GREAT WESTERN PARTNERSHIP

# Great Western Partnership

# Great Western Conditional Output Statement


**Greengauge 21**

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# Executive Summary

## The Great Western Partnership

The Great Western Partnership (GWP) action group, representing major businesses and public authorities in the South West of England and South Wales, has commissioned this Conditional Output Statement for the Great Western Main Line (GWML), the railway between London and Bristol and South Wales.

The report sets out quantified and timed outputs for the railway of clear benefit to the regions and cities it serves through to the 2030s. The outputs are *conditional* because their delivery depends on the rail industry finding an efficient means of providing them, either through the current substantial investment programme for the route, or through further measures. The evidence is set out showing why improvements to rail services in the Great Western corridor are valuable and important, especially to economic performance. The evidence draws on academic studies of the links between transport and economic productivity in the GWML corridor, on interviews with businesses to identify their transport priorities and on adopted policies of the local authorities in the GWP.

## A Conditional Output Statement

The Conditional Outputs can be summarised as:

A. Recreating an Intercity Railway
    i) With improved journey times to London, good performance reliability, sufficient capacity and high service standards;
    ii) With improved journey times and frequencies on services to other major provincial cities;

B. Providing Access to International Gateways
    i) With direct fast rail services to Heathrow Airport from the west;
    ii) With improved services to Gatwick Airport;
    iii) With direct services to Europe via HS2 and HS1 connections;

C. Building Regional and Local Services
    i) Ensuring the Thames Valley benefits fully from Crossrail and that sufficient capacity is provided for commuters into London;
    ii) A regional metro service between Swansea, Cardiff and Bristol, a commuter rail network for Swindon, support for local city-region campaigns and the adoption of affordable fares policies;

D. Moving Freight Sustainably
    i) Accommodating forecast increases in rail freight demand and making provision for new freight terminals;

E. A Continuing Staged Investment Programme
    i) A continuing programme of service improvement delivered through the Great Western franchise;
    ii) A 25-year investment programme that sees the GWML incorporated into the national HSR network, with a step-change in capacity and a progressive reduction in journey times.

There are several key parameters that define the outputs needed, of which one is the journey time to London, illustrated in the following table:

**Required journey times to/from London**

| London to... | Short term (to 2018) | Medium term (from 2019 to 2032) | Long term (from 2033) |
|---|---|---|---|
| **Swindon** | 55min | 50min | 40min |
| **Bristol** | 1h45 | 1h25 | 1h00 |
| **Cardiff** | 2h00 | 1h45 | 1h15 |
| **Swansea** | 2h58 | 2h40 | 2h00 |

It is important to consider all of the outputs together, because it is evident that there are needs for capacity, new connections, high levels of service punctuality and better service frequencies, as well as for meeting service quality standards, containing fare levels and meeting the needs of specific travel markets such as travel to airports. All of these – quantified and timed – should guide the strategic vision going forward.

## Vision

These measures provide for the development of the existing GWML through a programme of continuing improvement into a high-speed route. The cities served by the GWML will in the future be on the national HSR network.

The aim in incorporating the GWML into the national HSR network is not just to shrink journey times, but also to provide the capacity that will allow the creation of regional metro networks and the development of other local services – and to accommodate an increasing volume of railfreight. The aim, in short, is to create a framework so that South Wales and the South West have a transport system that will support an environmentally sustainable, expanding economy.

## Delivering the Outputs

The challenge now is for the rail industry to identify ways of achieving the outputs efficiently so that any investment needed offers a good business case. The next Great Western franchise, planned to commence in April 2013, will be the means of delivery of many of the priorities identified for the following 15 years. Given the emerging changes to Department for Transport (DfT) franchising policy, it is important for that the Conditional Outputs are used to inform not only the DfT's franchise specification, but also the plans of franchise bidders. Network Rail has a key role in ensuring the infrastructure required to deliver the desired Conditional Outputs are made available.

It is proposed that a partnership approach between the GWP and the rail industry is adopted for the development of a long term plan for the GWML corridor, with the DfT and Welsh Government playing a supporting role. The rail industry has the expertise in developing solutions to rail problems, while the GWP membership – in the private and public sectors – understands the needs of the wider economy, and therefore provides a proper basis for forward planning.

# 1. Introduction

## Background

The Great Western Main Line (GWML) is the railway between London and Bristol and South Wales, together with associated branches and extensions.

The Great Western Partnership (GWP) is an action group representing major businesses and public authorities in the South West of England and South Wales. Its members are Bristol City Council, Cardiff County Council, Newport City Council, Slough Borough Council, Swansea City Council, Swindon Borough Council, South East Wales Economic Forum, First Great Western, Initiative Swindon & Wiltshire, Institute of Directors (SW England), Cardiff Business Partnership, SWWITCH, GWE Business West, Thames Valley Berkshire LEP, South East Wales Transport Alliance, Welsh Transport Research Centre and West of England LEP.

Services over the GWML were dramatically improved 35 years ago with the introduction of the Intercity 125 train fleet. But in the period since, investments in north-south routes (electrification of the East Coast Main Line in the early 1990s, the modernisation of the West Coast Main Line completed in 2008, and the prospect of HS2 in the 2020/30s), mean that relative journey times to London from the cities in the Great Western corridor have fallen behind.

The Great Western Partnership stakeholder group now has in prospect a programme of major renewals and enhancements of the Great Western Main Line, intended to lead to major service enhancements. But there are always risks that the best of intentions may not result in plans coming to fruition. Funding constraints may yet adversely affect the rail sector in a way that has so far been avoided during the period of economic downturn. For these reasons alone, it is an important moment to set out the reasons why improvements in rail services in the Great Western corridor are so important, and especially to the economy.

Greengauge 21 was commissioned by GWP to draw together existing evidence and identify for GWP what it is that GWML services can and should offer the regions they serve, looking at the period of the next franchise and beyond.

## A Conditional Output Statement

The key deliverable is a *Conditional Output Statement* for the Great Western Main Line. The words are important: 'conditional', because whether the outputs can be delivered will depend on suitable solutions being found by the rail industry that are sufficiently cost effective that there is a good supporting business case. 'Outputs' because that is what a stakeholder group knows about and can evidence as being beneficial – leaving others (the rail industry) to do what they are best equipped for, which is working up the set of inputs – the most efficient means of achieving them.

Greengauge 21 has worked together with GWP members and others to build a picture of the outputs required over a 25-year timescale based on evidence on the real value to the regions served by the GWML. The outputs have timescales attached to them. Interviews with the key members of the GWP were carried out by Greengauge 21, who also undertook a thorough review of all of the available evidence on the relationship between Great Western rail service levels and economic performance in the corridor. The interviews were valuable in the key task of creating this evidence base, and we are grateful to all of those who helped unearth key pieces of research as well as answer the immediate questions.

The aim was to carry out the work in time for individual GWP members to consider it before finalising their submissions to the Department for Transport's consultation on the Great Western franchise replacement.

The report does not seek to replicate the specific aims for the Great Western franchise that have been identified by individual authorities. Rather, it concentrates on propositions that span the interests of individual GWP members to present a corridor-wide view. Sometimes local aspirations can help support a business case for a wider set of corridor-level enhancements; on other occasions, there can be conflicts – between for instance, ambitions for additional local stations or services and the needs of the railfreight and intercity sectors. We have shown in the Conditional Outputs that there are occasions where there are complementary aspirations.

## Contents of this Report

This report provides the Conditional Outputs in Chapter 2 and then summarises in Chapter 3 the evidence base supporting them. For the longer term, a critical factor will be that of capacity – in the light of the considerable increase in demand for rail services that is expected in both the passenger and freight sectors – a subject covered in Chapter 4.

The Conditional Outputs that have been developed here are capable of being delivered in the period to 2020 through the existing committed programme of infrastructure and rolling stock investments (summarised in Chapter 5) together with investments that have been the subject of at least preliminary planning studies and which could be implemented in that timescale. But there is a requirement for a matching set of commitments from the successful bidder through the period of the next Great Western franchise to 2028, and for further developments beyond that.

Our suggestions for how this Conditional Output Statement might be used in responding to the Great Western franchise consultation are set out in Chapter 6. The concluding chapter also identifies where work should be focused next to work in partnership with the rail sector in taking forward the longer term outputs identified here into firm plans and delivery.

# 2. The Conditional Outputs

Note: numbers in [ ] parentheses refer to the evidence-based propositions developed from the economic analysis (see summary on page 16); numbers in { } parentheses refer to the propositions developed based on the analysis of business requirements (see page 20) and those which arise from committed regional/local planning policies ( ) – see page 23.

## A: Recreating an Intercity Railway

*(i) London*

It is crucial for the economic performance of the key cities on the GWML that **journey times** to London are improved to help sustain existing businesses, attract inward investment and help drive up productivity levels [1]. Current frequencies of train service should be at least maintained to all major centres. (1)

The geographical coverage of destinations that are connected to London in 2 hours or less should be increased to help address the problems of peripherality. [2]

As services improve, **performance reliability** should be achieved at the nationally agreed standards for intercity routes, including during the periods of planned upgrade work. This includes maintaining Sunday rail services during engineering works such as take place routinely for the Severn Tunnel {2}.

**Capacity** should be increased to accommodate expected growth including at times of peak business travel [5] (1).

To sustain regional economic competitiveness, GWML services to London should deliver a visible medium and long term **programme of continuing improvement** over the next 25 years [6]. This embraces timetable improvements, provision of enhanced amenities for business and other travellers, including free access to w-fi (or in future, other communications media), and high standards of customer care throughout the journey {5}.

**Table 2.1 – Required journey times to/from London**

| London to… | Short term (to 2018) | Medium term (from 2019 to 2032) | Long term (from 2033) |
|---|---|---|---|
| Swindon | 55min | 50min | 40min |
| Bristol | 1h45 | 1h25 | 1h00 |
| Cardiff | 2h00 | 1h45 | 1h15 |
| Swansea | 2h58 | 2h40 | 2h00 |

**Table 2.2 – Required service frequencies for trains to/from London**

| London to… | Short term (to 2018) | Medium term (from 2019 to 2032) | Long term (from 2033) |
|---|---|---|---|
| Swindon | 15 minute interval | 15 minute interval | 15 minute interval |
| Bristol | 2 trains/hour | 4 trains/hour | 4+ trains/hour |
| Cardiff | 2 trains/hour | 2 trains/hour | 2+ trains/hour |
| Swansea/West Wales | 1 train/hour | 2 trains/hour | 2 trains hour |

*(ii) Services to the Major Provincial Cities*

It is also crucial for the economic performance of the key cities on the GWML that journey times to other major provincial cities are improved to help sustain existing businesses, attract inward investment and help drive productivity levels [1]. Current frequencies of train service should be at least maintained to all major centres (1).

In the medium term (from 2019), services should be improved in respect of **journey times and service frequencies** to Birmingham as set out in Table 2.3.

**Table 2.3 – Required service frequencies and journey times to Birmingham**

| Birmingham to… | Service improvements |
|---|---|
| Swindon | Introduce hourly direct through service via Cheltenham |
| Bristol | Reduce journey times by 11 minutes to 1h15; twice hourly service |
| Cardiff | Reduce journey times by 12 minutes to 1h45; hourly service |

There should be provision of enhanced amenities for business and other travellers, including free access to w-fi (or in future, other communications media), and high standards of customer care throughout the journey {5}.

Services between Bristol and Cardiff/Swansea should be radically improved following route electrification (see Output C below) {1} (1).

## B: Providing Access to International Gateways

*(i) Heathrow Airport*

South West England and South Wales and the Thames Valley should be provided with **direct, fast rail services to Heathrow Airport** [2, 7] {3} (5). Services should be provided to Heathrow from the west providing:

i) From 2019, four trains per hour throughout the day, including early morning and evening services from Reading, Twyford, Maidenhead and Slough (with journey times no greater than 28 minutes Reading – Terminal 5 and 32 minutes Reading – Central Terminal Area); selected services should be extended to Newbury and Oxford;

ii) From 2022/3, direct hourly services from Cardiff/Newport/Bristol Parkway/Swindon and from Bristol Temple Meads/Bath/Chippenham/Swindon with journey times determined by the speeds available on the GWML fast lines.

*(ii) Gatwick Airport*

From 2019 (or sooner if feasible) services to Gatwick should be provided from Oxford/Didcot/ Reading and offer an hourly **fast service to Gatwick Airport** with a target journey time Reading – Gatwick of 1 hour [2, 7].

*(iii) European services via HS1*

From 2026 or 2032 (i.e. whenever the connections to HS2 are implemented), **direct international services** should be introduced between Cardiff/Bristol Parkway and Paris/Brussels using the planned new HS2 links to Heathrow Airport and to HS1 [2]. This will lead to the operation of HSR services over the GWML, and the commercial viability of such services will be

aided to the extent that the long term programme (see Output E below) includes **upgrading the route for high-speed operation** [6].

When the HS2 link to Heathrow is provided, new European services could operate to/from Heathrow directly. This would create the opportunity for a convenient transfer point at Heathrow for passengers from the Great Western corridor using the Western Rail Access to access Channel Tunnel rail services, avoiding the need for double interchange transfers across central London.

## C: Building Regional and Local Services

*(i) London*

Accessibility to London from the Thames Valley will benefit hugely from the completion of the Crossrail project, now expected in 2019. Businesses place a high value on fast connections to the City of London, and the other major business centres in London {1}. To ensure that businesses in the GWML **benefit from Crossrail**, it is a requirement that the full GWML 10tph service is delivered and that the service is not made slower by requirements to stop at new stations that may be proposed for inner West London[1] [4], and also important that the introduction of Crossrail does not slow down other GWML services {1}. Direct outer London commuter services from the Newbury and Oxford directions should be retained and users should not be required to interchange to Crossrail at Reading.

London commuter services must be provided with sufficient seats for users consistent with the industry planning guidelines; since these do not allow for a requirement for passengers to stand for more than 20 minutes and since the existing services between Reading and Paddington are known to be some of the most crowded in the country, significantly greater **capacity** should be provided, with the requirement specifically being that no Reading – London passengers should be required to stand, including in peak periods [5] {5} (1).

*(ii) Other GWML services*

The GWML also delivers commuters into other towns and cities along the route, including: Slough, Reading, Swindon, Bristol, Newport, Cardiff and Swansea. Of these locations, Slough and Reading will benefit from the introduction of Crossrail from 2019; for the remainder, commuting volumes by rail are only substantial in the cases of Cardiff and Bristol, and in these cases more use is made of local service networks (e.g. the Valley Lines in the case of Cardiff). The GWML should facilitate the operation of regional and local metro/commuting services:

- A high-performance/high reliability **regional metro service** between Swansea, Cardiff and Bristol should be introduced as soon as the route is electrified (2017/8), helping to create an economic city region across the Severn [1, 3, 4, 5] {1} (1,2) with:
    - Four semi-express trains per hour between Bristol and Cardiff, with a target journey time of 40 minutes
    - Stops at Newport, a new station to serve the major development planned at LLanwern, Severn Tunnel Junction – for which a much expanded parking facility is needed [3] – and Filton Abbey Wood
    - At least hourly extensions to each of Swansea and Bath, with consideration also being given to extending some Cardiff services to Pontypridd (making use of the proposed Valley Lines electrification);

[1] An exception to this may arise in the case of the planned station at Old Oak Common if Crossrail is provided with a connection to the WCML as proposed by Network Rail in the London & South East RUS (July 2011) since then there would be significant connectivity improvements to WCML destinations for Thames Valley businesses.

- A **basic commuter rail network for Swindon** should be introduced from 2019, with half hourly services from Cheltenham/Gloucester, hourly services from Salisbury/Westbury/ Trowbridge and an extension of the London outer suburban commuter service from Didcot (with provision for new stations at Wantage/Grove and South Marston) once there is sufficient track capacity between Didcot and Swindon to accommodate this together with expanded intercity and freight services [3, 4];

- City region-based **campaigns for enhanced local rail services** – for example by the Greater Bristol Metro Rail Campaign - should be fully taken into account in developing rail industry plans [3, 4] (2). The South Wales Metro concept, advanced by the Cardiff Business Partnership, received the full support of the Welsh Assembly in December 2011;

- The adoption of **fares policies** for these regional commuting/metro services that take account of the wider economic benefits they bring, and the need for compatibility with fare levels set for other local rail service providers, rather than being set within the context of a long distance train service provision [3, 4, 5] {4} (4).

## D: Moving Freight Sustainably

Provision should be made to **accommodate rail freight demand** as forecast, noting that the latest MDS Transmodal projections are higher than those last developed by Network Rail for the GWML Route Utilisation Strategy (RUS).

This requirement arises because all of the local authority members of the GWP have sustainable transport policies that seek to maximise the opportunities for freight to be carried by rail, for environmental and other reasons {6}. These reasons include concerns over the impact of lorry movements where road capacity is under particular pressure, as it is on the M4 in South East Wales (3).

To meet this requirement, rather than adopt a piecemeal approach to adding freight capacity and capability, the GWP calls for the rail industry to adopt a long-term growth strategy for the GWML in which the demands of passenger and freight services are both considered and an overall plan for accommodating the expected growth is devised. Within this plan, provision should be made for new **freight terminals** and for the increased use of existing terminal facilities in the corridor (3).

## E: A Continuing Staged Investment Programme

There is a requirement that the new Great Western franchisee works in partnership with the local/regional agencies with a responsibility for economic development in the corridor, and undertakes a **continuing programme** of service improvement [6]. Local/regional partners will in return undertake to ensure that complementary policies and developments are pursued to capitalise on the improved services that the franchisee is obliged to deliver. This will include related land use/spatial planning policies and support for improving station access arrangements [3] (1).

In the longer term, as noted above, the GWP observes that a step change is likely to be needed in the capacity on offer – just as has been found to be necessary in the WCML corridor where HS2 is planned to be built. The GWP notes that Network Rail does not yet have any solution to the capacity constraints at the eastern end of the GWML, over the approaches to London. In tackling this problem, the GWP wants to see a **long term (25 year) investment programme** developed by the rail industry in partnership with the GWP, that identifies candidate solutions, compares and contrasts them and develops a preferred option. This work should incorporate the opportunity to seek a progressive reduction in journey times and incorporation of the Great Western corridor in the national HSR network [6].

Because of the lead times involved, the GWP makes it a conditional requirement that this work is carried out over the course of the next two years [1, 2, 5, 6, 7]. The plan should be used to identify how those Conditional Outputs noted here for delivery in the longer term will be realised.

# 3. The Evidence Base

## Economic Evidence

*Evidence on the effect of journey times on economic productivity*

There is a substantial body of evidence on the relationship between regional peripherality and economic productivity. It would be disproportionate to attempt to summarise it here. Nor should it be held that there is a single or common view on an area that has only relatively recently become amenable to useful research, through the availability of suitable data.

Of particular value, however, is work carried out for the South West Regional Development Agency (University of the West of England and University of Bath, 2006), since much of the analysis relates to places and sub-regions served by the Great Western Main Line. This research sought to understand the drivers of productivity differentials apparent at two levels:

(i) Between the regions and nations of the UK; and

(ii) Between the sub-regions of South West England – which has a geography that extends from the fringes of the London commuter belt at Swindon to a genuinely peripheral sub-region, the County of Cornwall.

The research makes extensive use of statistical data available at the level of individual businesses from the ONS. On this basis, the research shows that productivity in the South West is 33% below the benchmark level of London, and that Wales (as a whole) is 42% below the London level (in 2003, the most recent year for which data were available for analysis).

The analysis at the regional level seeks to explain the productivity gap of the SW region by a successive estimation of the contribution of various measurable variables.

Two of these alone – capital stock (which is lower per employee in the SW than in London) and industry structure –account for a large part of the differential: if these were equalised, the regional productivity gap would fall to 19%. A further 9% of the gap is explained by a clutch of variables – the ratio of full-time to part-time employment, an index of economic potential based on a gravity-type effect, business ownership structure, and qualification levels across the workforce and population density.

That leaves a 10% productivity gap. It is estimated that 7% of the productivity gap experienced by the SW region (that is to say, most of the remainder) is explained by two travel time variables: the average travel time to London and to the next four largest conurbations (Birmingham, Manchester, Leeds and Glasgow) (University of West of England et al, page 5). It is also noted that the journey time variable also has a significant bearing on the relative productivity of the Welsh economy (along with some other English regions). A 10% change in these journey times is associated with a 0.6% change in annual business productivity (University of West of England et al, page 6).

In practice, journey times to London and to the selected four conurbations will be determined by a mix of transport modes, not just rail. Yet it is clear that business travel to London, at least, is dominated by rail. The research paper suggests that the negative effects of peripherality derive from journey times and from the lack of proximity to large markets – the absence of 'agglomeration' factors.

The analysis at the sub-regional level within the South West region offers further insight. With Bristol set as a benchmark, productivity levels in Gloucestershire and Wiltshire are not significantly different, but Dorset has productivity 13% lower, Somerset 18% lower, Devon 25% lower and Cornwall 28% lower. For this analysis, the travel time variable is bundled with web access,

ownership structure and population density and together these variables explain 11% of the gap for the Cornwall case (i.e. nearly 40% of the within-region performance gap).

The South West RDA report concludes with a policy discussion on the implications of the sub-regional level analysis. The impact of peripherality is seen as important, because of the remoteness from large markets. It suggests that:

> "the direct time and monetary penalties of travel time faced by businesses in more remote locations may be part of the explanation [of relatively weak economic performance]. To this extent, improvements in transport infrastructure may have an impact". (University of West of England et al, page 11)

Earlier work by researchers at the Universities of West of England and Bath who carried out the work for the South West RDA, focused entirely on regional level comparators (Boddy, Hudson, Plumridge and Webber, 2005). They concluded as follows:

> "Travel time to London also has a considerable effect on productivity – the longer the travel time to London the greater, on average, the productivity penalty on individual establishments. As noted above however, none of the other travel time or distance variables have a statistically significant effect. In addition when the journey times to the four major cities were included separately they were again insignificant. Distance to these [provincial cities] is, however, significant with capital stock as the dependent variable […], indicating that these variables do have explanatory power and hence validity in a different context. Time distance from London may also be picking up agglomeration effects rather than simply penalties in terms of travel time as such. Proximity to London is likely to generate significant agglomeration effects over and above those already accounted for by population density. It may also represent the speed of knowledge diffusion where best practice spreads from the centre (London) to other areas at a speed inversely proportional to peripherality. These findings overall replicate in general terms the emphasis on the importance of distance and peripherality suggested by [other researchers]". (Rice and Venables, 2004)

The research authors therefore claim that this is "an important addition to, for example, the Treasury's set of 'key productivity drivers':

> "Significantly it is journey time that emerges as important from this analysis rather than simply distance in terms of miles – important given that [transport] investment could possibly impact on journey times as such but not on geographical distance *per se*. It also, however, suggests the productivity penalties faced by establishments locating some distance from the capital region. As noted earlier, this variable may also, however, be picking up agglomeration effects rather than simply penalties in terms of travel time as such. Again, however, reducing journey times could potentially spread the positive effects of agglomeration focused on London."

In summary, the impacts on regional productivity from the following significant changes in journey time to London, as measured by gross value added at factor cost (GVAFC) were found to be:

- a reduction in travel time to London from 90 minutes to 30: +12% GVAFC
- a reduction in travel time to London from 180 minutes to 30: +22% GVAFC.

### *Agglomeration Benefits*

Some work has been done to research agglomeration benefits and, more generally, so-called economic spillover effects, in the South West. The data suggest that agglomeration economies probably stop before a distance of 50km is reached (Webber, 2010). The agglomeration benefits are a key aspect of contemporary thinking on wider economic benefits that seek to reflect the

additional value created by transport investments that lead to further spatial clustering of businesses.

The 'spillover' research for the South West RDA leads its author to conclude that it makes good sense to seek to enhance agglomeration benefits by strengthening the major city urban cores, as a means to increase labour productivity (Webber, 2010, §4.27). But with rail only playing a modest role in commuting volumes – at least as far as south west England is concerned – the relevant role of rail policy is more likely to lie in addressing improving service levels and performance of train services to the main city centres. Indeed, work for the Welsh Government queries whether agglomeration benefits could be brought about by improvements to the rail services between Swansea and Cardiff (Mott Macdonald, 2010). The risk is that the alternative outcome could arise, with the investment leading to a strengthening of the larger city economy (Cardiff) at the expense of the smaller one (Swansea).

As Bannister and Berechman (2000) conclude :

> "rail investment whether urban or inter-urban is not guaranteed to have an impact on the local or regional economy. This supports [the] argument that 'transport investment is not a necessary condition for economic development, but it acts in a supporting role when other conditions are at work such as the presence of positive economic externalities'.

### *Journey Time Thresholds and Peripherality*

The economic value of the Great Western Main Line was addressed in another piece of research for the South West RDA (Halcrow Group, 2005). This concluded that the accessibility of the region had shaped and continued to shape its spatial economy and prosperity. The region's economic drivers were in the north and east of the region, particularly centred on the Bristol city region. Higher value business sectors, it noted, required good connections to London (in particular), and were unlikely to locate outside a certain journey time threshold (as is born out with the example of the original location decision of Admiral Insurance in the South Wales context – see below).

Accessibility to London was seen by businesses as being important for clients and networking, a conclusion confirmed by a survey of South West businesses. As the South West RDA inward investment team were able to confirm, it appeared that a two hour journey time from London is the threshold beyond which accessibility is judged to become poor (Halcrow Group, page 35). This creates an arc between Bristol and Exeter which is considered accessible; further west, the lengthier access times create poor accessibility, and it becomes increasingly unlikely that firms can be persuaded to locate there. Businesses in this further western location are likely to be more stand-alone and less reliant on clusters. The same pattern probably holds true for South Wales. In these remoter locations, foreign-owned businesses consider access by air to London as being a very important factor (and since this work was undertaken in 2005, London air connectivity has declined). London is still seen as a draw, and reductions in journey time are critical to reduce the adverse impacts of peripherality.

### *Competing Nationally*

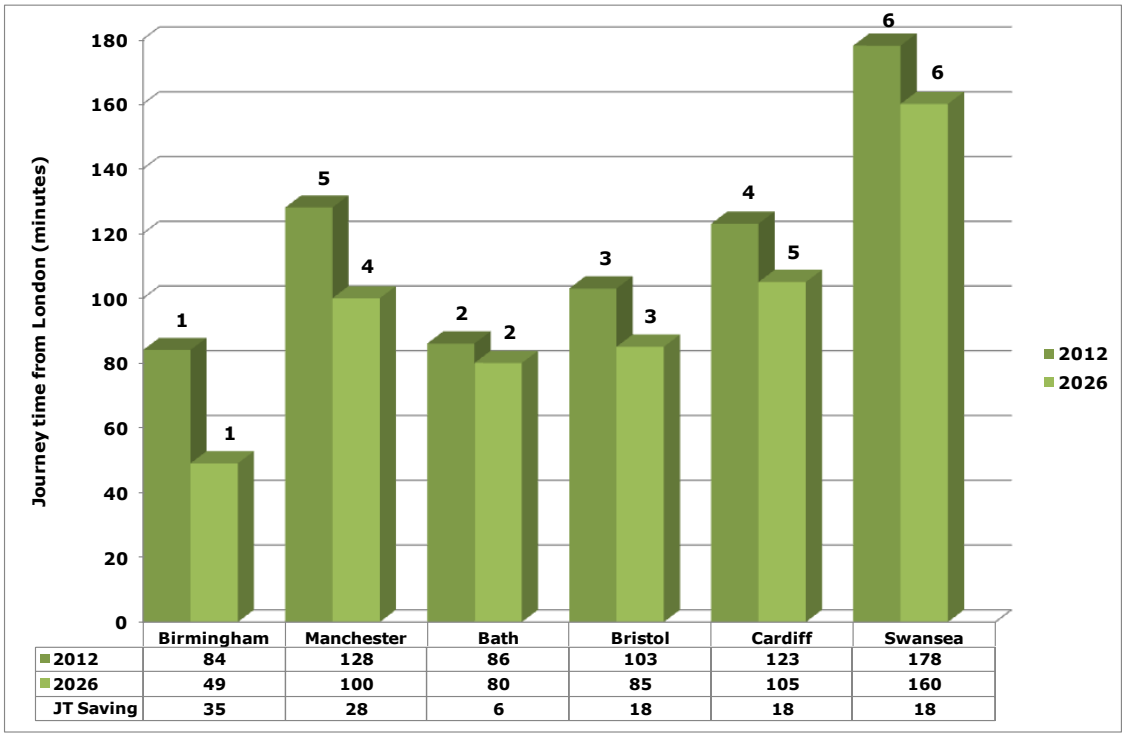
The research for the South West RDA notes the fact that the differences in sub-regional productivity across the South West are the most marked of all of the English regions, but this owes a lot in practice to the longitudinal orientation of the region in relation to the national capital. But the report argues that for the region to remain competitive, it needs continuous improvements in accessibility. This conclusion was reached in 2005, before HS2 offered the prospect of faster connectivity to London from the West Midlands and the North West.

Earlier research by Greengauge 21 illustrates the impact of the plans for HS2 on the Great Western corridor. This work, carried out for Greengauge 21 by KPMG, pointed to a reduction in the employment growth rate from 0.83% CAGR to 0.78% CAGR in the South West (and an equivalent decline in Wales) from the implementation of a national high-speed rail network (Greengauge 21,

2010). Clearly, the impact of HS2, as the first stage in a national network, would, on the same basis, be lower. But the increased attraction of the cities served in the first stage, Birmingham and Manchester in particular, could be significant for the main cities along the GWML since their relative accessibility to London will worsen.

In Figure 3.1, projected HS2 times are compared with projected post-electrification times using new Intercity Express Programme (IEP) trains currently planned for the GWML, and contrasted with today's typical journey times. While GWML major city destinations generally gain a shortening of 15 – 20 minutes, the impact of HS2 is greater, with over 30 minutes saved in some cases. The change in accessibility of cities to London is not very dramatic in terms of ranking, but Manchester becomes a little closer to London than Cardiff, which is the opposite of the case today. The critical factor here is the importance of the projected journey time savings on the GWML which do much to offset the effects of HS2. Yet these depend on the adoption of specific timetables by the new Great Western franchisee: much of the journey time reduction comes from an assumption of greater service frequencies with intermediate stops removed from longer distance services.

**Figure 3.1 –Rail journey times to/from London**




| | Birmingham | Manchester | Bath | Bristol | Cardiff | Swansea |
|---|---|---|---|---|---|---|
| 2012 | 84 | 128 | 86 | 103 | 123 | 178 |
| 2026 | 49 | 100 | 80 | 85 | 105 | 160 |
| JT Saving | 35 | 28 | 6 | 18 | 18 | 18 |

Moreover, in practice, it will also be important to maintain punctuality and reliability levels at appropriate standards in order that the journey time gains are seen to be real and not at the expense of system performance.

### *Access to International Gateways*

The Eddington study (2006) identified international gateways and supporting surface infrastructure as one of three key economic priorities for the UK's transport system:

> "The growing significance of globalisation means that the international connectivity of the UK has become more important, and is likely to be increasingly so over the next two to three decades."

Aviation in particular was identified as playing an important role in supporting the UK's high-tech manufacturing and financial services sectors.

Eddington points out that the demand for travel via air and via the Channel Tunnel cannot be viewed in isolation, because international business travellers rely on surface access links to provide access to airports and international rail terminals. Where good public transport links exist, such as at the major London airports, these are used quite frequently, by as many as 40 per cent of business passengers; otherwise private cars and taxis are used for most travel to and from airports (60 to 90 per cent). Naturally, foreign business travellers, who are less likely to have access to private cars in the UK, rely more heavily on trains and taxis for transit to their ultimate destination.

In an analysis of the potential economic returns from different types of transport investment, Eddington highlighted the strong case for investing in surface access to international gateways: "investment in additional fixed infrastructure in these places can deliver strong returns for the economy and benefit a wide range of users."

The issue of access to international gateways has already been recognised by the Great Western Partnership as being of significance. It is recognised as being unlikely that either of Cardiff or Bristol Airports will ever provide the range of services that international business needs (Great Western Partnership, §5.3). Close to half of all passengers from the South West region, for example, use one of the London airports – with both Heathrow and Gatwick figuring prominently.

### *Developing Conclusions from the Evidence*

The recent work for the Welsh Government has been cautious in reaching conclusions, noting an absence of Wales-based research, which has been concentrated mainly on *ex ante* studies and local line re-openings rather than wider economic assessments (Mott Macdonald, 2010). Neither here nor in the studies for the South West RDA or elsewhere have we found good evidence of the economic benefits of rail freight services. Nevertheless, this work was able to conclude that:

(i) Investment in rail in Wales is likely to centralise or re-distribute economic activity towards better connected places;

(ii) Rail services can sustain communities by connecting them to larger urban centres, helping to mitigate the risk of population loss and decline; and

(iii) To maximise economic advantage, Wales should be connected to or located on the national HSR network.

The first and second conclusions, developed from an examination of all of the evidence across the whole of Wales (and also experience elsewhere) provides important pointers that will have resonance for the definition of outputs for local rail services, especially in the western parts of the corridor (at the eastern end of the corridor, the dominating effect of London commuting would exert other influences).

But there is wider evidence on which to draw, and a useful – although slightly dated – body of work carried out of the South West of England RDA, as we have seen, when it comes to examining the wider relationships between rail service characteristics and economic performance. While some of this work relates to the far west of England, it is the analytical conclusions that we need to utilise, and they are important pointers to the likely effects of policy choices across south/west Wales too. Taking all of the work together, we can identify a number of propositions related to rail investment in the area of the Great Western Main Line based on some level of empirical evidence.

### *Evidence-Based Propositions*

The first proposition is that journey times to London affect productivity – as measured by GVA. Travel times to the major provincial cities (Birmingham, Manchester, Leeds and between the South West and Cardiff) also have an impact, but a lesser one.

Peripherality, and its inhibiting effect on attracting inward investment and on businesses that depend on networking through business clusters, starts to bite at journey times above two hours from London. So a related, second proposition is that pushing the two hour journey time boundary further west has the potential to bring specific wider economic benefits.

The simple point is that journey time (not just distance) to London matters to economic performance, and there is clear evidence that this is the case, both across the English regions/devolved nations and within the South West region. Rail is critical because it plays such a dominant role in longer distance business travel, even though its overall use across the trip purposes and for shorter distance travel is a small proportion of total demand in both South Wales and the South West.

The next proposition is that rail investment – as is widely appreciated – is not a sufficient condition for economic growth. There are areas of complementary policy and behaviour needed to capitalise on the investment. These include the support and opportunity and market appetite for relevant business expansion in the places that will benefit in accessibility terms from the investment made. This could be in particular in the highly interactive knowledge based industries, but also in others that rely on international markets. Further development – as is indeed contemplated – in the environs of Bristol Temple Meads and Cardiff Central stations and around other GWML stations is crucial. This way the scope for agglomeration benefits at a city region level may be realisable. So too is it essential to ensure that barriers to successful expansion of rail use are overcome, and this includes suitable access transport provision at urban or city region level and provision of sufficient parking capacity at stations. The question of fare levels is also relevant here.

The work for the Welsh Government and for the South West RDA leads to an important conclusion on the provision of commuting services: their improvement can strengthen the role of the bigger centres, and where this forms part of a city's development aspiration, supporting the appropriate improvement in rail commuting services has a potentially important role (which can also service the accessibility function just noted). Better and expanded commuting services can increase employee catchments, increasing the prospect of being able to match employer needs to specialised skill sets. These are likely to need to be set in the context of a city region transport strategy, where other transport modes may provide an alternative to conventional rail services.

Demand for rail travel is expected to grow strongly and road congestion is likely to worsen across the Great Western corridor as the GWP has already identified. This means that there is a need for a distinct proposition around providing sufficient capacity to meet the expected rail demand growth, reflecting the evidence that of the range of service features, being able to get a seat is of prime importance to business (as well as other) travellers. So there needs to be a proposition around at least keeping pace with demand growth.

The next proposition is around regional competitiveness. The evidence suggests that the adverse effects of HS2 may not be too substantial in practice provided that the full benefits of the planned investment in the GWML (in electrification and the new IEP fleet) are brought to fruition. But this is a mitigation philosophy, perhaps appropriate for the period to 2020/5 but not beyond.

To achieve a dynamic economy requires continuing improvements in accessibility to counter the attractions of locations elsewhere, both in the rest of the UK and abroad as a suitable place to do business. So it is appropriate that the GWP considers too a longer term ambition and starts to chart the way towards its implementation. This will include referencing the place of South Wales and the South West in thinking on a national HSR plan, to which all of the major political parties are committed. And in one specific respect – direct connectivity to Heathrow – it would be possible for the Great Western corridor to achieve a step-change improvement well before the corridor served by HS2.

The importance of connections to the international gateways on economic performance has been very clear since the Eddington Transport Report of 2006: it is especially important in a corridor that relies so heavily on London's airports for its international travel.  Connectivity in this regard

embraces the attributes of reliability, frequency and absence of complexity/interchanges as well as journey times. Since Heathrow already features in the (second stage of) the HS2 plans, the final proposition to improve access to international gateways and to Heathrow in particular might be feasibly combined with the Great Western corridor forming part of the national HSR initiative.

**Table 3.2 – Economic drivers**

| | Economic driver | Parameters |
|---|---|---|
| 1 | Economic productivity | Shorter London journey times<br>Shorter journey times to the major cities (Birmingham, Leeds, Manchester and Cardiff-Bristol) |
| 2 | Overcoming peripherality (to attract inward investment) | Pushing the 2 hour threshold westwards |
| 3 | Agglomeration benefits | Complementary land use development plans<br>Overcoming access barriers |
| 4 | Expanded commuter (employee) catchments | Service frequency/quality/dependability |
| 5 | Accommodating growth | Train service capacity |
| 6 | Regional competitiveness | HSR network |
| 7 | International gateway connectivity | Rail access to Heathrow (and potentially Gatwick) and to HS1 services to Europe |

## The Needs of Business

Effective transport networks are acknowledged as essential to the effective operation of businesses. In a survey carried out by the British Chambers of Commerce (2010), 80% of companies surveyed considered they were affected by shortcomings in the UK's transport infrastructure networks, causing problems such as a loss of man-hours [sic] or increased operating costs. On average the cost of these problems was estimated to be £19,080 a year per business. While businesses are most reliant on the road network, 59% considered the rail network to be important or essential to their business (British Chambers of Commerce, 2008).

Evidence on businesses' specific requirements for improvements to the Great Western railway is available from a limited amount of survey material in a number of studies and has been supplemented by Greengauge 21 through interviews with local businesses. The main priorities emerging are:

- Efficient travel to work networks;
- Fast and reliable travel to London;
- Direct connectivity to Heathrow Airport;
- Improving the value for money of rail fares;
- Improved quality of services
- Environmental sustainability.

*Efficient Travel to Work Networks*

The importance of the rail network for commuting into London is perhaps unsurprising, given the paucity of attractive alternatives, but interviews with businesses have highlighted that commuting by rail into towns in the Thames Valley, including Slough, Reading and Swindon, is also important, as are commuting flows into the cities of Bristol and Cardiff. In Cardiff, while many rail commuters travel on the Valley lines into the city, flows along the GWML from Swansea, Bristol and towns in between, are also significant, and longer distance/regional commuting seems to be becoming more

prevalent. Where services are crowded or expensive, these are noted as affecting staff retention rates.

Thus Admiral Insurance, a company that employs 4,500 staff in Swansea, Cardiff and Newport, says that better services and connections at realistic fares levels are a prime requirement, as inevitably, some staff need to transfer between offices.[2]

The priorities for improvements identified by interviewees focused on providing adequate capacity and connectivity (via well-located local stations) for commuters on reliable, frequent and quick services.

*Fast and Reliable Travel to London*

After commuter rail services, good connectivity to London is highlighted consistently by businesses as the most important function of the Great Western Main Line. The significance of journey times to London is that it has a major influence on the location decisions of medium and large businesses and so has a direct impact on inward investment, particularly for office-based activities.

A survey of businesses in South Wales and the South West (Oscar Faber TPA, 1995) found that five out of 17 office-based businesses which located to the area in recent years identified accessibility by rail as a significant factor in their location decision and London was the key location involved. This was also confirmed in a survey of the business community of South West England in 2005 (Halcrow, 2005) which identified the importance of connectivity to London in decisions on locating businesses. Only 17% of businesses considered that the South West region enjoyed good transport links to London (although it should be noted that this included the whole of the South West region including Devon and Cornwall).

Regional connections to cities such as Birmingham, Leeds, Manchester and Cardiff (Cardiff was outside the study area) were also identified in the 2005 study as important but much less so than connections to London. Country-wide transport connections also impact on sectors such as tourism, although less than 10% of tourists to the South West use rail services. Nevertheless, it is highlighted that the quality of rail services can help attract high value visitors to the region.

Case studies of companies located in South Wales highlight that journey time to London is the most important factor influencing company location. When Admiral Insurance was establishing its head office, for example, its financial backers insisted on a maximum journey time to London of no more than two hours to ensure ease of access. It is considered likely that the threshold would now be lower given that journey times elsewhere (e.g. on the West Coast Main Line) have reduced in the meantime.

Fast access to London is also important for those companies establishing regional offices in towns and cities along the GWML as staff need to travel between headquarters and regional offices and make effective use of their time. Thus a Cardiff business respondent noted that it would be extremely beneficial to have a fast limited stop (only at Bristol) service to London at least once an hour or perhaps during peak periods.[3]

This was reinforced by an executive based in Centrica's office in Cardiff who pointed out that the journey time threshold would now likely be 90 minutes from London given that businesses can now see the competitive improvement that HS2 would bring to Birmingham and Manchester. Interestingly, in the 2005 survey of South West businesses, improved journey times to London were seen as most important to those businesses located just beyond the two-hour zone (Halcrow, 2005). The interviewees from South Wales also pointed out that in practice the reliability of train services affects business productivity as much as journey time, and there are significant concerns over the lengthy diversions when the Severn Tunnel is closed or lack of robustness of GWML

[2] Admiral Insurance representative, Greengauge 21 interview, February 2012
[3] Cardiff & Co Interview, former Legal and General representative, Greengauge 21 interview, February 2012

services more generally. Indeed, a 2005 survey identified better reliability as the highest ranked improvement to rail services required by businesses, highlighted by 49% of respondents (Halcrow 2005).

Journey times can also have an impact on shorter distance travellers. In the Thames Valley, while acknowledging the improvements that Crossrail will bring to access to central and eastern London, there are concerns that it will slow down existing trains to Paddington.

*Direct Connectivity to Heathrow Airport*

Following good connectivity to London, direct connections to Heathrow can be identified as the next most significant factor that affects inward investment and this is particularly so for international businesses, hence influencing the level of foreign direct investment in areas such as HQ offices, R&D, marketing and sales (Oscar Faber TPA, 1995). The British Chambers of Commerce (2008) found that access to Heathrow is seen as important to 37% of businesses, rising to 58% amongst those with 250 or more employees. It is also especially important to 50% of businesses in the South West, 53% in the South East and 55% in London. In other words, while Heathrow may be described as a London airport, it has about the same importance to the South West as it has to London and the South East.

The Thames Valley area has many national and international companies that need to access Heathrow frequently. The Business Development manager of SEGRO, a major property company based in Slough, says:

> "The accessibility of the Thames Valley, both internationally and domestically, has played a vital role in establishing the region as one of the UK's leading business locations, helping it to attract some 2,000 foreign-owned businesses alone.
>
> Improved links to improve the accessibility of Heathrow are important for the region's future if we are to maintain, and increase, this competitive advantage and to continue to attract world leading businesses." (Slough Borough Council, 2012)

In studies carried out to support the Western Rail Access to Heathrow (WRAtH), 80% of survey respondents suggested that problems of access to Heathrow caused by transport delays in the Thames Valley were either serious or critical. Heathrow does not compare well with other competing airports: 70% of respondents suggested that access to Heathrow is worse than equivalent international airports. The lack of rail access also has a direct impact on business costs: it is reported, for example, that one major company in Slough spends £600,000 a year on taxis to Heathrow.

The Berkshire economy, which would be served by a western rail access to Heathrow, is performing well. There are good base level incomes and high value jobs with a skilled workforce working in the knowledge based industries. There are a number of industry hubs including ICT and financial services, and there are approximately 4500 planned new jobs in the pipeline over the next 18 months.[4] The Thames Valley Local Enterprise Partnership pointed out that many hi-tech industries have chosen to cluster in Berkshire because of the proximity to Heathrow. These clusters work well in terms of networking, partnerships and having a high-value skills pool in one area. A lot of Berkshire-based companies are American and need access to Heathrow.[5]

Access to Heathrow is not just important for companies based locally. For much of the South West and South Wales, for example, Heathrow is effectively the local airport of choice. Companies interviewed by Greengauge 21 identified the importance of an efficient rail connection to Heathrow – bringing down the overall journey time by avoiding doubling back from Paddington or a taxi/coach trip from Reading is the important factor. It was clear that a lack of good access to

[4] Thames Valley Local Enterprise Partnership, Greengauge 21 interview, February 2012
[5] *Ibid*

Heathrow for companies such as Admiral would influence future decisions over the company's HQ, by making European cities outside the UK more attractive than Cardiff. In this sense Admiral serves as a useful paradigm for business growth and retention in the corridor, since it has moved from start-up to major international player inside 20 years. The transport arrangements that support a start-up may be insufficient to retain a globally trading business.

For Admiral, efficient rail connection to Heathrow has also become increasingly important, with its overseas operations in Paris, Madrid etc. Executives have found it difficult to function as an international company with the poor connectivity between south Wales and Heathrow, as staff based outside the UK find it difficult to get to south Wales. In future, the choice of a location for the company's HQ may come down to south Wales or outside the UK. The proposed Western Rail Access to Heathrow via interchange at Reading would be welcomed as long as there is sufficient frequency of trains between Reading and Heathrow and they are fast with few stops – otherwise, this is seen as no better than going into Paddington and out again. A direct service from south Wales to Heathrow would be even more advantageous.[6]

This need for access to Heathrow is also supported by businesses in Bristol. The Chief Executive of Bristol & Bath Science Park said:

> "A direct rail linkage between Bristol and Heathrow would be a significant advantage in terms of attracting inward investment to the Bristol & Bath region. Last year we lost a significant inward investment opportunity because the non-UK based directors of the company concluded that Bristol was inconvenient in terms of travel from Heathrow. This was a major blow for the Park and for the region as the company had planned to consolidate 5 overseas research centres into one and to bring leading edge technology into the UK."

*Improving the Value for Money of Rail Fares*

While value for money of rail fares is often identified in national passenger surveys as an area for improvement, there appear to be particular concerns from businesses along the GWML. In the British Chambers of Commerce survey (2010), over three quarters of businesses (76%) rated value for money as the single most important aspect to address on the UK rail network, rising to 80% for businesses located in South West England. Reducing the cost of rail services was identified as the third most desirable improvement for South West businesses (Halcrow, 2005).

This was reinforced by business representatives interviewed by Greengauge 21: the Thames Valley Chamber of Commerce would like to see the value for money of rail fares improved, and, as already highlighted, Centrica finds that commuting costs are higher for those travelling on the GWML to Cardiff compared with journeys on the Valleys lines, impacting on staff retention rates. This is important evidence of the direct relationship between commuting fare levels and practical journey-to-work areas and may also have a bearing on unemployment levels.

*Improved Quality of Services*

A number of other factors that tend to be grouped under service quality issues are important to businesses, including:

- Minimising crowding, particularly identified as an issue for commuting services, not only into London but also into other centres along the GWML;
- High quality rolling stock, with modern facilities such as wifi;
- Smartcards for integrated journeys;
- Station facilities, access and car parking.

[6] Admiral *op cit*

There is also a desire for better local access to the rail network, through re-opened lines or well-located new stations such as that planned for Reading Green Park, serving business locations.

*Environmental Sustainability*

Environmental sustainability is becoming increasingly important to businesses, although does not yet appear to be having as much influence on travel decisions as factors such as travel time. The Chambers of Commerce found in 2008 that 61% of businesses have introduced environmental policies, while a further 14% had considered measures but not yet implemented them. In interviews, the environmental advantages of GWML electrification were identified by a number of companies and the need for publicly quoted companies to assess their carbon emissions was noted. It is clear that using public transport is now considered by many to be one way of reducing carbon footprint and electrification will improve the advantage of rail over car even further.

*Top Business Drivers*

This analysis of business needs has identified a number of ways in which the GWML can help contribute to business productivity, competitiveness and efficiency. The key issues are summarised together in Table 3.3 and have been used to inform the Conditional Outputs set out in Chapter 2.

**Table 3.3 – Business drivers**

| | Business requirement | Characteristics |
|---|---|---|
| 1 | Efficient travel to work networks | Accessible, frequent and reliable |
| 2 | Travel to London | Fast and reliable |
| 3 | Heathrow Airport | Direct, fast, reliable connectivity, with on-board facilities and timings suitable for air passengers |
| 4 | Improved value for money of rail fares | Reasonable fares |
| 5 | Improved quality of services | No overcrowding, smartcard for ticketing, easy access, good car parking, wifi on-board |
| 6 | Environmental sustainability | Exploit the electrification programme fully |

## Supporting wider economic regeneration, spatial planning and other policies

The following section is primarily based on interviews conducted by Greengauge 21 in February 2012 with GWP public sector member authorities (full list at Appendix A).

*Urban Regeneration Plans and Policies*

Across the corridor, and especially in the major urban areas, the planning authorities have adopted economic development strategies and spatial plans that seek to build on the accessibility provided by the GWML. In the cases of Cardiff, Bristol and Swindon, for example, this means major city regeneration programmes located adjacent to the main railway station. These policies rely on GWML services to achieve:

- High levels of accessibility for business journeys/visitors;
- An opportunity for businesses located in urban centres to achieve the high productivity and efficiency that rail based travel offers over car-use;
- A means of achieving sustainability objectives, both for the planning authorities and the businesses attracted to locate in these prime locations through the use of lower-carbon transport; and

- The opportunity for employees to choose rail as a preferred mode of commuting.

There is an inter-dependency between these policies and the positive evolution of rail service provision which will in part determine the success of private sector property-based developments.

**Cardiff Development Strategy**

Cardiff's major regeneration project and inward investment offer – the Central Business District – will be wrapped around Central Station. Rail links are mentioned as important by all potential investors – particularly those to London - as are the links to Heathrow, which is seen as a local airport.

A number of Cardiff businesses and public sector institutions have links to Brussels and prefer to use the train to London and then Eurostar.

More data centre companies are moving into South Wales as Canary Wharf and other London locations become less affordable.

There is a high-level skills base in Cardiff and the Valleys and the Valley lines network provides good access into Cardiff (as well as providing a valued access facility to the longer distance GWML services). With a wide and expanding employee catchment, the rail network is very important to Cardiff's competitiveness.

There is a bedrock of commerce that is reliant on the rail network. A quarter of the Cardiff workforce is employed in the financial and professional services sector and there is a need for frequent journeys to other UK locations. Another growing sector is media and creative (the BBC has located new studios in Cardiff Bay).

There has been a lot of investment in the hi-tech sector in Cardiff, in conjunction with the Universities, and this is attracting a number of high skilled staff to the area.

The Temple Quarter of major office development around Temple Meads station in Bristol has been successful and will develop further. Current thinking includes the possibility of restoring the historic Brunel trainshed at Temple Meads station and bringing it back into use for some of the new IEP services. This would reduce access times to the fast GWML services from Bristol to London.

In the case of Swindon, the town centre is in need of regeneration. There is a surfeit of unfit for purpose office floor-space (from the 70s/80s), which need to be replaced to attract new business. There is a latent demand for modern, economical office space and a better retail offer. Swindon Council is hopeful that an outline scheme for town centre redevelopment at Union Square will go ahead later this year (2012), helping strengthen its role as a regional destination.

In other urban areas, the distribution of growth opportunities is somewhat more dispersed – with substantial business/industrial parks at Reading and Slough, for example. And in the Bristol area, there are in fact three major development sites:

- Filton Airfield, could provide up to 5500 new homes and 30 ha of retail/commercial land – (near but not adjacent to Bristol Parkway);
- Enterprise Zone at Temple Quay, around Bristol Temple Meads station (as mentioned above); and
- Emersons Green Science Park, which could create up to 5000 jobs and which opened in September 2011 (with good access to the M4/M5, and Bristol Parkway station).

Slough's economy is dependent on good links to both central London and to Heathrow Airport. It has changed over the last 20-30 years from having a manufacturing basis to now being a centre for company headquarters including in the ICT, biopharmaceuticals, automotive and media and cultural sectors. Research and development and data centres are also growing strongly.

A high concentration of European and other International businesses have their HQ buildings in Slough including Citroen; Mars; O2; Honda: Amazon; Axa Novell; Burger King. There are approximately 83,000 jobs in Slough including 18,000 on Slough Trading Estate.

Slough Council is keen to retain companies currently based in Slough and to attract new ones. All of the companies based in Slough need to get to both London and Heathrow Airport regularly and need a frequent, express service to Paddington.

*Regions and Sectors*

But it is also evident that increasingly business and employment networks are being viewed as operating at regional level. The decisions that Admiral Insurance has taken to establish employment centres in each of Cardiff, Newport and Swansea is an example in practice.

It is clear that the Cardiff/Severnside/Bristol areas are emerging to become a single economic region – and one with a population greater than Scotland. The councils of the cities of Cardiff, Bristol and Swindon have recognised the important economic inter-linkages and of enhancing inter-connectivity, with a 'Western Way' agreement and a memorandum of Understanding signed in April 2011.

The Welsh Government has a list of prioritised business sectors it wishes to attract including professional services and life sciences - both of which require high levels of business connectivity – and construction, advanced materials and manufacturing (particularly aerospace), which may give rise to new rail freight flows (see Chapter 4).

*Reducing Carbon and Improving Air quality*

Road-based transport is dominant across the corridor as a whole. There is a high level of car dependency and the transport sector will be a significant contributor to regional-level carbon emissions.

To take a specific example, with the M4 experiencing congestion at peak times and a large capital outlay of over £0.5bn required to address the problem (but no apparent political appetite to do so) the air quality around Newport is poor. The Council is keen to decongest the road network by encouraging more people to use rail.

*Sustainable Freight Policies*

Increasing the volumes of rail freight is seen as desirable because it enables road traffic to be reduced. Network Rail has reported above average growth in rail freight through south Wales and the Severn Tunnel. There are national distribution centres in south Wales, such as Wilkinsons and Tescos, which have expressed interested in moving more freight by rail.

A large waste incinerator has been discussed for south west Wales which could serve south west England, potentially bringing more rail freight traffic. Avonmouth port has plans for expansion and could take the largest container ships leading to more freight on rail (subject to some rail loading gauge constraints being resolved)

There are a number of metals and recycling companies basing themselves in the Newport area and Newport Council would like to encourage them to transport their goods/waste by rail. Ebbw Vale has been designated an Enterprise Zone and is becoming a centre for the automotive industry. This could also lead to the transportation of goods by rail.

Swindon too is very keen to support and encourage the automotive industry. Both Honda and BMW, which has a large rail connected warehouse in Swindon, are significant to the national economy as well as locally. Swindon is keen to encourage both companies to transport their goods by rail.

*Social Policies*

The South East Wales Economic Forum, SEWEF, which covers the 10 local authorities in SE Wales, reports that Blaenau Gwent has the highest level of generational unemployment in the UK. The evolution of a commuting pattern from the valleys to employment centres along the coastal belt has been continuing for several decades, but at times of economic downturn, the pressures can become severe. A recent report by a coalition of charities highlights the extremities of 'transport poverty' in South-East Wales, where over 10% of household income is spent on necessity travel such as commuting to work (Citizens Advice Bureau, Age Cymru, Save the Children and Sustrans, 2012). This transport poverty is in evidence for over 50% of households in Blaenau Gwent, Merthyr, Caerphilly, Rhondda Cynon Taf, Torfaen, Bridgend, and Newport.

A major problem with the use of rail is unaffordability, and this is particularly the case for journeys that entail travel on main line services. As the work carried out for the Welsh Government has shown, it is clear however that a good commuter rail network can help sustain the decline of villages and less well-located towns, reducing population loss (Mott Macdonald, 2010).

South-East Wales is currently in a vulnerable economic position, yet neither Newport nor Cardiff is significant enough to solve the dire unemployment and poverty-related problems of the region in isolation (Centre for Regional Economic and Social Research, 2011). Better connectivity of a dispersed settlement pattern is seen as crucial by Newport Council, SEWEF and others to create a critical mass of employment opportunity to address this problem. These issues also arise further west in South West Wales.

*Wider infrastructure policies*

The Western Rail Access to Heathrow was identified as a 'strategic gap' in Network Rail's London and the South East Route Utilisation Strategy of July 2011. It was subsequently included in the rail industry's 'Initial Industry Plan' of 2011, which forms part of the process by which options are reviewed and formulated into a programme of investment and other policies for the period 2014-19. It also is referenced in the Government's National Investment Plan.

**Table 3.4 – Policy Drivers**

| | Policy | Characteristics |
|---|---|---|
| 1 | Economic regeneration, development and spatial policy | Acting at the city-region level<br>Substantial focus on city centre development |
| 2 | Reducing carbon and improving air quality | Achieving a mode share shift from road-based transport |
| 3 | Sustainable freight | Supporting rail-based industry and development |
| 4 | Reducing social inequality | Access from areas of high worklessness<br>Realistic fares |
| 5 | Improving access to national gateways | Western rail access to Heathrow |

# 4. Demand and Benefits

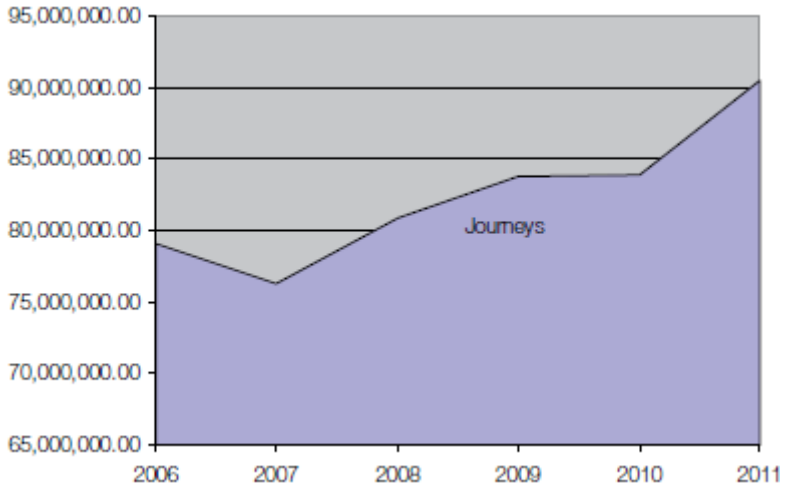
## Demand on the Great Western Route

*Passenger Demand*

The overall position of the GWML and its prospects were the subject of a comprehensive RUS published by Network Rail following consultation (Network Rail, 2010). This work revealed that, alongside the substantial programme of investment (see next Chapter), there was an expectation of very substantial demand growth – with passenger and freight demand very roughly expected to double over the twenty years to 2030.

In the recently published list of the top 10 most crowded trains in the London area (August 2011) services operated by First Great Western (the current franchised operator of most main line services on the GWML) accounted for all 10 of them.

**Figure 4.1– FGW passenger journeys 2006-2011**




*Source: Great Western Franchise Replacement Consultation, DfT, Dec 2011*

Demand for passenger services over the corridor to/from Paddington grew at 4.2% per annum over the ten years to 2007/8 (Network Rail, 2010, Figure 3.8). While the economic downturn and the period of high fuel prices have affected road traffic levels, rail usage has continued to rise. The network today faces significant pressures, especially over the section between Reading and Paddington and also in the Bristol area. Forecasts show that, without further measures, services between Cardiff and Bristol would be operating with inadequate capacity, with morning peak load factors of over 130% (passengers to seats) (Network Rail, 2010, Figure 5.5).

Of course, it is expected that with a speeded up and more frequent timetable, there will be both more capacity on offer with new electrified train fleets and a substantial uplift in demand, above the trend expectation. The publication of the Great Western RUS pre-dated final decisions on the IEP train fleet and on the rolling stock that will be deployed over the electrified sections of route – indeed, these matters are still not finalised. However, the current plans (described further in Chapter 5) would see the number of 125 mile/h non-stop services each hour increased from 4/5 (today's level, between Didcot and Swindon) to 6/7.

*Airport Access*

It was highlighted in the 2003 Aviation White Paper that 70% of air passengers travelling to and from Wales and the South West use airports in England, in particular Heathrow and Gatwick. This reliance on Heathrow and Gatwick is borne out by more recent statistics from the CAA, summarised in Table 4.1. Over 4.5m passengers from the South West use Heathrow and Gatwick airports, only slightly less than the numbers using the local Bristol and Cardiff airports. For Wales as a whole, 1.2m passengers use Heathrow and Gatwick, around half of the numbers using Bristol and Cardiff.

**Table 4.1 – Origin/destination of terminating passengers, UK airports**
**Thousand passengers, 2008**

| | Gatwick | Heathrow | Bristol | Cardiff |
|---|---|---|---|---|
| South East[1] | 25,441 | 35,185 | 76 | 8 |
| South West | 1,693 | 2,893 | 5,126 | 105 |
| Wales | 439 | 773 | 781 | 1,787 |
| Total | 30,199 | 43,238 | 6,101 | 1,925 |

*1. Includes Greater London*
*Source: CAA Passenger Survey Report, 2008*

This has implications for the mode of surface transport used to access the airport, as summarised in Table 4.2 for passengers using Heathrow Airport. The proportion of air passengers travelling to the airport by private car (or taxi) is similar, at around 60%, for those from the South West and Wales to those from the South East, although clearly, passengers from the South West and Wales will be making far longer journeys by road. The usage of the rail network by South West and Wales passengers, however, is substantially lower than for South East travellers, with much more reliance on coach and bus networks.

**Table 4.2 – Arriving mode of transport, Heathrow Airport**
**Percentage of total terminating passengers, 2008**

| | Private | Coach/bus | Rail/ underground | Other | Total |
|---|---|---|---|---|---|
| South East[1] | 61.9 | 9.2 | 28.5 | 0.4 | 100.0 |
| South West | 58.3 | 33.4 | 8.3 | 0.0 | 100.0 |
| Wales | 57.8 | 29.8 | 12.4 | 0.0 | 100.0 |

*1. Includes Greater London*
*Source: CAA Passenger Survey Report, 2008*

*Freight Demand*

The Great Western corridor has substantial freight flows, including many of significance to industry and to distribution networks. Railfreight has a major presence in the movements of metal products (especially steel) to/from South Wales, in handling aggregates (which nearly all make use of the critical Reading –London section of route), in moving containers by the trainload (especially from Southampton, but also other ports, including to a terminal in South Wales) and also coal traffic (and also biomass) to/from ports including those at Bristol to power stations. There are very substantial benefits in these traffics being on the rail network rather than on the road system, where many additional lorry movements would be needed.

The Great Western RUS envisaged that freight flows over the network would increase substantially, with flows over the Reading – London section increasing from 19 train paths/day in

each direction in 2019 to 56 by 2030 – which means running between 3 and 4 freight trains each hour over the pair of tracks that also have to accommodate Crossrail and other local services. Between Didcot and Oxford, over the Southampton – Midlands route that is very important for unitised (containerised) traffic, the rate of increase was not expected to be so high – from 25 paths/day in each direction in 2019 increasing to 39 by 2030.

However, while the RUS was only completed two years ago, it is already looking to be somewhat outdated. The latest forecast by MDS Transmodal for the Railfreight Group is based on the trends through the period of economic downturn, which has seen road haulage tonnages drop, but railfreight increase. While container volumes through the nation's ports were the same in 2010 as they were in 2005, container volumes shifted by rail have grown substantially (by 29%), taking market share from road. With an enhanced loading gauge route available from Southampton to the Midlands (which makes use of the GWML between Reading and Didcot), rail increased its share of Southampton flows from 30% to 36% following completion of the works in April 2011. Overall, MDS Transmodal expect railfreight flows (measured as train-km) to increase by 120% over the period 2010 -2030. The Great Western RUS had expected only a 55% increase in freight trains/day over the period 2006 to 2030 (also based on a forecast from MDS Transmodal). As a result, freight paths/day per direction would increase over the Reading – Didcot section from 17 today to 49 by 2030.

One area of growth that remains at an embryonic stage yet could be significant is the introduction of domestic intermodal rail freight traffic in the Great Western corridor. To date, this kind of traffic, which is largely built around the distribution systems of the Supermarkets, as been concentrated on movements between national distribution centres in the South Midlands and Scotland. But a new flow is starting early this year between Daventry and South Wales to serve this market – and movements to the South West could follow.

*Longer Term Capacity Challenges*

It has been pointed out by industry commentators that increasing the number of intercity services, as current IEP plans indicate may be expected, would make it virtually impossible to find suitable paths for freight services over what is essentially a two-track section of railway (Modern Railways, 2012, page 49). While solutions exist – investment in more and longer freight loops would be the 'standard' industry answer to this type of capacity challenge, there may be other prospects – as indeed the Great Western RUS identified – that bring wider benefits. Anticipating this type of problem, Network Rail identified the scope in the longer term for this section of route to be provided with additional tracks and saw this, together with a possible grade separation of the sub-standard junction at Wootton Bassett as a possible opportunity to create a pair of tracks suitable for operation at speeds above 125 mile/h (Network Rail, 2010, page 225). Speeds over 125 mile/h become feasible (subject to power supply, track condition and power supply considerations) once the planned move to cab-signalling under ERTMS is completed.

In a subsequent report, Network Rail was less sanguine about how the capacity challenge at the eastern end of the GWML would be tackled (Network Rail, 2011). This work in 2011 suggested that the GWML was one of three major routes into central London for which by the late 2020s it was not possible to identify a viable capacity solution that would meet the aspirations of all of the various train company operations.

In capacity terms, the most crucial section of the GWML is the Reading – Paddington section of route. Adding capacity to this route may be feasible up to a point, but east of Airport Junction it becomes increasingly difficult to envisage solutions short of building new lines – probably in tunnel for significant sections of route. And there is also a question of terminal capacity to consider too.

The benefits of investing over this part of the corridor are much greater than further west. As the Great Western RUS points out, if capital investment is required to have a benefit:cost ratio of 2:1, then it becomes possible to justify £129m over this section of route for every single minute of time saved on long distance services: this amount diminishes to £54m for investment over the Reading

– Swindon section and to £21-23m, for the sections west to Bristol via Bath and to South Wales (Network Rail, 2010, Appendix F). Yet it is also the case that rail already has a high share of travel to/from central London, and so the benefits in terms of mode diversion from investment in this area – while beneficially affecting the highest numbers of travellers – is perhaps the least likely to lead to diversion of traffic from other modes, with the wider benefits that would bring.

This is an anomaly that is recognised by Network Rail, which notes that over sections such as Bristol – Swansea, the scope for a significant switch in mode choice from service improvements is much greater (Network Rail, 2010, §5.8.7.3).

## Quantification of Benefits

With regard to the evidence on benefits, once we look beyond the existing investment programme for which full business case have been developed, the position is rather weak. There is growing interest in adapting and extending appraisal methodologies to examine the impact of transport investments on regional/local GVA levels, and to look explicitly at the changes in the level and distribution of employment and development that may ensue, there is as yet no agreed methodology for doing so.

While work in this area remains exploratory, we have discovered that there is some good research which was largely conducted under the auspices of the South West RDA, and we have drawn on this here extensively. While this is of great value – since it draws on material from the Great Western corridor (although also extending its research base into Devon/Cornwall, which lie beyond the remit area of the GWP) – it does not directly address the type of investment options that lie ahead for the GWML.

Of greater concern is the lack of evidence of 'conventional' benefit measures from, for instance, the introduction of high-speed services over the GWML or the creation of regional metro services on the soon-to-be electrified railway through the Severn Tunnel. Addressing this shortcoming should be a priority for the Partnership in its forward programme.

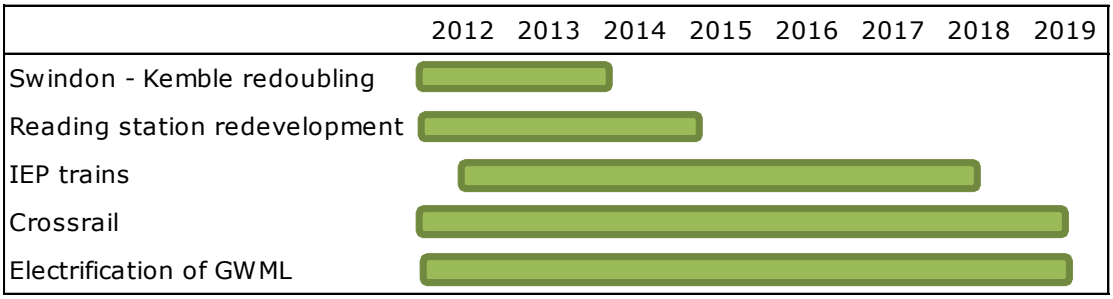
One area where some work has been carried out is for the Western Rail Access scheme. One limitation of this work is that it concentrates on a Reading – Heathrow service, which the evidence collected here suggest would be seen as only partially meeting the needs of the corridor – direct services from Bristol/Cardiff would be very helpful to business development across the wider corridor.

Nevertheless, preliminary work carried out on to date on the business case for WRAtH suggests there may well be a financial case for implementation of the scheme. With a capital cost of £417m (including a 25% provision for optimism bias), the additional revenues generated, net of operating costs, it is estimated, would provide payback after nine years of operation. A full business case, including benefits estimation, is required to be compliant with DfT appraisal methodology.

# 5. Committed Developments

A substantial programme of enhancements to GWML infrastructure and rolling stock is currently underway and will be completed over the next decade. The key elements of this programme are summarised in Figure 5.1 below.

**Figure 5.1 – GWML investment programme**




## Swindon – Kemble Redoubling

The reinstatement of double track over this 12-mile section of route will enhance capacity of the route to Cheltenham and improve robustness during service diversions when the Severn Tunnel is closed. The project is taking place during the current 2009 – 2014 control period.

## Reading Station Area Redevelopment

The redevelopment of Reading station and the surrounding track layout is currently underway, with completion expected in spring 2015. Intended to relieve the bottleneck on the GWML, the work comprises new platforms, a new station entrance, track work and the grade separation of Reading West Junctions. When complete, the scheme will allow an additional four train paths per hour in each direction to operate, along with an improvement in train performance in part through reducing the number of conflicting movements.

## Intercity Express Programme

From early 2017, new Intercity Express trains are expected to be delivered to the franchisee, with the full fleet available from early 2018, and the opportunity for a full timetable change to exploit the performance of the new trains together with the route electrification able to come into effect from May 2018. The IEP contract is based around a given number of train sets in service each day, with the overall fleet size determined by the train supplier, not the franchisee. Proposed allocations of IEPs are set out in Table 5.1 below.

**Table 5.1 – Proposed allocations of IEP weekday diagrams**

| Length | Mode | Quantity |
|---|---|---|
| 5-car | Bi-mode | 26 |
| 8-car | Electric | 11 |
| 8-car | Bi-mode | 12 |
| **Total** | | **49** |

*Source: Department for Transport, 2011*

The indicative timetable that has been developed for the introduction of the IEP service brings many benefits. It provides for:

- A new half hourly fast service between Bristol Temple Meads and Paddington, with just one intermediate stop at Bristol Parkway
- A continuation of a twice hourly Bristol service via Bath
- The introduction of an hourly Cheltenham service (doubling existing frequencies)
- Creation of a faster South Wales service by having one of the two trains/hour run non-stop between Newport and Reading.

## Crossrail

Crossrail is a new west–east railway linking Maidenhead and Heathrow in the west via tunnels under central London to Shenfield and Abbey Wood in the east. It will add significant capacity to London's rail network through the provision of up to 24 high-capacity, 10-coach trains an hour in each direction in the central section between Paddington and Liverpool Street during peak periods. Crossrail services will commence from 2018.

## Main Line Route Electrification

The Government has confirmed its commitment to electrification of the GWML for the routes between London Paddington and Oxford, Newbury and Bristol by the end of 2016, with an extension to Cardiff by the end of 2017. The majority of construction work is proposed to take place between 2014 and 2016. The scheme will allow the progressive introduction of electric passenger train services on main line, regional and suburban services and with selected electric haulage of freight services.

The first drive to install ERTMS will take place on the Great Western Main Line as part of the large-scale resignalling of the line, coinciding with the arrival of new trains and electrification.

# 6. Next Steps

## Vision

The Conditional Output Statement sets specific measures for the rail industry for which there is clear evidence that there will be economic returns to the Great Western Corridor.

These measures provide for the development of the existing GWML through a programme of continuing improvement into a high-speed route. The cities served by the GWML will be on the national HSR network.

The aim in incorporating the GWML into the national HSR network is not just to shrink journey times, but also to create the capacity that will allow the creation of regional metro networks and the development of other local services – and accommodate an increasing volume of railfreight. The aim, in short, is to create a framework so that South Wales and the South West have a transport system that will support an environmentally sustainable, expanding economy.

## In the Short Term

One of the aims of the Conditional Output Statement is to provide the Great Western Partnership with a clear set of priorities to feed into the Great Western franchise consultation, underway in spring 2012. It is important to recognise, however, that the Government's approach to franchising is evolving and is likely in future to involve a significantly less prescriptive franchise specification. This would provide bidders with greater freedom than before to propose rail service patterns that they consider most efficiently meet the needs of the franchise and also greater flexibility to change rail services in future in response to changes in demand or other external factors.

The implication is that it is as important for the GWP to engage with the Great Western franchise bidders and with the eventual successful franchisee in order to secure delivery of the short-term Conditional Outputs, as it is to respond to DfT's franchise consultation. Given the scale of works currently underway on the GWML, as discussed in Chapter 5, Network Rail will also have a key role in ensuring the infrastructure required to deliver the desired Conditional Outputs are made available.

## Long Term Planning

One of the Conditional Outputs is a long term plan for the corridor covering a 25 year period.

A new approach to the planning work is needed. Long term plans require flexibility, so they can be updated periodically for changing circumstances. While this inevitably introduces some uncertainty, updates are used to refine timings and detailed content, but not in general the strategic direction. The existence of a long term plan for the GWML is itself likely to be beneficial to economic investment plans in the wider economy.

While the rail industry has the expertise needed, it does not have the understanding that the GWP provides of the needs of the wider economy – needs that in large measure provide the rationale for investment decisions. We propose that there should therefore be a partnership, between the GWP and the rail industry (Network Rail and the relevant train operation companies) with DfT/Wales Government playing a supporting role. This partnership would adopt a two year programme with the following key steps envisaged:

1. Identification and appraisal of a long term strategic investment plan as specified in the Conditional Outputs. This would need to establish a position on issues such as the high-speed network, and on network capacity on the London approaches

2. Sub-regional studies, to establish within the strategic framework how best to resolve challenges and opportunities arising in the following critical areas:
    a. Bristol – Cardiff, *where there is a clear aspiration to achieve the agglomeration benefits of the cities working in tandem and maximising the value of investments that each city is anticipating, including in commuter rail services;*
    b. Reading – London, *where as yet there is no agreed solution to the foreseeable capacity shortfall, given the demands of Crossrail, intercity, Heathrow Airport and freight services;*
    c. Swindon commuter network*, where there are local benefits but also potential strategic gains for the corridor as a whole;*
    *d.* Cardiff to West Wales, *where average speeds are low.*
3. A reconciled overall plan for the GWML, building on existing investment commitments and the results of the three sub-regional studies.

The economic evidence highlights the problems for future economic growth in those areas beyond a two hour London journey time threshold. GWP will need to give consideration to the opportunities to improve services and times for those places west of Cardiff and Bristol where infrastructure investment and service planning decisions are likely to have an especially critical effect on economic performance.

# Appendix A Interviews carried out by Greengauge 21

Admiral Insurance

BAA

Bristol City Council

Cardiff & Co

Cardiff Business Partnership

Cardiff County Council

Centrica

GWE Business West (Bristol and Swindon)

Newport Council

North Bristol SusCom

Prof Stuart Cole

Slough Council

South East Wales Economic Forum

South East Wales Transport Alliance

South West Wales Economic Forum

South West Wales Integrated Transport Consortium (SWWITCH)

Swindon Borough Council

Thames Valley Berkshire Local Enterprise Partnership

Thames Valley Chamber of Commerce

Welsh Government

West of England Partnership

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