

HIGH SPEED 2

**Economic and Regeneration Impacts for
Birmingham**

Final Report

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Greengauge 21 & Birmingham City Council

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EXECUTIVE SUMMARY

Following the success of the Channel Tunnel Rail Link (HS1), further impetus has been given to the debate for a High Speed rail network in the United Kingdom. A High Speed Two (HS 2) corridor has been identified by Greengauge 21 between London and Birmingham/Manchester and this has formed the starting point for this analysis: this is set out below. HS 2 is clearly a very significant transport investment project with the potential to revolutionise travel between the West Midlands (and beyond), London and abroad via HS1 or Heathrow.

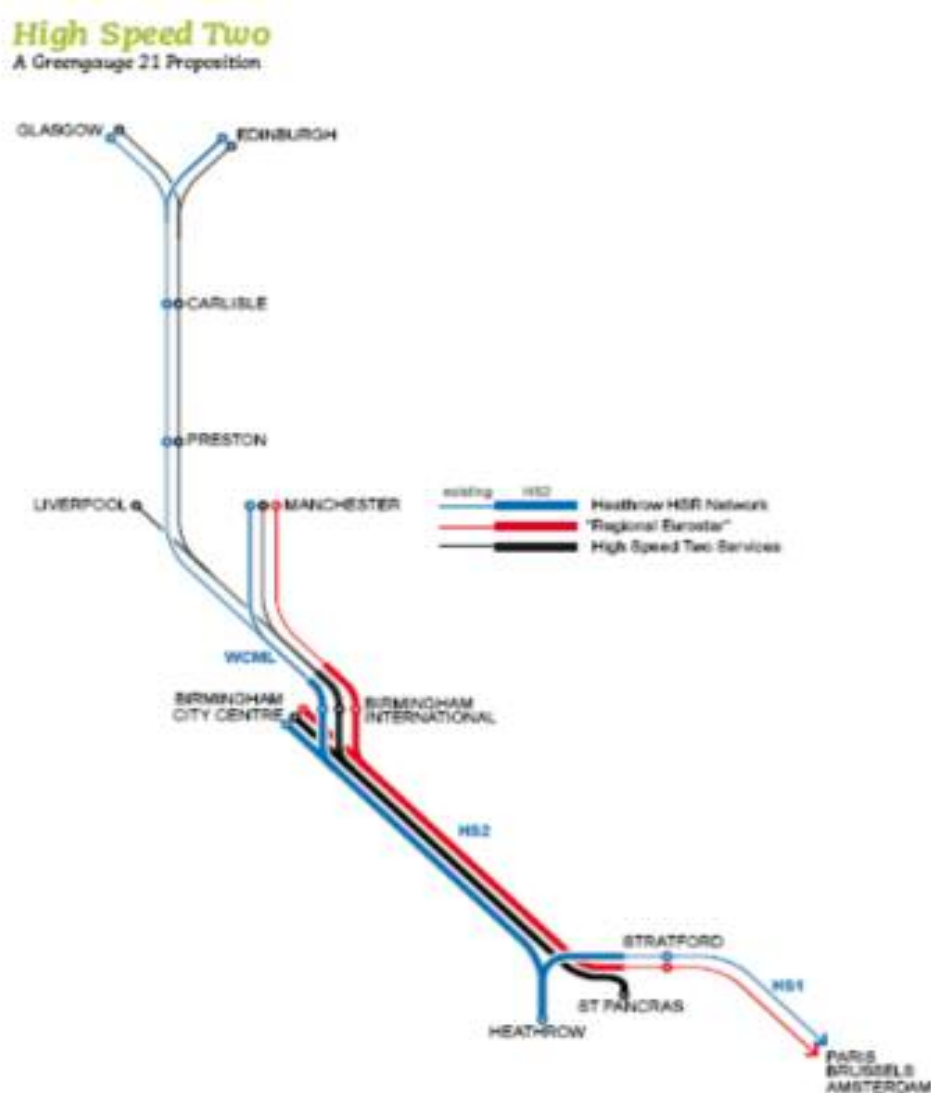


Figure 2 High Speed Train Services with HS2

Steer Davies Gleave was commissioned by Greengauge 21 and Birmingham City Council to undertake this Phase 1 study to provide an initial analysis to understand the scope and scale of economic benefits that might accrue to Birmingham. The objectives of the Phase 1 work were broadly twofold:

- Firstly, in conjunction with economic planning stakeholders locally, to identify

the range of potential economic benefits, the key HS 2 drivers for these benefits and the mechanisms by which they might be realised.

- Secondly, to quantify the broad magnitudes of conventional appraisal benefits in line with WebTAG, as well as the Wider Economic Benefits productivity benefits to Birmingham as defined in draft Government guidance.

Work has utilised existing transport planning tools (MOIRA) together with current economic data at the NUTS2 (local authority) level. Steer Davies Gleave has developed an analytical framework to allow the calculation of productivity, agglomeration and labour supply benefits which meets draft guidance criteria. This guidance is widely expected to be formally adopted as one of the 'quick wins' from the current DfT review of NATA.

The analysis projects that demand for HS 2 between London and Birmingham alone is expected to be in the order of 5 million trips per year (notional 2006 figure).

The quantification of HS 2 demand, transport and wider economic benefits represents a partial analysis at this stage. As required by the remit of the work, it focuses on the core Birmingham-London market and the distribution of benefits to Birmingham in particular.

Benefits have been aggregated over a 60 year appraisal period from an opening date of 2020 and discounted back to 2002 prices in line with DfT appraisal principles. The core analysis suggests the following key benefits:

- Conventional transport benefits of about £4bn PV of which more than three-quarters are benefits to business users.
- Additional quantified wider economic benefits of around £2bn PV of which the vast majority are agglomeration benefits to firms.
- An expected GDP impact of £5.2bn PV across a 60 year period.
- The GDP impact for the West Midlands is projected to be £2.24bn of which £0.54bn would be agglomeration benefits.
- The GDP benefits to Birmingham City would be £1.23bn of which £169m are agglomeration benefits.
- The biggest beneficiaries would be in the financial and business services sector within Birmingham.
- Indicative analysis suggests further significant benefits to Birmingham from the operation of the high speed services north from BIA to Manchester. These could be in the order of £100m PV.

The quantified benefits above are based on relatively conservative rail market growth assumptions. However, sensitivity analysis has shown that the results are robust to alternative higher growth and to a range of parameters determining the concentration of spatial benefits.

This analysis does not quantify all likely benefits to the West Midlands as it excludes any effects from crowding reductions or enhancements to other local services. The creation of HS 2 would allow a significant recast of existing rail services. As far as Birmingham is concerned, the capacity released by HS 2 should allow for a doubling of local train frequency in the Coventry corridor, a better service to/from Milton Keynes/Northampton and a general re-structuring of the local and regional timetable.

Regeneration

Benchmarking evidence suggests that there would be some enhancement in rental values for central Birmingham and a more significant impact in improving vacancy rates for commercial property. Premise relocation from the West Midlands to London is unlikely and there are prospects for growth in the relocation of 'back office' functions to the West Midlands, especially within the financial and business services sector.

The opportunity for new inward investment to the region could be enhanced provided the opportunities presented by HS 2 were integrated with the broader economic development strategy for Birmingham and the region.

There is likely to be growth in commuting to London from the West Midlands, particularly for highly paid jobs. In part, HS 2 will encourage workers to move away from the south east as they trade-off housing costs with travel time and costs. This can have second order multiplier effects for the West Midlands as higher wages from London jobs are spent locally.

The HS 2 link is likely to attract higher density employment development to the area around the station. This in turn will attract retail and other businesses to the area, resulting in a concentration of employment. While much of this economic activity is may be displaced from other locations in the West Midlands, it is likely to result in increases in property values overall to reflect higher economic value.

Next Steps

The analysis to date suggests that the following tasks should be prioritised as part of a second phase of work:

- Extend the WEBs analysis to consider the benefits of optimising freed capacity on the local rail network, and therefore identify a higher total economic benefit to Birmingham and the West Midlands.
- A 'high-level' assessment of potential HS 2 routing and station options.
- Examination of local regeneration opportunities around proposed station options, and their 'fit' with the broader regeneration strategy for Birmingham city.

1. INTRODUCTION

- 1.1 The High Speed One Eurostar service between St Pancras and Paris/Brussels opened in November 2007 to critical acclaim both for the quality of the offer to passengers and the success of delivery to time and budget. This has provided stimulus to the debate for a high speed rail network for Great Britain.
- 1.2 In October 2007, the Government presented a policy paper¹ in response to the Eddington and Stern reports, which highlighted a fresh approach to transport planning at the national level. At the same time, it announced a review of the appraisal framework (NATA) by which investment priorities are determined for transport. It is widely anticipated that this review will formally incorporate the measurement of productivity and competitiveness benefits – the so-called Wider Economic Benefits (WEBs).
- 1.3 A High Speed Two (HS 2) corridor has been identified by Greengauge 21 between London and Birmingham/Manchester and this has formed the starting point for this analysis: this is set out as Figure 1.1 below.
- 1.4 HS 2 is clearly a very significant transport investment project with the potential to revolutionise travel between the West Midlands (and beyond), London and abroad via HS1 or Heathrow.
- 1.5 Steer Davies Gleave was commissioned by Greengauge 21 and Birmingham City Council to undertake this Phase 1 study to provide an initial analysis to understand the scope and scale of economic benefits that might accrue to Birmingham. The objectives of the Phase 1 work were broadly twofold:
- Firstly, in conjunction with economic planning stakeholders locally, to identify the range of potential economic benefits, the key HS 2 drivers for these benefits and the mechanisms by which they might be realised.
 - Secondly, to quantify the broad magnitudes of conventional appraisal benefits in line with WebTAG, as well as the Wider Economic Benefits productivity benefits to Birmingham as defined in draft Government guidance.
- 1.6 The work has quantified the following scope of benefits:
- Conventional transport benefits: time savings to rail and highway users and vehicle operating cost savings, including disaggregation of business user benefits;
 - Agglomeration, labour supply and imperfect competition benefits as components of WEBs;
 - The distribution of benefits to Birmingham City, the West Midlands and further afield; and

¹ Towards a Sustainable Transport System Supporting Economic Growth in a Low Carbon World. Department for Transport. October 2007.

- The economic sectors within Birmingham which will benefit from productivity gains.
- 1.7 The work has also identified a broader range of impacts and likely effects, in outline, including:
- Benchmarking of economic impacts with reference to High Speed Rail elsewhere; and
 - The potential economic impacts of business relocation, inward investment decisions, commuting opportunities and broader regeneration stimuli.
- 1.8 The quantified analysis is partial at this stage of the work. Chapters 3 and 4 of this report highlight where we have been able to quantify demand and benefits, both conventional and in wider economic terms in line with emerging guidance. For example, whilst it is clear that the economic impacts of a direct fast rail link to Heathrow will be important to Birmingham and the West Midlands, the quantification guidance is not currently developed to capture all of this benefit. Chapters 5 and 6 summarise parallel work we have done to understand the regeneration and wider network impacts: this should be seen alongside the quantified work as helping to explain how the quantified benefits may manifest themselves or where the quantification may be incomplete.

FIGURE 1.1 HIGH SPEED 2 - NETWORK PROPOSITION

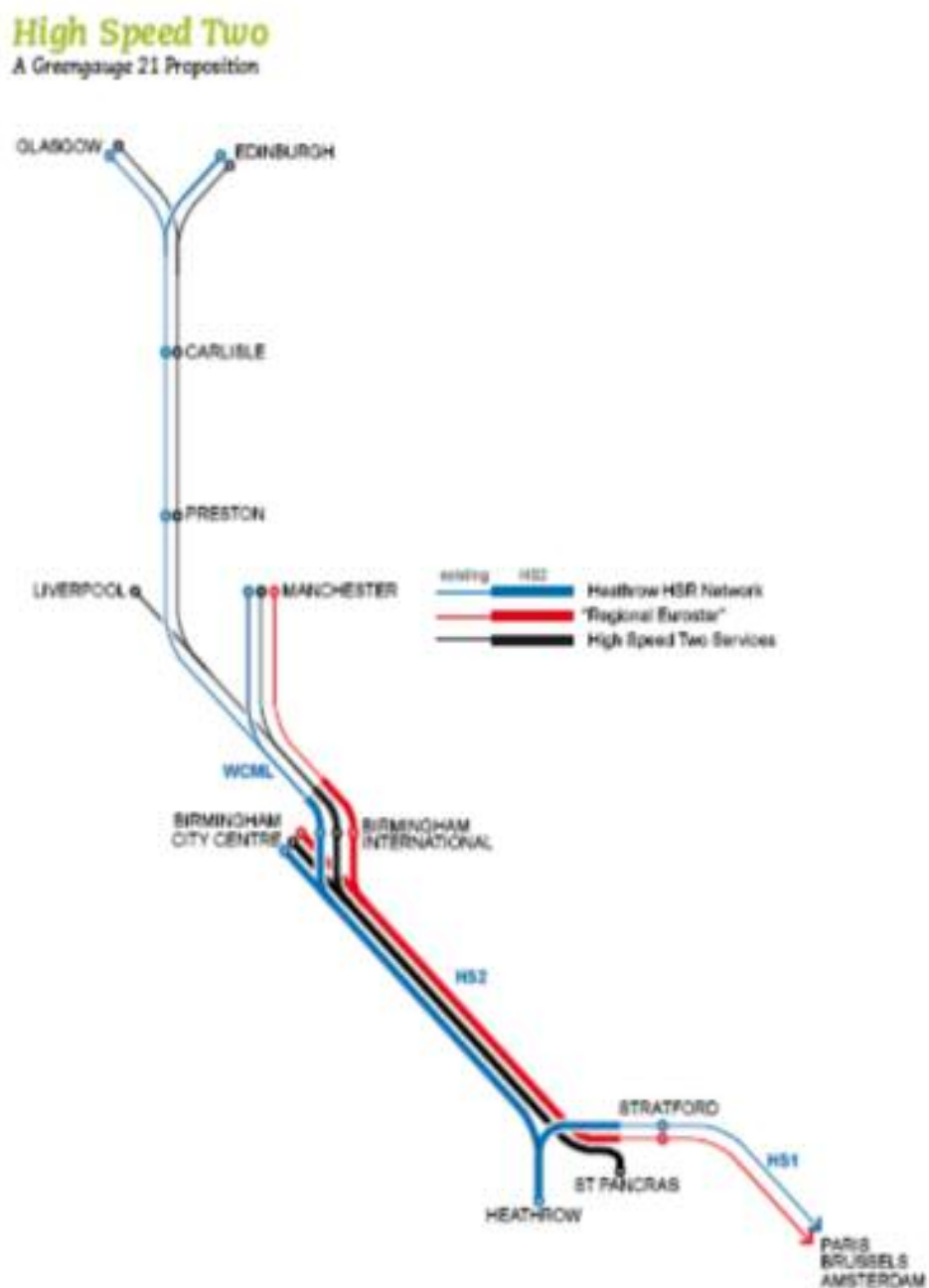


Figure 2 High Speed Train Services with HS2

2. OVERVIEW OF APPROACH

Approach

- 2.1 Our approach is based upon the assumption that the core HS 2 scheme would comprise a new line between London and Birmingham with a spur to Heathrow, allowing direct connectivity with HS 1 to the continent. We have also undertaken an outline initial assessment of the impact of improvements north of Birmingham.

Assessment of Transport Benefits, including externalities

- 2.2 The approach to assessing transport benefits has been to identify and, where possible, quantify² the transport benefits based on reductions in journey time on HS 2. This has focussed on the key markets connecting Birmingham to Manchester, London and Heathrow. Source rail data is from MOIRA ticket data, using an elasticity model applied to the 'Do Minimum' demand (based on existing demand and DfT rail projections), and do minimum journey time and fare assumptions. The analysis provides an assessment of journey time benefits to existing users and an estimate of the number of new users. Secondary assumptions about modal shift have been developed to identify the scale of potential associated 'externality' benefits (e.g. decongestion, safety and carbon reduction).
- 2.3 The HS 2 proposal will also deliver wider network benefits through freeing up capacity on a number of local, regional and freight services. We have identified train service opportunities which are likely to arise. These would enhance opportunities for commuting into Birmingham in particular, and provide opportunities for faster longer-distance services such as Cross-Country. These benefits would translate to additional conventional and wider economic benefits as yet un-quantified.

Wider Economic Benefits Assessment

- 2.4 We have applied DfT's methodology for quantifying the WEBs of the scheme. This includes estimating the welfare and productivity gains from *agglomeration*, *labour supply* and *imperfect competition* but not the wider impacts from a '*move to more productive jobs*' as this would require an employment model to formally consider the relocation of jobs. In outline, however, we have considered the broad potential for employment change for Birmingham resulting from HS 2.

² We have quantified the 'conventional' transport benefits for the core HS 2 market between London and Birmingham. We have provided an outline assessment only of transport benefits that would accrue between Birmingham and further north on HS 2.

2.5 The outputs of this assessment are:

- Additional welfare benefits beyond those captured in conventional appraisal;
- National productivity gains, in total and per worker (also by sector if desirable); and
- Indicative local and regional user benefits and productivity gains.

2.6 This simplified approach to calculating WEBs is not a substitute for a full assessment based on a comprehensive transport modelling exercise of the proposed scheme. However, it provides a very useful guide to the magnitude and potential distribution of additional welfare and productivity impacts from schemes at an early stage of development.

Financial Assessment

2.7 In Appendix A, we have provided initial thoughts on the funding and financial issues towards implementation and discuss the trade-offs inherent between fare levels, financial optimality and economic benefits.

Qualitative Assessment – Economic Regeneration Impacts

2.8 The assessment of Wider Economic Benefits provides an estimate of economic impacts in terms of certain GDP impacts at the national level. We have also undertaken a qualitative assessment of how some of these impacts are likely to manifest themselves in the local and regional context, and also highlight potential economic benefits from improved international connectivity.

3. HIGH SPEED 2 DEMAND AND REVENUE FORECASTS

The Base Travel Market

The Base Market – London to West Midlands

- 3.1 The mode shares for all journeys between the West Midlands and London are about equally split between car and rail (with some also by coach). The rail mode share is somewhat higher for business and commuting trips. Table 3.1 shows the mode shares by purpose and total. Almost 8m of the 17m trips are by rail.

TABLE 3.1 MODE SHARES BY PURPOSE BETWEEN WEST MIDLANDS & LONDON

| Mode shares | Rail | Car | Coach | Total |
|---------------|------------|------------|-----------|-------------|
| Business | 52% | 47% | 1% | 100% |
| Commuting | 57% | 43% | 0% | 100% |
| Leisure/Other | 39% | 50% | 12% | 100% |
| Total | 46% | 48% | 6% | 100% |

Source: National Travel Survey

- 3.2 Travel between the two regions is predominately for business and leisure purposes and there is relatively little commuting. Table 3.2 shows the distribution of the 17m trips per year between the two regions by purpose, for each of the three main modes, car, rail and coach. Car and rail travellers are about equally split between business and 'other' (non-commuting) purposes; although rail tends to carry a larger share of business journeys and car more 'other' trips. Coach travel is almost exclusively leisure.

TABLE 3.2 PURPOSE SHARES BY MODE BETWEEN WEST MIDLANDS & LONDON

| Purpose shares | Rail | Car | Coach | Total |
|----------------|-------------|-------------|-------------|-------------|
| Business | 49% | 42% | 9% | 43% |
| Commuting | 11% | 8% | 0% | 9% |
| Leisure/Other | 40% | 50% | 91% | 48% |
| Total | 100% | 100% | 100% | 100% |

Source: National Travel Survey

The Base Market –West Midlands to LHR

- 3.3 We have obtained survey data from the CAA on the mode used by Heathrow passengers when arriving to fly from Heathrow. Table 3.3 shows the break down by mode for all passengers and for passengers originating in the West Midlands region.

TABLE 3.3 SURFACE ACCESS MODE OF HEATHROW PASSENGERS BY ORIGIN (000S PER YEAR)

| Origin | | Private car | Hire Car | Taxi/Minicab | Bus/Coach | Tube | Rail | Total |
|---------------|-------|-------------|----------|--------------|-----------|-------|-------|---------------|
| All origins | Total | 15,202 | 1,100 | 12,156 | 5,807 | 4,036 | 5,930 | 44,231 |
| | %-age | 34.4% | 2.5% | 27.5% | 13.1% | 9.1% | 13.4% | 100.0% |
| West Midlands | Total | 379 | 8 | 513 | 156 | 13 | 19 | 1,087 |
| | %-age | 34.9% | 0.7% | 47.2% | 14.3% | 1.2% | 1.7% | 100.0% |

Source CAA Passenger Survey Report 2006

- 3.4 The table shows that the overall demand from the West Midlands to Heathrow represents over a million single-leg trips per annum. These figures represent the mode used for the last leg of journeys to Heathrow. This means that a proportion of the West Midlands journeys recorded as taxi/minicab is likely to include some made by rail as main mode, but taxi/minicab for the last leg – such as from Euston station or from a hotel near Heathrow to the airport. Nevertheless, this suggests there is a very significant untapped market for rail.

Travel Costs by Mode

- 3.5 Table 3.4 below shows the journey costs by car and existing rail services for a sample rail journey between Sandwell district in West Midlands and Southwark in London. The time element includes journey times as well as access, egress, waiting and transfer times. The fares/costs include fares for rail (based on current average yields) and vehicle operating costs, parking charges and London congestion charge for car. Generalised costs are calculated using standard DfT values of time by journey purpose.

TABLE 3.4 TIME AND COST FOR A JOURNEY FROM SANDWELL TO SOUTHWARK

| Sandwell to Southwark | Business | | Other | |
|-----------------------|----------|-------|-------|-------|
| | Rail | Car | Rail | Car |
| Time (minutes) | 222.6 | 224.8 | 215.2 | 197.8 |
| Fares/ Costs (£s) | 33.8 | 43.3 | 19.8 | 23.2 |
| GC (£s) | 182.3 | 193.1 | 39.8 | 41.5 |

- 3.6 We see that for all trips, rail and car are evenly matched in generalised cost terms with a slight advantage for existing rail. The broad equivalence of car versus rail generalised costs provides support for the mode shares observed and reported in Table 3.1

Analysis of Existing Commuting Market from WM to London

- 3.7 As a gauge of the potential for commuting from Birmingham to London with HS 2 Table 3.5 compares the proportion of workers living in Birmingham and Solihull districts that commute to London with the same proportion for workers in Coventry. The table also indicates journey times between the three districts and Euston with and without a HS 2, allowing for access time to the station.

TABLE 3.5 COMMUTING BY RAIL TO LONDON FROM BIRMINGHAM, SOLIHULL AND COVENTRY

| Rail commuting | Coventry | Birmingham | Solihull |
|---|----------|------------|----------|
| Journey time to Euston | 87 (86) | 120 (82) | 102 (77) |
| Total rail commuters originating in | 1538 | 9284 | 3256 |
| To London | 187 | 278 | 207 |
| Proportion to London | 12.2% | 3.0% | 6.4% |
| Share of commuters to London using rail | 36.6% | 15.7% | 41.1% |

Note: Figures show origins only, and therefore exclude, for example, people commuting to Birmingham.

Source: Census 2001

- 3.8 We see that from Coventry more than 12% of workers who commute by rail work in London, with a journey time to Euston of about 87 minutes. From Birmingham and Solihull the journey times are significantly higher and the proportion that commutes to London is much lower. Similarly, the last row shows the mode share of commuters working in London, which is more than twice as high from Coventry than from Birmingham.
- 3.9 With HS 2 to London, journey times from Birmingham and Solihull will be lower than the current times from Coventry and therefore fall within a practical commuting distance for many workers. There is therefore potential for rail commuting from Birmingham and Solihull to London to increase to between two and four times the current levels with HS 2.
- 3.10 This analysis is shown to indicate the potential for increased commuter demand. It does not feed directly into the demand or benefit forecasts as set out below.

High Speed 2 Service Proposition and Key Assumptions

MOIRA Forecasts

The Do Minimum

- 3.11 The HS 2 proposal has been modelled within MOIRA³, to generate demand and revenue forecasts, and to provide changes in transport generalised costs that are used to inform the estimation of both conventional and wider economic benefits.
- 3.12 We have used the MOIRA model as the basis of forecasting demand and revenue for HS 2, which is based on the 2006 demand and network. Demand growth is a key issue for the rail network in general, and capacity issues are a major issue for the West Coast Mainline. However, MOIRA is a modelling tool primarily used to assess the impact of service changes, and as such has only a 'base year' representation and does not have 'future year' models that would include forecast year demand matrices and future committed schemes and supply changes. We have therefore derived demand growth forecasts based on evidence from the WM RUS, the Rail White Paper, TEMPRO and the National Transport Model. Table 3.6 shows the assumed growth between 2006 and 2020 on the WM (London – Birmingham) corridor, on the rest of the rail network and for car and 'other' modes.

TABLE 3.6 DEMAND GROWTH ASSUMPTIONS

| | Source | Growth 2006 to 2020 |
|----------------------|---|---------------------|
| WCML corridor | WM RUS (3.9% pa to 2011, then 1.2% pa) | 35% |
| Rest of rail network | Rail White Paper (2.5% pa to 2014) and SDG (1.25% after 2014) | 31% |
| Car | NTM for Eddington (28% growth from 2003 to 2025) | 18% |
| Other modes | NTM for Eddington (22% growth from 2003 to 2025) | 14% |

- 3.13 The corridor growth factors were applied to demand between the West Midlands Region and London and the general factors to all other rail trips.
- 3.14 Other work has projected the potential for higher rail growth rates and so we have run a 'higher growth' scenario to understand the sensitivity of the results to this assumption. This employs a 74% growth on the route and 66% elsewhere, in line with Atkins' growth assumptions⁴ and those from the White paper in relation to long-distance rail travel.
- 3.15 In terms of the future year network, we have included a representation of the planned WCML service improvements (including service frequency improvements to/from Birmingham) that are currently planned to be implemented in 2009.

HS 2 Forecasting Assumptions

- 3.16 The assumed journey times and frequency of HS 2 services are presented in Table 3.7.

³ MOIRA is the rail industry's elasticity-based demand and revenue forecasting model, used to forecast the effect of service changes on overall demand and the split between specific routes and services.

⁴ Atkins Inter-Urban Rail Forecasts for the Eddington Transport Study and the DfT (2006).

TABLE 3.7 HS 2 – ASSUMED JOURNEY TIMES AND FREQUENCY

| | JT (mins) | Freq - per hour |
|--|-----------|-----------------|
| London – Birmingham CC – Direct | 45 | 3 |
| London – BIA – Direct | 45 | 3 |
| Birmingham CC – Paris/Brussels/Amsterdam - via Stratford | 180 | 1 |
| BIA – Paris/Brussels/Amsterdam - via Stratford | 180 | 1 |
| Heathrow – Birmingham CC | 40 | 2 |
| Heathrow – BIA | 40 | 2 |

3.17 The resulting demand forecasts are based on the MOIRA National model.

3.18 Other key forecasting assumptions for HS 2 are:

- Fares are assumed to be retained at their current level⁵; and
- The proportional increase in demand by OD pair from the MOIRA modelling year, 2006, is applied to 2020 demand.

3.19 To show the potential impact of HS 2 on the choice of mode for journeys between the West Midlands and London, we illustrate in Figure 3.1 the generalised cost of trips between the two HS 2 stations in West Midlands and London, respectively, for conventional rail, high speed rail and car.

FIGURE 3.1 JOURNEY COSTS BY RAIL AND CAR (£S 2016)

3.20 We see that conventional rail is slightly “cheaper” than car for journeys to and from Euston for business purposes, whilst HS 2 would mean a significant advantage for rail. For other purposes, existing rail is similar to car but HS 2 offers a small but distinct advantage at standard fare levels. For journeys to and from Heathrow rail is currently not an attractive option, whilst with HS 2 it becomes cheaper than car and coach for business travel and other purposes.

High Speed 2 Demand and Revenue Forecasts (2006)

3.21 The demand and revenue forecasts for a HS 2 service between Birmingham New Street and Birmingham International to London and to Heathrow in 2006, are presented in Table 3.8. These are only sub-markets of the total HS 2 potential demand.

⁵ In modelling terms this means that the average fare, for each journey by ticket type, within the MOIRA model is the same in both the base and Do Something scenarios. To match this assumption, no additional image, quality or reliability effect is built in to the forecasts.

TABLE 3.8 HS 2 DEMAND AND REVENUE FORECASTS, LONDON TO BIRMINGHAM FLOWS (2006)

| | Annual HS 2 Demand (m) | Annual HS 2 Revenue (£m) | Average Yield (£) |
|---------------------|---------------------------|-----------------------------|----------------------|
| Annual HS 2 Demand | 5.02 | 141 | 28 |
| <i>of which:</i> | | | |
| Bham BR – London BR | 3.89 | 101 | 26 |
| BIA – London BR | 0.84 | 34 | 40 |
| Bham BR / BIA – LHR | 0.29 | 6 | 21 |

- 3.22 The MOIRA forecasts suggest that the annual demand between London and Birmingham for HS 2 would be around 5 million trips, on the basis of 2006 demand levels. These forecasts therefore effectively exclude international demand to Paris and Brussels and significantly under-estimate demand to and from Heathrow.

Demand and Revenue - Abstraction and Generation

- 3.23 The majority of modelled HS 2 London – Birmingham demand (74% of the total demand and 80% of revenue) is accounted for by the key markets and movements identified below.

TABLE 3.9 HS 2 ABSTRACTION AND GENERATION (2006 '000S PA)

| Movement | Do Min | Do Something | | Uplift on existing | SHARE OF HS 2 |
|-----------------------------------|--------------|--------------|--------------|--------------------|---------------|
| | Total Market | HS 2 | Total Market | | |
| Birmingham BR to/from London BR | 1,441 | 2,457 | 2,458 | 71% | 52% |
| Wolverhampton - London | 242 | 146 | 338 | 40% | 3% |
| Birmingham Intl to/from London BR | 555 | 835 | 835 | 50% | 18% |
| Coventry to/from London BR | 580 | 39 | 617 | 6% | 1% |
| Other demand (see below) | | 1,247 | | | |
| Trips to LHR (see above) | | 290 | | | |
| Total | | 5,021 | | | |

- 3.24 The table above shows that HS 2 will generate 71% and 50% (either new journeys or abstracted from other modes) from Birmingham and Birmingham International, respectively.
- 3.25 On the basis of the figures above, the implied average load on the Birmingham – London service (the busiest service on the basis of these forecasts) would be in the region of 60% per train, assuming the service pattern set out in Table 3.1, and an average capacity per train of 766⁶.
- 3.26 For other movements, there are some abstractions from existing services and some generation, but these are relatively small.
- 3.27 The other flows that account for the remaining 26% of forecast HS 2 demand are:
- 227,000 trips per annum from a combination of Burton-on-Trent to/from London BR, Shrewsbury to/from London, Cheltenham Spa to/from London and Telford Central to/from London BR.
 - 1,020,000 trips per annum from ‘other flows’ (This includes lots of smaller flows between West Midlands to/from the rest of greater London and the south east).
- 3.28 In each case the demand above would be primarily from people using Birmingham of BIA as an alternative ‘gateway’ station, from where they travel to London, rather than using existing TOC services.

⁶ This is based on the capacity of HS1 services.

Limitations of MOIRA analysis

3.29 There are few specific limitations of MOIRA that affects our analysis

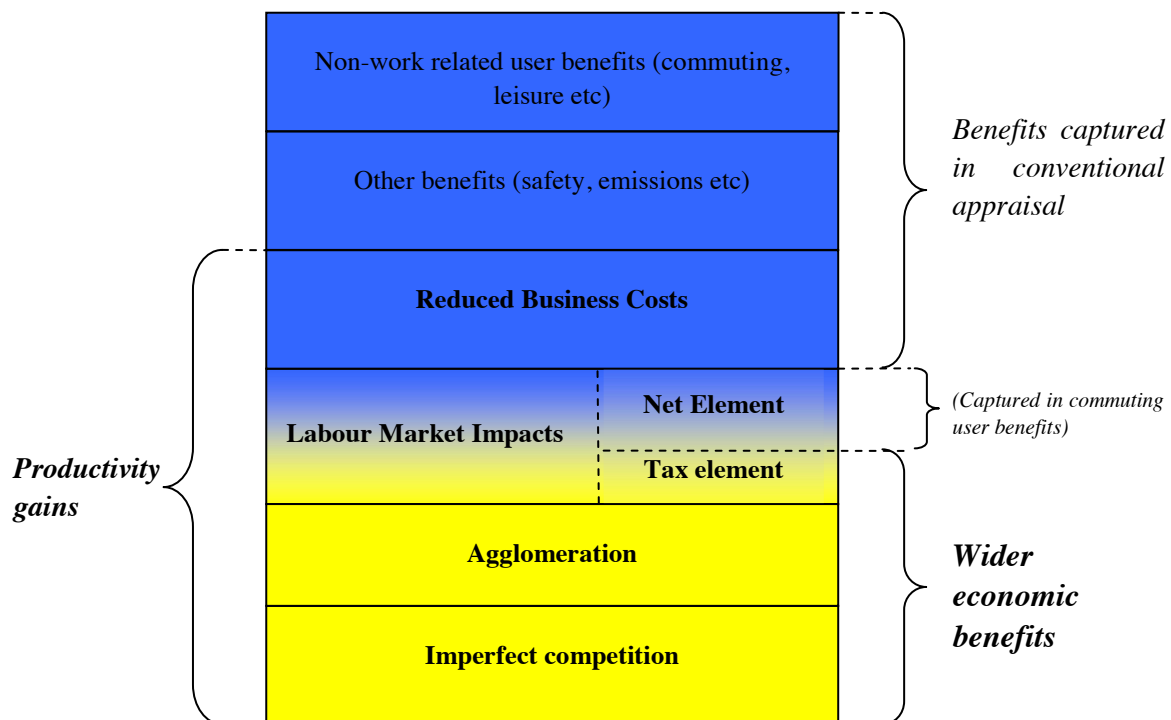
- MOIRA is an elasticity-based model, so can only generate changes in demand for movements where there is demand currently. This means that we have not been able to take account of demand generated from Birmingham to all destinations to the South and East of London and to the Continent. It also means that MOIRA is likely to underestimate the demand implications of large changes in journey times, particularly for movements where travellers are sensitive to the relative costs of travelling by rail versus other modes, as well for movements where demand is low to start off with.
- MOIRA does not represent travel by Heathrow Express, which, together with the limitation above, would mean that demand growth from the West Midlands to Heathrow airport is significantly underestimated. We have partially addressed this by supplementing the MOIRA demand matrices with our estimates of rail movements between the West Midlands and Heathrow (using numbers from table 3.3).
- MOIRA does not represent crowding, so our analysis will not reflect the benefits from increased capacity in the anticipated future crowded conditions on the WCML, nor that the reduction in crowding will have an impact on mode choice. Both of these limitations means our analysis underestimate the benefits of HS 2.

4. WIDER ECONOMIC BENEFITS ASSESSMENT

Policy Context

- 4.1 Transport appraisal is a relatively mature discipline. For about 40 years transport professionals have been using economic and modelling techniques to estimate the contribution of transport schemes to society.
- 4.2 The current appraisal framework is based on the Department for Transport's 'New Approach to Transport Appraisal', or NATA. This framework aims to capture the full set of benefits that society derives from a scheme under five objectives; the economy, environment, safety, interchange and accessibility.
- 4.3 Over recent years there has been a growing feeling that the current transport appraisal framework does not represent well the impacts schemes have on the wider economy. A significant amount of literature over the last years has addressed the potential for transport to deliver wider economic benefits - that is, benefits on the wider economy which the current approach to appraisal fails to capture. These additional benefits may arise where market failures cause the direct transport impacts to be magnified as they pass through the economy. New draft guidance from the UK Department for Transport (DfT) enables the quantification of wider economic benefits caused by agglomeration economies, imperfect competition and labour market inefficiencies. These have been found to typically add between 5% and 40% to the conventionally measured appraisal benefits.
- 4.4 Also, benefit-cost assessments often do not express benefits from transport improvements in terms that are relevant for many stakeholders. Travel time reductions and cost savings are all very well, but scheme promoters invariably have other objectives – for instance in terms of accessibility, jobs, employment and productivity.
- 4.5 To understand the full set of economic impacts of transport schemes, additional analyses beyond the conventional BCA is therefore needed. Figure 3 below seeks to help illustrate the sources of and relationship between conventional appraisal benefits, wider appraisal benefits and productivity impacts. Then each of the wider economic benefits identified by the DfT's guidance are explained briefly, in turn.

FIGURE 4.1 RELATIONSHIP BETWEEN CONVENTIONALLY MEASURED BENEFITS, WIDER ECONOMIC BENEFITS AND PRODUCTIVITY GAINS



Overview of WEBs

Agglomeration economies

- 4.6 Agglomeration simply means the geographic clustering of firms and workers. Cities are one type of agglomeration. In cities we often find that wages, rents, transport costs and other prices are higher than elsewhere. The explanation for the desire to locate in cities despite the additional costs must be that firms in a wide range of economic sectors are more productive when they are clustered.
- 4.7 Typically, firms are more productive when near other firms because they have access a large variety of inputs to their activities. It is also often argued that proximity to other similar firms increases the chance of acquiring new knowledge and of building connections and networks which support or increase productivity. Many firms are also more productive when they have access to a large labour market since this makes recruitment quicker and it is easier to find workers with the exact skills match that they are after.
- 4.8 When we talk about density of a city, we really mean the number of firms or workers that are accessible. Rather than number of jobs or worker per square km, it is more natural to consider the number of jobs or workers located within X generalised minutes. In other words, the role of transport in supporting accessibility, and therefore agglomeration, is important. If transport is made cheaper or quicker, more firms and workers will be located within reach and, according to the literature on agglomeration, productivity will increase. Importantly, these agglomeration benefits are additional to those already captured in appraisal.

Time and cost savings to travel in the course of work

- 4.9 This element of appraisal focuses on the assumption that travel in the course of work is usually not productive in itself and reducing the time taken in transit frees up time for additional productive activity. When an individual saves one hour travelling whilst in work, appraisal values this time at the gross cost to the firm of the worker's time (i.e. hourly wages plus national insurance contributions and other labour related costs). Identifying the productivity gains from business cost savings is therefore simple – they are identical to the business impacts as identified in the conventional transport appraisal.

Imperfect Competition

- 4.10 Despite the above, what we really seek to measure by time savings in the course of work is the additional value to society of the activity the worker now can undertake instead of travelling. By valuing workers' saved time at the level of costs to the firm rather than the value to society, current transport appraisal underestimates the benefits of in-work travel time savings. It can be shown that these 'missing' benefits equals about 10% of conventionally measured user benefits to freight and business travel.

Labour market impacts***Productivity gains of commuting cost reductions***

- 4.11 When individuals make decisions about labour supply, e.g. whether to work, how much to work and where to work, they take many factors into account. Importantly they balance the financial gains against what we may call personal costs (e.g. giving up spare time). If the financial returns to work increase or the personal costs decrease, more individuals are likely to choose to work, whilst some of those who already do will decide to work more or in more productive (and more demanding) jobs. The result is increased productivity.

Wider welfare gains of commuting cost reductions

- 4.12 As DfT's guidance on wider economic benefits argues, where individuals change labour market decisions because of a transport scheme, the consequent tax changes are additional to the benefits currently captured in appraisal. These additional benefits amount to about 30% to 40% of the labour market productivity gains.

Overview of Approach for this Study

- 4.13 The assessment of wider economic benefits of HS 2 requires a detailed understanding of the future transport demand and costs of movements. We have gathered the required data from a number of sources, including MOIRA, National Travel Survey and Census Travel to Work. The following sets out the main elements of our approach.

4.14 We have undertaken the assessment for one future year, 2020, and extrapolate the benefits over 60 years. In line with assumptions set out above, the work represents a partial quantified analysis of total benefits, concentrating on the core market between London and Birmingham. The following benefits are currently excluded from the fully quantified analysis:

- Improved links north to Manchester and beyond (although we do provide an outline estimate of benefits from Manchester);
- Direct connections to Paris and Brussels;
- Direct links to Heathrow;
- Additional rail capacity on the existing network; and
- Second order benefits of reduced crowding, including the improved ability to work on the train.

Rail

4.15 Rail costs and demands are based on the approach set out in Chapter 3. The Do Minimum scenario, i.e. without HS 2, includes the impacts of the upgraded West Coast Mainline. The Do Something scenario represents the HS 2 services on top of this.

Highway

4.16 Demand by car for short distance trips is derived from Census Travel To Work data, using NTS data on purpose split for car to estimate non-commuting demand. For longer distance trips NTS mode share data are used to derive car demand for each purpose based on the MOIRA demand data.

4.17 Journey costs by car have been estimated by extracting journey times and distances from journey planner software (DriveTime and Transport Direct) and using WebTAG guidance to calculate time and vehicle operating costs.

4.18 For Do Something, we have assumed that half the generated rail trips have been abstracted from car. This is in line with convention when forecasting additional rail usage using elasticity based models such as MOIRA. We estimate the reduction in congestion on the road network from the reduction in car km using evidence of congestion cost per km from the National Transport Model.

Other mode cost

4.19 Demand using coach and other public transport has also been estimated using the same procedures as for car. Journey costs by coach for the Birmingham to London corridor are based on actual coach travel times and fares, whilst for the rest of the model coach costs have been estimated based on car travel times and average per km coach fares.

Economic data

4.20 Economic data, including employment, productivity and agglomeration evidence have been sourced from the Department for Transport and from ONS.

Results and Interpretation

- 4.21 Table 4.1 presents the results of our analysis at a national level. All figures presented are in 2006 values and prices. The scheme delivers £3.9bn time and cost savings, the majority to business travellers. In addition, we have estimated accident saving benefits of £72m NPV as passengers switch from road to rail: this is equivalent to saving about 50 injury accidents per year. Carbon benefits accrue as HS rail is more efficient than car travel and this is shown as climate change benefits. Air pollution and noise benefits have also been derived from the standard WebTAG approach.
- 4.22 About 25% of transport benefits accrue as highway decongestion benefits. On top of this, there are agglomeration gains of about £1.7bn and other wider economic benefits of £0.3bn. In total, the wider economic impacts add 52% to the conventionally measured benefits.

TABLE 4.1 CONVENTIONAL AND WIDER ECONOMIC IMPACTS (£M, PV, 2006 VALUES AND PRICES)

| 2006 NPV | Welfare | GDP |
|-----------------------------------|--------------|--------------|
| Conventional User Benefits | | |
| Business User Benefits | 3,144 | 3,144 |
| Commuting User Benefits | 34 | |
| Other User Benefits | 682 | |
| Accident cost savings | 72 | |
| Air pollution | 22 | |
| Noise | 6 | |
| Climate Change | 67 | |
| Total Conventional | 4,004 | |
| Wider Benefits | | |
| Agglomeration | 1,712 | 1,712 |
| Imperfect Competition | 314 | 314 |
| Labour Supply | 6 | 14 |
| Total Wider | 2,032 | |
| Sum Total | 6,035 | 5,184 |

- 4.23 The rightmost column presents the scheme's impact on productivity and GDP. The cost savings to business users and agglomeration together lead to an increase in output of more than £5.2bn. In undiscounted terms, the GDP benefit to the economy would

⁷ To be confirmed: only reflects mode split from car to HS 2 not the relative carbon efficiency of HS and standard rail.

be £23bn, over the 60-year appraisal period.

Spatial and Sectoral Distribution of Benefits

- 4.24 We explore further the spatial distribution of benefits in Table 4.2, which shows impacts on London and West Midlands Regions, as well as for the West Midlands Metropolitan County (WMMC) and for the City of Birmingham.

TABLE 4.2 PRODUCTIVITY IMPACTS BY AREA (£M NPV, 2006 VALUES AND PRICES)

| Area | Agglomeration | Total Productivity gains |
|----------------------|---------------|--------------------------|
| London | 494 | 2,165 |
| West Midlands | 543 | 2,242 |
| - WMMC | 319 | 1,775 |
| - Birmingham City | 169 | 1,236 |
| Rest of UK | 674 | 778 |
| Total | 1,712 | 5,184 |

- 4.25 Taking the agglomeration benefits first, the benefits distribute in three roughly equal parts between the West Midlands, London and elsewhere. The impact on the overall accessibility for London is less, but the volume and value of economic activity weights the benefits more highly. Within the West Midlands, agglomeration benefits to the City of Birmingham amount to £169m PV. This represents 31% of the region's agglomeration benefit, whereas Birmingham's share of the region's employment is 20%. The agglomeration gains represent £13 per worker in Birmingham but only £7.70 per worker for the rest of West Midlands, confirming the greater concentration of benefit.
- 4.26 We are aware that the Department is aiming to derive new evidence on the parameter values determining the spatial scope of agglomeration benefits within the WEBs guidance. To check whether this would be likely to affect the distribution of agglomeration impacts within West Midlands Region we ran several sensitivity tests, changing parameter values. Our finding is that the local and regional distributions of agglomeration benefits are relatively insensitive to these parameter values.
- 4.27 The impacts of HS 2 as modelled are clearly concentrated on London on one hand and the West Midlands and Birmingham on the other. This is accentuated by the simplification that rail user benefits accrue at the high speed rail stations, due to limitations which MOIRA imposes. These productivity gains represent £94 per worker per year in Birmingham, £36 per worker in West Midlands region and £21 per worker in London.
- 4.28 Figure 4.2 shows the spatial distribution of total productivity gains whilst Figure 4.3 illustrates the distribution of agglomeration benefits alone.

FIGURE 4.2 **DISTRIBUTION OF TOTAL PRODUCTIVITY GAINS (£S PER SQKM)**

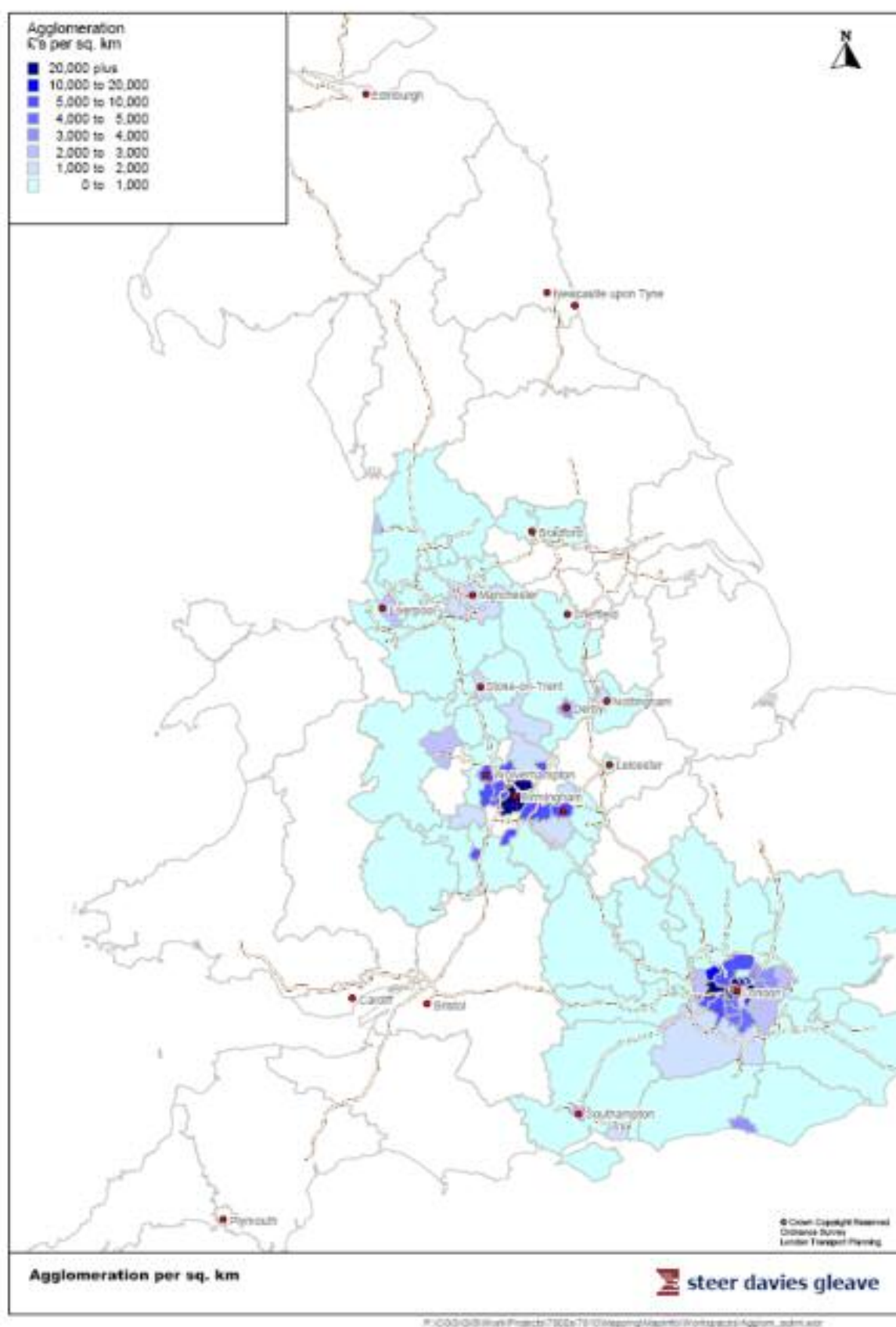
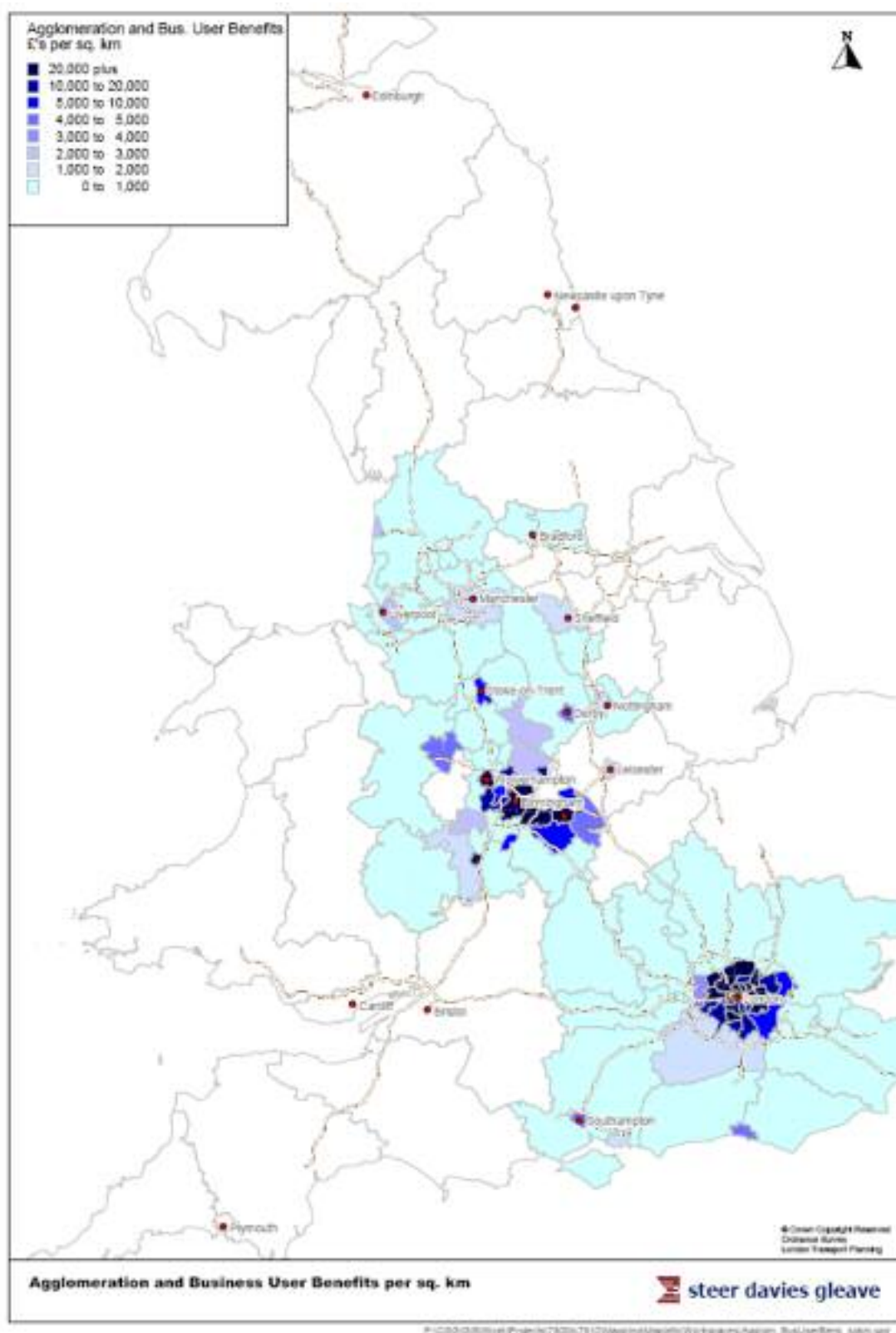


FIGURE 4.3 AGGLOMERATION BENEFITS



- 4.29 The majority of productivity gains are concentrated within London and the West Midlands Metropolitan County, with smaller impacts surrounding both urban areas. Most of the benefits outside London and the West Midlands region are from road decongestion.
- 4.30 Finally we illustrate the likely sectoral composition of the agglomeration benefits. The sectors that benefit the most from the £169m of agglomeration benefits to Birmingham are shown in Table 4.3.

TABLE 4.3 SECTORAL DISTRIBUTION OF AGGLOMERATION IMPACTS TO BIRMINGHAM

| | GDP NPV (£m) | Per worker per year (£s) |
|--|--------------|--------------------------|
| Financial and business services | 63 | 106 |
| Construction | 31 | 71 |
| Hotels and restaurants | 31 | 58 |
| Real estate, renting and business activities | 19 | 42 |
| Other sectors | 26 | - |
| Total | 169 | |

- 4.31 Unsurprisingly, financial and business services is the sector that benefits the most, both in absolute terms and in productivity per worker. This reflects both the sector's strong tendency to benefit from agglomeration and the significant presence of the sector in Birmingham.

Higher Growth Sensitivity

- 4.32 As highlighted in Chapter 3, we have considered a higher growth scenario with the following results:

TABLE 4.4 CONVENTIONAL AND WIDER ECONOMIC IMPACTS (£M)

| 2006 NPV | Welfare | GDP |
|-----------------------------------|--------------|--------------|
| Conventional User Benefits | | |
| Business User Benefits | 3,434 | 3,434 |
| Commuting User Benefits | 37 | |
| Other User Benefits | 746 | |
| Accident cost savings | 79 | |
| Air pollution | 24 | |
| Noise | 7 | |
| Climate Change | 78 | |
| Total Conventional | 4,334 | |
| Wider Benefits | | |
| Agglomeration | 1,776 | 1,776 |
| Imperfect Competition | 343 | 343 |
| Labour Supply | 6 | 14 |
| Total Wider | 2,125 | |
| Sum Total | 6,459 | 5,567 |

- 4.33 The higher growth scenario increases wider benefits by about 5% and conventional benefits by about 9%. The results are therefore relatively robust to growth forecast assumptions.

TABLE 4.5 PRODUCTIVITY IMPACTS BY AREA (£M NPV)

| Area | Agglomeration | Total Productivity gains |
|----------------------|---------------|--------------------------|
| London | 509 | 2,333 |
| West Midlands | 571 | 2,427 |
| - WMMC | 335 | 1,925 |
| - Birmingham City | 177 | 1,342 |
| Rest of UK | 695 | 807 |
| Total | 1,776 | 5,567 |

- 4.34 Agglomeration benefits to Birmingham City rise to £177m PV, about 5% higher, with higher rail growth.

- 4.35 The impact of the high growth scenario is comparatively modest as modelled, as the

⁸ To be confirmed: only reflects mode split from car to HS 2 not the relative carbon efficiency of HS and standard rail.

transport composite cost that underpins the WEBs benefits is a function of both the share of demand for rail and the change in cost. The higher growth scenario allows for the increased demand for rail over time, but rail costs are constant.

- 4.36 The analysis does not take account of the impact of crowding. In a higher growth scenario the level of crowding in the Do Minimum would be worse, and hence the benefits of HS 2 in reducing generalised transport costs would be greater. The high growth scenario presented is therefore likely to understate the additional benefits.

West Midlands – Manchester benefits – initial quantification

- 4.37 The service patterns specified in the above analysis have only considered time savings for high speed services running from Birmingham New Street/ Birmingham International to Euston and Heathrow. High-speed rail services from Birmingham to Manchester would naturally bring significant additional benefits. In order to gauge the potential for additional productivity gains from an extension of the HS 2 service between Birmingham International to Manchester Piccadilly with an assumed journey time of 45 minutes, we have assessed the impacts on three flows:

- Manchester to Birmingham (reduction in journey times from 95 to 75 minutes);
- Manchester to Solihull (from 135 to 90 minutes); and
- Manchester to Coventry (from 120 to 75 minutes).

- 4.38 The resulting productivity gains to the West Midlands region are £185m PV of which £106m fall to Birmingham and the rest split equally between Solihull and Coventry (we have assumed no benefit elsewhere in the West Midlands as existing rail would be broadly comparable). This represents a 10% increase in productivity gains to the West Midlands and to Birmingham compared to the main option. In addition there would be other movements from and to Birmingham that would benefit from the reduction in journey times from the HS 2 proposition (e.g. Liverpool, Glasgow), which would bring further benefits. And we have not attempted to assess the gains for other movements, such as between Manchester and London/ South East.

5. POTENTIAL REGENERATION IMPACTS

Introduction

- 5.1 Birmingham is currently engaged in the process of renewing much of the city centre infrastructure, transport, offices and retail. The development of a High Speed Rail station could contribute to this development and could have a significant impact in placing Birmingham at the centre of a transport hierarchy within the West Midlands.
- 5.2 This work is currently limited to a review of existing research and an attempt to extrapolate the findings to Birmingham.
- 5.3 Recent research into the impact of rail transport infrastructure in the UK include studies of the Jubilee Line extension to the London Underground, the proposed Crossrail underground link across London and, the sole High Speed Rail example, the CTRL to Ashford in Kent, the first town in the UK to be connected to a high speed rail network. The latter has been examined “The Impact of High Speed Trains on Socio-Economic Activity: The Case of Ashford (Kent)”, Preston, Larbie and Wall, 2006, and in “Local and regional implications of trans-European transport networks: the Channel Tunnel Rail Link”, Vickerman, 1999.
- 5.4 The study by Preston, Larbie and Wall found that the advent of a High Speed Connection tends to reinforce existing economic trends and connections. Although the opening of the International station led to large increases in the accessibility of Paris, Lille and Brussels, these were not centres that Ashford traditionally interacted with. Ashford has increasingly looked towards London for economic connections, a trend which is likely to be strengthened by the introduction of high speed domestic services in 2009. The opening of Ashford International station has coincided with an 11% increase in population, a 6% increase in employment and a 3% increase in house prices over that of the South East as a whole. However identifying the contribution of the HSR link to this growth is difficult, particularly given the designation of Ashford as a Growth Area for the South East. Similar conclusions about the effects of the CTRL for Ashford were found by Vickerman et al “Accessibility and regional development in Europe,” (1999.)
- 5.5 Other studies have considered the impact of High Speed Rail links in France and the Netherlands. The latter may be of more direct relevance to the UK as the spatial densities and transport networks may be more similar. In “High-Speed Rail’s Impact on the Location of Office Employment within the Dutch Randstad Area”, Willigers et al., 2005 considered the impacts on office location within regions. The increased accessibility of railway station areas – especially the high-speed railway stations due to the connectivity effect – leads to a higher attractiveness of railway station locations and therefore to a higher concentration of offices around stations.
- 5.6 Experiences with high-speed rail in France shows that for many cases urban and intra-regional effects are more important than the inter-regional effects. The effects at a local or intraregional level can be important, due to relocation of employment within regions and cities. In the “The Economic Impact of the High-Speed Train on Urban Regions,” P.M.J. Pol studied the case of Lille, an example of a city in transition from

an industrial to a modern knowledge-intensive, service economy which became linked to Paris via High Speed Rail. He found that the HST-connection can have a catalytic effect on the regional economy, drawing new activities and causing the regional economy to grow.

- 5.7 Pol concluded that new rail infrastructure will also help economic growth already underway in an urban region. Thus the advent of the HST can benefit cities that already have a strong competitive position. They normally already have a relatively high economic potential and attractive location factors for new service companies and well-educated residents. Both these advantages will be further enhanced by the improving external accessibility. In weaker urban regions, the advent of the HST can help improve their competitive position and to obtain a higher position in the European urban hierarchy. The improving external accessibility may help to enhance their economic potential and location factors. However, a precondition for economic growth and renewal for these cities will be that this economic potential exceeds a certain critical level. When it does not, the improved external accessibility may have negative effects (for instance, companies moving out of the urban region concerned, once local markets will no longer be protected by transport barriers).

Inter Regional Effects

- 5.8 There is relatively little research devoted to measuring the economic regeneration of High Speed Rail links. The existing research is mostly derived from European and Japanese experience. The studies of the UK relate to the impact of the CTRL station at Ashford in Kent. However it is difficult to interpret this evidence as there were many other influences affecting economic activity in the region at the time and these tended to outweigh High Speed Rail effects.
- 5.9 Much of the European research suggests that High Speed Rail links tend to reinforce existing patterns of economic activity between regions and within regions. Thus between the connected regions, the faster growing continue to grow faster. Thus the HS 2 connection is likely to reinforce the growth of the South East but it will also support the continuing growth in Birmingham.
- 5.10 Within a region with HSR connections, the larger economic concentration in the region again tends to grow faster than the smaller ones. Thus within a region newly connected to a high speed link, employment tends to move from the periphery to the centre with the high speed connection. Thus Birmingham is likely to experience faster growth than the rest of the West Midlands. This may result in the potential agglomeration and productivity benefits for businesses located in Birmingham.
- 5.11 However researchers in the UK have suggested the economic impacts of a north-south high speed line may be limited because UK economic centres are relatively well connected north-south.

Impacts on rail network

- 5.12 One of the main benefits of the HS 2 is likely to be reduced congestion on the existing rail network. Reduced congestion and improved accessibility within the region will be necessary to realise the potential agglomeration and productivity benefits. Improved

accessibility within the region will also have an effect on the general productivity of business within the region, by reducing business costs and improving access to the labour market by reducing congestion on local rail networks so that people are encouraged to come into the city to work.

Relocation Effects

London to Birmingham

- 5.13 Birmingham does have a significant and growing financial and business services sector which (with 37% of total regional employees in financial services and 24% in Professional services in 2003) is dominant in the West Midlands. This is essentially complementary to the services offered by the London financial services sector and may benefit from improved links to London.
- 5.14 Improved connectivity with London may support increased outsourcing of elements of this sector (such as back-office) functions from London to Birmingham relieving some stress on the London labour market and allowing Birmingham to share in the growth of the London financial services sector.
- 5.15 Birmingham can offer a cost structure which is lower than that of Central London and which may also assist such growth. For example average weekly earnings in Birmingham (workplace based) in 2006 were £511 compared with a figure of £714 for Greater London. (WMRO.)
- 5.16 Birmingham also enjoys an advantage in the cost of office accommodation. Office rents in Birmingham in 2007 were low compared with those in the City of London.

TABLE 5.1 OFFICE RENTS IN BIRMINGHAM CBD AND CITY OF LONDON

| Rents per annum | per M2 | per | Office Type | | |
|-----------------|--------|-----|-------------|--------|--------|
| | | | Type 1 | Type 2 | Type 3 |
| Birmingham CBD | | | £290 | £290 | £145 |
| City of London | | | £640 | £640 | £375 |

Source: Valuation Office Agency

- 5.17 However, as a location for the outsourcing of functions from the City of London, Birmingham would be in competition with towns and cities on the periphery of Greater London. There has been a recent sharp increase in outward commuting flows to the Outer Metropolitan Area to towns such as Uxbridge and Brentford.
- 5.18 Such locations may not have a labour cost advantage over cities such as Birmingham but they do offer rents that are lower than those in central London and lower than some of those in central Birmingham.
- 5.19 Journey times from such locations to the City of London are approximately an hour to an hour and a half by Underground. A HS 2 link from Birmingham to Central London that offers a 45 minute journey time may allow Birmingham to compete with such locations for employment overspill from Central London. However Birmingham may

need to improve its competitive edge in the provision of office accommodation.

Birmingham to London

Office relocation

- 5.20 There is unlikely to be much relocation of offices and staff from Birmingham to London as a result of HS 2 for the following reasons:
- Many of the manufacturing companies in the West Midlands have long association with the region;
 - Much of the west Midlands economy is manufacturing which is less likely to relocate because of the need to maintain links to suppliers; and
 - Many of the financial service firms in the region already have their head offices in London.
- 5.21 It may be noted that a survey of the financial, legal and business services sectors in the North suggested that head office relocation was mostly associated with mergers and take-overs.

Commuting

- 5.22 The HS 2 could provide a journey time of 45 minutes from central Birmingham to St Pancras Station in central London. This suggests that the provision of the HS 2 may make commuting to London from Birmingham possible thus both widening the London labour market and providing productivity gains by moving labour to markets of higher productivity. This is well within the journey times experienced by many London commuters. London commuters make longer journeys; 15% of London commuters make journeys of over 1 hour. City workers (those in the financial services sectors) travelled the furthest, on average (25km) where one in five of these workers travelled over 40km.
- 5.23 A recent study by Cambridge Econometrics found that commuter flows are strongly linked to shortages of resident labour in the different South East regional jobs markets. It suggested that growth in demand for inward commuting to 2016 would be confined to Inner London and that longer commuting journeys would be particularly associated with the London financial services sector. This suggests that the potential commuters are likely to be limited to higher income financial services professionals.
- 5.24 In 2003 there were a total of 100,202 employees in the financial and professional services sector in Birmingham. Of these approximately one third were likely to be employed in managerial and professional capacities. This might indicate the maximum scope of the potential market for HS 2 commuting. Chapter 3 gives more information on changes to the commuter travel market.

Regeneration

Relocation within the West Midlands

- 5.25 European evidence suggests that within the regions that it serves, HSR benefits the cities where the HSR stations are located by improving accessibility to other regional cities, particularly capital cities. This perceived advantage encourages firms within the region to relocate to the city with the HSR hub. The availability of high-speed train services can raise the image or status of a location, which is an extra factor attracting activities.
- 5.26 Thus the hub city in a region is likely to attract employment from the surrounding region. Thus Lille benefited from the connection to Paris at the expense of more remote areas in the same region resulting in accelerated integration of regional economy. Similarly in Grenoble the revitalized station area did attract several firms and institutions from other places within the city but not from outside the region. Similar effects were observed in the Netherlands.
- 5.27 Attempts to measure similar impacts at Ashford in Kent were unable to separate effects attributable to the CTRL from those attributable to other large development measures.
- 5.28 However a further particular attraction that might draw West Midlands firms to relocate to Birmingham could be the proposed HS 2 direct connections to Heathrow. The advantage of such access has been observed in towns in the Outer Metropolitan Area to the west of London, in Berkshire which have experienced rapid local growth in employment. This has resulted in a cluster of journeys to workplaces close to the M25 ring, many connected to Heathrow (“Commuter flows in the Wider South-East 2006/2016”)
- 5.29 It is likely therefore that the presence of an HS 2 link in Birmingham will attract employment and economic activity from elsewhere in the region. In addition there will be agglomeration effects in Birmingham. Such relocations by employers are likely to result in increased commuting within the region which will place demands on the transport networks.
- 5.30 While French regional experience with high speed trains may not translate directly to the West Midlands the overall conclusion of the literature, including the studies of CTRL at Ashford is that HS connections reinforce existing growth trends within and between regions. The picture is more complicated in the West Midlands because there are significant economic centres besides Birmingham such as Coventry and Solihull. While these are smaller than Birmingham they have higher per capita GVA and, as we noted, this may attract employment from within the West Midlands including Birmingham.
- 5.31 The determinants of office location are the subject of a study of the Jubilee line extension (Machin and Gibbons) and a study of businesses in Amsterdam and Rotterdam (Willigers et al.) The latter concluded that potential high speed accessibility is an important factor in determining office locations particularly where international business travel is important and that most relocation occurs within the metropolitan area.

- 5.32 HS 2 will allow Birmingham to compete particularly with towns in the Outer Metropolitan Area of the wider South East which have experienced an increase in employment from the centre. Birmingham may have advantages over some areas in accessibility and labour costs but currently (VOA 2007) office rents in the central business district were not always competitive.
- 5.33 Relocations may have impacts on regional productivity and offer agglomeration benefits. Thus if employment moves to areas of higher productivity regional productivity may increase. However it may not always be the case that productivity increases with the move. Figures for GVA per capita (all sectors) at the NUTS3 level show Solihull and Coventry with a higher per capita GVA than Birmingham. Thus some patterns of redistribution of employment may reduce actually productivity.
- 5.34 The movement of some sectors of employment to the HSR cities is likely to actually benefit the other regional cities and towns within the West Midlands. This can occur because:
- Overall regional income may increase; and
 - Residents' income in the other regional cities and towns may increase as a result of commuting to higher paid employment in Birmingham. For example many towns in the South-East rely on commuting to London to provide high value employment and a significant portion of residents' income. This is associated with a restructuring of local regional economic structures with more retail service, tourism and hospitality employment.

Investment

Property Impacts

- 5.35 There have been some ex-post evaluation studies which show increases in commercial activity and hence land values around some (but not all) high speed rail stations in Europe. However these effects may reflect displacement of activity from elsewhere and should not be interpreted as being indicative of net growth.
- 5.36 The size of the price effects is dependent on the scale of the increase in transport accessibility. Studies of the Jubilee line Extension (Banister 2007) showed that an estimated total property value increase around Southwark and Canary Wharf Stations of over £2.1 billion is solely attributable to the impact of the JLE. However neither location previously had underground rail access. Where access was already good less price effect was found.
- 5.37 A study by Vickerman and others in 2004 examined the impact of the CTRL on Kent. The study used regression analysis to suggest that since 1996 domestic property prices in Ashford have received an increase over and above the time trend of 26.5%. However, properties in the South East as a whole have received a stimulus of 23.2%. This suggests an additional (statistically significant) increase in Ashford of around 2.7%. For commercial properties the main effect is a drop in vacancy rates in Ashford (from 13% in 1998/9 and 8% in 2004/5). By contrast, vacancy rates elsewhere have increased from 7% to 9%.

- 5.38 One additional possible property price effect might result from improved journey times on the existing network. If the HS 2 improved congestion on the existing network and journey times reduced there may be price benefits for properties already connected to the existing network.
- 5.39 A study for DfT of the impact of new rail access on house prices suggests that improved access to transport modes, reduced commuting time and increased transport options will result in an increase in house prices. In “Rail Access and House Prices: an Evaluation of the Wider Benefits of Transport Improvements, 2003” Gibbons and Machin estimated that reducing the distance to the Tube station by 1km results in an increase of around 2% of property prices in their London sample in 2001. This represents the capitalised savings of journey time savings for commuters. In the case of locations around an HS 2 station in Birmingham, premium prices might be realised for residential properties close to the station as result of the increased labour market options made available to those who could commute to London to work.

Inward Investment

- 5.40 Foreign Direct Investment has had a significant effect in the West Midlands over the last 15 years resulting in the creation of approximately 14,000 jobs in Birmingham alone. Over the same period inward investment has safe-guarded a further 22,000 jobs in the city. A further 20,569 jobs were created and 55,420 safeguarded in Coventry Solihull and the Black Country as a result of foreign direct investment.
- 5.41 Factors which are reported as attracting foreign investment include:
- Labour flexibility;
 - Labour skills;
 - R&D capability;
 - Good transport links especially to Heathrow; and
 - Proximity to London’s specialised financial and business services to facilitate investment.
- 5.42 The latter two factors are important elements where an HS 2 is likely to increase the relative attractiveness of Birmingham as a destination for foreign investment.
- 5.43 The recent report by ECOTEC “Developing a Strategic Framework for Investment: The Economic Impact and Potential of the M42 Corridor in Solihull,” considers the incidence of these factors in the West Midlands. It points to the strong research and knowledge capability based in the triangle of Coventry, Solihull and Birmingham, and the concentration of advanced business services and the strong specialisation in advanced manufacturing sectors and medical and pharmaceutical industries. The region has a flexible labour force and in parts of the region, Coventry and Solihull in particular, labour force skill levels (Level 3+) are equal to or above the average in England (West Midlands Regional Observatory).
- 5.44 The combination of labour skills and flexibility helped the West Midlands attract a total of 361 foreign direct investment (FDI) projects between 2002 and 2006. Other factors essential to attracting FDI include good transport connections and commercial infrastructure such as office space etc. In this context high speed access to London’s

international financial expertise and a direct connection to Heathrow would assist the region to be at the forefront in attracting such investment.

Employment

- 5.45 The HS 2 link is likely to attract office developments to the area around the station. This in turn will attract retail and other businesses to the area, resulting in a concentration of employment. Much of this economic activity is likely to be displaced from other locations but it is likely to result in increases in property prices. The link may also result in shifts of employment with increased commuting of professional staff to London and the possible relocation of employment from the Outer London Metropolitan Area to Birmingham.

Conclusions

- 5.46 The high speed rail line linking Birmingham and London is likely to promote the growth of Birmingham as the major centre within the West Midlands. The line is likely to have a major impact in relieving future congestion and crowding on the existing rail network to the South East and within the West Midlands
- 5.47 A high speed direct link to Heathrow is likely to have a significant impact in attracting development and investment to Birmingham, particularly through providing excellent transport links to Heathrow and improved connectivity with to London's specialised financial and business services to facilitate investment, both of which a key factors influencing inward investment identified by the ECOTEC M42 study.
- 5.48 A high speed link between Birmingham and London could bring Birmingham within commuting distance of London. However this is unlikely to result in large daily commuter flows as demand is likely to be confined to those with specialised skills working principally in the financial and business services sectors in London.
- 5.49 The high speed link station is likely to attract office development to the station area resulting in an increase in employment some of which will be displaced from elsewhere.
- 5.50 The high speed link is likely to produce a small increase in property prices where it results in a significant increase in accessibility. It is likely to have a larger impact on commercial vacancy rates.

6. WIDER NETWORK OPPORTUNITIES

Wider Network Opportunities: the scope for re-utilising released capacity

- 6.1 Creation of HS 2 would trigger the need for a major review of the timetabled services on the routes that it parallels. There are two routes that would be particularly affected:
- The West Coast main line; and
 - The Chiltern line.
- 6.2 The second of these would experience a set of changes that would bring substantial benefits to existing rail services in the M40 corridor. Services over the Lapworth – Dorridge – Solihull – Tyseley – Moor Street corridor need not change at all as a result of HS 2. However, the business case for expanding cross-Birmingham services via the Snow Hill – Moor Street line would be significantly uplifted. Earlier schemes such as the use of the Benson Road chord to provide a western corridor destination to make best use of a service frequency uplift might be worth progressing.
- 6.3 The main area of attention, however, insofar as Birmingham would be affected would be:
- the West Coast Main Line; and
 - the Coventry corridor in particular.
- 6.4 With a frequent high quality Birmingham – central London link over HS 2, there would be minimal demand for a direct Birmingham – Euston service. Certainly it could not compete on speed, reliability, quality or frequency. That is not to say that a ‘classic’ route rail service between Birmingham and London is unlikely to remain: it is. Over both the ex-LM and ex-GW routes, there would remain at least an operational logic to a retained London service, but its focus would be on serving intermediate destinations and the available frequency may well be reduced. Thus what is expected to be provided under the London Midland and Chiltern franchises over the next 10 or so years might well continue, but the existing West Coast Trains service would be radically restructured. Instead of three trains/hour (which in future might conceivably be increased to four/hour), there would be a case to retain the hourly through Wolverhampton – Euston service only (and this might be extended back to start in Shropshire). It would serve Milton Keynes and Watford Junction too.
- 6.5 There will be a transformation of the occupation of the fast lines between Rugby and Euston, with a need only for services from places beyond the electrified network to remain. Currently, this would mean an hourly North Wales/Chester service and the hourly Wolverhampton train. This means that the train service to/from the key growth areas of Milton Keynes/South Midlands could be radically improved. Currently it is not possible to stop peak period Birmingham trains at Milton Keynes for instance: in future it will be. Longer distance commuting services into Birmingham as well as London will therefore be much improved.
- 6.6 Coventry would be provided with a HS 2 service with the new high-speed infrastructure accessed at Banbury; this creates a fast Coventry/Leamington/Banbury – London service. This service could be extended back to Wolverhampton, or Walsall.

- 6.7 It would also be possible to route one of the existing Cross Country trains onto the high-speed line, joining in the south near Aynho and bypassing Birmingham to rejoin the WCML in the Trent Valley to reach Manchester. This would bring very substantial journey times savings.
- 6.8 This means that two (and possibly three) trains an hour could be removed from the Coventry Corridor (that is from the December 2008 timetable). This would allow a major restructuring of the timetable and a doubling of the frequency of the existing half hourly local service is one possibility.
- 6.9 In short, as far as Birmingham is concerned, the capacity released by HS 2 should allow for:
- A doubling of local train frequency in the Coventry corridor;
 - A better service to/from Milton Keynes/Northampton; and
 - A general re-structuring of the local and regional timetable without the need to accommodate limited stop trains except insofar as they are considered helpful to the West Midlands region and the City of Birmingham.

7. SUMMARY CONCLUSIONS

Key Analytical Findings

- 7.1 Demand for HS 2 between London and Birmingham alone is expected to be in the order of 5 million trips per year (notional 2006 figure).
- 7.2 The quantification of HS 2 demand, transport and wider economic benefits represents a partial analysis at this stage. As required by the remit of the work, it focuses on the core Birmingham-London market and the distribution of benefits to Birmingham in particular.
- 7.3 Benefits have been aggregated over a 60 year appraisal period from an opening date of 2020 and discounted back to 2002 prices in line with DfT appraisal principles. The core analysis suggests the following key benefits:
- Conventional transport benefits of about £4bn PV of which more than three-quarters are benefits to business users.
 - Additional quantified wider economic benefits of around £2bn PV of which the vast majority are agglomeration benefits to firms.
 - An expected GDP impact of £5.2bn PV across a 60 year period.
 - The distribution of agglomeration benefits shows that West Midlands firms would secure about 32% of these and that Birmingham city alone would benefit by £169m PV.
 - The biggest beneficiaries would be in the financial and business services sector within Birmingham.
 - Indicative analysis suggests further significant benefits to Birmingham from the operation of the high speed services north from BIA to Manchester. These could be in the order of £100m PV.
- 7.4 These quantified benefits are likely to be conservative as they exclude crowding reductions, enhancements to other local services and relatively conservative rail market growth assumptions. However, sensitivity analysis has shown that the results are robust to alternative higher growth and to a range of parameters determining the concentration of spatial benefits.

Regeneration

- 7.5 Benchmarking evidence suggests that there would be a small enhancement in rental values for central Birmingham and a more significant impact in improving vacancy rates for commercial property. Premise relocation from the West Midlands to London is unlikely but there are prospects for growth in the relocation of 'back office' functions to the West Midlands, especially within the financial and business services sector.
- 7.6 There is likely to be growth in commuting to London from the West Midlands, particularly for highly paid jobs. In part, HS 2 will encourage workers to move away from the south east as they trade-off housing costs with travel time and costs. This can have second order multiplier effects for the West Midlands as higher wages from London jobs are spent locally.

- 7.7 The HS 2 link is likely to attract higher density employment development to the area around the station. This in turn will attract retail and other businesses to the area, resulting in a concentration of employment. Much of this economic activity is likely to be displaced from other locations in the West Midlands but it is likely to result in increases in property prices overall.

Next Steps

- 7.8 The analysis to date suggests that the following tasks should be prioritised as part of a second phase of work:
- Extend the WEBs analysis to consider the benefits of optimising freed capacity on the local rail network, and therefore identify a higher total economic benefit to Birmingham and the West Midlands.
 - A ‘high-level’ assessment of potential HS 2 routing and station options.
 - Examination of local regeneration opportunities around proposed station options, and their ‘fit’ with the broader regeneration strategy for Birmingham city.

APPENDIX A

FINANCIAL IMPACTS AND FUNDING OPPORTUNITIES

A1. FINANCIAL IMPACTS AND FUNDING OPPORTUNITIES

Financial Impacts and Funding Opportunities

- A1.1 The financial impact of High Speed Two has not been modelled explicitly in this study, although some key points can be drawn out of previous studies and experience elsewhere.
- A1.2 The Atkins High Speed Line study (2003) concluded that, for the wide range of north-south high speed line options it tested, fare revenues from the high speed services would comfortably exceed operating costs but would be insufficient to fund the entire capital cost of constructing the new infrastructure. There would therefore need to be some element of public sector funding to deliver a new high speed line.
- A1.3 The likely funding gap between revenues and costs could be minimised by:
- Optimisation of scheme design to minimise construction costs, in particular by making use of existing infrastructure or transport corridors to access city centres;
 - Adoption of a policy to maximise fare revenues (discussed further below); and
 - Exploitation of other commercial opportunities such as property development around new stations, or use of the right of way.
- A1.4 In establishing the appropriate level of fares to charge for new high speed rail services, there is a trade-off between maximising fare revenue or economic benefits. Establishing premium fares for high speed rail services would ensure that users were paying for much of the benefits they were receiving (in economic terms, extracting much of the “consumer surplus”). This would improve the financial return to potential investors. However, the resulting fare levels will result in a lower level of patronage than if fares were similar to those charged for existing rail services – and hence may result in less diversion from other modes, thereby underplaying the economic benefits. Higher fares act as a cost to businesses for employee travel in the course of work and in getting to and from work, which would mitigate the extent of wider economic benefits also. The choice of fares policy is essentially a political decision on who should pay for the benefits of the new rail service.
- A1.5 The scale of the funding gap would also be affected by the choice of project structure adopted. In the current environment, it is likely that some form of Public Private Partnership (PPP) or PFI scheme would be adopted, which brings in private sector equity and finance and shares project risk between the public and private sector. This would allow public sector funding to be spread over a 20-30 year time-span and would allow the scheme to stay off the Government’s balance sheet. It has been demonstrated that there is plenty of market appetite for private sector financing of high-speed rail schemes, based on PPP and PFI models – there are two PPPs for high-speed rail underway in France, for example. Appropriate government guarantees, particularly in relation to demand risk in the early years of operation, are likely to be needed to support the involvement of private sector financiers.

- A1.6 Assessment of the public sector funding impact must also take into account the effects on existing railway franchises. As highlighted in chapter 3, High Speed Two would abstract revenues from existing inter-city rail services currently operated by Virgin West Coast. In order for this rail franchise to remain financially viable, additional subsidy would be required to compensate for a loss of revenues that cannot be fully recovered through reduction in operating costs. This remains likely even if new or modified services were introduced within the Intercity West Coast or West Midlands franchise to make use of the freed capacity on the West Coast Main Line. These new services are likely to be local services on the Coventry corridor or intra-regional services to/from Milton Keynes/Northampton and therefore less likely to generate financial surplus than the inter-city services they replace. An increase in subsidy for the existing rail franchises is therefore to be expected. Given the long lead time for development and construction of a new HS 2, the change in franchise economics can be planned in advance and handled during the normal re-franchising process, avoiding direct negotiation with the existing franchisee.

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