, South Fylde is definitely a peripheral region.



→
The Federal State of Hesse, Germany

North Hesse forms the northern part of this state, with the city and district of Kassel shaded.

Emerging key issues

Kassel pioneered interoperation (track sharing with heavy rail), but the key issue we have found is interoperation versus seamless transfer to large hubs. The second issue is interchange. Here a concept has emerged that we call 'thick versus thin links': thick links with good, frequent service through big stations, versus thin service, including less attractive tram-train services on lines with poorer frequency. The third issue is the potential to trigger regeneration and new development; one of the most important points of all: the real point about these technologies is whether they realise potential in peripheral regions. Fourthly, we are interested in improving and strengthening the business case process – and recognising wider territorial and economic benefits, and in appraisal practices in different EU countries.

1. Interoperation
Kassel, and earlier Karlsruhe, pioneered interoperation. In Nijmegen we concluded that the tram option was better than interoperation because Deutsche Bahn did not like the idea of trams sharing their tracks in Kleve, although it had allowed this in Karlsruhe and in Kassel. In West Flanders and in Valenciennes, interoperation was not an option.

In Valenciennes SNCF / RFF is not keen on interoperation, at least so far. In West Flanders we had the issue that the costal tram (*Kusttram*) is a metre gauge tram, not easy to run over standard European gauge tracks. In the Fylde Coast, the tram extension to a main rail hub was the strongest option. Interoperation on a second route is still an option, and we hope to consider it, but it depends on our ability to establish that there will be wider territorial benefits. A key issue we have found is interoperation versus seamless transfer to large hubs; the latter is possible with many French tramways including Grenoble and Montpellier.

North Hesse, Germany: Sintropher mentor region

Building on the success of the tram-train technology pioneered in Karlsruhe, Germany, Kassel has developed the RegioTram system, linking the city tram network with the Deutsche Bahn mainline. Tram-train in Kassel has been running since 2007 and, within Sintropher, the North Hesse actions centred on the assessment of the experience and plans for future expansion.

South Fylde, UK

Kassel was the initial model for Sintropher, and we wanted to apply it in other places, particularly Blackpool in North West England on the Fylde Coast. Here a heritage tram service has been upgraded. The Blackpool tramway system has potential for a number of extension options, and our work addressed the practicality of a Fylde Coast sub-regional light rail network, including tram-train and tram-rail to key regional and national interchange hubs.

This plan would include connecting the existing trams to a railway line with a very poor service – the South Fylde line – by tram-train on the Kassel model. This has not yet happened, although it still might. Following the examination of a number of options for improving integration between tram and train, the immediate priority improvement scheme was identified as extending the tram network to Blackpool North station.

This provides a direct interchange opportunity between the two modes. It will attract passengers travelling between the station and tram-served destinations such as the Tower, Sea Life Centre and Pleasure Beach, as well as providing a convenient means of access to rail services for residents. Sintropher investments provide for the first extension to Blackpool North railway station to be achieved.

West Flanders, Belgium

The focus in West Flanders, Belgium, is on the three towns and municipalities of Veurne, Koksijde and Diksmuide in the Westhoek area in the western part of West Flanders. It is semi-rural, coastal, with poor accessibility between towns, rural areas and coastal resorts, although the coast itself is served by the 68 km coast tram (*Kusttram*) and by a parallel branch of SNCB, the Belgian national railway, to De Panne near the French border where it connects with the tram.

Tourism is important for the region, and it would benefit from enhanced transport links. Activities in West Flanders chiefly involved demonstration projects at stations in order to improve interchange and the station experience. The coast tram has played a major role in regenerating the coast, and here our project has been to create a a new junction station for the coast tram at Koksijde; this new interchange point will complement a potential new hub at Veurne, with a particular emphasis on a Park and Ride facility for tourists arriving via the coastal motorway.

There are plans to extend that tram a short distance inland to create a seamless interchange in Veurne, enabling it to become the regional hub for public transport in the Westhoek through integration of all transport modes including train, tram and bus at Veurne railway station. Feasibility studies are complete, and regional politicians are soon to make a decision. Sintropher also invested in a demonstration project to upgrade the station facilities as a train-bus interchange at Diksmuide.

Valenciennes, France

Valenciennes, in north east France and close to the Belgian border, is an old coal mining and industrial region with one very successful tram line. Our project has been to help create a second tram line running north and then east using revolutionary single track operation technology with a new signalling system.

The new, relatively inexpensive line uses novel passing loop and signalling technology on 30 km of single track tramway, and successfully opened in early 2014. There are plans to extend the tramway across the border into Belgium, using a currently abandoned line.

Nijmegen, Netherlands

Nijmegen is in the east central Netherlands. Here the project was to open up an old disused railway line as a tram or tram-train line across the border to Kleve in Germany. In 1991, the Nijmegen to Kleve rail link was closed, however in the last decade the relationship between Nijmegen, Kleve and surrounding municipalities has become increasingly important, although public transport connections between the areas on both sides of the border have not kept pace with developments. Three alternatives were appraised for a rail link between between Nijmegen, Kleve and nearby Weeze Airport, so improving the quality of border mobility. Weeze Airport has become an important airport for Dutch travellers: in 2009, 52 per cent of people travelling from Weeze Airport came from the Netherlands.

However, about 95 per cent of all visitors are car-oriented, with parking revenue being a key part of the airport's operating revenue. Travellers also come from a geographically dispersed area, and feasibility studies discounted the practicality of an airport link. Nevertheless appraisals indicated that there is sufficient demand for a reinstated connection between Nijmegen and Kleve, and feasiblity studies for tram, tram-train and train options have been carried out. If the scheme is to come to fruition, there are still a number of hurdles to overcome, most particularly the different preferences each side has over choice of technology.

2. Motive power
North Hesse elected to use hybrid DC and diesel power on one line of the Kassel tram network, but other partners have considered, and rejected, hybrid technology. Advances in electric technology, plus stringent new EU emissions regulations, have made hybrid technology much less attractive. This is very relevant to Blackpool as the South Fylde line remains non-electrified.

Some of the most important and exciting developments during Sintropher have related to new transport technologies: super capacitor technology at the Shanghai Expo 2010 that enables vehicles to pick up electricity at each stop from; battery technology, which has established a world record of running 16 kilometres on a test track outside Berlin in May 2011; and induction technology. Trial tests of the Bombadier PRIMOVE induction-powered tram were completed successfully on the Augsburg tram network in June 2012, although to date the project has not been taken further.

Another key innovation is the Valenciennes single track system with alternating operation. It is the first in Europe to be bi-directionally signal controlled, and offers major cost savings, and can run well on the narrow urban streets that are characteristic of so many of our European historic cities.

3. Connections to regional airport hubs
One topic that we thought was going to be very important was connections to regional airport hubs. Many of our regions have small airports where they hoped to develop low cost routes. However, we discovered that with low cost operations, passengers tend to come from wide areas, mainly on leisure trips, and with amounts of baggage making them unsuitable for public transport.

In the case of Nijmegen and Kleve, the airport on the German side (Weeze or Niederrhein), is a Ryanair airport whose operators are dependent on parking charges and not at all interested in tram-train or any other public transport service.

↑
Connecting systems

A key issue we have found concerns the advantages and disadvantages of interoperation over seamless transfer to large hubs. Many French tramways such as Grenoble and, pictured here, Montpellier, show this successfully.

4. Development and regeneration potential:
Koksijde in West Flanders, has achieved extraordinary urban regeneration since the installation and modernisation of the coast tram. Perhaps similar regeneration could be seen on the South Fylde coast following investment in that region?

Valenciennes' first line served an expanded university, and there are now plans for a major 'technopole' next to the university. Line two runs through a rather depressed area and is being promoted as a development corridor. Kassel would like to test the feasibility of RegioTram developments to major employment areas.

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Cost benefit analysis is often positive, but insufficiently strong to establish the case in weaker peripheral regions, and there is an urgent need to recognise and understand wider territorial economic benefits

A major study carried out for Sintropher by French consultants CETE, now Cerema, looked at six case studies across Europe to assess the urban and economic impacts of tram-based systems, and the different approaches to appraisal and decision-making in different European countries. Further studies have looked at the wider impact of transport investment on urban and regional development, as well as developments in the appraisal process itself. These reports are available from the Sintropher website: **www.sintropher.eu.**

Governance frameworks

The weight given to cost benefit analysis varies between one European member state and another. One of our reports suggests that countries are converging in their assessment practices.

Most consider this a critical issue underlying the potential for economic growth in disadvantaged regions but, as not all impacts can be valued equally, new approaches are emerging to understand the role of wider benefits. Importantly, countries that centralise their budgets, as notoriously in the UK, tend to place greater weight on cost benefit analysis. Those with devolved, local, regional government tend to place greater weight on economic development potential.

France is one clear example: it has a hypothecated tax – the *versement transport* – that tends to put local and urban development potential at the forefront of the decision-making process, only later taking into account benefit / cost considerations. We consider this a very important emerging message and are focusing closely on the merits and challenges of the various approaches.

↑
Motive power innovation

In Kassel the tram-train retracts its pantograph and runs on diesel power over conventional railway lines to reach small towns in the countryside.

←
Development potential

Koksijde's western end: new hotels, new apartment blocks, Michelin-starred restaurants, and a new train station (for which the Sintropher project provided ERDF funds) which will, it is hoped, connect to the tramway extension.

Key messages from Sintropher

Lower-cost technology solutions: Tram-train has potential but a conventional tram often presents a better business case. Rapidly evolving technology opportunities have meant that we've struggled to keep up with understanding on all fronts, and now know that there's room for a great deal more testing. Seamless interchange to major hubs is essential.

Economic appraisal: cost benefit analysis is often positive, but insufficiently strong to establish the case in weaker peripheral regions, and there is an urgent need to recognise and understand wider territorial economic benefits.

Financial feasibility: even projects with good business cases can experience long delays due to the austerity era following the 2008 crash. We need to learn from innovative financial models used in the UK and elsewhere.

Political feasibility: this a key success factor. Political factors have often weighed very heavily indeed across our case study projects, and we are striving to better understand the nature of such political influences.

Governance: a strongly devolved context, particularly a city regional system of governance with added capacity and powers, appears to be the best model for promotion of tram-based and light rail schemes.

Organisation: inter-agency silos remain between transport and other departments involved in territorial planning and can result in issues of poor understanding and communication.

Next steps: Sintropher Plus

The Sintropher project will be extended, running as 'Sintropher Plus' for a further year from June 2014. It will have two main themes: low-cost solutions, focusing on new technologies and their potential contribution; and secondly on a new appraisal framework that will better recognise wider territorial benefits outside of a conventional cost benefit analysis. It will also consider better integration of transport investments with wider territorial planning.

This will be developed over one year and be demonstrated in regional test cases. And even beyond Sintropher Plus we can see potential in further work and further conversations to the new generation of EU programs, such as Horizon 2020 (see page 22 for more information).

In terms of Sintropher Plus' first theme, low-cost solutions, focusing on new technologies and their potential contribution, we are very much dependent on the UK's Network Rail Route Utilisation Strategies (RUS) report of 2013. This is exploring new possibilities including battery power and the Paisley Canal solution (discontinuous electrification).

We consider this has major potential implications for cutting costs on new electrification schemes, for example in our Fylde Coast case study area. In this region, the new Blackpool North Station hub with major regeneration around the train station is a success, but has left the South Fylde line un-electrified.

We want to consider the potential for different solutions, for example discontinuous electrification, Paisley Canal fashion, and other possible innovative technologies such as battery trains, which have already been developed in the UK.

Stimulating regional transport connections

Keir Fitch, Head of the Research Unit, Directorate-General Mobility and Transport, outlined what is happening at European level to stimulate regional transport connections, and to ensure that they have a positive impact on economic growth

'Investment in network infrastructure can boost long-term economic growth,' said Fitch. 'Lack of access and cross-border physical interconnection leads to sub-optimal use of infrastructure, resulting in economic inefficiencies and limited movement of people and goods across Europe.'

Looking at the programmes that the European Commission (EC), and in particular, DG MOVE[1] , have brought out over the last couple of years, he suggested, shows that the Commission is absolutely convinced that investment in network infrastructure is vital to the long-term economic health of European regions. It has two key programmes, Horizon 2020 and the TEN-T programme. In December 2103, the European Commission launched calls for proposals worth €350 million for the TEN-T programme.

Europe is a single market, a single economic area in which we enjoy free movement as individuals, but also free movement of services and goods. Without good connectivity across Europe, vital elements of the European project simply aren't delivered on in practice for many of our citizens.

Boosting connectivity was key for Siim Kallas as European Commissioner for Transport, as was ensuring that historic errors were corrected in the form of the division that is still found across Europe in the transport networks of the former Eastern bloc.

Over the next seven years, as we build new networks with the significant sums of money available for new programmes, we will ensure that we make good use of innovative ideas from universities and laboratories which, for various reasons, simply have not been practically visible across the networks in Europe to date, explained Fitch. This recent lack of innovation is a serious drawback given that, as we are all aware, rail and tram systems are very expensive to build, maintain and expand.

The Transport White Paper published three years ago set out guidelines for meeting our vision of decarbonising European transport, while at the same time building a system that can support long-term economic growth. Rail transport needs to play a much greater role because of its potential fuel efficiency and because we know that, with the right degree of investment, it is possible to make far more intensive use of the networks.

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The purpose of the new TEN-T policy, and of including €11 billion from the regional funds, is to ensure that we deliver at a European level, creating networks so that we build the missing links and eliminate the bottlenecks which are slowing the growth of transport across Europe

Programmes in practice

The research programme Horizon 2020 and the Trans-European Network Programme (TEN-T) will build bridges between research and delivery. Horizon 2020 will have a greater emphasis on the deployment of large-scale demonstration concepts, with significant sums of money available to finance live demonstration projects across Europe (see below).

TEN-T aims to support implementation of the Transport White Paper framework through new infrastructure policy, including a dual-layer approach based on objective methodologies. The infrastructure development of the trans-European transport network is closely linked with the implementation and further advancement of EU transport policy.

In the past, TEN-T policy was perceived as a funding instrument for major projects, but it has now grown into a genuine policy which reinforces the network approach, thereby establishing a coherent basis for the identification of projects and for service provision in line with relevant European objectives. Within TEN-T, we now have the possibility of funding innovative solutions on trans-European networks through the Connecting Europe Facility (CEF).

The new TEN-T guidelines and the CEF reflect a new transport infrastructure policy that aims to connect the continent, closing the gaps between Member States' transport networks, removing bottlenecks that hamper the smooth functioning of the internal market and overcoming technical barriers such as incompatible standards for railway traffic. It promotes and strengthens seamless transport chains for passenger and freight, while keeping up with future technological trends.

This project will help the economy in its recovery and growth, with €26.25 billion available for transport. Its aims are to streamline and facilitate EU support for infrastructure by optimising the portfolio of instruments available, standardising the operational rules for using them, and capitalising on possible synergies.

TEN-T, which covers not just transport, but energy, broadband and telecoms, has seen a major budget increase. The vast majority of the €26 billion fund goes to transport, an increase from €8 billion. This will mostly be spent on nine core corridors, and is important for the big cities that form the hubs of the network, but also for joining up the local services and the long-distance services in the cities.

The vast majority of the TEN-T funding is focussed on rail. Much is also aimed at the poorest countries, although the updated approach is to deliver value for Europe as a whole. The purpose of the new TEN-T policy, and of including €11 billion from the regional funds, is to ensure that we deliver at a European level, creating networks so that we build the missing links and eliminate the bottlenecks which are slowing the growth of transport across Europe, outlined Fitch.

The impacts of investments in Trans-European Networks (TEN-T)

For regions in the European core with highly developed infrastructure, additional gains in connectivity bring only small additional incentives for economic growth. But in regions at the periphery, such additional gains have the opportunity to have a much more significant impact on economic growth, especially in Southern and Eastern Europe.

Available analysis indicates the important impact on job creation.

Increased connectivity is also likely to support the efficiency of the transport system and promote more sustainable transport.

The map on the right shows the level of connectedness across Europe and the effect that that has on GDP.

The most connected part of central Europe shows a positive effect on GDP, but at the peripheries GDP falls by anything up to half a percent due to lack of connectivity. Increasing connectivity is vital to the European project.

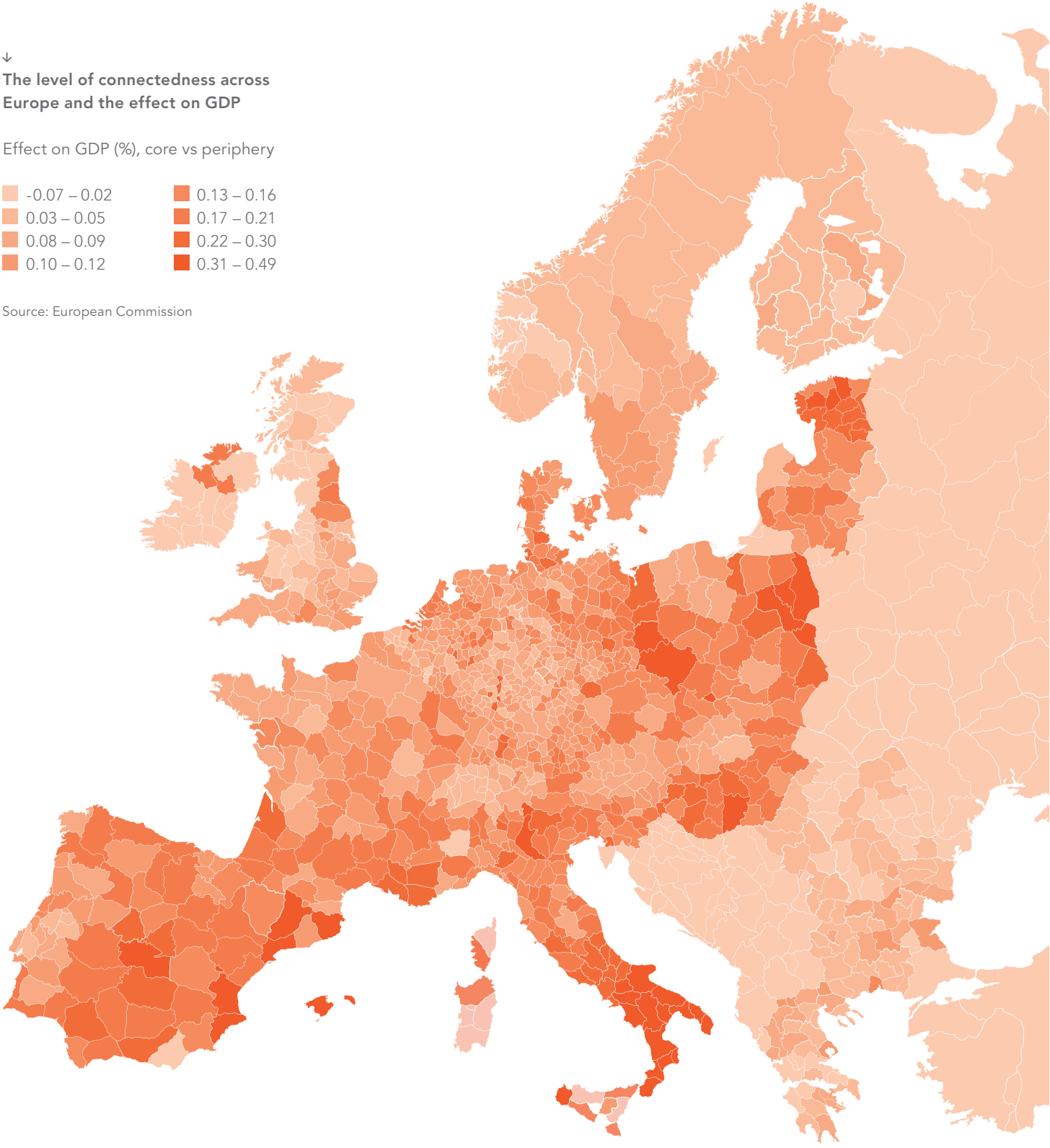
↓

The level of connectedness across Europe and the effect on GDP

Effect on GDP (%), core vs periphery

- -0.07 – 0.02
- 0.03 – 0.05
- 0.08 – 0.09
- 0.10 – 0.12
- 0.13 – 0.16
- 0.17 – 0.21
- 0.22 – 0.30
- 0.31 – 0.49

Source: European Commission



Research and innovation: Horizon 2020

Horizon 2020 is the European Union's flagship programme supporting research and innovation across industry and science. It is a sizable programme, amounting to more than €70 billion over the next seven years, and transport is a very significant component, being allocated just under 10 percent of the total budget at €6.4 billion.

This represents an increase of around 50 per cent from the previous programme. And this is the just the EU contribution – coupled with leveraging funds from the private sector, an overall value for the programme of approximately €10 billion will be reached.

The research programme has three priorities: pure science, industrial leadership, and societal challenges, all delivered in a new, simplified framework that will enable effective use of funds.

New technologies: Shift2Rail

Within the transport sector, a number of jointly funded technology initiatives are planned, working with industry to promote the development of new technologies. In the area of rail, this would include tram systems as well as all rail-based transport. A new structure called Shift2Rail[2] will triple the amount of research money available for the railway network from about €150 million in the past programme, to nearly €450 million over the next seven years.

Shift2Rail will bring together infrastructure managers, rail and tram manufacturers, SMEs across the industry and university research department to work on a range of connected programmes from high-speed rail to the tram systems to low-cost innovative technologies. It is designed to meet the challenges inherent in the future of light and heavy rail.

Notes

1 DG MOVE: Directorate-General Mobility and Transport, responsible for all transport policy in the Commission

2 See: www.shift2rail.org

The European context: a regional development perspective

In Europe, around one third of its population of 480 million lives in towns of less than 50,000 inhabitants or in suburbs.

Transport is a crucial element in strengthening cooperation between less connected cities, but we need to analyse our investment priorities carefully to ensure that they deliver planned outcomes, explained **Corinne Hermant-de Callataÿ**, Directorate-General for Regional and Urban Policy

It will become more and more crucial to understand functional 'urban shape' as European Commission investment is concentrated with a strong focus on results. Looking at the results of EU Cohesion Policy – which is not only a redistribution policy, but an investment policy – from 2000 and 2006 figures, I found some very interesting facts, noted Callataÿ: between 2000 and 2006 we saw a big emphasis on rail, with 8,400 km built or improved, as opposed to investment in only 5,100 km of roads.

By 2007 and 2013, we see that we have delivered 2,236 km of new roads, 1,208 km of new roads under the Trans-European Network (TEN-T) programme, and a further 23,601 km of reconstructed roads.

In the case of new railways, investment has decreased from 8,000 km to 5,000 km: 305 km of new railroads, 1,495 km of TEN-T railroads and 2,369 km of reconstructed railroads. What is obvious, and was also shown by the previous speaker, my colleague Keir Fitch, is that remedying important economic and social disparities remains a key objective.

The big increase in investment on roads is not a real surprise as road infrastructure was very weak in many of the less developed regions of Europe.

Regions with a GDP per capita which is less than 75 per cent of the average EU GDP per capita (in orange) are the regions where there is a concentration of investment. For 2007 / 2013 this represented 80 per cent of ERDF investment. Light green regions are close to the EU average and dark green regions are above the average.

In 2014 / 2020, we propose a greater concentration because we realise that some of our investments didn't yield the results that were expected due to funds being spread too thinly on too many issues. Our plan now is to concentrate ERDF investment, with a stronger focus on results built into programme design.

In the case of more developed regions, 80 per cent of investment must go to four objectives: energy efficiency and renewable energy; research innovation; competitiveness of small- and medium-size enterprises and use of ICT. Of this 80 per cent, 20 per cent should go to energy efficiency and renewable energy.

The respective figures for less developed regions are 60 per cent for the four objectives and 15 per cent investment for energy efficiency and renewables. Investment priorities are grouped in 11 Thematic Objectives, of which two address transport. Thematic Objective Seven relates to investment in, and connections to, the TEN-T Network. Other issues addressed are sustainable, regional mobility and a comprehensive, interoperable railway system, with much more emphasis on rail.

Urban development

In terms of urban development, our objectives relate to sustainable urban mobility, stressed Callataÿ. Our focus now goes beyond social and economic cohesion to embrace territorial cohesion; in fact, territorial cohesion is being given greater emphasis. Under Thematic Objective 4, for example, there is specific mention of sustainable, multimodal urban mobility.

This will apply more for the more developed regions than Objective 7, because we hope that under Objective 4, developed regions may also access ERDF funds.

We also have a new instrument for this period called the Integrated Territorial Investment (ITI), which allows for the creation of an integrated strategy for a metropolitan area. Within this strategy, national and regional funds may be combined, as may Europe and Social Funds and ERDF funds, thus creating a more integrated strategy.

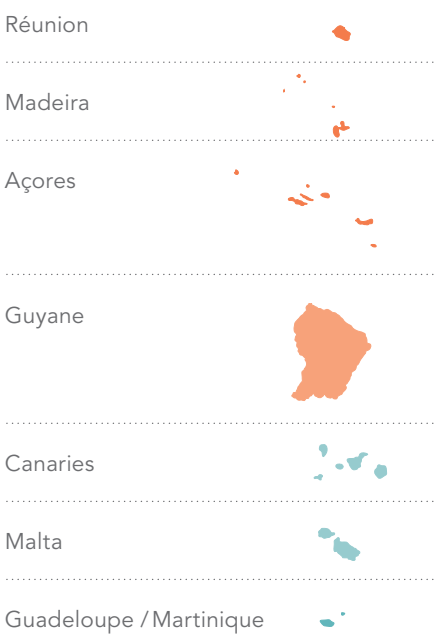
Introduction of ex-ante conditionality is important because we want to encourage the development of comprehensive transport plans within realistic and mature timescales, and to ensure the capacity of intermediary bodies to deliver on such projects.

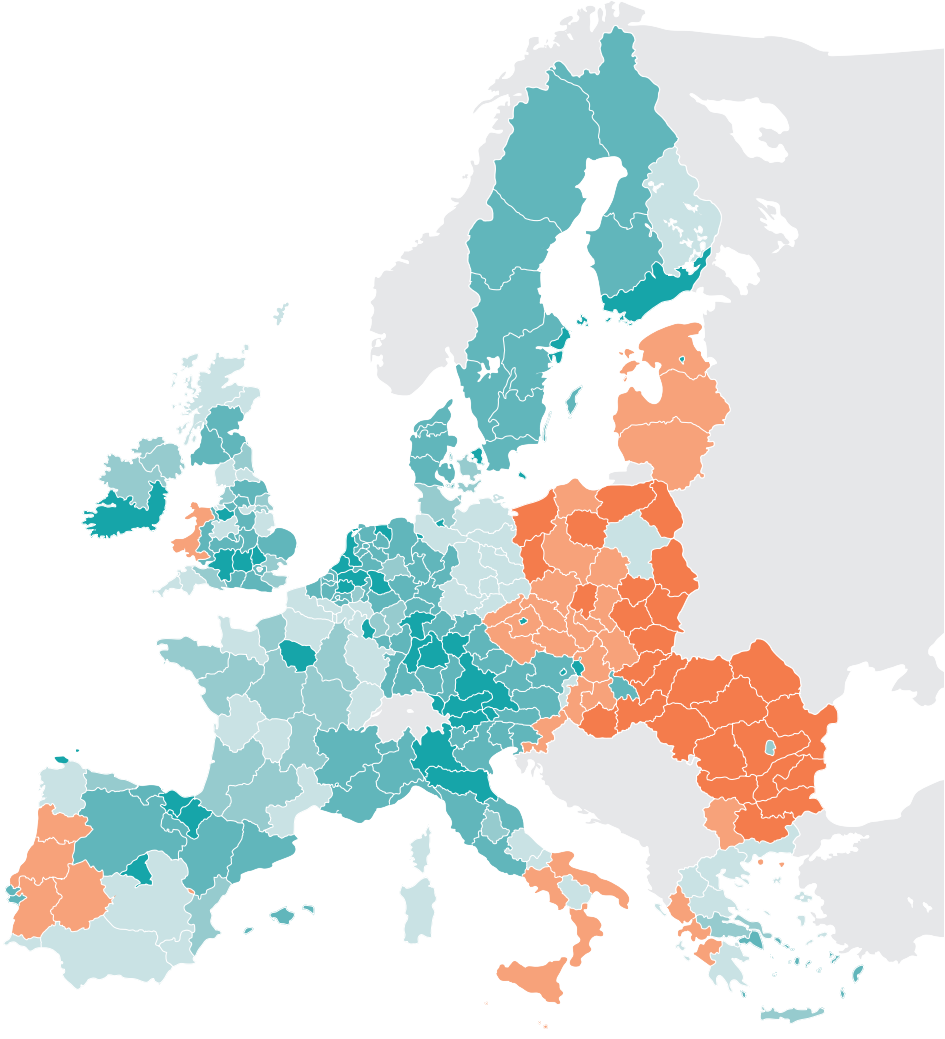
→
Why do we need cohesion policy?

Economic and social disparities hamper integration and development. Closing these gaps remains a key objective.

Regional GDP per capita* 2006-2008
*index EU27 = 100

- < 50
- 50 – 75
- 75 – 90
- 90 – 100
- 100 – 125
- > 125





Thematic Objectives

Objective 4: supporting the shift towards a low carbon economy in all sectors

4e: promoting low carbon strategies for all types of territories, in particular for urban areas, including the promotion of sustainable, multimodal urban mobility (Sustainable Urban Mobility Plans or SUMPS)

Objective 7: promoting sustainable transport and removing bottlenecks in key network infrastructures

7a: Supporting a multimodal Single European Transport Area by investing in the TEN-T network

7b: Enhancing regional mobility (ERDF funds only)

7c: Developing and improving environment-friendly (including low-noise) and low-carbon transport systems in order to promote sustainable regional mobility

7d: Developing a comprehensive, high quality and interoperable railway system, and promoting noise-reduction measures

Challenges ahead

Europe is very dense, with many small- and medium-sized cities. Recently, when speaking with colleagues at the OECD about harmonised definitions of cities at EU level, we worked on a definition based on urban densities rather than administrative borders. In Europe, around one-third of the population lives in areas of more than 50,000 inhabitants. But one third of the European population – that is one third of 480 million inhabitants – live either in towns of less than 50,000 inhabitants, or in suburbs. It will become more and crucial to know about 'urban shape'. Periurban areas are becoming more important to Europe, and we must preserve small and medium-sized cities as centres of services.

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One third of the European population – that is one third of 480 million inhabitants – live either in towns of less than 50,000 inhabitants, or in suburbs. It will become more and crucial to know about 'urban shape'. areas are becoming more important to Europe, and we must preserve small and medium-sized cities as centres of services

These may not be the most competitive places at the world level, but regionally and nationally they have played their role for decades, and remain important. We cannot just close small cities as we close a company. We must ensure their sustainability or we will be faced with difficult-to-manage migration patterns. We see migration flows from east to west, with many non-qualified people arriving in our bigger cities and creating congestion, unemployment and pockets of poverty.

Comparing the location of universities and print shops in the 15th century with current corridors of urbanisation, we find a surprising match. There is no connected EU pentagon, but rather the 'connected banana': a clear challenge for regional policy.

→
The connected banana: 21st century corridors of urbanisation

Source: *The Oxford Handbook of Cities in World History*, Edited by Peter Clark, Oxford University Press, 2013

Since the crisis, discourse on growth and competitiveness has led to a tendency to reinforce the EU Pentagon and the connected banana, so what to do? Should we aim to improve conditions in the connected banana, or should we look at the other parts of Europe? And, of course, in the European Commission's Urban Development and Territorial Cohesion Unit, the answer is that we should look at the other parts of Europe.

Some cities are less connected than others. A friend from Hungary told me it can take eight hours to travel to a city which is 200 kilometres away on the other side of a national border. Such lack of mobility can seriously constrain potential. We need to focus on where people want and need to go, rather than on the existing transport offer. We should think about city regions; as the links between the peripheral cities will become more and more important.

Transport is a crucial element if we wish to strengthen cooperation between cities. But we need to analyse our investment priorities carefully to ensure that they deliver planned outcomes. A high-speed train link was built between Torino and Milan in Italy, and between Milan and Bologna, for example, and the result is exactly opposite that was expected. The expectation was increased accessibility for Torino and Bologna, but the result is that more people from Torino and Bologna now travel to work in Milano.

We also need to pay more attention to urban density. Atlanta, USA, for example, is an agglomeration of 5.5 million inhabitants, the same as Barcelona. The difference is that Atlanta's territory is five to ten times larger. How can we realistically compare the costs and benefits of transport in such situations? Our solution is to undertake more analysis into the actual shape and function of cities; into the impact of urban sprawl, the characteristics of compact cities and the functioning shape of territories across Europe.

Transnational cooperation in North-West Europe

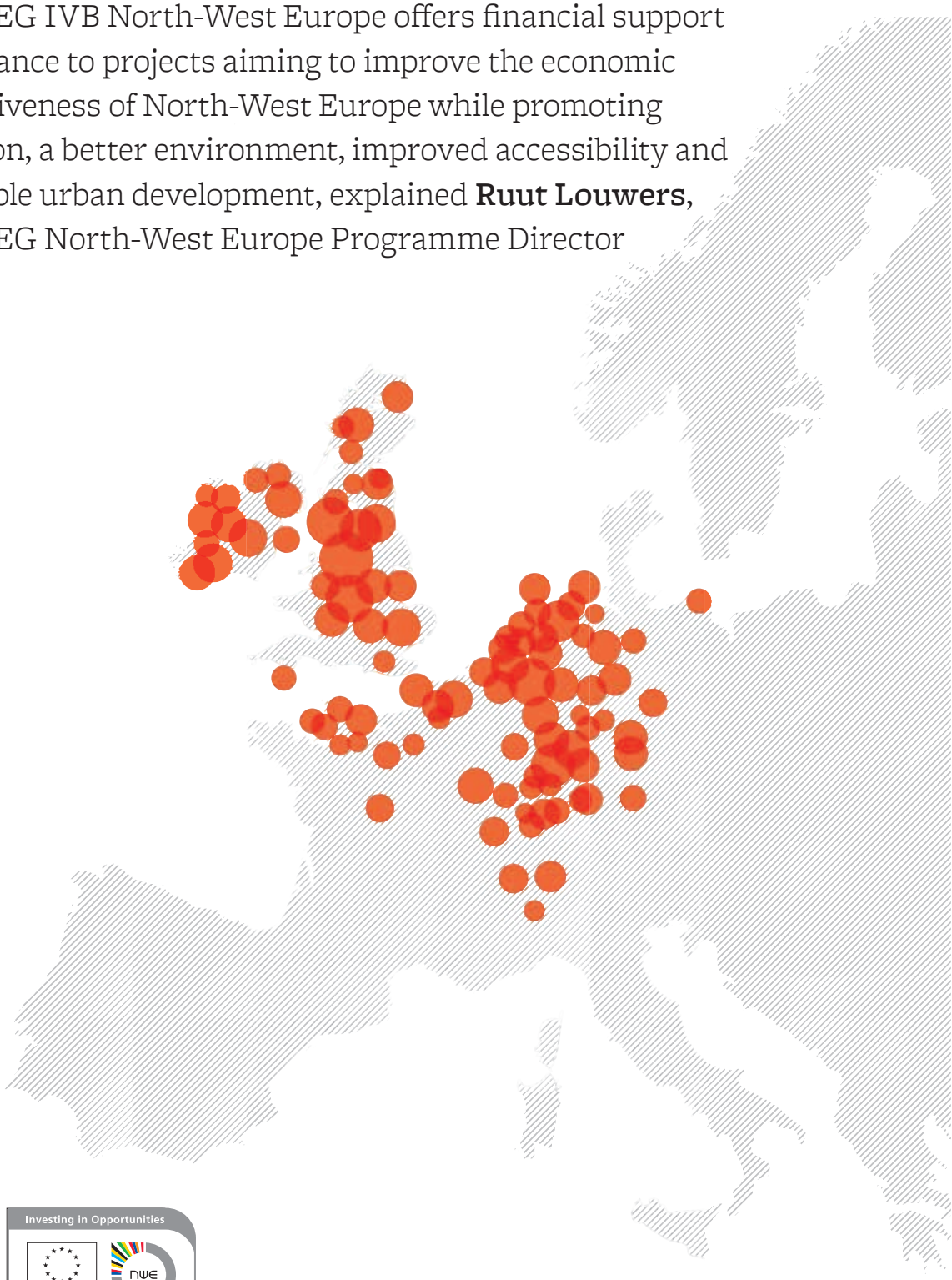
INTERREG IVB North-West Europe offers financial support and guidance to projects aiming to improve the economic competitiveness of North-West Europe while promoting innovation, a better environment, improved accessibility and sustainable urban development, explained **Ruut Louwers**, INTERREG North-West Europe Programme Director

Programme budget
€338.4m

Percentage of projects invested in infrastructure
64%

Number of projects invested in
114 projects

Number of partners involved
1,118



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Spread and concentration of INTERREG IVB projects

Projects have addressed climate resilience, freight corridors, motorways, integrated ticketing, and improving connectivity to hard to reach areas. In all projects, transnationality and cooperation are key elements.

Investing in Opportunities
This project has received European Regional Development Funding through INTERREG IV B.
nwe
INTERREG IVB

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In future we will also be more results-orientated, with a focus on baselines, impacts, uptake – and change. There will be more experimentation, we will take well-managed risks and be prepared to learn from failures.

We will focus on concentration, on opportunities rather than problems, and monitor impacts on cohesion and smart, sustainable and inclusive growth

INTERREG IVB North-West Europe is a financial instrument of the European Union's Cohesion Policy. It funds projects which support transnational cooperation. The aim is to find innovative ways to make the most of territorial assets and tackle shared problems of Member States, regions and other authorities. Since 2007, INTERREG IVB North-West Europe has addressed challenges affecting the economic, social and territorial cohesion of the area. Thanks to the programme's financial support and guidance, projects are improving the economic competitiveness of North-West Europe while promoting innovation, a better environment, more accessibility and sustainable urban development.

'We are achieving this by increasing concentration,' said Louwers, acknowledging that funds cannot be spread too thinly. 'In future we will also be more results-orientated, with a focus on baselines, impacts, uptake – and change. There will be more experimentation, we will take well-managed risks and be prepared to learn from failures. We will focus on concentration, on opportunities rather than problems, and monitor impacts on cohesion and smart, sustainable and inclusive growth.' There is also a new focus on simplification, although Louwers noted that 'I am afraid that simplification is not that obvious', despite being a key programme driver.

Building the 2014–2020 programme strategy

While the programme is reaching its final stage of implementation for the current period (2007–2014), the European Union is preparing for the future. The Cohesion Policy Regulations were approved and published in the Official Journal of the European Union in December 2013. They are designed to reinforce cohesion and to target EU investments on Europe's long-term goals for growth and jobs.

The new programme strategy will also align with the objectives of the Europe 2020 strategy, the EU's growth strategy for the coming decade. In this respect, the EU has set five ambitious objectives – on employment, innovation, education, social inclusion and climate / energy – to be reached by 2020. Each Member State has adopted its own national targets in each of these areas. Concrete actions at EU and national levels underpin the strategy. The North-West Europe 2014–2020 Programme will focus on the challenges and needs that can be effectively tackled through transnational cooperation. To do so, it will be capitalising on the results achieved so far.

North-West Europe thematic focus for 2014–2020

The North-West Europe Member States have started to prepare the content of the future programme and have agreed on the following Thematic Objectives:

- Strengthening research, technological development and innovation.
  The programme will invest in enhancing the capacity of the North-West Europe territory to generate innovation, on the basis of its existing potential. It will seek to reduce the innovation capacity gaps between regions and contribute to the implementation of the smart specialisation strategies of participating regions.

- Supporting the shift towards a low-carbon economy in all sectors.
  The programme will invest in the area's climate change mitigation potential, reduction of greenhouse gas emissions, energy efficiency and the share of renewable energy sources in the consumption and production mix.

- Protecting the environment and promoting energy efficiency.
  The programme will invest in eco-innovation and resource efficiency. The purpose is to reduce the environmental footprint of human activity on the environment, and decouple the growth curve from the material consumption curve.

Although there is no longer a specific focus on transport, the transport theme is relevant to each of the three key objectives. It is relevant to innovation, as advances are always possible, to a low carbon economy and to resource efficiency.

Beyond transport policy to cohesion policy

Louwers explained why, in practical terms, the programme has supported projects such as Sintropher and how it will select projects for support in future. 'It's not a transport project, it is a cohesion project,' he says. 'It is about bringing Europe together, and forming a European identity along with local and regional connections. There is a steady growth in people that feel European, now 62 per cent. Even in the UK, which has sections that are critical of the EU, 42 per cent of people report that they feel at least partly European.

'Cohesion policy funding is unique to the EU. It's a very powerful tool for Europe and a great asset when approaching territorial cooperation. The North-West Europe region may have specific and identifiable territorial characteristics, such as high densities in the cores, but it also has peripheral areas and for us, connectivity is one of the key elements of improving cohesion.'

The current programme has supported 114 projects in five clusters, one being a transport cluster. It takes in 1,118 partners and seven member states, plus Switzerland; this scope is how we aim to improve cohesion. Projects have addressed climate resilience, freight corridors, motorways, integrated ticketing, and improving connectivity to hard-to-reach areas. In all projects, the concepts of transnationality and cooperation are key elements. Looking forward, said Louwers, 'Design, Develop, Decide, Implement, Disseminate' (DDDID) will take on greater importance; this emphasises cooperation and joint working which we hope will add a sharper focus to project aims.

The current programme is near its end, so our focus now is capitalising on results. The projects have made investments, but we are also looking for output indicators and impacts.

For the next programme, we would rather invest in opportunities. The operating budget will be €400 million, and the subsidy percentage will be raised to 60 per cent, successful outcomes in line with the relevance and 'added value' potential the proposed project offers. The draft operational programme is now being consulted upon, and there will be a call for proposals in early 2015.

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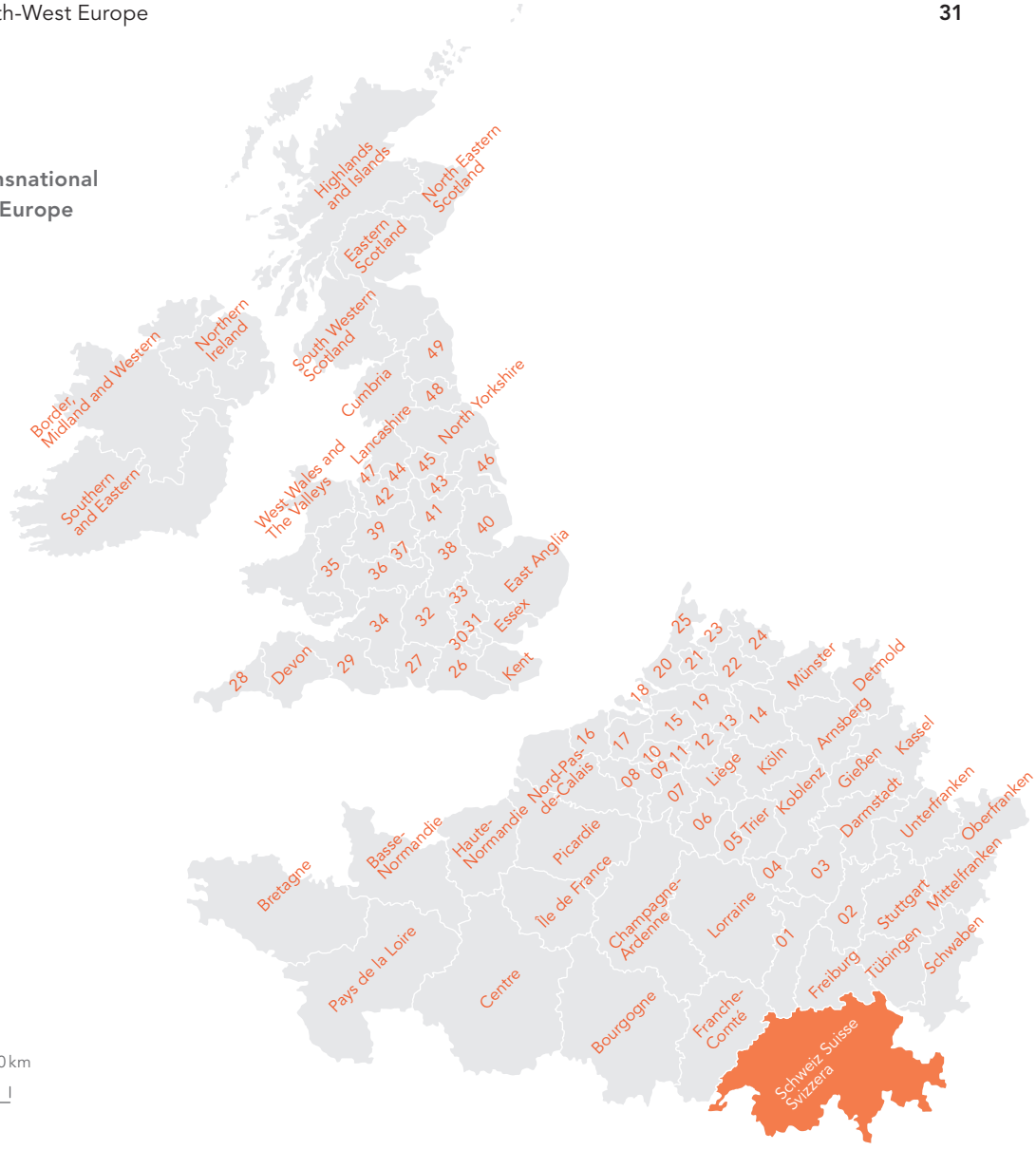
Structural funds 2007-2013: transnational cooperation areas, North-West Europe

EU27 Cooperation areas
Other cooperation areas



01. Alsace
02. Karlsruhe
03. Rheinhessen Pfalz
04. Saarland
05. Luxembourg (G-D)
06. Luxembourg
07. Namur
08. Hainaut
09. Brabant Wallon
10. Brussels Hfst. Gew. / Rég. de Bruxelles-Cap.
11. Vlaams-Brabant
12. Limburg
13. Limburg
14. Düsseldorf
15. Antwerpen
16. West-Vlaanderen
17. Oost-Vlaanderen
18. Zeeland
19. Noord-Brabant
20. Zuid-Holland
21. Utrecht
22. Gelderland
23. Flevoland
24. Overijssel
25. Noord-Holland
26. Surrey, East and West Sussex
27. Hampshire and Isle of Wight
28. Cornwall and Isles of Scilly
29. Dorset and Somerset
30. Outer London
31. Inner London
32. Berkshire, Buckinghamshire and Oxfordshire
33. Bedfordshire and Hertfordshire
34. Gloucestershire, Wiltshire and North Somerset
35. East Wales
36. Herefordshire, Worcestershire and Warwickshire
37. West Midlands
38. Leicestershire, Rutland and Northamptonshire
39. Shropshire and Staffordshire
40. Lincolnshire
41. Derbyshire and Nottinghamshire
42. Cheshire
43. South Yorkshire
44. Greater Manchester
45. West Yorkshire
46. East Riding and North Lincolnshire
47. Merseyside
48. Tees Valley and Durham
49. Northumberland and Tyne and Wear

Session 02
Connecting regions and cities: what are the opportunities and potential of new technologies and systems?

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Delivering intermodality and seamless travel

SYNAPTIC, a cluster of related INTERREG IVB projects, lasted from 2011 to 2013 and aimed to look at best practice across Europe in terms of seamless journeys between one transport mode and another.

Professor **Sir Peter Hall** introduced SYNATPIC's animated vision of a multimodal trip in the 2030s

S-MAP 2030

SYNAPTIC (Synergy of New Advanced Public Transport Solutions Improving Connectivity in North-West Europe) was an EU-funded INTERREG IVB cluster of four North-West European mobility projects RoCK, BAPTS, Sintropher and ICMA amobilife. It brought together 52 partners from eight North-West European countries with a common objective: to enhance the framework conditions for intermodality and seamless door-to-door journeys.

A central aspect of SYNAPTIC was production of a vision for the future, imagining a fully linked-up rail service from the North of England to continental Europe. There was a particular focus on Preston station, a major interchange hub but identified as one of the ten most problematic stations in England because of its poor physical access.

One idea promoted a link-up with tram-train from Blackpool, past a large university campus – the University of Central Lancashire – via a disused railway, across the motorway to a Park & Ride site and possibly to a new garden city development. We imagine High Speed 2 has been completed, due to reach Preston in 2032, linking directly in London to High Speed 1 and European cities.

We also imagine connections to all parts of the region through the Preston hub, including tram-train and the new regional tram. That is our vision, and it can be viewed online at: **www.sintropher.eu / news-updates / seamless-public-transport-2030**

S-MAP 2030 (Seamless Mobility Action Plan for 2030)

S-MAP 2030, an output from SYNAPTIC, presents recommendations for policy changes and investment initiatives at EU, national and regional levels. They will help build a system of seamless door-to-door journeys in the North West Europe (NWE) region, focused on the needs of the individual traveller. It also sets out a vision and guiding principles that will help achieve a radical improvement in daily door-to-door journeys in NWE by 2030 by identifying opportunities ('development potential') and market barriers ('crunch points') that need to be unlocked to facilitate seamless journeys.

S-MAP 2030 is based on an analysis of journeys completed in the NWE region in 2012, on expert reviews of current European good practice, on consultations with industry and passenger organisations and round table seminars involving representatives of representatives of the European Commission. Detailed Findings are available upon request (S-MAP 2030 Technical Report, November 2012; S-MAP 2030 Technical Report of NWE Journey Audits, November 2012).

Published in 2012, feedback from numerous key mobility stakeholders in North-West Europe has led to further elaborating short and long-term recommendations of this S-MAP 2030 Action Plan towards policy makers and stakeholders at all levels whose decisions and actions can alone make it happen.

Visit: **www.synaptic-cluster.eu**

New models of urban mobility

Moving to an incremental light rail planning approach instead of working within a naive rational planning paradigm will lead to the successful delivery of more urban light rail projects.

We need to go beyond the illusion of total control, explained **Dr Rob van der Bijl**, a consultant at RVDB Urban Planning in Amsterdam

Dr van der Bijl's focus was on the need to adopt a more resilient and flexible approach to delivering light rail and tram-based schemes. He outlined the five 'E's to justify high-quality public transportation such as light rail.

Efficiency

This is a well-known argument. Transport means meeting demands; with high-quality public transport it is possible to make more efficient use of limited public space and introduce better traffic design principles, optimise operational costs, and make more civic and socially-oriented use of public space. Rail-based urban transport can be very efficient. Take the ring tramways of Budapest and of Paris, and the Amsterdam tram serving the historical centre with its very narrow streets, for example. It would simply be unthinkable to use any other mode than trams in these particular situations.

Enhancement

This is inspired by the well-known practice in France, where a tramway project in an urban environment is used to improve the quality of the city and to enhance urban planning and design. Reims, France, is one such successful project.

Environment

This is one of the most important Es. However, the environment, at least in the Netherlands, has not been an issue in any of the major public transport projects of the last 25 years. The relationship between density and the energy used for transportation varies: Atlanta, USA, has as a very low density and the highest energy consumption for transportation. Most European cities are in the mid-range. Low density cities, hence cities with a low density public transport network, perform very badly regarding energy consumption.

Economy

There is some proof that a range of economic effects come into play once public transport is of a better quality than the average quality of a typical bus service. Investment in trams can deliver economic benefits. Certainly there is a relationship between the quality of rail-based infrastructure and, for instance, land and real estate value. But maybe a more important fact is that rail-based infrastructure allows places to be proactive regarding property development. This may not be a causal effect but, especially in the US, it has been shown to create very favourable conditions for economic development.

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We face a major challenge over the next 30 years in terms of framing the objectives and potential of light rail projects successfully

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Reims

Several schemes failed before being rejuvenated and becoming successful, for example Reims, France, in 1995.

Equity

This is the most important argument for enhancing and augmenting public transport in European and American cities.

Although the economy is obviously successful in many places in Europe, there are many rich countries finding it challenging to cope with class mobility and economic divides. So the equity argument is very important because public transport allows a great many less well-off people to connect to their places of work.

The evidence base

In terms of 'hard proof', van der Bijl explained that he was working on two case studies, a historic case study of Watts, Los Angeles, USA, and a contemporary study of Detroit, USA. In the early 1960s all public transport networks in Los Angeles were demolished, with the last regional tramway ceasing to exist in 1961. Several sources were found to connect the disruption of the service between Watts and Long Beach and downtown LA with social uprising and the severe rioting that took place a few years later. Because public transport ceased to exist, people were disconnected from social life and, most especially from their places of work.

Successful project characteristics

- Obvious scope
- Plan and strategy (make a 'plan B' available)
- Citizen involvement
- Mature design / engineering
- Sound political decisions and stakeholder involvement
- Funding decisions in place
- Stakeholder management
- Availability of long-term view

A new paradigm of incremental planning

- Focus on 'why', not primarily on 'how' and 'what'
- Keep it simple! (e.g. use proven technologies, minimise short-term changes)
- Appropriate project phasing
- Create 'faits accomplis' to deliver quick wins and drive buy-in
- Socially involved project management
- Unconventional approach towards politics and administration
- Opportunistic stakeholder management
- Communicate and manage the project's context and future

The second case is Detroit. There are plans for a bus or a tram, and studies show that people without means of transportation, i.e. without cars, live adjacent to the projected new routes of the (still to be delivered) public transport.

'It is obvious that the five Es could be very important, but personally I don't know of any project from the last 25 years which was justified because of them', explained van der Bijl. 'We face a major challenge over the next 30 years in terms of framing the objectives and potential of light rail projects successfully. For example, Sintropher's Nijmegen-Kleve[1] project had a great deal of potential, but it was never allowed to become a real 'project', merely a feasibility study, without clear political support, and lacking focus and rationale, and with poor buy-in from stakeholders.'

So what are the hallmarks of a successful project? Many promising schemes have been killed off during the last 25 years. But why did they fail? There are three key reasons: taking an overly technocratic attitude; conceiving the planning process as a rational process; and lacking project focus and context. Van der Bijl put forward a number of characteristics a successful project would have, together with a new paradigm for incremental planning (see left).

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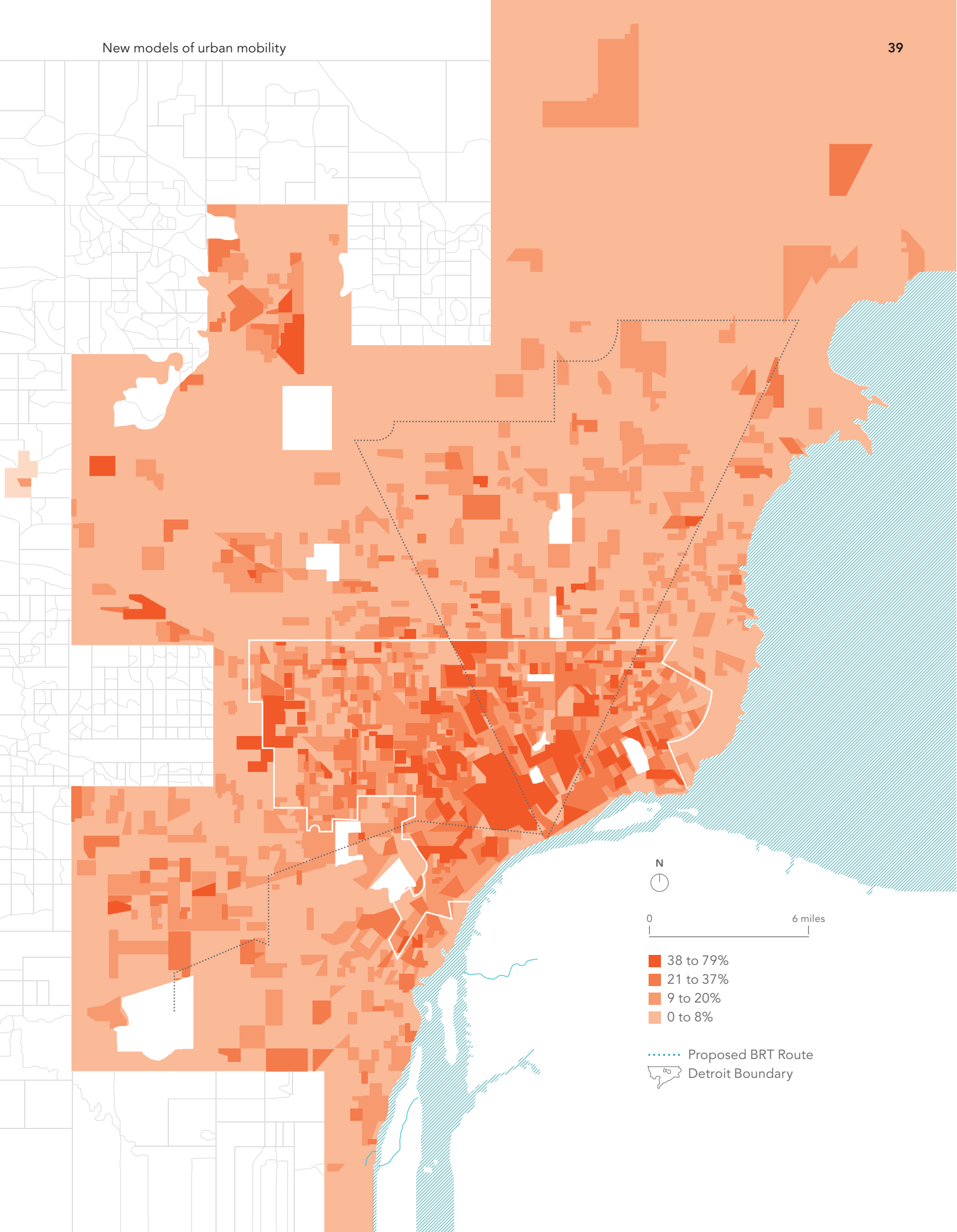
Detroit. Percentage of households without a vehicle in the proposed BRT service area

The central city of Detroit: people without means of transportation, i.e. a car (shown in dark red), are adjacent to the projected routes of the planned new public transport network.

Source: American Community Survey, 2006–2010


N
0
6 miles
38 to 79%
21 to 37%
9 to 20%
0 to 8%
Proposed BRT Route
Detroit Boundary

Groningen Regiotram System

Infrastructure **01 Infrastructure integration & design**	Material **02 Rolling stock**	Organisation **03 Maintenance & management**	Organisation **04 Transport services**	Integration **05 Environment**
1.1 Tram system	1.2 Non-tram infrastructure	1.3 Construction	1.4 Street furniture	1.5 Landscaping	1.6 Underground infrastructure
Tram track	Roadway	Artwork	Street lighting	Trees	Cables and ducting
Tram stops	Cycle paths	Buildings	Information systems	Gardens	Sewerage
Station furniture	Footpaths		Waste bins	Shrubs	Pollution run-off
Traction system	Functional strip		Waste containers	Grass	Household connections
Sub-stations	Facilities at intersections		Waste provision	Edges	
Catenary	Parking		Fences		Drainage
Security system	Bus stops				Sewers and services
Preparatory works					Divers

↑

New contractual challenges

The Groningen RegioTram project involved a challenging experiment with a new kind of contracting, design, build, finance, maintenance, operational and procurement contract.

Tendering was almost complete in October 2012 when the city's politicians decided to pull the plug: an example of the illusion of total control.

Note

1 The 'Nijmegen-Kleve' project is a proposal to reopen a disused railway line from Nijmegen in the Netherlands across the border to Kleve in Germany, investigated as part of the Sintropher project. The scheme has options to use either light rail or heavy rail technology.

↓
Planning and urban design

The complexity of light rail in an urban environment does not allow for straightforward rational planning. In addition, behind such an approach is usually a rather technocratic attitude, for example establishing fixed contracts to cover and calculate all issues in advance.

Mulhouse, France, although a very rationally planned project in some ways, was justified by a great design concept around a green structure with many new trees.

The art of the possible

In Eskişehir, Turkey, the mayor and city authorities took the pioneering step of creating the Eskişehir Light Rail Transit System (EsTram), a high-capacity transportation system that was completed within two years.

Ümit Güney, Head of External Affairs, Eskişehir Municipality, outlined the process

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You don't only change the transportation system with a tram, but also the entire city

↙
Projecting an image of a flourishing city

The EsTram has been highly successful, contributing significantly to Eskişehir's urban renewal.

Eskişehir is a city in the central Anatolian region of Turkey with a population of around 450,000. The city has a large concentration of young people owing to the presence of two university campuses, which requires a highly integrated and efficient public transport system. The tram is known as the EsTram and it was implemented in order to provide a high-capacity, fast and efficient transportation system, while at the same time reducing traffic congestion and air pollution. The 15 km network links universities, state and private hospitals, leisure and cultural facilities, the main line railway station, the coach station and the city centre.

The first line of the project was begun in July 2002, financed through an export credit from Sweden and credits from Nordic and European investment banks. A second line, Osmangazi-Opera, was added in 2003. Construction was completed within 20 months in June 2004 and the system opened for business in December 2004. Projected to cost more than US$125 million, the whole system came in under budget at less than US$120 million.

Operations

The tram has a normal operating speed of 50 km / h and each tram is capable of carrying 159 passengers with 59 seated. The entire network has a maximum capacity of 120,000 passengers per day. The electronic EsKart travel pass allows for free transfers between bus and tram, and between tram and tram, provided the transfer is made within 45 minutes.

To promote EsTram, a wide campaign was launched, involving handouts and seminars, among other activities, targeting primary and secondary schools, universities and governmental institutions, such as police stations, health centres, and fire stations. In the first seven years of operation (from December 2004 to 31 March 2011) total ridership was over 184.5 million passengers, averaging 97,820 passengers per weekday.

The tram as part of urban renewal

Construction coincided with a number of other projects in the city being implemented under the Eskişehir 2010 Strategic Plan, including limited pedestrianisation in the city centre, rehabilitation of the River Porsuk, which runs through the city centre, and which over the years had become highly polluted, and renewal and redevelopment of declining built-up areas, also in the city centre and along the river.

Yılmaz Büyükerşen, Mayor of Eskişehir, was a strong leader with national political support, and opted to pioneer the tramway as part of a coordinated approach to transport and urban planning designed to improve the image of the city. In this respect there is consensus that the arrival of a light rail system contributed to the success of the urban renewal schemes, which in turn validated the need for such a system in the first place, providing an overall synergy to the strategic plan. Speaking of the tram's implementation, Büyükerşen said: 'You don't only change the transportation system with a tram, but also the entire city.'

In 2004 the project received a Rail System Award from the UITP (International Association of Public Transport) in recognition of its success.

↑
Image credit: Aycan

↑
Before and after construction of the Eskişehir tram

These images show well the tram's positive regeneration influence on the built environment.

Only seven Turkish cities have trams. Three cities have subways and the rest use a variety of bus services, minibuses and private shared taxis. Cycling is also beginning to make an impact as municipalities begin to build cycle paths and establish regulations for cyclists.

The subway in Ankara has two lines and a third one is under construction, approximately 50 kilometres long. Scheduled for completion by 2007, work is still in progress in 2014.

Istanbul has four subways and three trams, yet 80 per cent of the trips are made by motor vehicle.

Only 14 per cent of trips are by rail; the rest are by bus and sea. In Ankara the subway sits only 10 metres under the ground, but cost US$190 million per kilometre. A tram would have cost around US$3 million. On this basis, Güney maintains that in terms of economics, passenger capacity, endurance and safety, Turkey needs to build more tram networks.

Additional details of the Eskişehir ESTRAM taken from the Eltis urban mobility portal case study: **www.eltis.org**

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Transport in all weathers

Tramways provide a reliable means of travel year round.

Changing transport technologies – what is now possible for tram-train?

The latest thinking in tram-train technology and assessment of viability for regional connectivity: key points from a tram-train working group reported by **Nils Jänig**, Deputy Director, Head of Transport, Planning and Rolling Stock Technology, TTK, Germany

Alongside the Sintropher conference Supporting Growth through Regional Connectivity on 27 February 2014, Tram-Train Technology 2014[1] was held on the previous day, 26 February, to discuss and define the next steps in intermodality and innovative technological development that are bringing trains, trams and metros together into a new range of smart urban rail solutions.

The sessions were chaired by Nils Jänig, who who reported key points to delegates.

The seminar noted that tram-train, although showing great potential, has many issues to overcome. These are more institutional than technical; being focussed around transport and urban planning, politics and leadership, traditional cost benefit analyses and the financial / funding aspects of tram-train delivery, all of which need more attention than developing appropriate technologies.

Key issues include:

Institutional and legal aspects: integrated transport and urban planning

- Politics and leadership
- Cost benefit analysis and business cases
- Financial aspects
- Technical aspects including rolling stock

City and regional cooperation: A key point is cooperation between cities and regions. If they do not work closely with each other it can be difficult to manage tram-train projects, which are especially suited for crossing borders. Cooperation needs to be carefully looked at from the institutional point of view, as several past projects have failed due to lack of partnership working.

Local and regional transport planning authorities: Manchester, UK, was mentioned as a good example, having developed a new planning body to push transport projects for the wider city and region. The city took a fresh view and was able to promote integration in a collaborative manner. There are more and more examples in Europe where tram-trains are simply not affordable, and regional tramways should come into focus: tram-train is not the only answer, as their complex institutional context can make project delivery unfeasible.

Infrastructure owners: For tram-trains this is a major issue because of interoperability; the support of the infrastructure owner is vital to their success. The possibility of giving up infrastructure to local authority / operators was discussed, along with how this has worked in practice, for example in Karlsruhe, Germany. The session also provided several examples from Network Rail, UK, which is considering such integrated partnerships. The benefits of taking a network-based approach rather than a line-based approach were also noted.

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Vossloh Citylink NET 2012 tram-train on test in Karlsruhe

This low-floor vehicle was delivered in 2014 and is fully approved to run both on tram and mainline railway tracks. Image credit: mwmbwls from Flickr.

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Overcoming barriers between city, region and the needs and expectations of many stakeholders can be complex, but is more likely to be successful when the widest range of stakeholders is involved

Politics and leadership: Overcoming barriers between city, region and the needs and expectations of many stakeholders can be complex, but is more likely to be successful when the widest range of stakeholders is involved. Ideally, there will be a project champion to drive the projects, as is the case in the UK with Network Rail as a key project promoter. The project driver needs to be involved long-term, over five, ten, or 15 years: however long it takes.

Linking politicians and technical people, swapping them around and encouraging them to learn from each other is also good practice and helps to overcome cultural barriers. Empower those involved to be agents of change: these may include innovative engineers, planners, city leaders, governments, EU agencies, passengers and the media.

These potential change agents should not simply be kept informed, but treated as stakeholders in the project. Efficient communication is important, as it is vital for all potential economic, environmental, health and safety benefits to be clearly put across to decision-makers.

Finance, cost benefit analysis (CBA) and business cases: It is important to note the key differences between cost benefit analysis and business cases. Although there are differences across countries, many cost benefit analysis processes are too heavily focussed on costs rather than on benefits. Wider social benefits and user needs should be captured in a more holistic manner in cost benefit analysis. This will involve the improvement of tools and assessment criteria, and planners need to respond to the potential benefit of a network, and not only of a line.

Long-term benefits need to be better captured and given more weight. Different countries also take varying approaches to the weight they give cost benefit analysis in the decision-making process.

Missing data: in many cases, the kinds of wider benefit data necessary to support the business case are unavailable or unreliable. Defining and gathering data needs to be dramatically improved.

Financial aspects: Track access charges remain unfavourable to lighter and smaller tram-train vehicles which pay as much as heavy rail. Vehicle costs are high as fleets are small, often customised and so economies of scale are not frequently realised. Operational costs savings are needed if tram-train is to remain viable.

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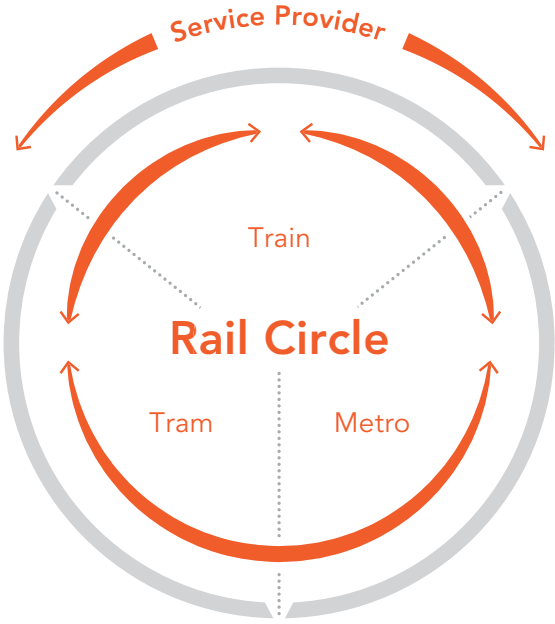
Approaches to light rail: a typology

This diagram represents how light rail can operate on one or more types of rail infrastructure, and shows the fluid relationship between different rail-based modes. For the service provider, one mode such as tram-train may not be the only solution.

Benefits come from a network approach when connections can be made, rather than a line-based approach. Success factors for tram-train include the close integration of urban and regional aspects in one planning approach. How they interact influences the particular mode.



We need to consider and adapt new and innovative ways of financing projects, noted Jänig, for example the *versement transport* in France, a hypothecated tax levied on employers within a defined area which funds local and regional transport projects. Consideration must be given to how such funding streams can become an integral part of the business case.

Technical aspects including rolling stock: Technical aspects are important but are by no means the main issue inherent in delivering tram-train. Standards are being set by the railway sector, heavily influenced by the main railway suppliers. Tram-train advocates must always fight for light rail standards which adds cost, time and risk to a project. For vehicle suppliers, tram-train numbers are small, with the result that there are few suppliers interested in the business.

Future directions

Recently, more general movements in favour of rail transport also open up new possibilities for tram-train, for example, the Shift2Rail project [2] which opens up new opportunities for tram-train schemes across Europe. This new public-private partnership will invest one billion Euros in research and innovation to get more passengers and freight onto Europe's railways, including increasing capacity and promoting interoperability.

Notes

1 Tram-Train Technology 2014 was supported by a specialist professional online network launched with the support of New Transit and Modern Railways magazines, and other partner organisations. See: www.tramtraintechnology.com

2 See: www.shift2rail.org

Improvements in regional connectivity and implications for growth

A case study from the city of Kassel: new, noteworthy indicators are demonstrating how positive the RegioTram has been for the city and the region, said **Prof. Dr.-Ing. Helmut Holzapfel**, Kassel University, Germany

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The tram system has not only improved connectivity with distant places, it has vastly improved internal connectivity within the region

Regional connectivity, and its implications for growth, is a difficult issue because economists do not really know exactly what 'growth' is. If we look at transport as a driver of growth, we see a typical 'chicken and egg' problem: without growth there is no transport, without transport there is no growth. Delivering a clear, empirical statement is very difficult. But in Kassel, where the RegioTram has been in operation fully since 2007[1], some really interesting indicators are showing just how positive the tram has been for the city and the region, explained Holzapfel.

Kassel has connections to many international networks. There is an ICE station on the German high-speed train network, as well as a central station, and the ICE connection has definitely led to better access for Kassel. But many German cities have similar access, yet are not developing to the same extent as Kassel.

Looking at data over two years, in 2012 Kassel was the most dynamic city in Germany, according to data published by the Cologne Institute of Economic Research, despite its relatively small size of 180,000 inhabitants in the centre of the country. In 2013 it was still in the third place. So there is obviously stable progress taking place.

This may partly be due to influence from Kassel's forward-thinking university, but other university cities, for instance Braunschweig, near the former East German border, have not developed in similar ways, as otherwise might have been expected. Instead, we feel, explained Holzapfel, that the advantages of the high-speed rail system are extended across the wider region of North Hesse by the regional connectivity of the public transport system: the tram-train-based RegioTram, plus the existing rail network.

Using tram-train, it takes 60 minutes, for instance, from the town of Hofgeismar to the centre of Kassel and the ICE station. This therefore makes even this relatively small town a potential venue for international congresses thanks to its stable and reliable links. But Holzapfel's main message was not that the tram-train system has improved connectivity with distant places (although it has), rather that it has vastly improved internal connectivity within the region.

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Connecting the region

Intra-regional connectivity is good, meaning that even the shopping centre in Kassel becomes more attractive because people can travel there reliably.

Shopping in Kassel is worth a great deal, with about €1.5 billion volume of sales in 2012.

Three examples – housing, retail and education – illustrate the effects of the system in three different areas:

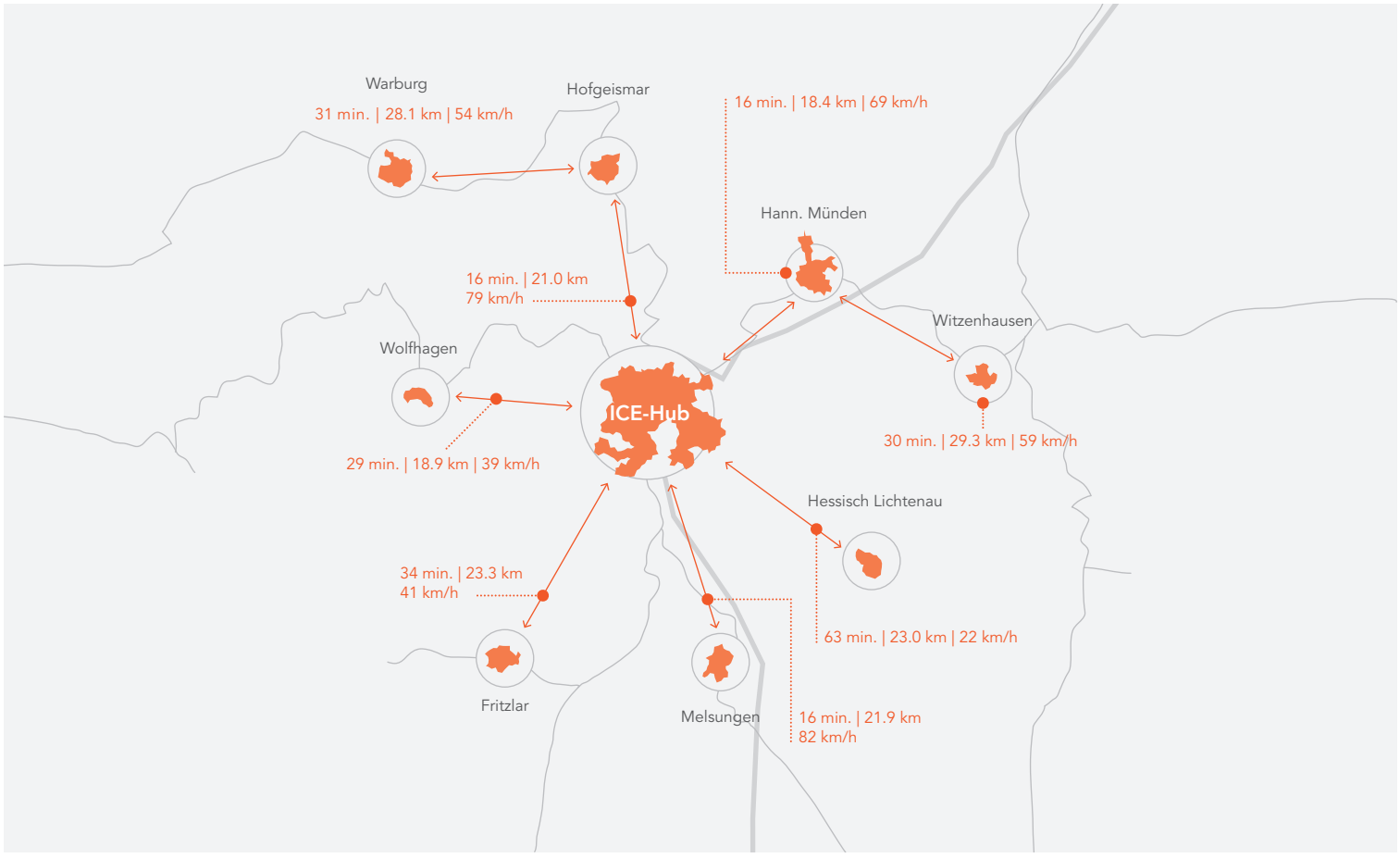
Housing: In Germany there is a great deal of demographic change: many regions are experiencing population decline, especially in rural areas, and finding that house prices are falling. But in Kassel's 'tram communities', this demographic trend is not occurring to the same extent. In fact housing occupancy levels are higher than average, and the house prices have been rising in rural areas, a very rare situation in Germany at this time. The effect is particularly noticeable in those places served by the tram-train.

Retail: Shopping in Kassel had a €1.5 billion volume of sales in 2012. Yet the city has fewer out-of-town malls and shopping centres than other regions, because public transport brings shoppers into the centre of Kassel. Mode share is impressive: bus and tram together have 70 per cent, maintaining 59 per cent during the month of November.

During times of disruption such as accidents and strikes, the economic performance of Kassel's city centre shopping centres suffers significantly, which shows their high public transport dependency.

Education: Some people ask, what has education to do with public transport? Is this not a very theoretical connection? Not in Kassel: as education is becoming more and more important for regions and their economic performance, people are attracted to the Kassel region for its educational opportunities, and then staying on afterwards. Upskilling the workforce and the types of work available in the region is key to success, and Holzapfel noted that public transport is a very important element in this trend. Of students and visitors to the University of Kassel, around 94 per cent use means other than a car. This is really impressive and there is no other example in Germany of universities having such high levels of public transport use.

Holzapfel again underlined the importance of internal connections and how these figures support this. The high volume of business and levels of connectivity in the region are much more important than what take place outside it. The positive upward trends in the region, in shopping, education and high land values, are only possible because of the good internal connectivity in the Kassel region.



N

0 5 10 15 20 25 km

Railway
High-speed line

34 min	Fastest journey time to hub
24.3 km	Shortest distance
41 km / h	Average journey speed

↑
ICE-Hub Kassel

With its ICE station and city centre station, Kassel is well connected to many international and domestic networks, increasing its accessibility from further afield. But just as important, good onward RegioTram connections through the ICE hub open up the region further.

Note

1 The RegioTram began service in January 2006 but only as a replacement for existing rolling stock. Only when the link connecting the mainline network to the tramway opened in August 2007 could the system fully be exploited as planned.

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The Kassel RegioTram network

The positive upward trends in the region in retail, education and land values are only possible thanks to the good internal connectivity of the region's RegioTram system, illustrated here.

Session 03
Regional connectivity: identifying and capturing the benefits

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About the contributors

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Economist and Senior Partner, Volterra

Increasing the potential of regional connectivity to support development and regeneration

An overview of the appraisal, benefit capture and funding of regional connections; case study evidence for success and failure.

Stephen Perkins, Head of the Joint Transport Research Centre at the International Transport Forum, OECD

The International Transport Forum at the OECD includes members from across the world; it comprises 54 member governments and is an integral part of the OECD. Work is divided into two main parts: a large annual ministerial meeting held in the third week of May every year in Leipzig, at which politicians discuss investment and funding for regional transport and connectivity. The remaining time is devoted to economic research across all modes of transport.

Perkins' first case study was London. He explained that the Docklands zone was developed in the 1980s and became a very successful project. The land at the time was worth very little; now it is very valuable. Prior to the construction of the Docklands Light Railway and the Jubilee Line Extension that linked this area to the centre of London, land in the Docklands area was a very poor substitute for land in the city. Following the transport investment, it became a much more attractive option and land prices rose sharply.

Why did it work? At the time, the City of London was very overcrowded, the finance sector was growing strongly, rents were high and wages were high: it was a good opportunity to bet on expansion.

The options were either building up, in terms of building heights, or out, and London chose to go outwards to new areas.

Perkins drew a comparison with a not-so-successful project in the UK, the Sheffield Supertram, which is a network roughly the same length as the Docklands Light Railway, and was built at the same time and in the same overall economic climate. But passenger use is significantly lower than in Docklands. Sheffield is not a land-constrained city like the City of London; there was no demand to go either up or out and therefore the project transformed nothing.

The Øresund Bridge linking Copenhagen and Sweden via Malmö could potentially also have been controversial. It is a large bridge with a very high price tag, serving a region with a very low population. There was a risk that it could have been a white elephant, but the project involves much more than just a single transport link; it is part of a package of investments designed to make the region one of Europe's leading high-tech development industry centres. There are investments in universities in Malmö, with high-profile new development at its centre; and investments in science parks on the Copenhagen side of bridge, including good transport links to integrate it into existing networks. The result is a series of interventions which have generated a fairly high usage rate for the bridge, and is beginning to transform the region.

Paris Super Metro

One of the projects on the drawing board at the moment is the Super Metro plan for the Paris region. This, in the same way, is a whole package of measures, not simply one single transport investment.
The transport plan is for a high-speed, driverless Metro system to the far reaches of what is currently the City of Paris. It is designed to connect important parts of the infrastructure of the city in terms of knowledge; in particular, to connect business centres with university campuses and new science centre developments, as with the Copenhagen example. But it is also there to structure development for the future expansion of the city.

Housing and business are planned to be developed around the new stations on rings around the city. This kind of project is of course extremely difficult to assess with the kind of transport investment tools that we have available. Cost benefit analysis is very reliable, but is designed for assessing marginal changes; it was not designed to handle this kind of radical restructuring. There is a whole range of benefits in terms of agglomeration and regional connectivity that cost benefit analysis fails to pick up without supplementary analysis.

Crossrail

Returning to London, the major investment here at the moment is in Crossrail, the biggest construction project in Europe. It will deliver a ten per cent increase in the capacity of the London rail network in the central area and is designed to cut congestion on existing public transport networks and to remove transport bottlenecks where there is potential for growth on the business side.

It is a £15 billion project, with 118 kilometres of track and tunnel connecting the central stations of the London Underground network to the mainline railways on the east and the west side of the city.

Extensive and sophisticated assessment has been undertaken on the project, starting with cost benefit analysis but considering agglomeration effects and other wider economic benefits as well. In 2005 when the main studies were carried out, the Jubilee Line extension in particular was encountering funding problems meaning that the government was very sensitive about the benefits and justification for the project. A precedent for very comprehensive assessment of the benefits had been created.

Cost benefit analysis

What was found in terms of conventional cost benefit assessment, based mainly on time savings, amounted to about £15 billion of benefits (2005 rates). Looking at the wider economic benefits added on £3–4.5 billion from increased productivity through agglomeration effects, and nearly one billion pounds from a broader participation in the labour market and from resolving competition issues in the city. So incorporating these wider benefits lifted the overall benefit cost ratio from 1.8 to 2.6, which had the effect of shifting the project from a marginal to a very positive priority project. Later appraisals have judged the benefit cost ratio to be even higher.

This assessment influenced how the project was funded; funding is now made up of £7.1 billion from Transport for London, £2.3 billion from Network Rail and just over £0.5 billion from property developers, who will benefit directly from developments around the new stations.

However, in addition to this, a new tax was introduced on large businesses across London. This is a business rate supplement, a tax that goes to central government, and it raised £4.7 billion of funding this project, which is roughly the level of the wider economics benefits identified back in 2005 – hardly a coincidence. The studies were part of the process of identifying advantages for business through better connectivity in London and turning it into a quantitative estimate of that value beyond the time savings. This was important in getting a consensus in agreeing to pay this new tax.

> “Current and future research agendas should include new kinds of analysis that can quantify findings in terms that decision-makers and taxpayers can relate to

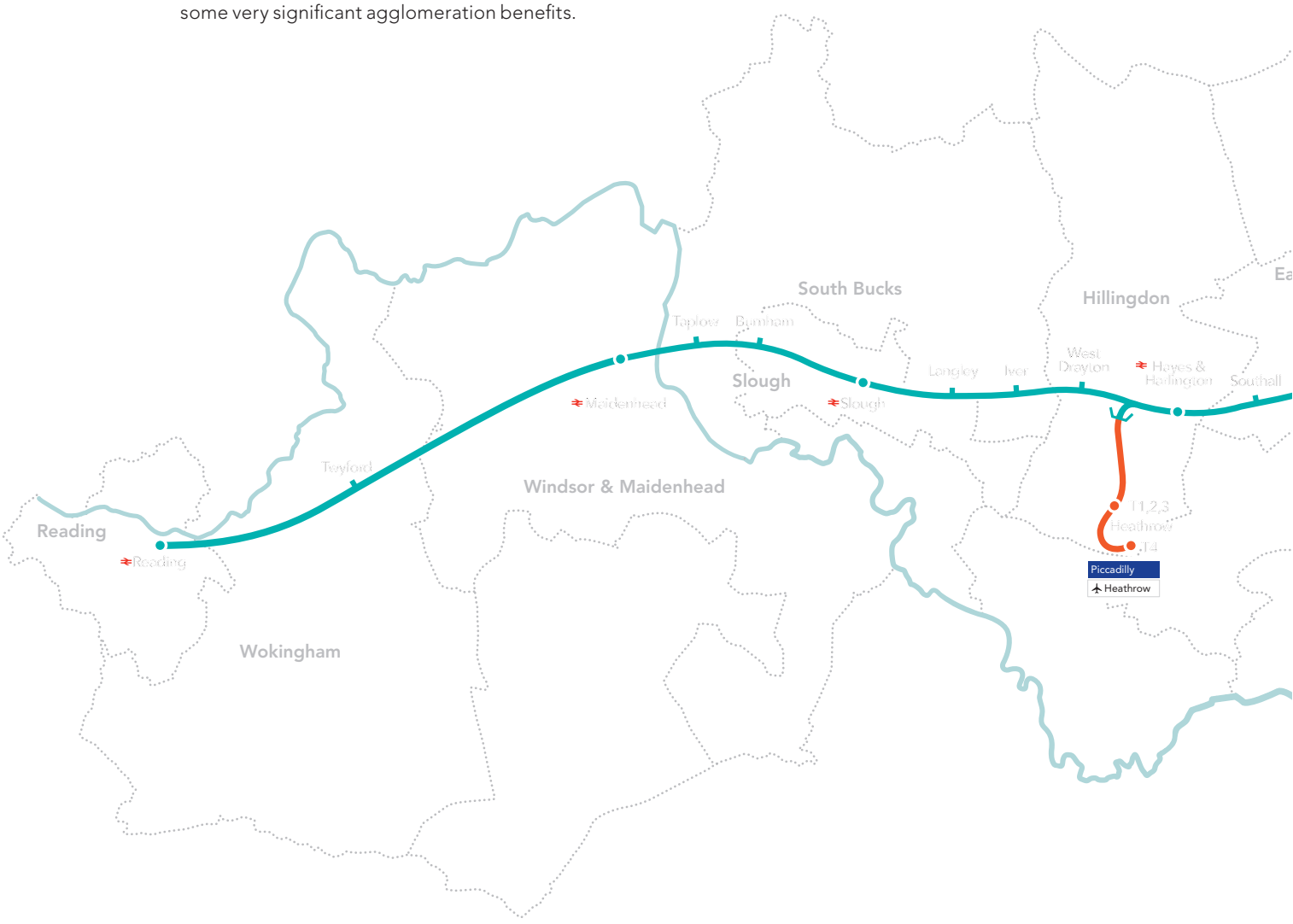
Conclusions

Cost benefit analysis in countries that use it regularly will remain at the core of decision-making. For major projects, it is extremely useful to complement this with additional analysis of the wider economic impacts. This is not to say that all projects have these kinds of wider agglomeration effects: in the case of a high-speed rail line across Europe, for example, most of the effects, or at least the direct effects, have been opportunities for moving jobs from one place to another, making the central city more attractive than the cities that it previously served.

With the UK High Speed 2 proposal, for example, the direct effects in terms of agglomeration will not be that great for either London or the cities in the north that it would serve. But there are probably some very large indirect effects in terms of the capacity that will be released on the existing crowded main lines; capacity that will allow commuter services into and out of the main cities including London and all of the cities in the north. That released capacity should drive some very significant agglomeration benefits.

Any assessment has to be detailed enough to establish causality; and robust assessment of wider benefits is a powerful argument for benefit-capture funding mechanisms. However, the kind of analysis needed to get a handle on these benefits is detailed and costly, and the analytical tools to really capture the data we need are missing, noted Perkins.

Part of current and future research agendas should include new kinds of analysis that can quantify findings in terms that decision-makers and taxpayers can relate to.

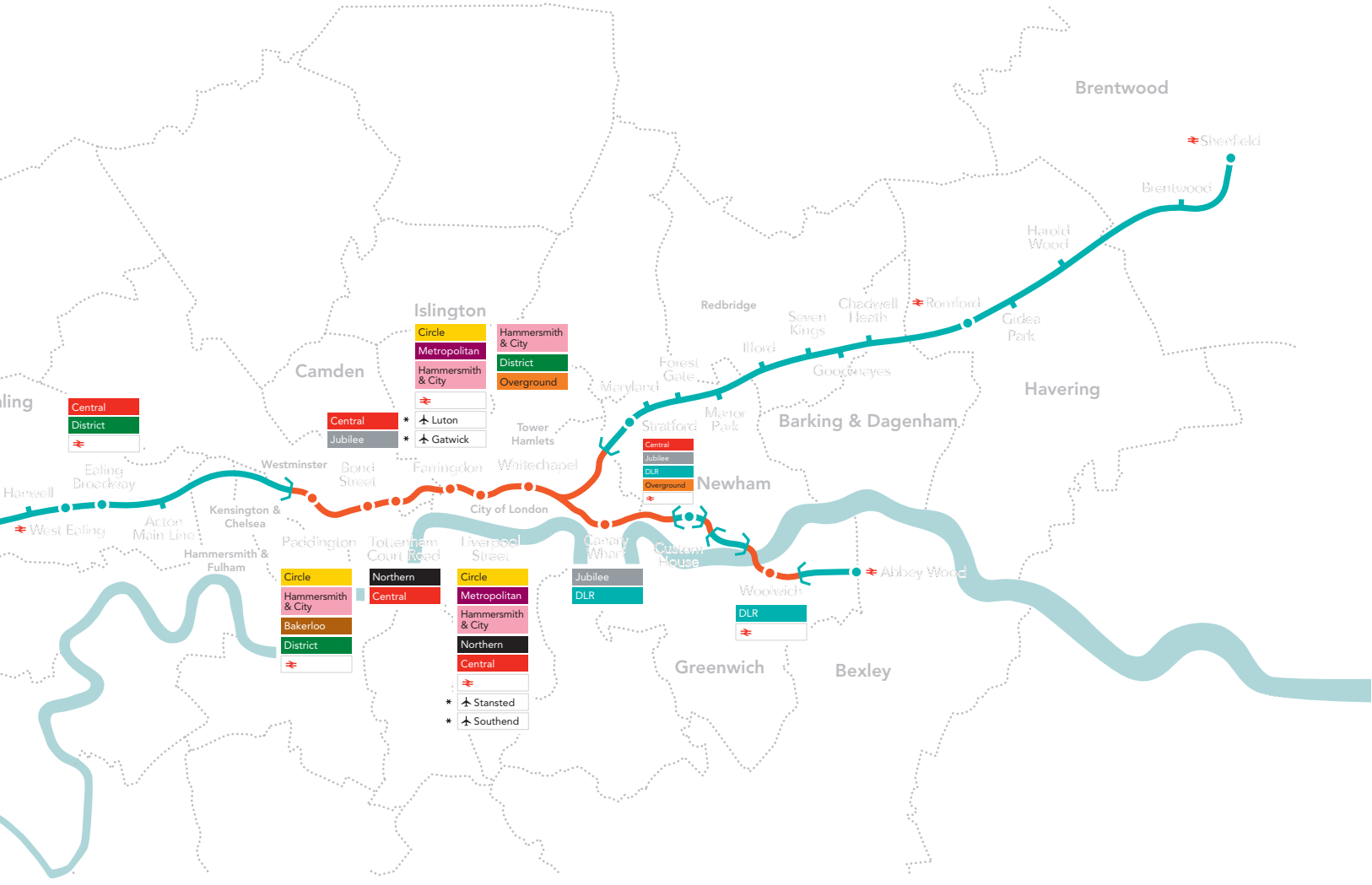


↓
Crossrail

For Crossrail in London, a business rate supplement has raised £4.7 billion of funding; this is roughly equal to the wider economic benefits identified in 2005.

- Surface line
- Tunnel
- Portal (tunnel entrance and exit)
- National Rail connection
- Airport connection

* Airports not on the Crossrail route – to travel to these airports passengers will need to travel on other connecting rail services.



Identifying the impacts of good accessibility for regional development

Incorporating potential into planning and transport investment: making the economic case for public transport. **Jérôme Pourbaix**, Head of Policy, International Association of Public Transport (UITP).

The context for connectivity and economic development is important, stressed Pourbaix, especially in terms of the growth of urban mobility. In 2005, there were about 7.5 billion trips made in cities or in metropolitan areas worldwide every day, with three times more trips made by private vehicles than by public transport.

A UITP study suggests that between 2005 and 2025, the number of trips made in cities worldwide will increase by 50 per cent due to demographic and economic development trends.

In Europe, because the demographic change is less, the change in economic development is also less. However, the increase in mobility will still be high, but still less so than at the global level; the number of trips in European cities by 2025 will increase by 25 per cent. When talking about mobility and connectivity, it is these figures that have to be considered. Part of the solution must be to encourage more balanced mobility patterns, but in practice, this is simply not happening fast enough.

One of the elements that can help is to make a better economic case for public transport, complementing the environment and climate change case.

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> Studies generally show that the value creation of investing in public transport exceeds the initial investment by a factor between three and four; a very strong multiplier effect. The catalyst effect linked to connectivity plays an important role in this multiplier effect

Pourbaix then explained that he would present some results that illustrate the economic impact of economic transport and better connectivity.

Investing in public transport

A number of studies have been done in several countries to 'measure' the impact of investing in transport. There is no standardisation between those studies; they use different concepts and approaches, but we can still distinguish similarities.

These studies illustrate direct effects and impacts of investing in public transport: the effect or impact linked to the operation of the network. Indirect impacts on the other hand are linked to the supply chain and developments in it. Induced effects link to the regeneration of the economy, and to a range of wider, long-term, 'catalyst' effects linked to agglomeration and improved connectivity.

The results of such studies generally show that the value of investing in public transport exceeds the initial investment by a factor between three and four, a very strong multiplier effect. The catalyst effect linked to connectivity plays an important role in this multiplier effect.

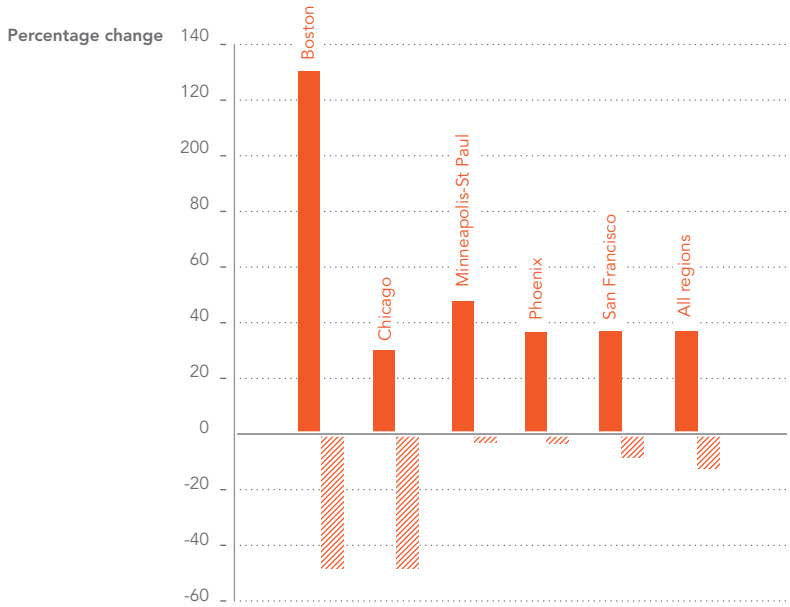
In relation to Europe and North America, where growth and jobs are at the centre of the political agenda, a study by the American Public Transport Association[1] explored high-growth clusters (see case study box).

It highlighted growth industries and looked at their localisation and clustering patterns, also identifying many constraints in terms of access to these areas.

This study addressed issues of business productivity, market access and transit service for high-growth business clusters in the United States, and concluded that there is a solid case for expanding the future role of public transportation to support growth of high-tech business clusters. The study also quantified the potential of job creation linked to these high-growth clusters, and aimed to quantify how public transport would unleash this potential by solving the accessibility problem, an approach that is certainly valid for European cases.

Another example from North America – which Pourbaix felt was quite good at making the economic case for public transport; we have a lot to learn from them – explored the resilience of property values in areas served and not served by public transport (see graph below).

The results suggested that the value of properties located close to public transport has held up better than those not linked to public transport over the past six or seven years, and throughout the real estate crisis.



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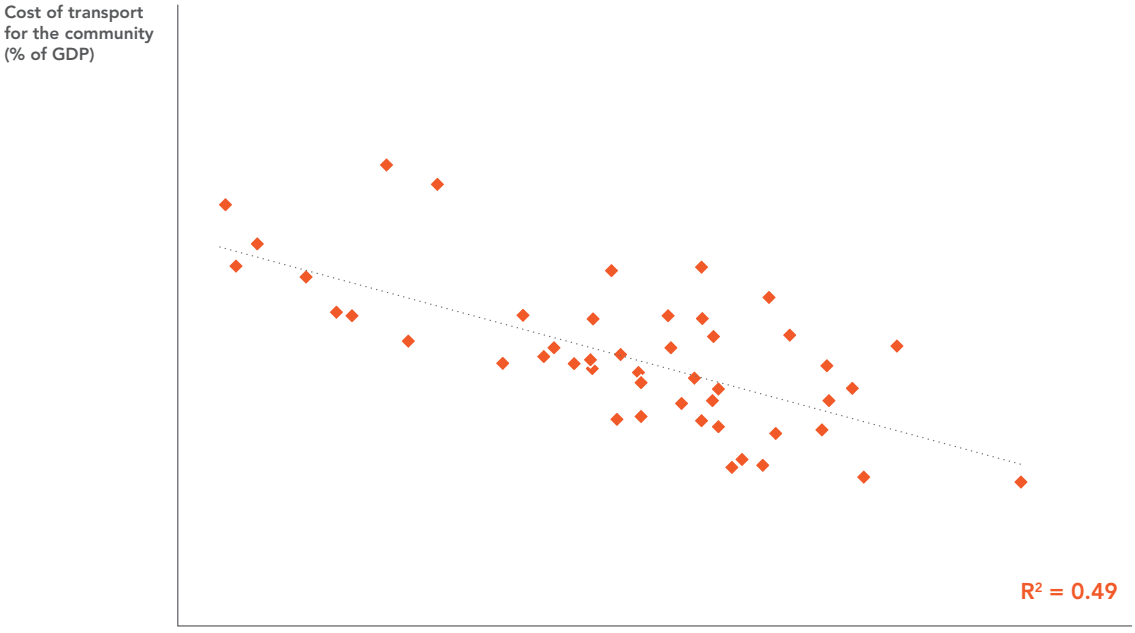
Percentage change in average residential sales prices in relation to the region, 2006-11

Property located within a transit catchment area
Property located outside a transit catchment area

Growth clusters and transport in the US

A study published by the American Public Transport Association explored high growth clusters. Key findings from these cases and the accompanying national-level analysis are:

- All of the clusters examined are rich with examples of firms choosing locations near other firms and actively seeking ways to get people to these places
- There are very real access constraints looming that will affect the growth of high-tech business clusters and the competitiveness of US firms. Those constraints apply (to some extent) across all such business clusters
- The private sector is currently spearheading efforts to develop transit to sustain the cluster location and ensure workforce accessibility
- Between 379,000 and 480,000 jobs could potentially be affected by the year 2040, depending on steps taken to address transport capacity constraints
- Transit access to clusters could support approximately 104,000 of these jobs, accounting for $13.6 billion in annual business output, $5.7 billion in wage income and nearly $8.6 billion in GDP
- Given constraints on continued roadway system expansion, there is a solid case for expanding the future role of public transport to support growth of high-tech business clusters



Going one step further, and looking at the regeneration impact of public transport, one example from a few years ago suggests that the opening of a new metro line in Lyon, France, significantly increased the rate of renovation in the part of the city that it served.

The proportion of buildings that were renovated or built for business purposes was four times higher than the city's average, illustrating a link between the connectivity afforded by public transport and investment and reinvestment in the area.

The link between connectivity and tourism, and the economic impact of tourism, is also valid. Here again, figures from North America show that hotels in cities that are well-connected, where there is a good connection from the airport to the city centre by rail, have much better performance rates than cities with fewer or no fast rail connections between the airport and the city centre. Indeed, room rates and revenue per room can be up to 11 per cent higher in such well-connected cities. This remained true even during the recession (2008–2010).

The examples given so far have focused on the role of public transport in supporting connectivity and its economic impact. Other examples focus on the economic role of public transport, but not necessarily linked to connectivity. The first element Pourbaix considered is the cost of mobility in percentage of GDP versus modal split (see graph above).

Public transport also creates jobs, both in the sector and in the supply chain. Research has shown that per amount invested, investment in public transport infrastructure creates twice as many jobs as investing in other areas – roads, for instance – for the same amount invested. This is due to a number of factors, one being that public transport projects usually require less space, so less money is spent on land acquisition and can be spent on other elements.

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Correlation between the cost of transport as a percentage of GDP and the proportion of non-car-based trips made

Studies show clearly is that in cities with higher modal shares of public transport, walking and cycling, the cost of transport for the community is halved, compared to cities where there is almost no public transport.

This means that citizens can spend their money on other things than fuel, and that they can spend this money locally, so supporting local economic development.

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Lyon

The opening of Line D of Lyon's metro system quadrupled the rate of urban regeneration in the corridor it served.

The proportion of new or renovated buildings for commercial purposes rose to 60 per cent compared to 13 per cent elsewhere.

Public transport projects in cities are complex and require a wide range of competencies and capabilities, and also link to jobs in the supply chain. Building public transport vehicles involves a large number of organisations, specialities and skills. It takes in multinationals and small family companies, and competencies from IT to design, so creating a strong network of employment linked to the supply chain of public transport.

Strengthening the economic case of public transport helps to prioritise public transport investment programmes, based on sound economic appraisal frameworks. Securing a sounder business model for public transport by increasing the reliance on contributions from indirect beneficiaries, including businesses and property owners helps to create a solid business model for public transport. The economic argument is not only an argument for public authorities; it is also for the business communities.

Public transport has very significant benefits for business communities and so it is increasingly important to involve businesses and employers in the funding of public transport. This can work either on a voluntary basis – as with the Butzweilerhof industrial park in Cologne where businesses based there decided to contribute €5 million directly to the cost of a tramway extension to serve the park – secondly through a funding mechanism at the local level, such as the *versement transport* in France, or different versions of value capture finance.

Making the economic case for public transport for both public authorities and the business community means that we need to improve our economic appraisal practices for public transport and connectivity benefits.

Note

1. See: www.apta.com / resources / reportsandpublications / Documents / TransitHighGrowthClustersUS-Final2013-1124.pdf

Capturing the value of indirect impacts

Accessibility is absolutely essential to economic growth. It can't happen without it, but it's not sufficient.

Numerous other elements such as skills, development potential, capacity, co-investment, development opportunities and collaborative partnerships are also required to make transport-related growth work, explained **Bridget Rosewell**, Partner, Volterra

'What is the purpose of a transport system?', asked Rosewell. 'Most are indirect: getting goods and services to market, facilitating a labour market, creating leisure opportunities. It is all about enabling concentration of activity. Transport is necessary for a growth economy, but it is not sufficient to drive it.

'In the UK I was responsible for the economic appraisal for the Crossrail project in 2004–05. I really wanted to try and move the debate on from the rather static mechanisms which were previously being used, so I introduced the concepts of agglomeration and concentration.

'This enables specialisation and the division of labour: Adam Smith talked about it as one of the ways in which economic growth and productivity can be created. After all, without a transport system, there is no economy. A series of peasant communities, if entirely self-contained, cannot be described as an economy.'

Rosewell further explained that by getting divisions of labour we get economies of scale. Agglomeration is not only about economies of scale, it is about the ability to exploit a niche. It is about the ability to find the person with whom you can do business. It is about the ability to create new ideas and innovate, which is absolutely crucial to a developed economy.

Developing economies can catch up with developed economies. They can move resources into more productive things – but those more productive things have to be invented. So transport is necessary for an economy, but it is not sufficient. This is a key theme, because it means that it is very hard to prove what the impact of a particular piece of transport is, because of all the other things that have to go around it.

Looking at transport schemes in terms of direct impacts, where direct impact means independent of other investments, then we are restricted to welfare benefits. But because such schemes are inextricably linked to skills, institutions, markets and development capacity, they involve a mix of these attributes: of capacity, speed, reliability and comfort, all of which relate to accessibility. One of the key challenges to all those in the transport field is developing good measures that can bring together all of these things into one overarching measure of what it is that our transport system provides.

And, of course, this raises a very fundamental issue concerning appraisal, because we cannot separate the transport issue from the other aspects of the economy. We have to become more holistic. Separation implies a static economy in which there is no growth and perfect competition. If we talk about growth, we also talk about change, then we do not have the sort of static economy which is the basis of many of the cost benefit analyses that we still see in use.

In practice, structural change implies a need for different investments. 'Indeed', Rosewell remarked, 'I think one of the big weaknesses of all of the analyses of high-speed rail in the UK is that in every single one, the economy is taken as a given. None of our analyses so far have been based on the assumption that there would be some real growth in the investment that is being made. That also tells me that if we're going to have structural change, we need a different way of thinking about it.

'A vision of what we're going to do is very important. And another key point, and we in the UK are particularly brilliant at this, is engaging in death by analysis.'

This illustrates the difficulty, when we get into appraisal, that we keep on thinking that a transport scheme must do one thing. Actually large schemes in particular have many objectives, and if they are making big changes, then history is not going to necessarily be a good guide to the future. And the really important thing here is the crucial judgment about what is held constant.

This is true whether making a financial business case or a broader, non-financial, economic case. In the case of a whole-system investment, which might be for a city, or it might be for a country, then what is it exactly that we need to be doing? Crossrail added capacity in a constrained environment, so it is quite easy to show how that would work.

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If we talk about growth, we also talk about change; then we do not have the sort of static economy which is the basis of many of the cost benefit analyses that we still see in use. In practice, structural change implies a need for different investments.

Underlying issues of appraising investment

Is the plan to facilitate an economic activity or to create a welfare benefit? The standard model of cost benefit analysis is welfare benefit. In effect, it says the economy is held constant. These choices imply a crucial judgement on what is being held constant and the timescale over which changes happen.

We also need to think about the beneficiaries of any scheme in a more structured way. An important aspect of the appraisal judgement is about desired beneficiaries. These could be system benefits, widely dispersed and hard to capture, for example in the case of intercity travel. They could be time savings for users, who will make trips for all kinds of reasons. It can be economic benefits, in output, jobs or profit.

A high-speed railway across the country is going to deliver very dispersed benefits: everybody will benefit from it, therefore it is obvious that the taxpayer will pay. But if the main benefit is time savings for users, then you might expect that those users would be expected to pay. There may be desired distributional aspects; making it possible for people with low incomes, for example, to use the transport system. Outputs generate taxes. In her work for Crossrail, Rosewell showed, for example, that taxes generated by it could easily pay for it.

Analysis finds it easier to capture small changes than large ones, as more can be held constant. Benefits invariably get transferred; early railway investments were a huge benefit to the economy but not to the shareholders who financed them, as most lost money. However the whole economy became completely different as a result. This is a function of the dynamics of pricing and control as well as economic location. How the economy evolves is a key element in scheme appraisal, and it cannot be held constant.

Accessibility is absolutely essential to economic growth. Growth cannot happen without it, but on its own it is not sufficient. Numerous other elements such as skills, development potential, capacity, co-investment, development opportunities and collaborative partnerships are also required to make transport-related growth work.

Assurance on supporting investments

- Transport is a necessary but not sufficient condition for development – if that is the objective
- The timescale of supporting investments may be long, but needs to be considered
- Site availability, market conditions, financial background may all be relevant
- It is important to match expectations with timescales

How did London grow?

- Creating real value by industrial activity
- Using it to mix different investments
- Achieving stability in built investments
- Building an institutional structure for decision-making to balance different interests
- Risking excess capacity

Key challenges

- In a rapidly changing world, data is out of date even when it is accurate – look for easy to monitor information, even if it is not perfect
- Do not believe that planning is a complete answer as it can close off opportunities that smaller-scale interventions can grasp
- Big-picture planning is, of course, essential but it must stay broad-brush, with details to be filled in by lower levels
- Remember that capacity is not well captured in models, as 'full capacity' is not an absolute concept

→
London infrastructure

In London, the sewers and the building of the Embankment in London were not preceded by any sound appraisal in the sense of how we understand the term today.

Engineer Sir Joseph Bazalgette took the part of London with the greatest population density and worked out how much effluent it created.

He then assumed that the rest of London was the same (obviously this was not so, being much less dense at that time). And then he doubled his estimate, so creating a huge infrastructure capacity that is still in use today. It facilitated a huge amount of growth that nobody would have been able to predict.

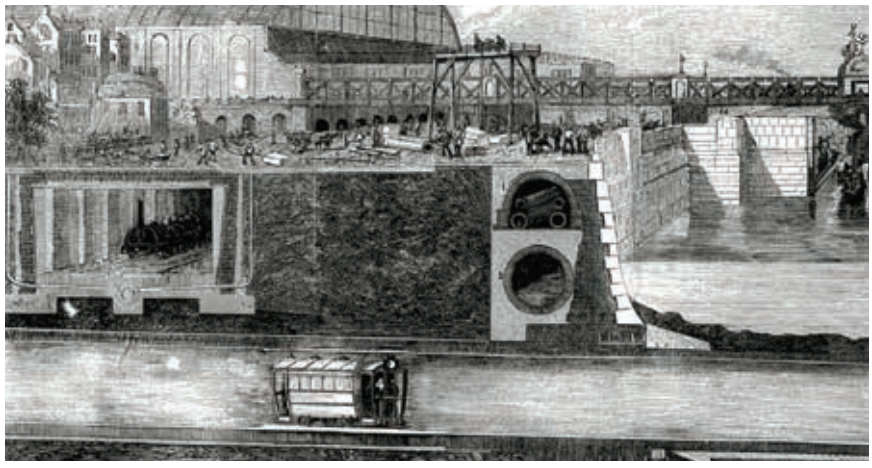
The moral? Beware the demand model.
The demand model is always based on history, and it will not be able to capture significant changes.
This infrastructure was financed by a combination of borrowing, rates, and coal and wine duties.

→
Battersea Power Station

Battersea Power Station needs better access in order to attract high-density development. The inquiry on funding the existence of a spur on the northern line suggests that funding will come from a mixture of the fare box, developer contributions, and capturing rates.

'It isn't a special rate scheme; we are simply saying that these businesses will not be there to pay rates if we don't go ahead with this development. It is a new form of rate income that can go towards paying for a new railway line,' said Rosewell. 'Rebuilding the power station at high density is the vision.
The business case is that financing the new underground line requires capturing business taxes on the new development.

'This Tax Increment Finance (TIF) scheme, a billion pound scheme, is the first major one that will have been achieved by being able to draw a red line around it.'



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King's Cross

New stations change things: At King's Cross, Google is taking a million square feet, next to St Martin's School of Art.

All of this has become possible because of the High Speed 1 rail link, and because of a new willingness to invest in fantastic architecture.

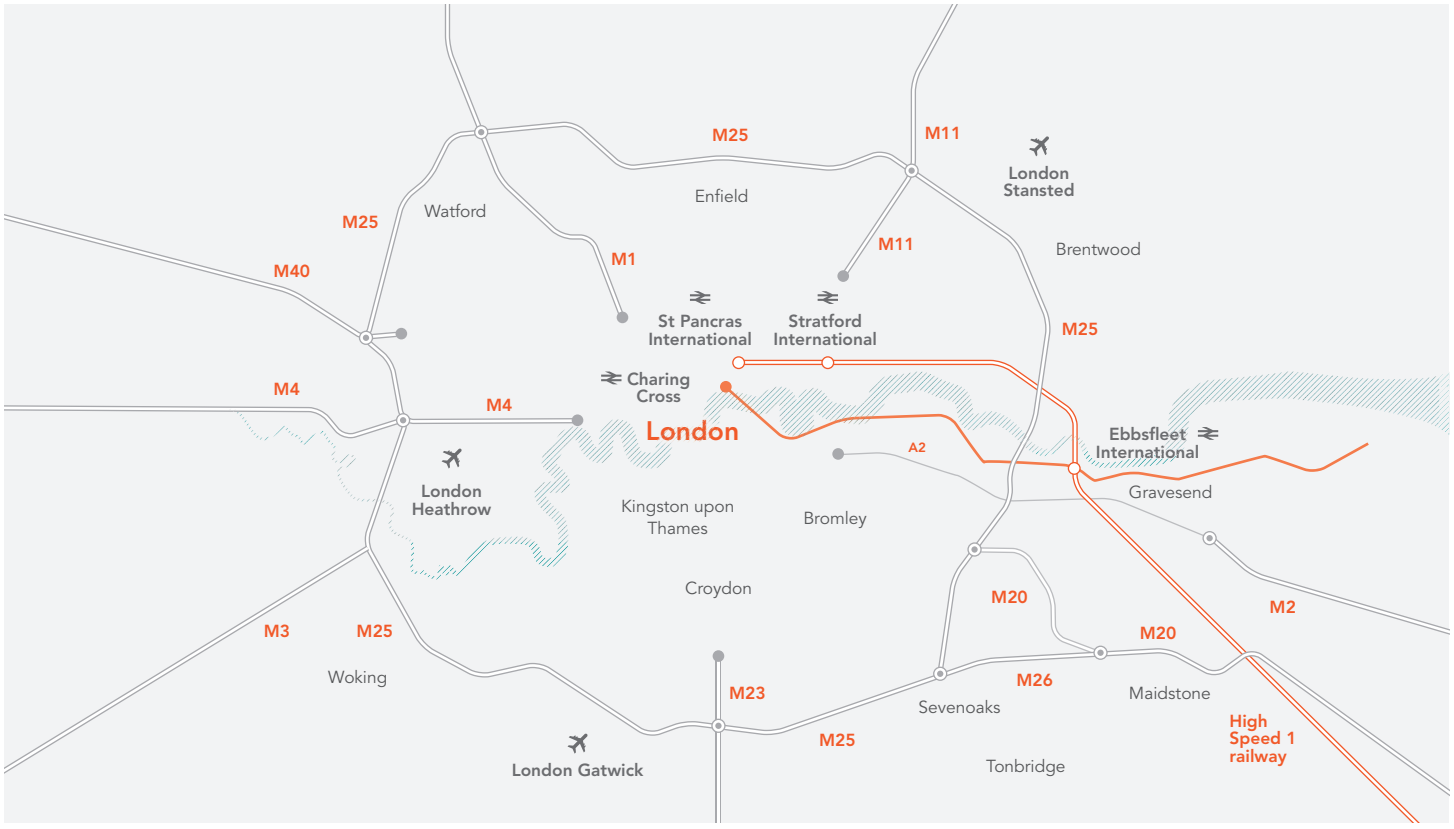
This is changing an area which used to be known for prostitution and drug abuse. And if only 10 percent of the activity that is on this site is additional, in other words would not have happened without the rail links, it justifies the spending on the high-speed railway into St. Pancras International.

←
The Leamside Railway Line

The Leamside railway line in the North-East of England was closed in the 1980s. Reopening it to passenger traffic as an additional line into Newcastle would probably cost about £300 million.

Doing so would effectively provide increased resilience and capacity on the East Coast main line at reasonable cost, rather than speed.

Plans for the UK's second high-speed line (HS2) have both capacity and speed implications, but case-making keeps getting hung up on one or the other.



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Ebbsfleet

Ebbsfleet is a station on the UK's High Speed 1 rail link (HS1). Despite big plans for a major development here, mooted back in the early nineties, the site has never attracted the hoped-for 10 million square feet of development for which planning permission was granted.

So why not? Is it because transport does not create growth? Or is it, in fact, because you need the other bits and pieces of the jigsaw to support growth? Transport is necessary, but it is not the sole criterion for growth, and this is an example of how the stated goal has not been reached.

Ten billion pounds of investment went into Stratford, London, for the Olympics. And the Stratford Westfield Shopping Centre brought private investment on top of that, making it much more difficult to attract the investment to Ebbsfleet. However, the Ebbsfleet plans helped to justify the spending on HS1 initially. And there is still a massive opportunity there, but over a longer timescale than originally envisaged: the project illustrates how long it can take to fulfil a vision and the risks involved.

At 30 years, even the Docklands in London took longer than everybody thought. As for Ebbsfleet, the UK Government's 2014 Budget announced new plans for developing it as a garden city.

Session 04
Making change happen: finance, governance and decision-making in context

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Integrating transport, spatial planning and economic development strategies

London's evolving approach to integrated strategy, including the growth context, the economic role of central London, the evolution of London governance and the current integrated approach to planning was outlined by **Ian Birch**, Transport for London

Central London hosts most of London's 'world city' functions, including very large and valuable financial and business services sectors. It has an exceptionally open economy, attracting £52bn of Foreign Direct Investment per year, the highest of any EU region and 45 per cent of the UK total. Its projected natural growth rate will mean that it has 11.3 million inhabitants by 2015, according to the London Plan scenario.

Central London covers only 26 sq km (2 per cent of London's area) but accommodates more than 30 per cent of the city's jobs. This exceptional level of employment density has evolved over time in response to agglomeration economies.

These have generated virtuous cycles of development whereby higher productivity increases the area's attractiveness to firms, which stimulates further productivity growth. Central London's 1.3m million workers are consequently on average 71 per cent more productive than UK workers overall. They generate a significant 'tax export' to the rest of the UK (£10 to £15 billion per year).

Excellent rail access has enabled London's high productivity and central employment core to develop. It is clear that central London's future development will be closely linked to the continuing development of the rail system. The challenges this system faces reflect its historical development: the UK's railway system developed in the mid-19th century on the basis of a series of major radial routes emanating from London, with each route having its own main terminus.

This meant that instead of a single central station, London had a chain of stations developed around the edge of its centre, for example Paddington, King's Cross, Waterloo, Liverpool Street (there are 14 in total, of which eight are large). Consequently the railways did not generally serve the areas in which people actually worked, and there was a need for onward travel. This was met partly through the construction of the underground network.

Use of public transport has been increasing since the 1980s with both bus and rail shares rising. It currently accounts for around 90 per cent of all trips entering central London in the morning peak. The share of private transport has been correspondingly declining over the same period but there has also been significant change; car travel is declining and cycling is increasing. In 2012, cycles accounted for around a quarter of all vehicles entering central London in the morning peak.

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It is accepted that growth will not be uniform across London. The transport needs of successful places will vary according to their function, but demand across the full range of trips from international to national and local need to be taken into account in strategic planning.

The challenges facing London's railway system

01	Getting more out of the existing system	→
02	Improving radial links into central London to help support London and UK economy	→
03	Delivering a customer-centric system	→
04	Avoiding an erosion of international links	→
05	Ensuring a better and not just a bigger city	→
06	Maximising the potential of defined growth areas	→
07	How to support major densification within London	→
08	How to support expanded / new towns beyond London	→
09	Maximising the wider growth potential of a new hub airport	→

Future growth

It is accepted that growth will not be uniform across London. The transport needs of successful places will vary according to their function, but demand across the full range of trips from international to national and local need to be taken into account in strategic planning.

The population growth will be greatest in east London. Growth in jobs will be greatest in the West End, the City and Canary Wharf (business and other services, finance, tourism, retail). The role of Mayoral strategies is central in terms of planning for sustainable growth. Economic development, spatial planning and transport are considered holistically along with air quality, climate change and waste. Each policy area shares a common evidence base.

One legacy of the massive growth of London in the early 20th century is that there is very strong protection for the green space around the edge of the city: 5,000 sq km of green belt; more than three times the size of city.

South-east England also has many protected landscapes including National Parks and Areas of Outstanding Natural Beauty, which limit where the city can grow. There are also limits to the sustainability and affordability of additional long distance commuting. Again the answer is reinvention: London has a great deal of land available for re-use.

From an economic perspective, the growth that London wants to accommodate serves central London workers as they power the economic engine of the UK. They are highly productive and with their earnings they generate much higher than average demand for local services (0.25 additional local service jobs).

London is defined by the administrative boundaries of

33 boroughs

It has a population of

8.2 m people

It covers

1,500 sq km

It is part of a wider city region with a combined population in excess of

20 million

London's city region forms the most prosperous part of the UK and is one of the wealthiest areas of the EU

Central London is the economic dynamo of London, the south-east region and the UK

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The London Plan sets out 33 Opportunity Areas (OA) and 10 intensification areas throughout London.

These are significant to London's growth as together they have the potential to provide around 250,000 homes and 500,000 jobs.

Around one-third of new trips are projected to originate from opportunity areas (almost three-quarters in the east sub-region).

Each Opportunity Area can typically accommodate at least 5,000 jobs or 2,500 homes, or a combination of the two with other supporting facilities and infrastructure in place.

Those in the east of the city are rooted in the delivery of the 2012 Olympics and its legacy; the convergence of east London boroughs with the rest of London suggests that newly developed areas in the east will attract their fair share of higher wage central London workers (who will bring local jobs in their wake).

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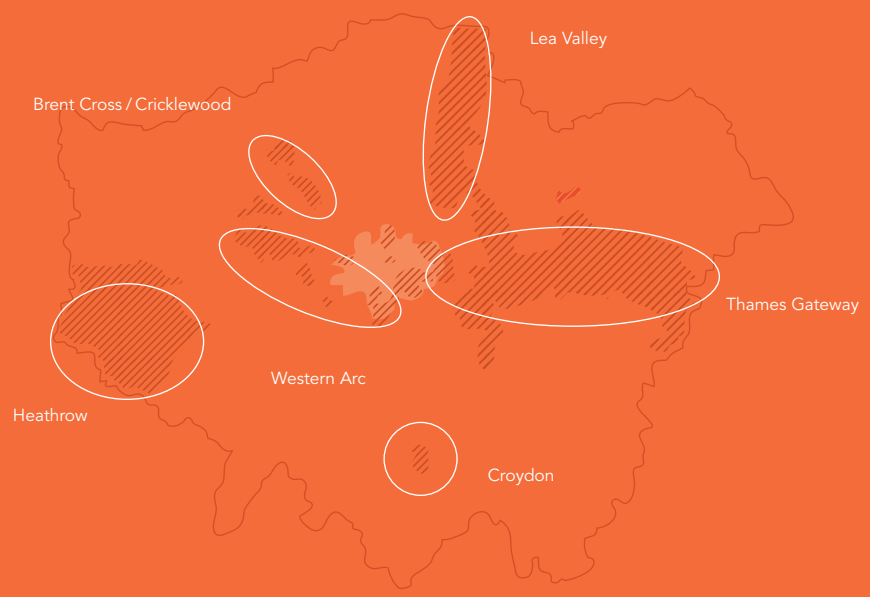
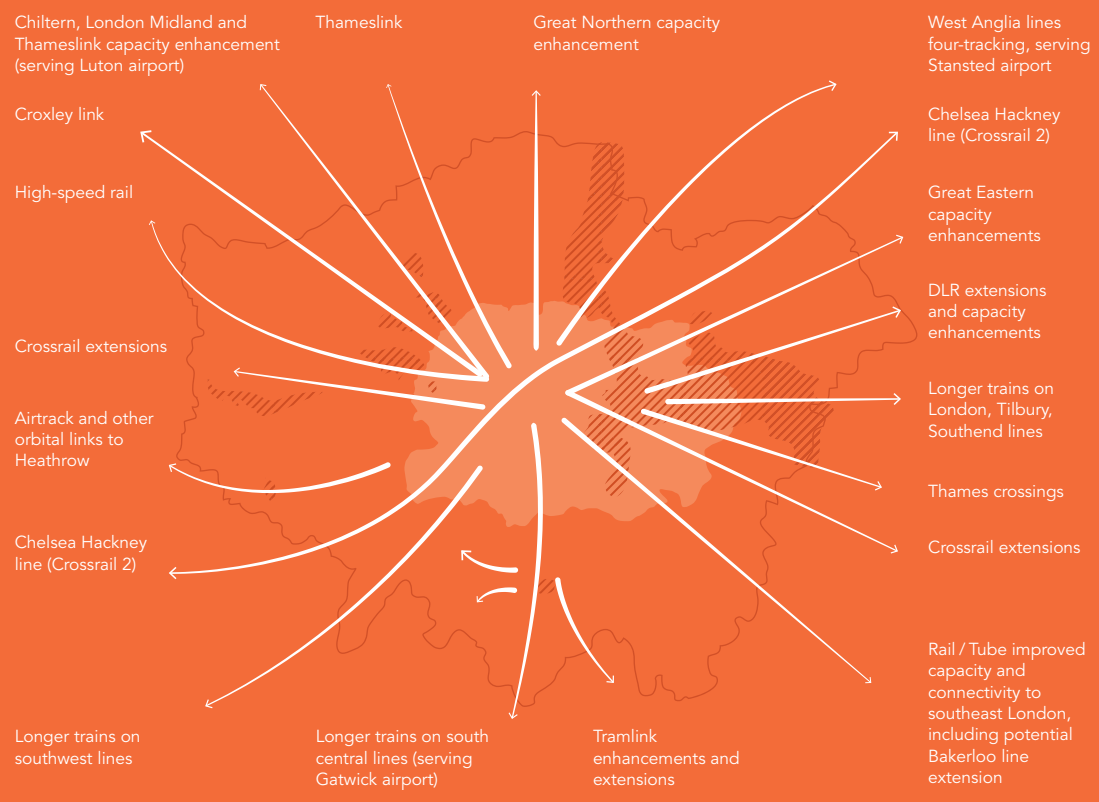
Solutions for the transport challenges include integrated land use planning and optimising existing assets such as the road network, smoothing traffic flow and improved public transport integration. Demand management will be applied to both personal and freight transport. Major investments in the suburban rail network will enhance radial capacity, as will further upgrades to the underground, for example the Northern Line extension), Crossrail and DLR enhancements.

In terms of orbital connectivity there are plans for new river crossings and better strategic interchanges. Local improvements include bus service enhancements, walking and cycling improvements, town centre improvements and physical accessibility improvements.


Lea Valley
Brent Cross / Cricklewood
Thames Gateway
Western Arc
Heathrow
Croydon


Chiltern, London Midland and Thameslink capacity enhancement (serving Luton airport)
Thameslink
Great Northern capacity enhancement
West Anglia lines four-tracking, serving Stansted airport
Croxley link
Chelsea Hackney line (Crossrail 2)
High-speed rail
Great Eastern capacity enhancements
DLR extensions and capacity enhancements
Crossrail extensions
Longer trains on London, Tilbury, Southend lines
Airtrack and other orbital links to Heathrow
Thames crossings
Chelsea Hackney line (Crossrail 2)
Crossrail extensions
Rail / Tube improved capacity and connectivity to southeast London, including potential Bakerloo line extension
Longer trains on southwest lines
Longer trains on south central lines (serving Gatwick airport)
Tramlink enhancements and extensions

The integration of development and transport is key. Local and strategic development planning processes seek to ensure:

- High trip-generating developments are located in areas of high public transport accessibility, connectivity and capacity
- The design and layout of sites maximise access on foot, cycle and to public transport facilities
- Maximum opportunities for sustainable freight distribution where possible
- Land for transport use is safeguarded in line with London Plan policy and Supplementary Planning Guidance
- Planning contributions are sought for transport improvements, where appropriate

Making the case for further investment

By demonstrating direct links between transport provision and economic growth through integrated planning and enhancement of evidence-gathering initiatives, the case for sustained investment in the transport system is stronger. The Mayor will be making a strong case for investment in London's transport system in the Comprehensive Spending Round 2014.

There is a longer term question about whether London should be more fully responsible for funding and financing its infrastructure needs. In this respect, the 2050 Infrastructure Plan, currently being prepared, will help to inform decision-makers about the scale of need, and build a case for more devolved fiscal powers.

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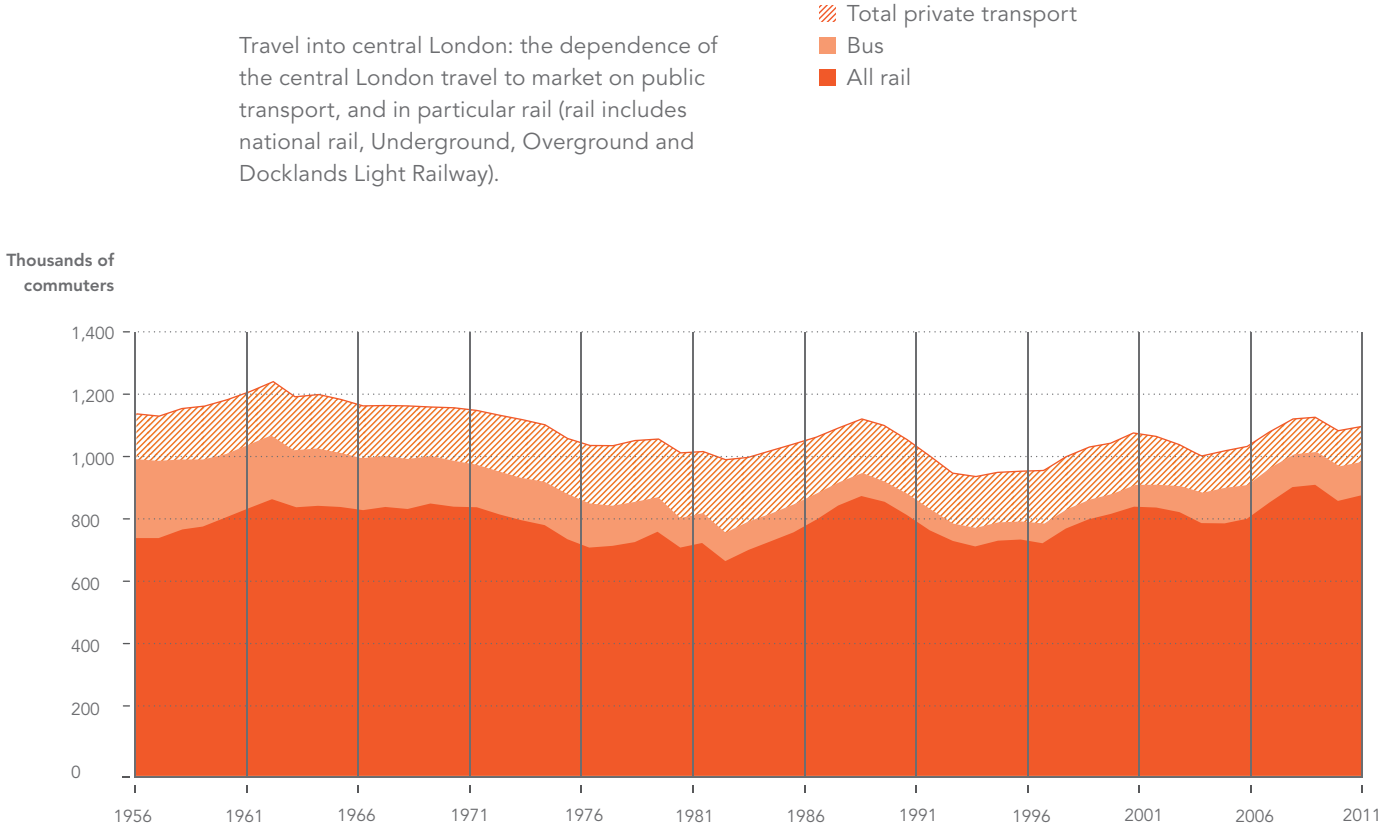
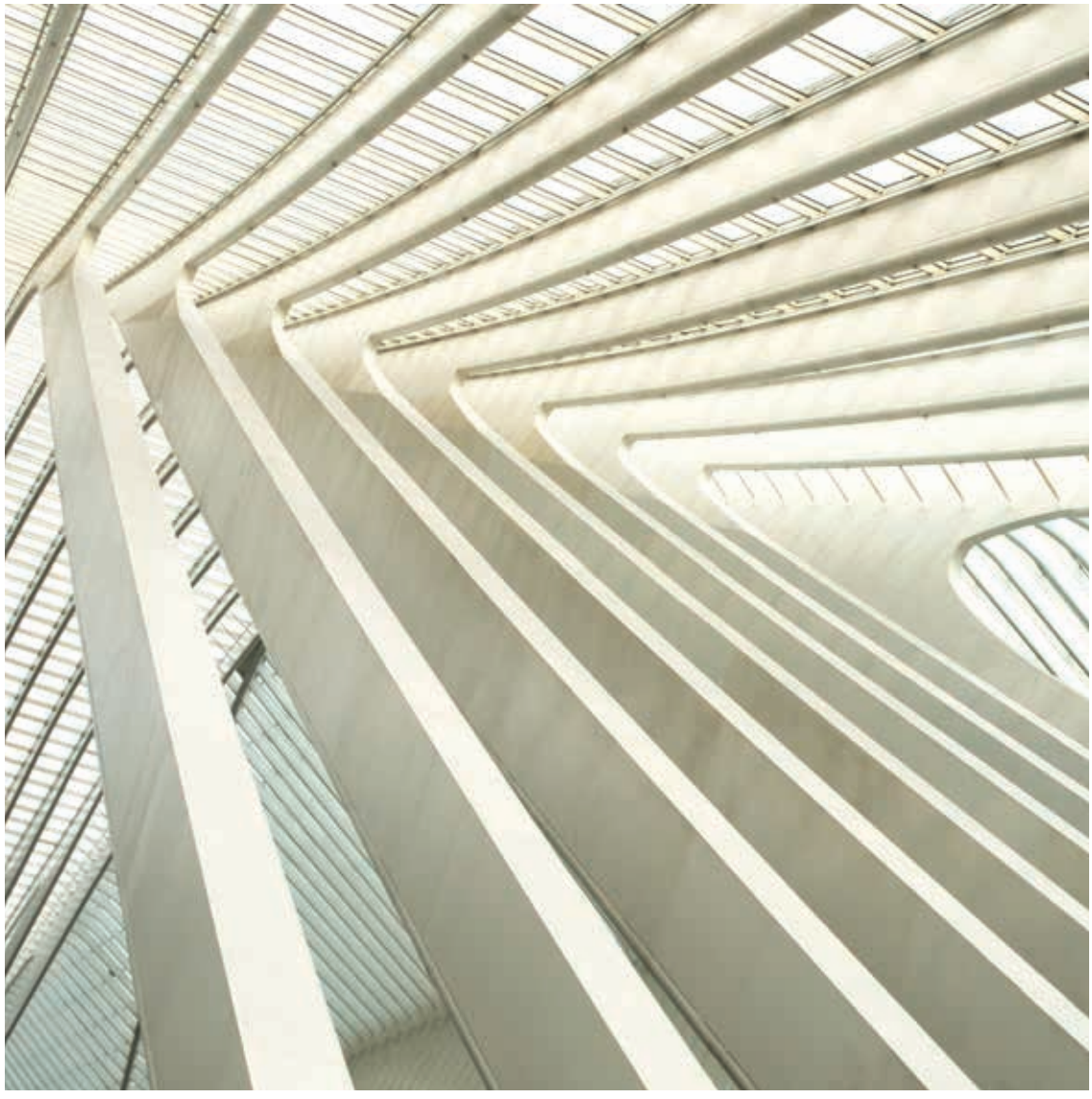
People entering central London in the weekday morning peak

Travel into central London: the dependence of the central London travel to market on public transport, and in particular rail (rail includes national rail, Underground, Overground and Docklands Light Railway).





Integration between regional planning and urban development

Outlining best practice support for decision-making from France, Switzerland and Germany, **Jan grosse Beilage**, Senior Consultant, TTK, Lyon, France, demonstrates how linking transport and urban planning makes a city more sustainable

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Cooperation between planning and transport authorities

In Grenoble, France, transport project contracts are negotiated with the transport authority and include local municipalities; these organisations work together to create housing and activities around the stations, plus active public spaces.

Rail axes are potential drivers for sustainable cities. In cities such as Copenhagen, sustainable agglomerations combine transport and spatial planning by developing tram or light rail services – or even short-distance rail – by restricting private car use in the city centres, and limiting the construction of new road projects in the periphery.

These measures are accompanied by spatial planning actions such as creating intermodal interchange and providing walking and cycling infrastructure. High-quality train or tram services interact with urban development around stations, leading to urban renewal and densification through increased land use pressure and the process of urban polarisation around stations and terminals.

A study from 2000, of the suburban Düsseldorf area, explored the impact on household mobility of urban development near stations. It found that for trips of 10 to 50 km from home to work, areas served by tram or train stations experienced less car use than in areas not served by public transport. There was an increase in modal shift to public transport with longer distances travelled, less energy consumption and pollution without restricting mobility, plus increased revenue for public transport (60 per cent more customers).

It appears that living near a good tram / light rail or rail service has a great influence on travel patterns. It reduces the negative impacts associated with mobility (pollution and congestion). Conditions for success include urbanisation up to 1000m around stations, and attractive rail services delivering frequency, punctuality, comfort and tariff integration.

Building by negotiation

Sustainable cities are built by negotiation. This means that the local stakeholders are integrated into projects, and that there is a local link between public transport projects and urban planning. If these elements are respected, there is little need for special financial tools and schemes to bring transport and urban development together.

In France, there are examples such as the Greater Paris region charter for sustainable land use; axis development contracts in Toulouse, Grenoble and Béarn (Pau), and the circular development zones in Lille.

Working within these regulations required stakeholders to move towards improved integration between urban development and transport systems, for example increasing densities around public transport nodes and intensifying urbanisation around stations.

The French state also implements a system of financial subsidy to local transport authorities for projects which respected certain conditions. These relate to the opening up of socially disadvantaged districts, the quality of surroundings and landscape, improvements to social cohesion and better integration between urban space and economic development.

A number of French planning tools have been developed to attempt to better integrate transport and urban planning. One example in Lille is the DIVAT (*Disques de valorisations des axes de transport*), developed by the Lille Métropole Communauté urbaine, which comprises circular zones of 500m radius (approximately 78ha in area) around key public transport stops (metro, tram, railway, high-frequency bus).

The overall aim is for urban developments to be prioritised near transport routes and stations, integrating the two, and so these zones are identified as having potential for improvement and urban development. The idea arose in 2007–2008, when addressing the issues of town planning and city transport during a review of the urban mobility plan. This review formed part of a political vision to implement the principles of a 'compact city' in order to reduce car trips and to promote sustainable mobility, within the Lille Métropole area, a partnership of 85 municipalities.

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Local stakeholders must play a clear role within the planning process. The rail system should be fundable by local and regional communities, with local decision-makers accountable for investment and how it is used

The *Contrat d'axe* in Grenoble is a policy partnership between transport and territorial authorities whereby the local transport authority undertakes to carry out a public transport project with a focus on accessibility, pedestrian walkways and cycle lanes, and at the same time local communities undertake to carry out an urban project which will increase urban density and improve amenities.

The goal of the contract was to build the city around the tram. The axis contract, a new tool to integrate town planning and transport in Grenoble, was signed by transport authorities and municipalities. The first contract was signed by SMTC (Transport Union), Métro (Urban area of Grenoble), the French State, and other transport authorities and municipalities. It will reorganise the intersecting municipalities around the future tram line E and represents the result of more than five years of studies and dialogue undertaken by the SMTC, assisted by the Urbanism Agency of Grenoble. The axis contract has the following objectives:

- To develop urbanisation around the tram. The four municipalities involved have pledged to create nearly 2,000 dwellings in the six months following the start-up of the line and 6,000 by 2020. This represents an urban densification of 15 per cent
- To implement an offer of sustainable and effective mobility centred on the tram (10 km), operational by the end of 2014
- To organise the automobile traffic in favour of urban spaces
- To develop quality public spaces around the tram centre

This requirement for sustainable land use highlights the local link between transport planning and housing construction. France makes good use of such transport and urban development contracts, ensuring consistency and local linkages are preserved.

In Switzerland, the local rail network around the Bern agglomeration has a high-quality transport offer. It is quite a recent service, developed in the last 10–15 years, and the first actions relating to integrated development between urbanism and transport were carried out in the 1980s when a national planning directive mandated integrated development, and local planners followed this directive.

In Germany there is a principle of densification along rail access, stipulated in masterplans. The decisions are made at inter-borough levels, with one municipality working together with its neighbours. In the federal state of North Rhine-Westphalia, for example, a regulatory tool demands a close link between transport and urban planning, as subsidies for housing depend upon increasing the density and proximity of new housing around public transport stations.

In well-planned systems, railway lines should be considered as backgrounds for the development of densified neighbourhoods around stations, rooted in national development plans and local contexts. Local stakeholders must play a clear role within the planning process. The rail system should be fundable by local and regional communities, with local decision-makers accountable for investment and how it is used.

Necessary conditions can be identified: there is a need for institutions to work together within integrated masterplans. However, whilst necessary these are not sufficient in themselves. Also required are land around stations, and accompanying measures such as the improvement of the walking and cycling networks. Improved road accessibility, in parallel with integrated urban and mobility plans, can destroy the efforts of densification by diluting the pressure on land. So controlling car traffic and road construction policies are also necessary requirements for public transport schemes to be successful.

The creation of permanent spaces, services next to stations, and the concentration of urban development around the train and tram stations are key ingredients that cities make use of when delivering sustainable transport and urban development.

Pforzheim is a city in southern Germany near Stuttgart with around 120,000 inhabitants. It is served by four main railway lines and a local rail service. The tram serves as a connecting light rail service with more local stops.

The frequency of the offer is very important, as is the synchronisation of timetables using on-peak hour and off-peak hours, a very clear demarcation. The train arrives on the same minute, every hour (the so-called Taktfahrplan), and bus timetables are also synchronised with the train.

In peak hours, the service is doubled on the half hour. Ticketing is integrated with train and bus using the same ticket. Urban development is planned in terms of densification along train axes, separated by green belts.

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Interchange nodes

Pforzheim station, Germany, a central interchange point for long-distance, regional and local traffic.

Financing and funding regional transport in challenging times

How challenging are times for regional cities? **Matthew Dillon**, Arup, UK, identified linkages between projects and benefits to support regional growth including the role of local champions, case studies for best practice, and reasons to be cheerful

In an uncertain financial climate, GDP differences between capitals and the regions in European countries vary widely. In the UK, capital growth remained just above the national, with territorial cohesion mainly improving, unlike the majority of EU countries which demonstrated worsening territorial cohesion. London has fared averagely compared with the rest of the UK in the last recession.

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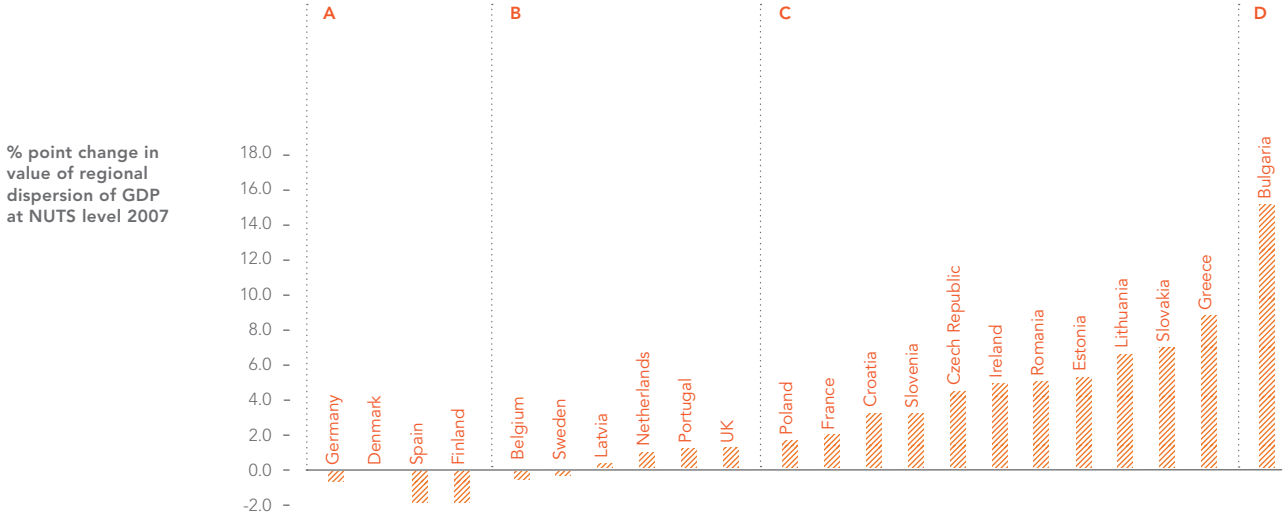
GDP differences between capitals and the regions in European countries

A. **Capital growth less than national:** territorial cohesion unchanged or mainly improving
B. **Capital growth at or just above national:** territorial cohesion mainly improving
C. **Capital growth moderately above national:** territorial cohesion worsening
D. **Capital growth significantly above national:** territorial cohesion worsening

Source: Parkinson (2012), *In an age of austerity why invest beyond the capital cities?* (Eurostat cited)



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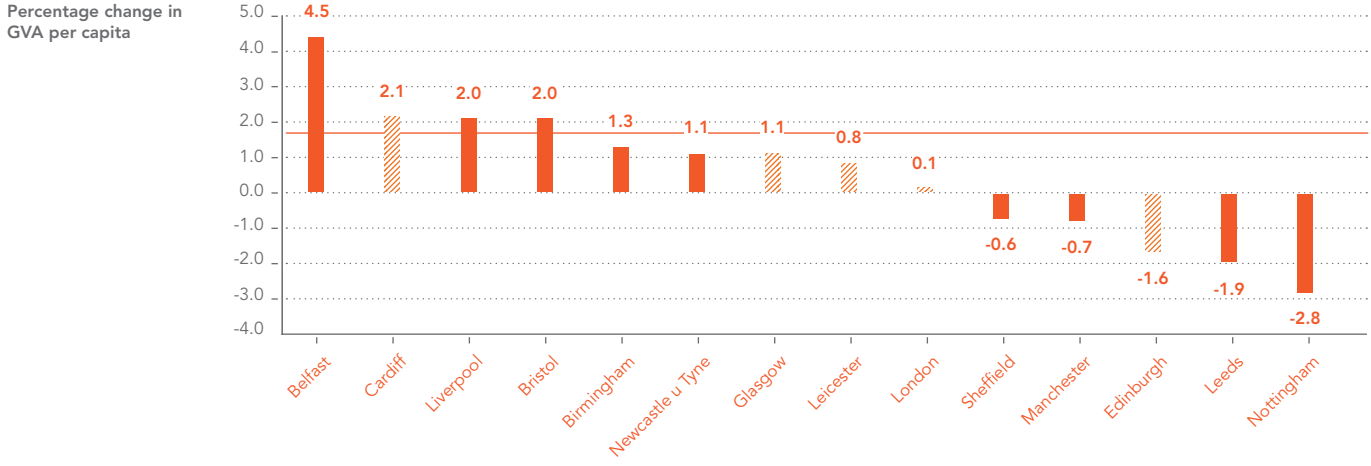
London

London has fared averagely compared with the rest of the UK in the last recession. This graph shows the percentage change in GVA per capita, 2008-2011. UK 'Core Cities' shown in red.

City-region — UK average

Source: Parkinson (2012), *In an age of austerity why invest beyond the capital cities?* (EIUA calculation for ESRC research project cited)



However, UK regional differences are long-standing but are getting steadily worse, in comparison with other countries that have greater devolved spending powers. In this scenario, UK regions may find it harder to justify transport investment, as this table shows:

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UK regions and transport investment: schemes taken forward

	Scheme	Benefit Cost Ratio
Major schemes taken forward	London Crossrail	2.0:1
	London Thameslink	1.4:1
	London Jubilee Line Extension	1.75:1
Major schemes not taken forward	South Hampshire Tram	3.0:1
	Leeds Supertram	2.4:1

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A business rate supplement of 2p on non-domestic properties with a rateable value of £55,000 or more created £4 billion for the project, nearly as much as the government is providing.

New offices will be built above stations by developers; this is novel in the UK, but a common way of funding infrastructure elsewhere

On the back of the Crossrail scheme in London, currently under construction, property price rises have shown great potential to support the tapping into of local tax revenues to help fund infrastructure, with the percentage uplift in property prices within half a mile of a Crossrail station between 2005 and 2013 reaching more than 50 per cent, compared to less than 40 per cent for property more than half a mile from a station.

For several decades it looked as if the project would never go ahead, being first mooted in 1974, then only formally considered from 1989 onwards. Importantly, the project's planners managed to attract a substantial amount of private-sector money:

Crossrail is being financed by a combination of government grants, fares and an enhancement of land values. A business rate supplement of 2p on non-domestic properties with a rateable value of £55,000 or more created £4 billion for the project, nearly as much as the government is providing.

New offices will be built above stations by developers; this is novel in the UK, but a common way of funding infrastructure elsewhere. Any future Crossrail 2 may make use of ultra-local taxation to fund its construction.

City Centred

The UK's 'City Centred' Campaign is calling for greater financial freedoms to empower cities to better direct growth, drive their economies and boost the national economy. Specifically, the aim is the devolution of property tax and revenue streams – including council tax, stamp duty, land tax and business rates – with the ability to reform those taxes while retaining prudential rules for borrowing.

Based on a London Finance Commission report from 2013, the 'City Centred' Campaign also gives cities more power to join up public services and plan for future needs.

By increasing the tax base through local taxation, cities will be able to become financially self- sustaining. While many novel local funding mechanisms are available – but are relatively untested – the 'City Centred' campaign gives cause for optimism of further devolution.

However, in the UK, and despite introduction of Local Transport Boards to manage transport planning and investment, central Government still contributes significantly, even in the cases of Crossrail and Crossrail 2. A high-profile local political champion, and evidencing a contribution to the national economy, can help obtain such centralised funding.

↓
Sources of local funding, from Arup analysis

Mechanism	Political risk	Attractiveness to private sector partners	Economic cycle risk	Track record of success (credit worthy)
Workplace charge / Congestion charge	High High	Low? Medium	Possibly Possibly	No Limited to London
Farebox (user pays)	Medium	Medium	Possibly	Very mixed
Payroll tax	High	Medium	Medium	Yes
Bedroom tax / Roof tax / Sales tax	Unclear?	High	Yes	Yes, but...
Developer contributions	Low	Medium-low	High	Yes
Local Bonds	Low	High	High	Yes and no!
"Recycling" assets / Local asset backed vehicles	Medium	Medium	High	Yes
Business rate supplement / Community Infrastructure Levy	Medium	High	Medium	Not quite yet
Tax increment	Low-medium	High	Possibly	Yes

But devolution is high on the agenda for the future. In the words of Lord Heseltine (2013): 'Big government does not work. Ministers and their officials are not that clever. Events are not that predictable ... Government must now reverse the trend of the past century and unleash the dynamic potential of our local economies.'

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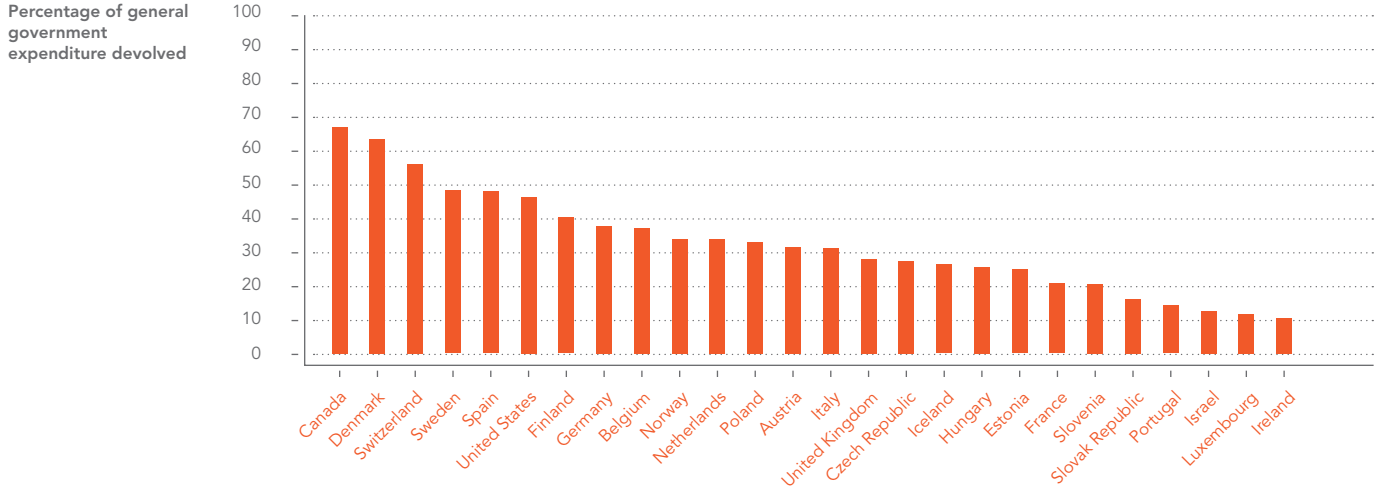
Extent to which countries devolve their spending

Other countries have greater devolved spending powers. Percentage of general government expenditure spent by authorities below central government level (2010).

Source: Heseltine (2013), (OECD National Accounts cited)



Session 05
Finishing the unfinished business

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About the contributors

Michael Glotz-Richter
Senior Project Manager, Sustainable Mobility, Senate Department for Environment, Construction and Transport, Bremen, Germany

Professor Sir Peter Hall
University College London

On the way to 2040

Michael Glotz-Richter, Senior Project Manager, Sustainable Mobility, Free Hanseatic City of Bremen, reminded us that radical change in movement technologies may be just around the corner: we must learn to understand the potential and to build new possibilities into future, long-term, transport and urban planning paradigms

Michael Glotz-Richter outlined the huge challenge of cutting carbon emissions by 2040, especially in the transport sector, and also highlighted the escalating cost of oil and fuel prices, and our political dependence on oil-producing nations. He pointed out the electric cars may help in this respect, but they will do little to reduce congestion or the problems of cars in terms of how much land they take up. Electric cars will not solve transport problems, yet the sector is enjoying a huge investment boom. If the same kinds of funds were going towards high-quality public transport, we would be a lot closer to reducing carbon levels and congestion.

'We need to adopt longer-term planning horizons', argued Glotz-Richter, looking beyond the typical 2025 and 2030 timespans to 2040. '2040 is only 26 years away. A great deal can happen in 26 years. If we look back 26 years to 1988, we appreciate the many changes – and the many things that remain the same. Cars don't look that different, and they use only a little less fuel.'

'We have not made much progress in reducing the number of cars on the road. However, in terms of mobile connectivity and online, real-time services, we are in an age that would have looked like science fiction from back in 1988. Who would have thought that, in 2014, we could look up the actual times of trains in New York City on our phones, wherever we are? These are the areas in which real progress has been made, and where we should be looking to solve our transport challenges.

'The first car-sharing scheme in Germany began in 1988; in February 2014 we celebrated having attracted 700,000 people to car-sharing. In future, car sharing and bike sharing offer huge potential. The number of driving licences issued to young people in many areas of the world is decreasing, and this is a trend we can build on. Automated transport also offers new potential for reducing levels of car ownership, as self-driving cars could act like taxis, being called by passengers remotely on demand.'

Although driverless cars are not yet allowed to operate without drivers in Europe due to a clause in the Vienna Convention, there are driverless car pilots running in mixed traffic in several other countries, including the USA. Already cars can park themselves.

This scenario poses a challenge for public transport, as personalised, as opposed to public, transport may be preferred, when available, by many users. It may also pose a threat to traditional driving jobs should bus, road and freight traffic become automated – up to 42 per cent of jobs in the USA, according to the Financial Times of London.

The food for thought is that radical change may be just around the corner: we must learn to understand the potential and to build new possibilities into future, long term, transport and urban planning paradigms.

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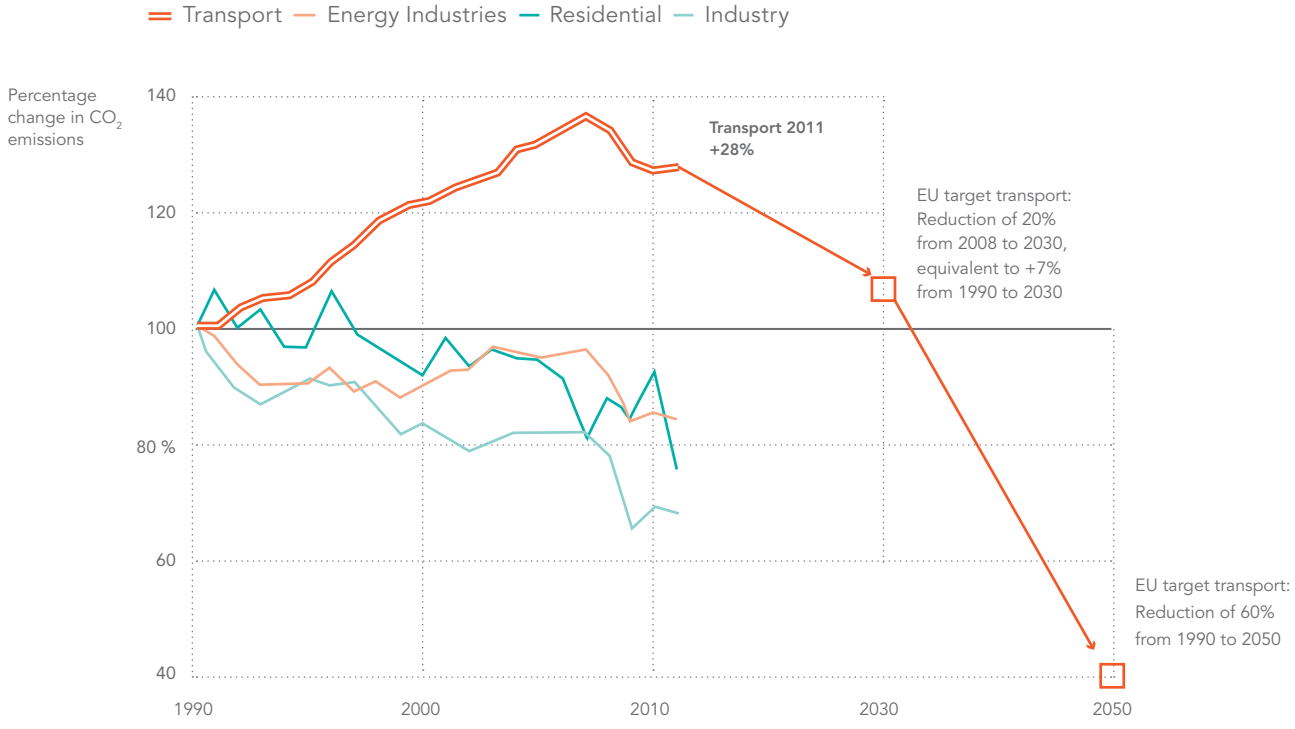
Carbon dioxide emissions

Cutting carbon emissions by 2040, especially in the transport sector, is a major challenge.

Source: Allianz pro Schiene



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E-mobility and tram

Electric cars will not solve transport problems, yet the sector is enjoying a huge investment boom.

If the same kinds of funds were invested in high-quality public transport, we would be a lot closer to reducing carbon levels and congestion. These streets, photographed in 1988, could just as well be streets today.

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The first car-sharing scheme in Germany began in 1988; in February 2014 we celebrated having attracted 700,000 people to car-sharing. In future, car sharing and bike sharing offer huge potential

← ↑
2014 and 1988

Many cars have not changed that much since 1988, and only very few use much less fuel.

←
Google

Automated transport offers new potential for reducing levels of car ownership.

Finishing the unfinished business

Professor **Sir Peter Hall**, UCL, thanked all speakers and participants, acknowledging an excellent day's contributions with a high level of debate, and he outlined several of the emerging key issues

A major issue that has emerged is that transport investment has to be integrated into packages; or structuring networks, and transport investment must serve concepts of development. The principle of agglomeration, or clustering, discovered 120 years ago by Alfred Marshall and re-applied to transport economics by economists such as Bridget Rosewell from Volterra, is key to understanding growth patterns.

In London and many other major cities, agglomeration of small manufacturing industries has been replaced by a larger agglomeration of advanced services such as the hugely dynamic area which is now called TMT, telecommunications and media and technology, and which is growing faster than even the financial services industry.

'This seems to me to be fundamentally very important as it has an effect at every scale', said Peter Hall. 'In a country such as the UK, there is a division between boom cities – and London is the archetypal boom city – and middle range cities, which we call the core cities, and the post-industrial cities that have lost their industrial function: I actually fear that a few of these places may actually be beyond hope.'

In some cases, transport can connect a boom city to a more problematic periphery, such as Copenhagen to Malmö, with great effects for both places. In London, the regeneration of east London and the Thames Gateway by High Speed 1 and other measures is having a similar effect on internal restructuring. But the UK has a real problem of regional imbalance: the Centre for Research on Socio-Cultural Change (CRESC) at the University of Manchester has even suggested that London is becoming a city republic, almost divorced from the rest of the UK.

'We now have a new phrase in our country, Re-UK, which refers to the rest of the UK after Scotland leaves, if it leaves', added Hall[1]. 'But we ought to be thinking about Re-England, and particularly Re-England outside London, and outside these few core cities. This is the background to our exploration of 'irrigating the regions'.'

→
Sir Peter Hall

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The value of the French approach is that transport funding goes beyond a new metro line, or a new tramway; it goes to a total concept of urban regeneration around that tramway

The impact of transport investment

'In our theoretical discussions about evaluating the impact of transport investment, Bridget Rosewell stated that transport is a necessary, but not sufficient condition, for growth and development. We also need to consider education, skills and a wide range of other related social factors. This is my takeaway thought from the day, and it raises another question: how to compare transport policies versus other socially necessary policies such as educational policies? In the UK, transport funding has to compete with health, sport, education and all other policy sectors.

'Agglomeration effects are important, but relate to the question of what can be done. We've stressed that there is no single measure we can use, no single magic number, in a cost benefit analysis. And again, this is a point that Bridget Rosewell made, that we need to be much more geographical. We can get the economists to measure agglomeration effects forever, but we will still have serious dissent among leading experts in the area of spatial economics, as is currently happening in the UK over High Speed 2.

'We find it very difficult to agree on how to measure these things, we need to disaggregate much more than we currently do, but how we do this I don't think any of us quite yet knows.

'In terms of providing capital, we've heard about the effects of hypothecated taxes in France, the business rate supplement for Crossrail in UK, the Nottingham workplace levy, and the Manchester Tax Increment Finance scheme. All these could be valuable in giving cities and regions greater autonomy. But it is very important that this money is not used merely for transport, but for also for related investment around transport.

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In this respect I'm hugely encouraged that the UK's Network Rail has taken the brave decision to publish a report last summer suggesting that it is willing to look beyond the traditional ways of doing things, with more support for local transport and the promise of better and cheaper outcomes for everyone.

'The value of the French approach is that transport funding goes beyond a new metro line, or a new tramway; it goes to a total concept of urban regeneration around that tramway. How this is done, and what agency is appropriate, is related to the challenge of providing 'patient capital' that can carry us through large-scale long time frame development or regeneration schemes before they pay off.

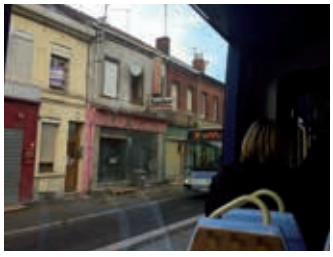
'Do we need a development corporation approach? Countries like Singapore and Hong Kong do this at a national level. Stockholm did it for years because it owned all the relevant land. But now it is time for a new approach that will combine capital for transport improvement and capital for urban development infrastructure in a package that will allow things to happen.

'And we must remember the question of timescales; as we know that it can take many decades or longer to realise uplifts in land and property values, during which it is not always possible to foresee what the future might bring. Remember also that transport improvements can bring disbenefits as well as benefits. And in public choice economics the people who feel the pain of development as it happens feel it much more deeply that than those who may feel the promise of the benefits a long time in the future; yet another issue that the UK is currently experiencing with HS2.

'Finally we need to consider the scale at which we make interventions. If we devolve spending and investment decisions to regional and local government, what is the right scale? Is it the city region represented by the Länder in Germany, or the Communautés urbaines in France, or the Manchester strategic city region? Or is it a wider region which takes into account not merely the single city and its immediate purview, but the wider region, which contains many peripheral and less well-connected places?

'Research from Sintropher has shown that in Lille Métropole, France, it has been the wider connections between urban tram and metro and the regional railways that have been hugely successful in connecting depressed places with Lille. However, in this context, we cannot forget the need to relate the purview of the state and regional heavy rail providers to the needs of local transport.

'In this respect I'm hugely encouraged that the UK's Network Rail has taken the brave decision to publish a report last summer suggesting that it is willing to look beyond the traditional ways of doing things, with more support for local transport and the promise of better and cheaper outcomes for everyone.'



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Valenciennes

Transport is a necessary but not sufficient condition for growth and development.

In Valenciennes, France, new development is taking place alongside the recently opened new tramway Advertising for new homes capitalises on their position on the tram route, and a new secondary school is highly accessible thanks to a dedicated stop. The regeneration challenge is shown by the nature of the existing building stock.

Other key issues raised included:

- Restricting / constraining space available for cars; the potential impact of peak car and declining car use trends in some towns and cities; and demographic and cultural shifts toward public transport
- The direct experience of decision-makers at regional, national and European levels of actually using public transport: do they know how it really operates? EU data reveals an over-estimation by the politicians of the level of interest the public has for its private cars
- The central role of leadership: there is a need for a strong, symbolic figure to drive and popularise policies
- Including the emotional view and managing behaviour change: Margaret Thatcher once remarked in the UK that anyone over the age of 26 who rode on a bus was a failure, and it has since taken a great deal of work to transform the image of the bus in many cities from merely a low-grade form of transport for the poor
- Fare levels, fare fixing and smart finance: keeping fares affordable is important, yet we need to avoid recreating the image of public transport as specifically a poor people's system
- The challenge of greenhouse gas emissions: achieving a 60 per cent reduction by 2050 cannot be solved by technology alone; the problem of unpredictable future fuel price; the question of resilience
- Planning for the longer term: going beyond the typical 2040 horizon, which is only 26 years from now. A great deal can happen in this time, and technology is advancing quickly with real-time traffic data, car sharing via the internet and apps (there are now 700,000 car-sharers in Germany); bike sharing; autonomous vehicles; more efficient use of infrastructure; moves away from traditional car ownership

Note

1 This conference took place before the referendum in which Scotland had the opportunity to vote for independence.

Biographies

Professor Sir Peter Hall

University College London

Sir Peter (1932–2014) was Bartlett Professor of Planning and Regeneration at the Bartlett School of Planning, University College London, and Director of Sintropher.

He was author, co-author or editor of 50 books including Urban and Regional Planning, Cities of Tomorrow, Cities in Civilization, The Polycentric Metropolis and Good Cities, Better Lives.

Keir Fitch

Head of Unit, Research and Innovative Transport Systems, Directorate-General for Mobility and Transport, European Commission

Keir Fitch was formerly Deputy Head of Cabinet of Siim Kallas, Vice-President and Commissioner for Transport. He was also the coordinator of the White Paper of the Future of Transport.

Mr Fitch studied mathematics and law at Cambridge, was a lawyer at Herbert Smith and then moved on to the UK civil service in 1993. He joined the European Commission's Legal Service in 1999.

Before joining the cabinet of Mr Kallas in 2004, he was a Member of Cabinet of Vice-President Kinnock, responsible for Administration.

Corinne Hermant-de Callataÿ

Inclusive Growth, Urban and Territorial Development Unit, Directorate General for Regional and Urban Policy, European Commission

After starting her career as a urban researcher within the French National Research Centre, Corinne Hermant-de Callataÿ joined the European Commission in 1988 and was involved in designing and implementing several research and 'cooperation in education' programmes.

She now works as a senior policy officer, advising on policy development on urban issues. In 2011, she co-authored a report on Cities of Tomorrow published by the European Commission, following a Europe-wide reflection process with stakeholders and researchers.

Ruut Louwers

Director, INTERREG IV B North West-Europe Programme

After studying business and economics, Ruut Louwers worked for an audit firm in Amsterdam and for the audit department of the Ministry of Agriculture, Nature Management and Fisheries in The Hague.

Moving to the Ministry of Housing, Spatial Development and the Environment, he became responsible for INTERREG overall, and also for the development of the Territorial Cohesion Policy.

He was responsible for the Netherlands for the development of Cohesion Policy Objective 3 (Cooperation) within the negotiations on both the Financial Perspectives 2007–2013 and the regulatory framework.

In 2007 Mr Louwers was appointed Director of the INTERREG IVB North-West Europe Programme in Lille, France.

Dr. ir. Rob van der Bijl

Consultant, the Netherlands

Rob van der Bijl is an urban planner and independent consultant based in Amsterdam, the Netherlands. His practice is known for its innovative approach to research and design.

Recent projects have been characterised by a multidisciplinary approach at the intersections of urban planning, transport, culture and technology.

In early 2010 he completed a major project to research the urban design, planning and real estate potential of railway station environments, commissioned by the Chief Government Architect of the Netherlands.

Dr van der Bijl received his engineering degree (1985) and PhD (1998) from the Delft University of Technology in the Netherlands.

Ümit Güney

Head of Foreign Affairs, Eskişehir Metropolitan Municipality, Turkey

Having graduated as Deputy Police Chief from the Police Academy, Ümit Güney worked in Istanbul, including a period as consultant to the Kosovo Law Enforcement Organisation in Pristina.

He returned to Ankara in a traffic management role, studying for a Master's in Traffic Criminality, and undertook research into Crime Scene Investigation in Traffic Accidents. Later he was posted to Haiti as a UN traffic accident investigation expert.

On his return, Mr Güney became Head of the Transportation Division of Eskişehir Metropolitan Municipality, with special focus on public transport and cycle zones. He transferred as Head of Foreign Affairs in March 2013.

Mr Güney speaks fluent English and is married with two children.

Nils Jänig

Deputy Director, Head of Transport Planning and Rolling Stock Technology, Transport Technologie-Consult Karlsruhe, Germany

Nils Jänig has been Deputy Director and Head of the International Studies Department at TTK since 2005.

TTK is a subsidiary of the Karlsruhe tram-train operator and PTV AG. He studied at the Technical University of Berlin and holds an MSc in transport planning.

He is a specialist in the field of LRT and tram-train, especially with regard to operations, rolling stock, ITCS systems and economics. In these fields Mr Jänig has been part of the technical consultant team on the Sintropher projects in Nijmegen-Kleve and Blackpool.

In recent years he has worked mainly on LRT / tram-train.

Professor Dr.-Ing. Helmut Holzapfel

University of Kassel, Germany

Helmut Holzapfel is a civil engineer, transportation scientist and urban planner.

Between 1995 and 1998 he was responsible for all transport planning at the Ministry of Transport in the German state of Sachsen-Anhalt.

Since 1998 he has been a full professor and Head of the Institute for Integrated Transport Planning at the University of Kassel.

Michael Glotz-Richter

Senior Project Manager, Sustainable Mobility, Senate Department for Environment, Construction and Transport, Bremen, Germany

For more than 20 years, Michael Glotz-Richter has been actively involved in European transport projects and international networks, initiating well-regarded pilot projects and knowledge transfer.

Bremen is well known for its ambitious sustainable transport strategies and the city was selected to showcase its car-sharing concept at the 2010 World Exhibition in Shanghai. The strategy has been recognised with numerous awards.

Mr Glotz-Richter has given numerous contributions on sustainable transport at international conferences and seminars. He lectures at Bremen University for Applied Science and has published several articles about sustainable transport.

He holds a degree in Urban Planning.

Stephen Perkins

Head of the Joint Transport Research Centre at the International Transport Forum, OECD

Stephen Perkins is the Head of the Joint Transport Research Centre of the International Transport Forum and the OECD. The Forum, part of the OECD family, is an international governmental organisation for transport ministers with 54 member countries.

Mr Perkin's previous experience includes energy industry restructuring and regulation at the International Energy Agency, work on economic regulation for a major gas utility, and consultancy on energy policy and environmental issues for government and industry.

He holds degrees in Energy Economics and Environmental Sciences from Imperial College London and from the University of East Anglia in the United Kingdom.

Jérôme Pourbaix

Head of Policy, International Association of Public Transport (UITP)

Jérôme Pourbaix studied sociology in Belgium and the United Kingdom and gained further training in transport economics. He was involved with public transport and mobility through his work at the European Commission and the international city network Polis.

Mr Pourbaix joined UITP in 2003 where he was responsible for the Mobility in Cities Database project (urban mobility data). He has recently led the development of a toolkit on public transport financing and established scenarios for urban transport by 2025.

He currently coordinates UITP's international advocacy activities.

Bridget Rosewell, OBE

Economist and Senior Partner, Volterra

Bridget Rosewell is one of the UK's most influential economists. She is a founder and Senior Partner at Volterra Partners, a non-executive director of Network Rail and of Ulster Bank.

She recently relinquished her post as Chief Economic Adviser to the Greater London Authority, and has just published Reinventing London.

She has worked extensively on infrastructure projects and on major developments, from cement plants to Crossrail and film studios to HS2, the UK's proposed new high-speed rail line.

Ian Birch

Transport Economist, Transport for London

Ian Birch trained in economics and law and has 16 years' experience as a transport economist and planner, both in the public and private sectors.

He has been with Transport for London's Strategy and Planning department for the last three and a half years, working on a wide range of strategic planning projects and policy areas. These include new hub airport capacity for London, a second 'Crossrail' route, and the extension of London Underground's Northern Line to Battersea.

He is currently working on a London infrastructure investment plan to 2050.

Jan grosse Beilage

Senior Consultant, TTK, Lyon, France

Jan is an expert in the development of urban transport concepts as well as in spatial planning and traffic infrastructure.

From 2002–2006 he was Head of Department for transport planning at the AURM regional planning agency in Mulhouse, France.

Between 2001 and 2002 he was an adviser for traffic and technical infrastructure within the planning agency of the Rhine Hessen-Nahe and Western Palatinate region, Germany.

Prior to 2001 he was technical adviser for research coordination, research programmes and international cooperation with the Federal Road Research Agency BAST, Germany.

Matthew Dillon

Associate, Transaction Advice, Arup

Matt Dillon is a transport economist, business case specialist and project manager and is an Associate in Arup's Transaction Advice group.

In September 2013, he joined Arup from a senior Civil Service post at the UK Department for Transport, where he led the team working on the £5.7bn Intercity Express Programme (IEP).

Mr Dillon also oversaw the business case work on the £8.6bn West Coast Route Modernisation programme whilst at the UK Strategic Rail Authority (SRA), and spent several years chairing the European Union-sponsored NETLIPSE special interest group on transport business cases.

He is an economic migrant to London from the peripheral European region of north-west England.

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