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SOUTH OF ENGLAND NORTH-SOUTH CONNECTIVITY: ECONOMIC STUDY

FINAL REPORT

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**Wiltshire County Council, Dorset County Council and Bath &
North East Somerset Council**

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TABLE OF CONTENTS

	Quality Management.....	1
	Tables.....	iv
	Figures.....	iv
1	EXECUTIVE SUMMARY	1
1.1	CONTEXT.....	1
1.2	WHY IMPROVED CONNECTIVITY IS SO IMPORTANT	1
1.3	WHAT CAN BE ACHIEVED.....	3
2	INTRODUCTION.....	4
2.1	BACKGROUND.....	4
2.2	THE STUDY AREA.....	4
2.3	PURPOSE OF THE STUDY.....	6
2.4	STRUCTURE OF THE REPORT.....	7
3	STUDY PRINCIPLES AND APPROACH	8
3.1	INTRODUCTION.....	8
3.2	ECONOMIC CONTEXT AND THE NEED FOR IMPROVED CONNECTIVITY.....	8
3.3	WIDER IMPACTS MODELLING	8
3.4	OTHER ECONOMIC IMPACTS.....	9
3.5	QUANTIFICATION OF IMPACTS	9
3.6	OPTIONS ASSESSMENT.....	9
4	THE NEED FOR ENHANCED NORTH-SOUTH CONNECTIVITY	10
4.1	INTRODUCTION.....	10
4.2	THE ECONOMIC GEOGRAPHY OF THE AREA	10
4.3	SWINDON AND WILTSHIRE.....	10
4.4	DORSET.....	15

4.5	BATH AND NORTH EAST SOMERSET	19
4.6	BOROUGH OF POOLE	22
4.7	SUPPORTING CORE STRATEGIES AND GROWTH PLANS	23
4.8	BUSINESS SURVEY	24
4.9	CONCLUSIONS.....	26
5	WIDER ECONOMIC IMPACT MODEL.....	28
5.1	INTRODUCTION.....	28
5.2	DEFINITION OF AGGLOMERATION (FROM WEBTAG UNIT A2.1)	28
5.3	MODEL STRUCTURE	29
5.4	STUDY AREA DEFINITION	31
5.5	KEY DESTINATIONS DEFINITION.....	31
5.6	JOURNEY TO WORK DATA PROCESSING	33
5.7	GENERALISED COST OF TRAVEL	33
5.8	HOW THE MODEL CALCULATES WIDER IMPACTS.....	34
5.9	MODELLING CORRIDOR SCENARIOS.....	35
5.10	ANALYSIS OF THE GIS DATA.....	35
6	ECONOMIC POTENTIAL	38
6.1	INTRODUCTION.....	38
6.2	AGGLOMERATION BENEFITS – INITIAL TEST RESULTS.....	38
6.3	AGGLOMERATION BENEFITS – MAIN WORK	39
6.4	SENSE CHECKING AND SENSITIVITY TESTING	39
6.5	OTHER ECONOMIC BENEFITS	40
7	OPTIONS ASSESSMENT AND REFINEMENT	42
7.1	INTRODUCTION.....	42
7.2	DFT’S EAST TOOL.....	42
7.3	EARLY EAST ANALYSIS.....	42

8	CONCLUSIONS.....	47
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TABLES

TABLE 5-1	SUMMARY OF KEY DESTINATIONS IN STUDY AREA.....	32
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FIGURES

FIGURE 2-1	STUDY AREA	5
FIGURE 4-2	GVA PER HEAD: WILTS CC V UK AVERAGE	11
FIGURE 4-3	STRATEGIC TRANSPORT CORRIDORS IN WILTSHIRE.....	13
FIGURE 4-4	PRINCIPAL HOUSING AND EMPLOYMENT SITES IN WILTSHIRE	14
FIGURE 4-5	GVA PER HEAD: BOURNEMOUTH AND POOLE / DORSET CC V NATIONAL AVERAGE	15
FIGURE 4-6	KEY TRANSPORT CORRIDORS IN DORSET	17
FIGURE 4-7	KEY FREIGHT TRANSPORT CORRIDORS IN DORSET.....	18
FIGURE 4-8	GVA PER HEAD: BANES, NORTH SOMERSET AND SOUTH GLOS V NATIONAL AVERAGE	19
FIGURE 4-9	TOTAL JOBS TRAJECTORY IN BANES, 2000 - 2013	19
FIGURE 5-1	WIDER ECONOMIC BENEFITS MODEL (SCHEMATIC).....	30
FIGURE 5-2	DEVELOPMENT OF BESPOKE NETWORK (SCHEMATIC)	36
FIGURE 5-3	DEVELOPMENT OF BESPOKE NETWORK – VERSION 2 (SCHEMATIC).....	37
FIGURE 7-1	EAST: A350 CORRIDOR UPGRADE	43
FIGURE 7-2	EAST: A46 / A36 CORRIDOR UPGRADE	44
FIGURE 7-3	EAST: RAIL UPGRADE ON SALISBURY – WESTBURY – TROWBRIDGE – BATH CORRIDOR	45
FIGURE 7-4	EAST: A338 CORRIDOR UPGRADE	46

1 EXECUTIVE SUMMARY

1.1 CONTEXT

WSP | Parsons Brinckerhoff were commissioned by Wiltshire County Council, Dorset County Council and Bath and North East Somerset Council (BaNES) to appraise the wider economic benefits that are being foregone due to constraints on north – south corridor connectivity in the study area.

The objective was not to define technical solutions to the issue (such as the upgrade of a specific corridor) but instead to focus on the current problems associated with a lack of north – south connectivity and the extent of wider benefits that are effectively being lost as a result of this.

This work forms an initial evidence piece given that Highways England (HE) want to understand whether a long term solution can be found to improve north - south connectivity. If a compelling economic case can be made, HE is willing to examine options for improvements that could be taken forward as part of the “Route Investment Strategy (RIS) 2” process.

The study area is defined as a large ‘rectangle’ that covers Dorset and the coastal areas in the south, the whole of Wiltshire, the BaNES area (centred on Bath) and the intersection with the M4 corridor to the north. Although the wider economic benefits will be primarily realised in this area, improved north-south connectivity will also benefit long-distance traffic, especially commercial vehicle movements, from the Midlands into the study area and on to the south coast.

“UK plc” will thus gain from the benefits of enhanced connectivity within the study area (via increased productivity as workers and jobs are effectively brought closer together) *and* the benefits associated with improved trade connectivity between the north and the coast.

Other economic benefits from enhanced north – south corridors will be the ‘unlocking’ of much-needed new developments, especially new housing sites at strategic locations in the study area. Although not quantified at this stage, the land value increases associated with these unlocked developments can be calculated and included as one of the economic benefits of improved corridor connectivity.

These benefits are known as Dependent Development within Department for Transport project appraisal guidance.

1.2 WHY IMPROVED CONNECTIVITY IS SO IMPORTANT

Relatively low productivity (Gross Value Added, GVA, per capita) is one of the most pressing national economic issues at the current time and UK plc is falling behind its competitors as workers are not producing as much output per head compared to other nations.

Given how enhanced connectivity can boost productivity, this is one key reason why improved transport corridors in the region are a critical requirement.

At the moment, GVA per head in Wiltshire (at £19,771) is below the national average with the ‘gap’ between the UK average and that in Wiltshire also growing over time.

This is especially noticeable in recent years where Wiltshire GVA per head has ‘flatlined’ compared to continued growth across the UK. Even in the recovery period after the last recession, GVA per head in Wiltshire has not returned to the previous growth trajectory.

With respect to economic competitiveness (measured by the UK Competitiveness Index), there is evidence that this has declined in Swindon and Wiltshire in recent years with the LEP area's ranking slipped from 12th position to 14th (out of 39) between 2010 and 2013.

There is a similar picture in Dorset where productivity (GVA per head) is considerably less than the national average. Even in the more economically active (and urbanised) Bournemouth and Poole areas, GVA per head is still below the national average.

As well as these differentials with the national average, the gap has also been growing noticeably over time. This is clear from the differential in 1997 (£2,600 per head) being significantly less than the difference in 2014 (over £5,200 per head).

As better connectivity will help close the 'productivity gaps' in both Wiltshire and Dorset, the economic potential of this needs to be tested and this is why DfT's recognised wider impacts methodology has been used to quantify the benefits the region is effectively losing out on.

The BaNES area has different economic characteristics in that there is a high number of small, specialist firms in Bath and the surrounding area. Although the economic importance of these businesses is reflected in relatively high GVA per capita, the continuation of this is very much dependent on businesses being able to draw labour from the wider area, not least from the key A46 / A36 corridor.

The A46 / A36 corridor is also constrained by having to pass through parts of Bath city centre (towards the east) and better north – south corridor connectivity will thus help eliminate this bottleneck.

The economic importance of tourism to the region is also extremely important with existing and proposed attractions generating significant benefits in the form of tourism-related employment and visitor spending.

Under better north – south connectivity, housing and growth plans (as set out in Core Strategies and Local Plans) could be achieved more readily as 1) housing developments would take place on a sustainable basis – such as near Poole where developments away from busy urban areas are much needed – and 2) employment growth plans will be greatly assisted if workers and companies are brought closer together through better transport links.

Also, as noted earlier, DfT's Dependent Development economic impact guidance enables the potential land value gain from unlocked residential development to be included as a further benefit of improved transport connectivity. As the work progresses on enhanced north – south corridors, this can be assessed in more detail.

Results from a business survey of companies in the study area clearly indicate that infrastructure issues are a major concern as are the frequent delays caused by constraints on existing corridors. This is particularly apparent for businesses in Dorset (including commercial haulage companies) where north – south connectivity is impacted by bottlenecks and capacity restrictions on key corridors such as the A350.

What is also clear is that better connectivity on north – south links will take away some of the 'pressure' on the main east to west links in the study area. The east to west links (both road and rail) have traditionally been the major gateways into and out of the region and by improving north – south connectivity, new markets can be opened up whilst workers and businesses will have better access to each other.

1.3 WHAT CAN BE ACHIEVED

Based on DfT guidance on agglomeration improvements, a series of wider impacts have been calculated. A model has been built that enables these to be quantified even though a traffic model is not available at this stage.

The model was run for three scenarios: **Scenario a)** what would the study area gain if current journey times were better on the overall “A36” corridor?, **Scenario b)** what would the area gain if journey times were lower on the A350? and **Scenario c)** compared to today, what is the potential wider impact gain if journey times were better on both corridors?.

The results are summarised below with the values representing discounted benefits over the standard 60-year DfT appraisal duration:

- **Scenario a)**: £7.3 billion of wider (agglomeration) impacts over 60 years;
- **Scenario b)**: £12.2 billion of wider (agglomeration) impacts over 60 years; and
- **Scenario c)**: £20.5 billion of wider (agglomeration) impacts over 60 years.

Agglomeration improvements represent the total impact of improved productivity. Based on data available from sources such as the Office of National Statistics (ONS), it is possible to estimate how many additional jobs could be generated. When indirect and induced employment is included, up to 1,400 new jobs in a typical year could be supported by enhanced connectivity.

Other potential gains will be those to “UK plc” in the form of increased revenues from personal income taxation of these new workers as well as additional corporation tax revenues as firms will be able to produce more economic output (and hence profit) per worker.

The commercial goods sector will also benefit as the unit costs of transport will be lower when journey times are considerably improved, especially on long-distance movements from north to south.

Based on discussions and feedback from DfT, the potential for Dependent Development benefits (i.e. the value gain from land that is unlocked by improved transport connectivity) is another major economic impact that can be taken account of as more detailed work progresses.

2 INTRODUCTION

2.1 BACKGROUND

WSP | Parsons Brinckerhoff were commissioned by Wiltshire County Council, Dorset County Council and Bath and North East Somerset (BANES) Council to undertake a wider economic impact assessment of improving north – south connectivity across strategic transport corridors in the area covered by the three counties.

Improved connectivity is required to support economic growth in the region whilst also addressing the constraints currently posed by the relatively slow journey times and poor journey reliability on these corridors.

It is important to emphasise that the work does not propose specific solutions to improved north – south connectivity (such as widening of a particular road) but instead focuses on the current problem of poor connectivity and the extent of wider economic benefits being foregone as a result of long journey times on the corridors.

The work focuses on compiling evidence that summarises the economic situation in the study area as well as presenting a strong rationale for improved connectivity. Although the study area is diverse in terms of its economic characteristics, there are several reasons why improved connectivity will benefit the area as a whole. These are discussed in more detail in Chapter 3.

One of the key benefits of improved connectivity, for example, is that it will enable travellers and businesses to have better access to key areas of economic activity and employment.

It will also help unlock development sites, not least the much-needed housing and residential developments that cannot proceed at present as there is simply not sufficient highway connectivity to make these feasible.

2.2 THE STUDY AREA

The 'core' study area is shown in Figure 2-1 overleaf. The figure shows the main 'north to south' corridors through the study area, including the key A46 / A36 corridor that provides a strategic link between Southampton, Bath and the conurbation centred around Bristol.

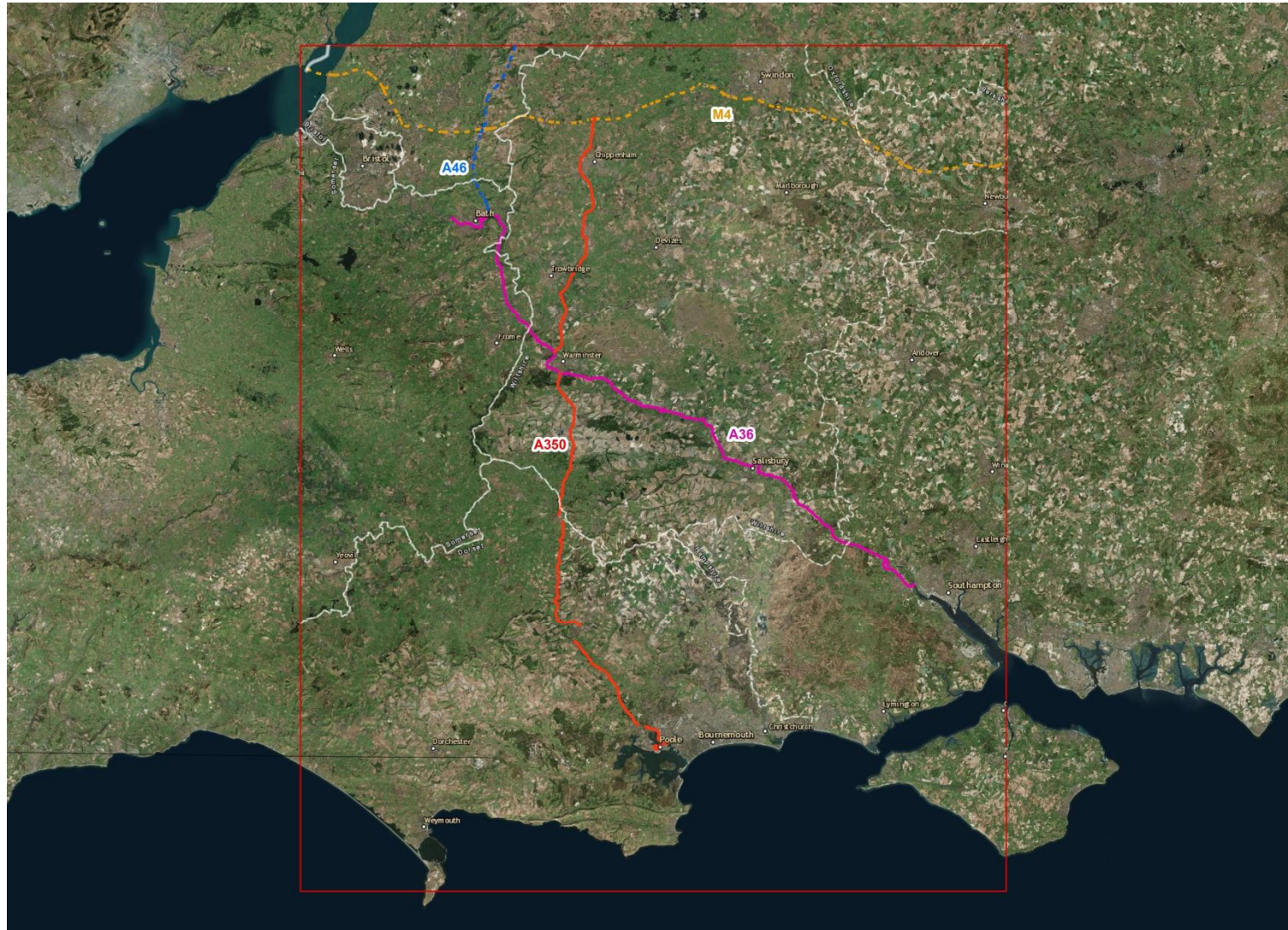
There is also the north – south corridor providing a key link between the south coast towns of Bournemouth and Poole and the major centre of economic activity centred near to Swindon.

In addition to these corridors, there are various other corridors on a broad north – south alignment, including the A350 and the A354 / A338 corridors respectively. There is also the rail corridor linking Southampton and Salisbury with points through Wiltshire and on towards Bath and Bristol. This is a 'cross country' route operated by short diesel trains with relatively long journey times compared with the main line routes from Bristol to London and Southampton to London.

From a transport perspective, the area is thus characterised by relatively long journey times and low levels of journey reliability. This is in contrast to other neighbouring areas where Exeter to the west, for example, is linked to points north via the M5 corridor and Southampton to the east has the M3 (and A34) corridor.

This means that compared to other areas, Dorset and Wiltshire have comparatively poor links to major areas of economic activity to the north.

Figure 2-1 Study Area



2.3 PURPOSE OF THE STUDY

The north - south corridors through the region have been an issue for the local authorities and the local population who use them. Since the demise of the “Roads for Prosperity” policy in the mid-1990s, successive attempts by regional and local promoters to improve the corridors have had limited success. Although the A46 / A36 remains a Trunk Road through the region, for example, there are no proposals in Highways England’s current Route Improvement Strategy (RIS) 1 to upgrade this.

Based on recent meetings with DfT and Highways England (HE), HE wants to understand whether a long term solution can be found to improve north - south connectivity. If a compelling economic case can be made, HE is willing to examine options for improvements that could be taken forward as part of RIS 2.

Previous studies have focussed on current traffic conditions on the main corridors. Although awareness of peak time delays and congestion on the links (both road and rail) has been demonstrated, the theoretical spare inter-urban capacity seems to have led to the conclusion that compared to routes in other areas, the current north – south corridors could not be justified as investment priorities.

In line with Government policy, Wiltshire, Dorset and BANES councils want to look at connectivity issues from an economic perspective. This will enable them to understand how the current transport infrastructure is constraining economic growth, urban renewal and productivity.

Following on from this, the councils also want to consider what investment would be required in the existing and potential new north south movement corridors to realise the economic potential of the region.

This work is also relevant at this time given that Highways England published “The Road to Growth” discussion paper in November 2016. The paper discusses HE’s emerging strategic economic growth plan and aims to maximise the economic contribution of HE and the strategic road network.

The work undertaken here has resonance with the discussion paper as enhanced north – south corridors in the study area will enhance connectivity to the strategically important Port of Southampton. This is clearly shown in different sections of the discussion paper where north – south connectivity with the Port is marked on various maps. Good connectivity to the Port is essential given that it is one of the busiest ports (by freight tonnage) in the UK whilst it is the main port for exports from the UK.

One of the main features of this study is to therefore focus on how improved connectivity could ‘unlock’ the wider economic benefits associated with improved access to jobs (and for businesses, improved access to skilled workers).

Based on recognised guidance (i.e. DfT’s Wider Impacts and Dependent Development guidance), the following impacts underpin this process:

- Increase the labour supply available to employers;
- Improve access to education and training - so that workers can develop skills and maximise their economic potential (economically). This will enable them to increase their productivity which will have benefits to “UK plc” as well as regional benefits;
- Gain economic benefit through agglomeration improvements – agglomeration is a measure of economic activity in a particular area and is linked to productivity levels (economic output per worker). If connectivity is improved, productivity (and hence agglomeration) will also improve

as workers and jobs are brought much closer to each other in terms of journey time and ease of access; and

- Gain potential benefits via the land value increases captured from 'dependent development' (unlocked development sites, particularly new residential developments).

2.4 STRUCTURE OF THE REPORT

This report consists of seven chapters in total and the remainder is structured as follows:

- Chapter Two contains a summary of the study principles and approach;
- Chapter Three contains detailed information of the 'study context' and the prevailing economic characteristics in each area (including early results from a business survey);
- Chapter Four contains a description of the technical aspects of the economic modelling;
- Chapter Five contains the results of the wider impact assessment;
- Chapter Six contains an early assessment of the different options emerging; and
- Chapter Seven contains an overall summary and conclusions.

3 STUDY PRINCIPLES AND APPROACH

3.1 INTRODUCTION

The purpose of this chapter is to summarise the overall approach adopted and the different phases of the work. There are two main elements of the work:

- 1) Establish the need for improved north – south connectivity through analysis of the economic characteristics, growth potential and current impediments to this potential in each area; and
- 2) Based on recognised DfT “Wider Impacts” guidance, develop a series of indicators of the economic potential of the area when north – south connectivity is improved.

For the economic impact element of the work, specific “solutions” are not being put forward at this stage (such as the technical specification of widening the A350, for example). What is being evaluated here are the “problems” associated with poor connectivity. This takes the form of calculating the wider economic benefits that are effectively being foregone given current corridor characteristics in the study area.

3.2 ECONOMIC CONTEXT AND THE NEED FOR IMPROVED CONNECTIVITY

Based on meetings with representatives from each of the councils and data collation, the ‘context’ of the study and why north – south connectivity is so essential has been set out. This is covered in Chapter 4 with each council area addressed separately.

A significant amount of data has been obtained from a variety of sources, including national data (from ONS etc.), local authority data – specifically that from economic development and planning teams, and data from the relevant LEPs (in this case, Swindon and Wiltshire, Dorset and West of England LEPs).

The ‘context’ is also supported by the results obtained from a business survey developed using DfT guidance. Business surveys are relevant as they allow information to be gathered on the characteristics of businesses in the area and their dependence on good transport infrastructure.

The business survey also enables tourism businesses to respond (as well as manufacturing and other types of businesses). This is especially relevant given the importance of the tourism sector in the study area. As well as extensive current tourism activity, several new major sites are also planned and these are described in more detail in Chapter 3.

3.3 WIDER IMPACTS MODELLING

One of the key objectives is to calculate the wider economic benefits that the area is effectively foregoing due to poor north – south connectivity. As described in Chapter 4, the methodology is based on DfT “Wider Impacts” guidance as set out in WebTAG Unit A2.1.

The main feature of this guidance is the calculation of agglomeration improvements once connectivity has been improved in a defined area. There are several advantages of this method:

- It is recognised by DfT (and Highways England) when major scheme appraisal is being undertaken and is based on UK Treasury Green Book guidance;
- It captures improvements in productivity – one of the key economic metrics that the Government is looking to improve;

- It enables benefits covering the whole study area to be captured – in other words, the benefits are not just along the corridor itself but across all Local Authority Districts (LADs) in the defined area; and
- It allows the ‘problem’ of current poor connectivity to be quantified by means of testing the impact if better north – south connectivity existed – i.e. a specific engineering-based solution does not need to be developed at this stage. Instead, the impact of significantly improved connectivity can be tested through different journey time improvement assumptions.

3.4 OTHER ECONOMIC IMPACTS

Current DfT wider impact guidance focuses on the benefits of enhanced connectivity between workers and jobs (with the productivity gains this generates). As well as these agglomeration impacts, however, a number of other wider economic impacts are also likely to arise.

These include the following:

- Additional direct employment opportunities supported by the additional GVA generated;
- Indirect (and induced) employment generated from the spending of the additional direct employees;
- The gains to commerce and businesses from improved connectivity; and
- Tourism gains through increased visitor numbers and spending.

Although these types of impacts are not traditionally captured using standard DfT guidance, they are important to take into account given the role tourism, for example, plays in the area. Long-distance commercial (HGV) traffic between the south coast in Dorset and points much further north – as far as the West Midlands, for example – is also taken into account.

Another potential impact is ‘dependent development’ whereby land value gains from unlocked development can be quantified as an additional benefit. As the appraisal of north – south corridor improvements progresses (and more focus is given to specific corridors), these benefits can be calculated as particular residential and commercial developments start to be identified throughout the study area.

3.5 QUANTIFICATION OF IMPACTS

Having developed the methodology and run the wider impact model, a series of economic impacts (such as agglomeration improvements) are quantified. These are reported in Chapter 5.

This chapter also contains the findings and results of the other economic impacts.

3.6 OPTIONS ASSESSMENT

Although specific, engineered ‘solutions’ to north – south connectivity are not proposed here, a series of high-level option assessments have been undertaken based on using DfT’s Early Assessment and Sifting Tool (EAST).

EAST is a decision support tool developed to quickly summarise and present evidence on options in a clear and consistent format. Given that it provides decision-makers with relevant, high level information to form an early view of how options perform and compare, it is relevant here as it forms a useful input to the next phases of the work (where more detailed options are evaluated).

4 THE NEED FOR ENHANCED NORTH-SOUTH CONNECTIVITY

4.1 INTRODUCTION

In this chapter, the following is set out:

1. The study area and study geography;
2. Economic characteristics of the area (covering GVA, GVA per capita, employment and population);
3. Transport and travel characteristics of the area;
4. What is the evidence base?; and
5. Further details of consultation and responses (including results from the business survey).

4.2 THE ECONOMIC GEOGRAPHY OF THE AREA

Before describing specific transport constraints in the area, it is necessary to understand the economy of the study area and how growth of this economy is affected by transport issues. From a geographical perspective, it is necessary to review each area separately as each has different characteristics. Given the geographical coverage of the Local Enterprise Partnerships (LEPs) in the area, these are used as the key reference points:

- Swindon and Wiltshire;
- Dorset;
- West of England (covering Bath and North East Somerset); and
- Borough of Poole.

Each is discussed in turn.

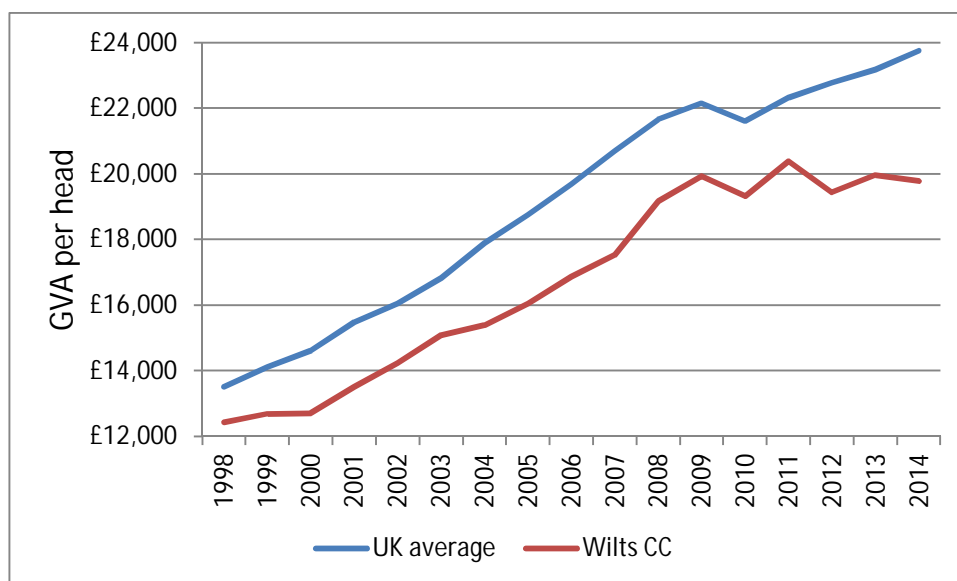
4.3 SWINDON AND WILTSHIRE

Swindon and Wiltshire is a diverse area comprising the urban centres of Swindon, Chippenham, Trowbridge and Salisbury, market towns, rural villages and extensive countryside. There are almost 700,000 people living in the LEP area as of 2014 (up from 600,000 as relatively recently as 1998).

Office of National Statistics (ONS) data highlights a major characteristic of the area – Gross Value Added (GVA) per head in Swindon (£30,945 in 2014), one of the key measures of productivity, is among the highest in the country outside London and considerably above the UK average (£23,755). By contrast, GVA per head in Wiltshire (£19,771) is below the national average and when considering how this differential has been changing over time, the ‘gap’ between the UK average and that in Wiltshire has been growing over time.

This is especially noticeable in recent years where Wiltshire GVA per head has ‘flatlined’ compared to continued growth across the UK. This is shown in Figure 4-1 overleaf where the trend over time is clear, especially in the recovery period after the last recession where GVA per head in Wiltshire has not returned to the previous growth trajectory.

Figure 4-1 GVA per head: Wilts CC v UK Average



Given the importance of improved connectivity as a means of boosting productivity, the role improved transport links can play in Wiltshire can be seen here.

With respect to economic competitiveness, there is evidence that this has declined during the last decade. The UK Competitiveness Index, for example, benchmarks the relative competitiveness of individual local economies using a basket of indicators. The 2013 index (the most recent available) shows that Swindon and Wiltshire was ranked 14th out of 39 LEPs in England. Between 2010 and 2013, its ranking slipped from 12th position to 14th.

The LEP's Strategic Economic Plan (SEP) also states that connectivity is a key enabler of economic growth and is central to the SEP. Although Swindon and Wiltshire have direct access to London, Bristol and Reading (and international gateways such as Heathrow Airport), businesses in the area encounter a number of significant transport-related barriers.

Without interventions and targeted investment, these barriers are likely to become more pronounced over time. In a series of workshops convened to support a new Transport Vision for the area, stakeholders identified the following transport barriers:

- Indirect and infrequent north and south rail connections;
- Poor southeast–northwest links between the south coast and Bristol;
- Comparatively high traffic levels through settlements along core roads;
- Limited capacity on the A350, a key north-south freight route; and
- The southeast–northwest A46 / A36 corridor provides a poor link between the south coast and Bristol.

In addition to these constraints, it is also acknowledged that there is low productivity in Wiltshire (measured in terms of either GVA per capita or GVA per hour worked). Given that low productivity is one of the most pressing national economic issues, the ability of enhanced connectivity to boost productivity levels is one key reason why improved transport corridors in the area are necessary.

This is why, for example, the LEP's vision for 2026 sees the A350 corridor (linking Malmesbury, Chippenham, Melksham, Trowbridge, Westbury and Warminster) as an interlinked series of local employment hubs driving economic growth. With a population and economic output equivalent to that of Swindon, the area is home to many of Wiltshire's most important businesses (such as Siemens, Herman Miller and Knorr Bremse).

The towns on the A350 are growing significantly and together generate between 40% to 50% of Wiltshire's GVA. Such is the strategic role of the A350 corridor, there are already signs of 'agglomeration' benefits' whereby businesses are able to draw on the pool of workers from other towns on the corridor.

The connectivity potential of the corridor is also being demonstrated by consolidation of certain businesses in the area. Taking Herman Miller as an example, it has consolidated its business in Melksham whereas before it had premises in Bath and Chippenham.

Other key developments along the corridor include those at Warminster where a seven-year 'business plan' has been initiated. This contains various growth proposals.

The A350 also provides a key link to the M4 at Junction 17 and again, there is potential to develop this further as a major transport and economic hub.

The significant barriers to growth in the A350 corridor include limited highway capacity, journey time reliability, quality of rail connections and frequency of rail services. In addition, there are "pinch points" at a number of points along the A350. The bottlenecks at Beanacre and Westbury are well known, for example, and have been included for potential Local Growth Fund (LGF) allocation.

Other examples include the single carriageway sections of the A350 that currently experience peak time congestion (particularly the Western Bypass around Chippenham) as well as journey time unreliability due to high traffic volumes.

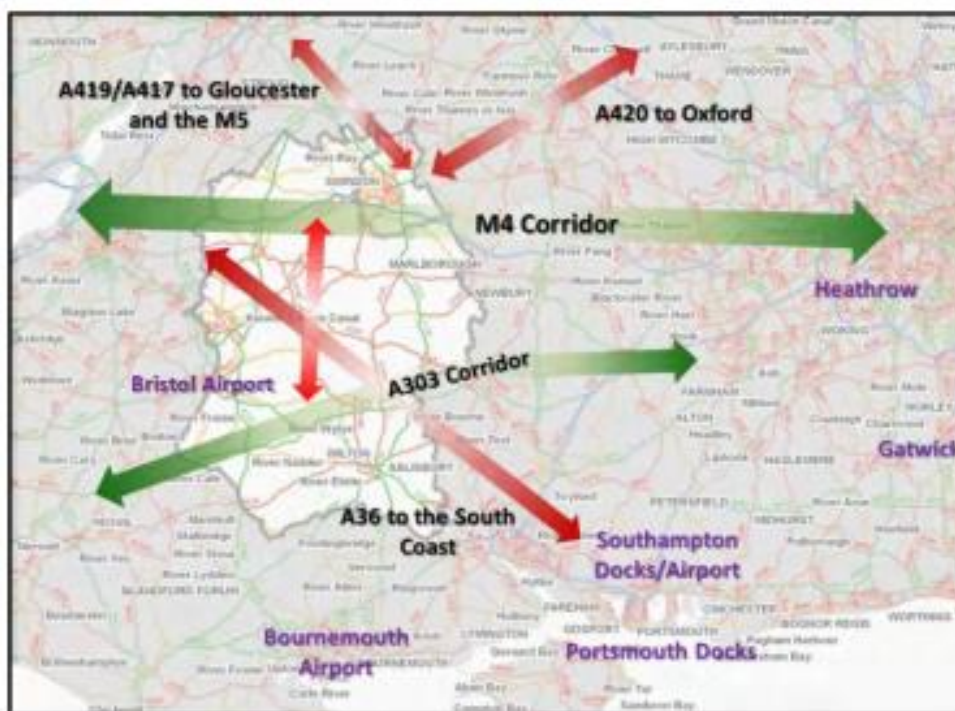
Congestion is exacerbated by large numbers of HGV movements on the route (the large number of movements reflect the A350's role as the primary route connecting Poole and the south coast with the M4 corridor).

In south Wiltshire, the A46 / A36 corridor (also known as the Southampton Road) is constrained by a combination of narrow carriageway width and a large volume of turning traffic movements generated from adjacent developments. These result in insufficient capacity for through traffic in the vicinity of Salisbury.

Around 30% of traffic currently on Salisbury's roads (and an even higher proportion of HGV traffic) is through traffic, including that on the A36 and A46. This has to be accommodated at the same time as local traffic whilst the congestion also impacts on the local environment and air quality.

The regional importance of the A46 / A36 corridor is also demonstrated in Figure 4-2 overleaf (taken from the LEP's "Transport Vision 2026"). This shows the how the A46 / A36 provides essential connectivity on the south east to north west corridor whilst also intersecting with the important north – south A350 corridor.

Figure 4-2 Strategic Transport Corridors in Wiltshire



A key focus of Local Plan policies in the LEP area (and the emerging SEP) is the development of “agglomeration economies” across the three priority spatial zones shown in Figure 4-3 overleaf (centred around Swindon, Chippenham, Salisbury and Trowbridge).

Agglomeration is the technical term used to denote a geographic concentration of people and businesses. Evidence has shown that concentrations (‘effective density’) of economic activity increases output and productivity, thus delivering wider economic benefits as a consequence.

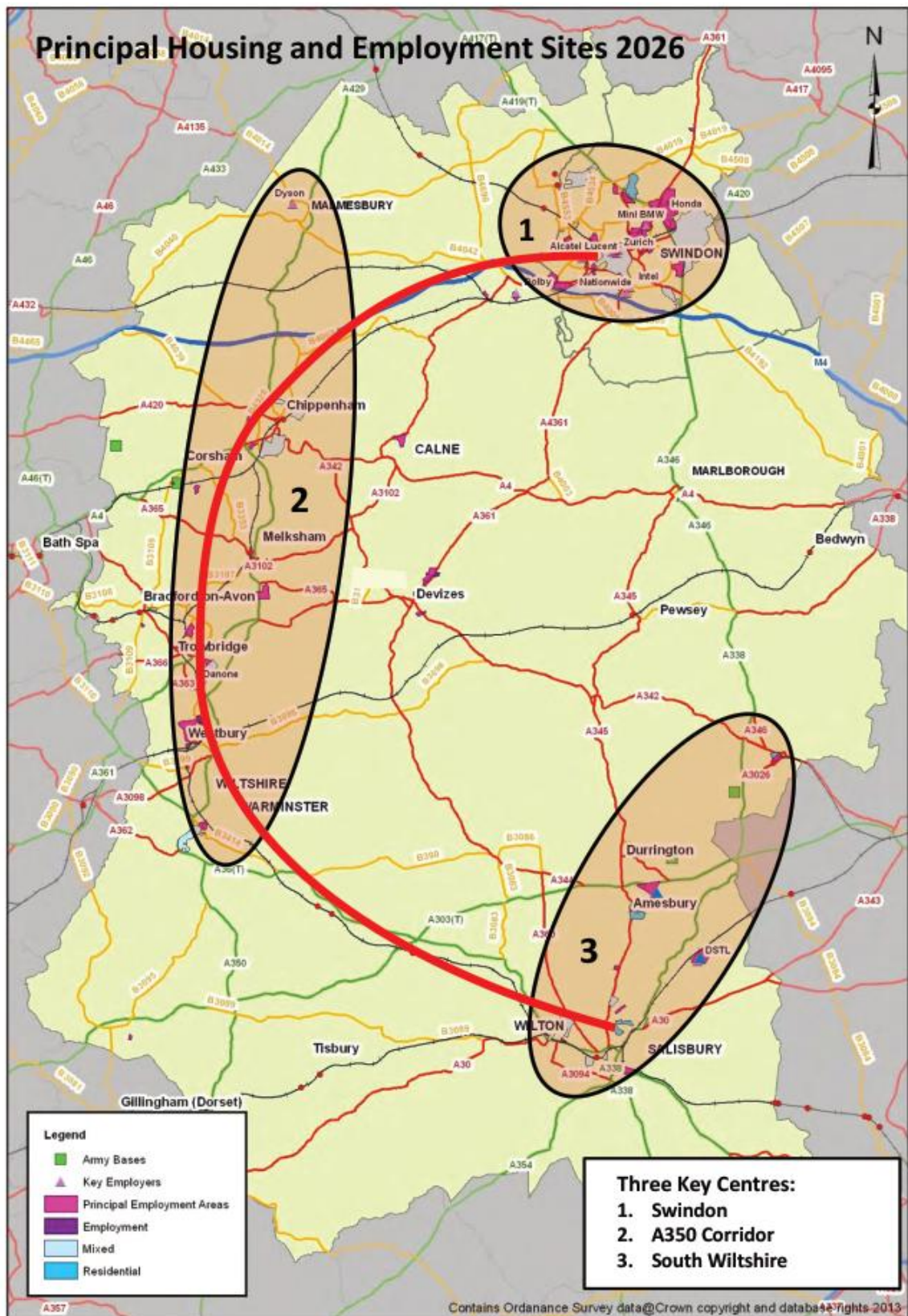
Efficient transport networks can serve to increase the effective density of an urban centre by increasing the number of people who can access the area quickly. This expands the prospective pool of talent to businesses and the opportunities to network, share knowledge, develop specialist technical clusters, and attract supporting services and amenities, which all serve to bolster the economic competitiveness of the area.

This is the theory underpinning DfT’s “Wider Impacts” guidance and is the approach and methodology discussed in the next chapter.

Private vehicles will continue to serve a vital role in the LEP area and a quality highway network will be essential to underpin the area’s economy whilst also accommodating the increasing volumes of freight movement through the area as a result of the projected growth in activity.

Another major advantage of improved corridor connectivity is that it will prevent fragmented, uncoordinated development taking place across the county. With a significantly enhanced A350 corridor, for example, development can take place in a more holistic manner with good access and connectivity between the areas of development.

Figure 4-3 Principal Housing and Employment Sites in Wiltshire



4.4 DORSET

The Dorset LEP area covers the area currently served by Dorset County Council, Bournemouth Borough Council and the Borough of Poole Council. The total population of the LEP area in 2014 was 759,800 with 55% living in the area served by Dorset County Council, 25% in Bournemouth and 20% in Poole.

Although the area is predominantly rural, there are urban centres in the south east centred on the coastal resorts of Bournemouth and Poole as well as the Weymouth and Portland district (centred on the coastal resort of Weymouth).

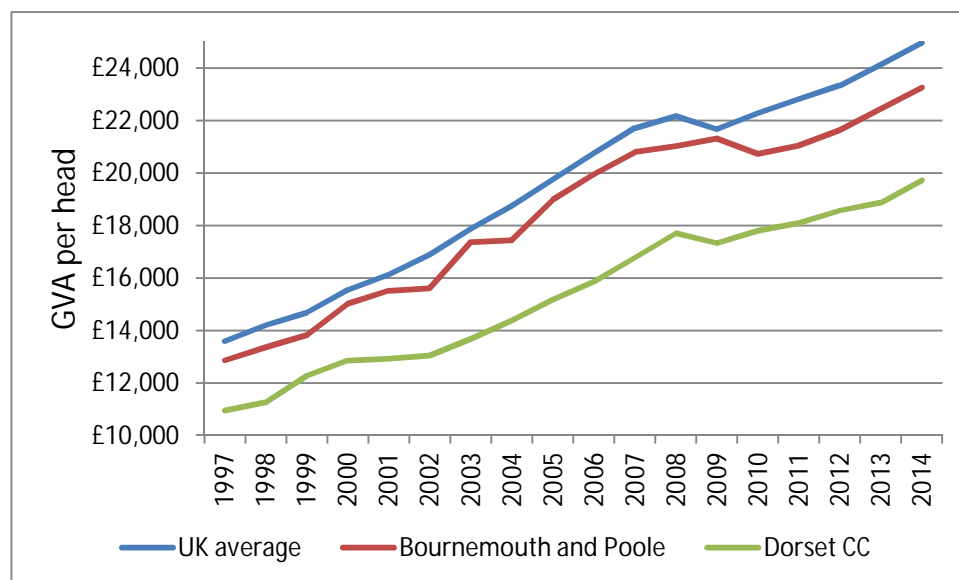
Many of the area's coastal towns have grown over time as a result of their popularity as tourism destinations and tourism continues to be important for their economies. Other market towns have developed in the past largely as a result of their importance as hubs for the farming sector.

Gross Value Added (GVA) is the value of all goods and services produced and can therefore be used as a standard measure for both efficiency and productivity. It can also be used as a gauge for competitiveness.

GVA per head differs considerably between the national average and that observed in the Dorset County Council area (GVA per head in Bournemouth and Poole is closer to the national average, albeit still below the average).

These trends over time are shown in Figure 4-4 below.

Figure 4-4 GVA per head: Bournemouth and Poole / Dorset CC v National Average



As well as the difference between GVA per head in Dorset and the national average, the differential has also been growing noticeably over time. This is clear from the differential in 1997 (£2,600 per head) being significantly less than the difference in 2014 (over £5,200 per head).

To help reduce this 'productivity gap', improved connectivity will be important given that better transport links between workers and jobs will boost productivity (i.e. businesses will have improved access to a wider set of worker skillsets whilst workers will also have better access to a broader range of employment opportunities).

The gap can be partly explained by the differing population structures and commuting patterns within the area. The structure of the local economy also has an effect. Different employment sectors have different impacts on GVA with some sectors having low GVA (such as health and social services, education, agriculture, forestry and fishing) whilst others are higher value-added businesses (such as business services and advanced manufacturing).

Over the past decade, the area saw significant differences in growth in these high value-added sectors with the Dorset County Council area having higher than average growth relative to the UK (in both financial services and production industries). By contrast, Bournemouth and Poole saw lower than average growth across most sectors.

Tourism is an important part of the Dorset economy with the sector comprising numerous hotels, self-catering accommodation, conference facilities and other tourist-related activities or which benefit from tourism. High value tourism is also important in the area and likely to increase in importance in the future given the planned expansion at the Port of Poole.

Other important tourism developments in Dorset include the Jurassica and MEMO developments that will boost the region's attractiveness significantly. Both sites will benefit from improved connectivity, especially that to / from the north.

There are also clusters of advanced engineering activity with AgustaWestland's presence in the region being one of these. There is also significant activity at Poole and Portland whilst the former nuclear facility at Winfrith is the site of an Enterprise Zone (the site covers 50 hectares and could accommodate up to 20,000 jobs).

The UK Competitiveness Index shows that all but one of the local authority areas in the Dorset LEP area are rated close to, but just below, the UK average for competitiveness. The exception is Weymouth and Portland where an Index of 80.9 (UK = 100) ranked the borough as the 17th least competitive local authority out of a UK total of 379. Given that Weymouth and Portland has always been ranked considerably lower than its geographical neighbours, one explanation is likely to be the borough's relatively poor connectivity, especially in terms of north-south connectivity.

The need for better transport connectivity is also demonstrated by the fact that 34% of all employment vacancies in Dorset were proving hard to fill based on a 2011 survey. This is more than the national average of 21%. With better connectivity, for example, employers will be able to access a larger pool of suitably qualified workers as the latter will now be able to reach employment opportunities in much quicker times.

The survey also found that just over 30% of all vacancies were seen as hard to fill because of a shortage of skilled applicants (twice the national average). Again, with better connectivity, employers will be able to draw on a wider skillset.

The strategic network in Dorset is under considerable pressure and low traffic speeds occur on the main approaches to the main conurbations, particularly on the main radial corridors. The main A350 north-south route is largely unsuitable for the traffic it carries, for example, and a number of key junctions are operating at capacity.

In rural areas, the volumes and speeds of traffic can negatively impact on rural character and local communities.

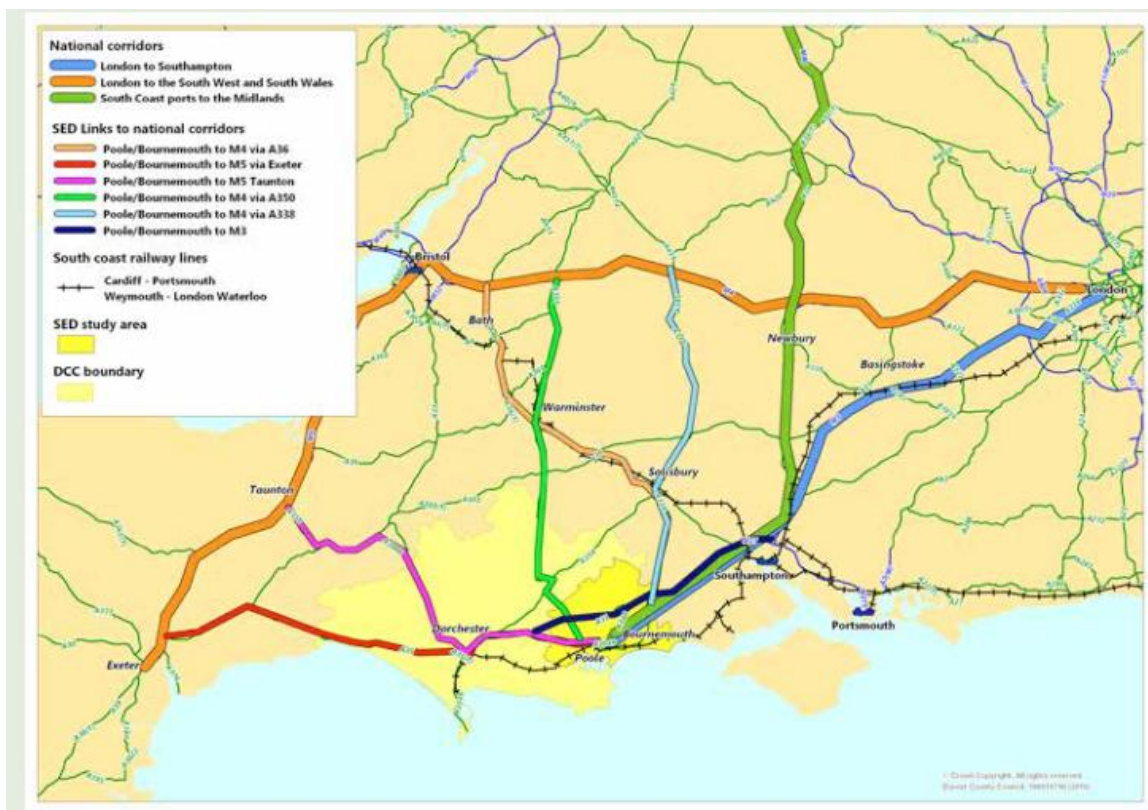
Infrastructure is critical to the economy given that the key transport issues cover:

- Strategic links to the north, west and east;
- Traffic and congestion management; and
- Public transport.

Given the nature of the rural areas in Dorset, these tend to suffer from lower levels of physical connectivity whilst urban areas face other difficulties such as congestion, capacity of the strategic road network and a need for key transport improvements to unlock development potential.

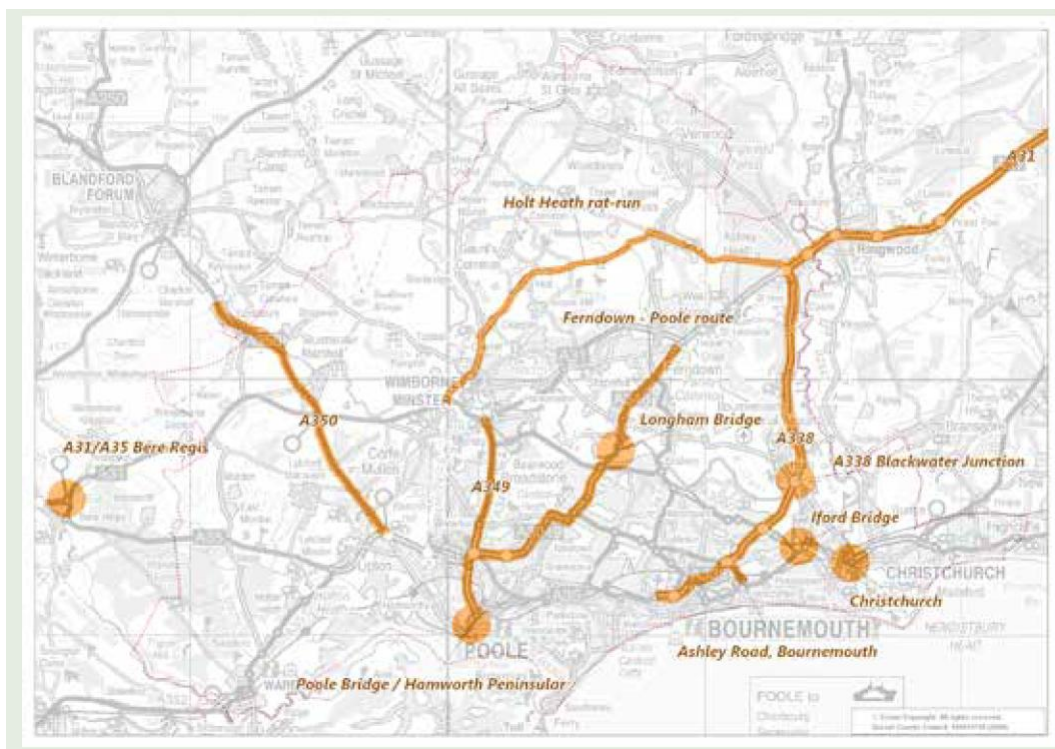
Figure 4-5 below shows the importance of north – south connectivity in Dorset and the wider area. The key corridors here include the A46 / A36, A350 and A338 as well as the rail corridor that broadly parallels the A46 / A36 corridor. Figure 4-5 also shows the importance of strategic north – south links connecting Dorset and the south coast with Bristol.

Figure 4-5 Key Transport Corridors in Dorset



The importance of north – south corridors for freight traffic is also shown in Figure 4-6 overleaf where “hot spots” are clearly identified on the key A350 and A338 corridors.

Figure 4-6 Key Freight Transport Corridors in Dorset



On this basis, proposed corridor improvements put forward within Dorset include the following:

- **A338 Corridor:** the A338 is the key corridor linking Bournemouth with Salisbury and points further north. In excess of 60,000 vehicles per day are common and the tourism and business destinations that it serves would be unable to cope without it. Many sections of the road are in a poor state of repair having effectively reached the end of their useful life. Complete reconstruction is now required. The section of A338 between Ringwood and Salisbury is single carriageway with multiple bends and high traffic volumes. The road's safety record is also poor whilst there is extensive HGV traffic through small villages;
- **A350 Corridor:** as the most direct route northwards, this is a strategically important corridor and handles large volumes of traffic. Journey times on the road are unreliable as there are several narrow sections with frequent tight bends and undulations. The road also passes through ten small villages and at many locations, it is difficult for HGVs to pass each other. Dorset County Council has long sought to improve the A350 sufficiently to provide an effective north - south route but this has not been possible due to the substantial funding required (as well as environmental factors);
- **A37 Corridor:** the A37 provides part of a direct route from Weymouth and Portland to the M5. The route is important for freight an improved A37 to M5 corridor will provide a realistic alternative for freight traffic using the A350. A major consideration is the trunking of the A37 to provide a more suitable north - south link. The A37 also has a parallel rail route that similar to the road corridor, exhibits poor connectivity through low frequencies south of Westbury and significant overcrowding in the Bristol

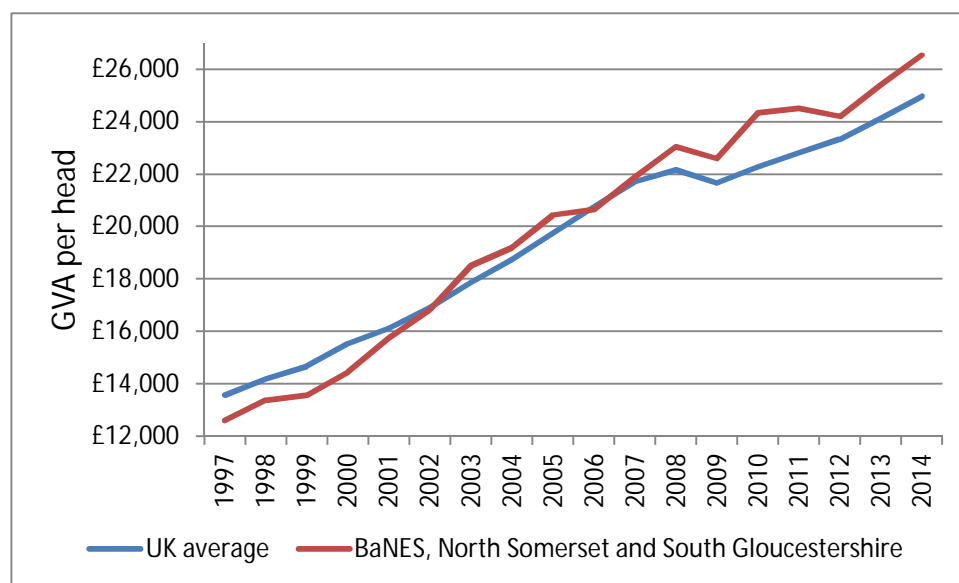
To conclude, good north - south connectivity is essential in Dorset, especially for freight traffic as the transformative corridors will provide good access to the ports and will promote economic growth in South East Dorset and in Weymouth, Portland and Dorchester.

4.5 BATH AND NORTH EAST SOMERSET

The West of England (including the Bath and North East Somerset area) has traditionally had a stronger economy than the rest of the UK and 'weathered' the recession better than other areas.

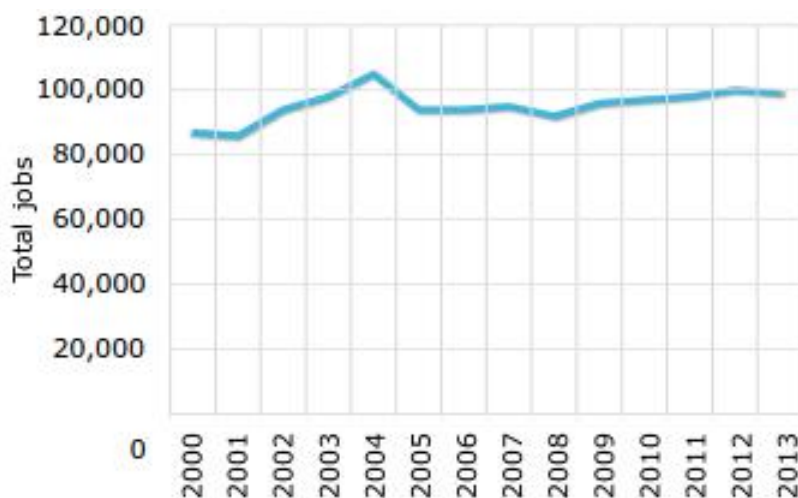
The most recent ONS data shows, for example, how in terms of GVA per capita (one of the principal measures of productivity), the combined BaNES, North Somerset and South Gloucestershire area has out-performed the UK average in recent years. This is demonstrated in Figure 4-7 below. The figure also shows how GVA per capita in this area was below the UK average up to the early 2000s and has remained above the national average since the end of the last recession.

Figure 4-7 GVA per head: BaNES, North Somerset and South Glos v National Average



The economy of BaNES supported approximately 99,000 jobs in 2013 and has grown moderately since 2008. This is shown in Figure 4-8 below.

Figure 4-8 Total Jobs Trajectory in BaNES, 2000 - 2013



To demonstrate the relative strength of the BaNES economy, the majority (over 88%) of businesses in the area were 'micro businesses' employing ten or less employees whilst in 2013, 970 new businesses were registered in the area. This was the highest number of start-ups since this information was first collected in 2004.

Business survival rates in BaNES have also been above the national average for all businesses registered since 2008. This again demonstrates the relative strength of the local economy and given that employment in the knowledge economy is high in this area, there is a strong case for improved connectivity as this will enable workers living in the corridor to the south of Bath to access job opportunities (using the A46 / A36 corridor and / or the parallel Salisbury – Westbury – Bath rail corridor).

In 2013, 19,500 workers in Bath and North East Somerset were employed in Knowledge Economy industries. This was equivalent to 22.9 per cent of all employment and is above the UK average of 19.7 per cent as well as the West of England average of (21.8 per cent).

The Economic Strategy developed by BaNES states that the provision of a reliable transport network is essential to support economic growth in the area. The Strategy also states, however, that there are challenges, especially given the important role Bath plays in the economy of the wider area and the planned level of overall employment growth in the Enterprise Area.

These challenges include the congestion (especially at major intersections) on the A46 / A36 and A4 routes in the city. A key issue for the area is the routing of the A46 / A36 through the east of Bath (for north – south flows). Although both 'A' roads provide key north – south connectivity (for commuters, those on business, holidaymakers and commercial vehicle movements), the need to pass through the eastern part of the city (and across the river) adds considerably to delays and poor reliability.

The Strategy also emphasises how accessibility to major employment locations needs to be improved to allow businesses to draw from a wider labour catchment area. This is the impact captured through increased 'agglomeration' whereby economic benefits – from improved productivity - arise from ensuring employers and employees are sufficiently close to each other in terms of access and travel time.

With an improved A46 / A36 corridor to the south of Bath, for example, employers will be able to draw on the extensive skillset of those living in towns to the south of the city (into Wiltshire and into Dorset if journey times are improved sufficiently).

BaNES intends to boost productivity by building on the area's business strengths and specialisms in specific sectors. By supporting business growth and investment in these areas, BaNES aims to close the 'productivity gap'.

There are eight Priority Sectors in the BaNES area and these are defined as "Core" or "Key" sectors. Core sectors employ significant numbers of people locally and will continue to be important in employment terms whilst Key sectors are generally smaller but are "higher value added" in economic terms. Key sector businesses will also have potential for significant future expansion.

Core Sectors:

- Tourism, leisure, arts and culture;
- Retail;
- Health and wellbeing;
- Finance and professional business; and
- Services.

Key Sectors:

- Creative and digital;
- Information and communication;
- Advanced engineering and electronics; and
- Environmental and low carbon.

The Priority sectors cover almost 60% of BaNES' total employment (excluding self-employment) and because these sectors are higher value-added in terms of productivity, they account for a much larger share of BaNES' total economic output. The eight Priority sectors account, for example, for 64% of BaNES' GVA.

The Priority sectors have the potential to deliver up to 11,500 new jobs in BaNES by 2030 and make a significant contribution to increasing the area's GVA output and productivity. Improved corridor connectivity will therefore enable these sectors to draw on the necessary types of workers from around the area and region. With these agglomeration improvements in place, productivity will increase.

The "Well Connected" section of BaNES' Core Strategy also emphasises that the highway network remains heavily trafficked and that this highlights the need to undertake transport and access improvements to:

- Facilitate growth in housing numbers and jobs;
- Minimise the adverse effect of traffic; and
- Enable environmental improvements to be made to existing centres.

On this basis, the Council will continue to safeguard the route for the Temple Cloud/Clutton bypass whilst recognising the need for studies to assess the Saltford bypass and the A46 / A36 link (the latter to eliminate the 'bottleneck' in Bath and to improve north – south connectivity).

This approach brings with it a wide range of benefits. The most significant, long term benefit to BaNES is that the approach creates more economically successful and more accessible places in which to live, work and visit.

The Core Strategy also notes the importance of removing high volumes of road traffic (especially HGV traffic) from built-up areas and this is particularly true for the eastern parts of the Bath city centre where improved north – south connectivity on the A46 / A36 corridor will have the twin benefits of taking traffic away from the route through the city as well as improving access on the key north – south route.

4.6 BOROUGH OF POOLE

Improved north-south connectivity also has a major role to play with respect to the Borough of Poole as better transport links to the north of the urbanised area will help economic development and growth plans as well as helping some of the existing congestion problems.

Based on previous multi-modal strategy work, for example, the evidence base suggests that congestion is costing the conurbation approximately £300 million per annum. The key north – south corridors for Poole include the A37 linking Dorchester to Yeovil as well as the key A350 corridor heading in a north – north westerly direction.

The Borough has worked closely with both Dorset County Council and Dorset LEP with the 'Connected Dorset' initiative being actively promoted by all three bodies and sharing several transport objectives, not least the importance of the A350 corridor to both freight and passenger traffic.

Improved north – south links will help unlock economic growth in Poole by enabling much-needed new housing to be developed and located in areas that are accessible to employment opportunities in the conurbation.

At the moment, housing development plans are out to public consultation with a mixture of approaches being examined:

- Intensification in the town centre; and /or
- Greenbelt development (of circa 6,000 residential units).

With improved north-south connectivity, new housing development away from the town centre becomes more viable as well as more sustainable. Given the high levels of car ownership in the area and the high levels of commuting into and out of Poole each day (about 200,000 movements), the need for better connectivity is apparent.

The need for better links to new housing developments is also evident from Dorset LEP's pursuit of a Major Scheme Bid for a new link to housing near Wimborne whilst development of the A350 (and the A31) is also seen as being key to the area's growth plans as it would help unlock housing development.

The Borough also generates economically important freight traffic with haulage companies such as Wyvern Cargo handling large amounts of commodities into and out of the area. There is also a high volume of freight traffic travelling long distances to / from the Port of Poole and in recognition of the importance of freight movements, A Freight Partnership has been put in place with direct input from the County Council and other organisations.

The constraints on north – south connectivity are also perceived as suppressing demand and growth in the large hinterland that surrounds the Borough and the wider area. This is evident from the growth that has taken place in the main conurbation itself and the resulting congestion this has generated.

For the area to achieve its growth potential (in a sustainable manner), the opportunities opened up by enhanced connectivity will be substantial and demonstrate how north – south connectivity is important both to individual areas in the region, such as Poole and the south coast conurbation, as well as for longer distance inter-urban movements into and out of the region.

Dorset is also expanding other key transport hubs with both Bournemouth Airport and the Port of Poole undergoing significant enhancements. Both will benefit from improved north – south connectivity.

4.7 SUPPORTING CORE STRATEGIES AND GROWTH PLANS

Improved north – south connectivity will also greatly assist the realisation of the area’s core strategies and growth plans. These plans envisage housing and employment land development as well as the attainment of specific employment targets.

These objectives are far more likely to be achieved if better connectivity is in place. This will mean that 1) residential development can take place in a sustainable manner (i.e. enhanced corridors will enable new housing to be developed away from some of the more built-up areas, such as Poole) and 2) enhanced corridor connectivity will also make it much easier for employment to grow in key areas as workers and jobs will effectively be brought closer to each other.

For each area, a summary of core strategies and growth plans is given below:

- **Wiltshire:** the Spatial Strategy makes provision for the growth of approximately 27,500 jobs and at least 42,000 new homes from 2006 to 2026, including 178 hectares of new employment land. These will help deliver job growth and regeneration opportunities. The strategy will also seek to deliver a sustainable level of growth (i.e. one which does not exacerbate existing commuting problems) and this is where the enhanced connectivity will be so beneficial

This balanced mix of new development is essential for the long term prosperity of Wiltshire. The Core Strategy will therefore support critical social, economic and environmental objectives. As well as protecting existing infrastructure, the securing of timely investment in new infrastructure is also a core part of the Strategy and clearly from this perspective, improved north-south connectivity will have a major role to play

- **Dorset:** Dorset LEP’s Strategic Economic Plan states that there are several barriers to housing and commercial development and that these threaten to undermine economic and population growth. The Plan also notes that one of the barriers is poor transport connectivity (i.e. there are pinch points and ‘access barriers’ to key housing and employment locations) with road constraints in particular acting as a barrier at a number of locations such as Gillingham and Dorset Green – both have considerable housing and commercial development potential

The housing development plans throughout Eastern Dorset alone indicate how important transport connectivity will be to help facilitate housing needs between 2013 and 2033 (the period covered in the Strategic Housing Market Assessments). The objectively assessed housing needs for each district in Dorset demonstrate the scale of what is required: Bournemouth (979 dwellings *per annum*), Poole (710 dwellings *per annum*), Christchurch (241 dwellings *per annum*), East Dorset (385 dwellings *per annum*), North Dorset (330 dwellings *per annum*) and Purbeck (238 dwellings *per annum*)

- **Bath and North East Somerset:** BaNES’ Core Strategy is to support and deliver elements of the Economic Strategy, which in turn aims to create the conditions for jobs growth. Given that the highway network remains heavily trafficked, this highlights the need to undertake transport and access improvements to facilitate growth in housing numbers and jobs (as well as minimising the adverse impacts of traffic, and to enable environmental improvements to be made). One of the key projects mentioned in the Core Strategy, for example, is the A46/A36 link

Improved transport infrastructure will help facilitate delivery of the new homes needed to respond to expected demographic whilst it is also important to ensure the development of new homes is aligned with the provision of necessary infrastructure

The scale of the housing need in the BaNES area is well defined in the Core Strategy with approximately 13,000 new homes required by 2029 (7,000 of these will be in Bath). In order to meet the economic growth aspirations, the Plan also enables the delivery of around 10,300 new jobs. Improved north – south connectivity will also help deliver this by means of ensuring businesses can develop via better access to the labour market

Improved corridor connectivity will help these growth plans reach fruition on a sustainable basis by providing the additional transport capacity needed in the area.

4.8 BUSINESS SURVEY

A business survey was undertaken with the questions based on the guidance in DfT Unit A2.2 ('Regeneration'). The survey was developed using the recognised Survey Monkey software and was conducted online with all responses collated in a central database.

A wide variety of businesses in the study area responded to the survey with the majority of companies located towards the south coast where improved north – south links would be particularly advantageous.

When undertaking these types of surveys, the DfT guidance notes the following:

- The surveys do not focus exclusively on transport, but should cover a range of topics that might affect how well the business is performing (to avoid excessive weight being given to transport issues in the responses); and
- It explores the importance of transport to the business, but does not ask directly how many new jobs would appear if the transport improvement goes ahead.

The topics covered in the survey include 1) contact details, 2) employee details, 3) customers, suppliers and competitors, 4) the business sector, 5) the location, 6) movement of goods, 7) movement of staff, 8) business travel and 9) tourism (if relevant).

Although the survey is ongoing, the first tranche of results provided useful, relevant information. The key emerging themes are shown below.

Reasons for Expected Growth / Decline in Businesses

Several of the firms surveyed mentioned that current uncertainty in the wider economy is likely / is having an impact on growth potential. With respect to the expectations of businesses, the picture is mixed with expected growth in some firms matched by either a 'static' outlook or one of possible decline given the current economic uncertainty.

Strengths and Weaknesses of the Location

The responses here are of note as they reference transport infrastructure issues in several cases. The key responses (primarily from businesses in Dorset) include the following:

- *"Poor road infrastructure"*
- *"Easy train journey to London is a strength - weakness is that all other public transport locally is very poor. Bad delays due to congestion on the roads".*
- *"Poor road network and shortage of labour"*
- *"Strengths: excellent terrain (for specific land uses). Weaknesses - steep hills and very poor road infrastructure"*
- *"Although good locally, regionally Weymouth is a poor location (due to connectivity issues)"*
- *"Long road journey times to / from Weymouth"*
- *"Infrastructure" (no further information provided)*
- *"Geographic isolation and poor communications can be beneficial" (the reason for this is not given)*
- *"Strengths - port accessibility, Weakness – competition"*

- *“Successful customers get taken over and relocated to more central locations” (presumably due to connectivity issues)*
- *“Strengths - good communications locally. Weakness - difficult parking”*
- *“Located too far south - long journey times to and from the offices”*
- *“Ideal location for local distribution but poor northbound links, especially from the South West to the M4”*
- *“Accessible, but only by private transport”*
- *“Strengths - central city location. Weakness - lack of work-orientated parking, accessibility to central Salisbury in rush hour”*

What Would Improve this Location for the Business?

Given that transport infrastructure and connectivity is identified as a key issue, the responses to what could potentially be improved provide clear indications:

- *“Better access to the area”*
- *“Better transport links and parking”.*
- *“Good road links to M4 (and more work opportunities)”*
- *“Better roads (and more flat terrain)”*
- *“Better transport links by road and rail”*
- *“Transport links”*
- *“Better roads would certainly help the efficiency of the business”*
- *“Road access”*
- *“Dualling of the A338/A346 between Ringwood and Swindon”*
- *“Better parking”*
- *“Improved road network to and from Dorset”*
- *“Cheaper parking”*
- *“Availability of suitable (and suitably priced) land”*
- *“Better north - south links”*
- *“Better, faster access to other Wiltshire locations, improved car parking for those working in the city”*

What is the Incidence of Delays? (and Consequences for Business)

As good indicators of how delays impact on businesses, the following responses were received (the broad range of responses reflecting the different characteristics of the businesses):

- *“25% of deliveries are delayed – this means that excess labour costs are incurred”*
- *“Periodic impacts, e.g. Beaminster Tunnel closure, impact of half term road works and main road congestion etc.”*
- *“Regular rail cancellations on Weymouth line and road closures due to accidents on single carriageway roads”*
- *“Obvious challenges of delays on public holidays, carnival and festival days”*
- *“Rush hour is very difficult and in the summer months, movement is extremely difficult throughout the day”*

- *“Inbound vessels arrival times are predictable – by contrast, outbound road delivery movement times are constantly unpredictable”*
- *“Inadequate north - south connectivity to South East Dorset Conurbation (adds time and mileage costs which ultimately impacts on our customers)”*
- *“Delays affect 20% of delivery activities (paperwork sent out weekly to clients)”*
- *“Delays to deliveries to sites result in increased charges for wasted time by contractors and delayed payments caused by later completion dates”*
- *“Little impact”*
- *“We experience delays on a daily basis making it a challenge to provide the required service levels to our customers”*

Other issues emerging from the survey include the factors having an influence on **business travel** and **tourism**. With respect to business travel, there are several recurring themes and these include the following:

- Excessive journey times;
- Congestion-induced delays (linked to the long journey times); and
- Relatively short section of dual carriageway.

With respect to tourism, there is agreement that the south coast in Dorset would benefit from enhanced connectivity across the study area and specifically in terms of better connectivity from the south coast towns such as Weymouth to other locations. Feedback includes:

- *“Western Dorset...badly needs an improved route to the M5 and the markets of South Wales, the Midlands and the North. Also, an east-west route between Bridport and Honiton as part of one from the M27 to the M5 at Exeter”*
- *“Weymouth could be fantastic. We need a better fast road from the M5 and Bournemouth. We also need a good train service such as a 'seaside express' that only stops at fewer stations. We need to pedestrianise the historic harbour rather than letting 'vans' and cars use it as a short cut”*
- *“Many guests complain about the difficult roads to get to Weymouth (i.e. bad junctions, bad signage etc.)”*

4.9 CONCLUSIONS

Although all four areas have different characteristics in terms of their 'economic geography' and transport requirements, there is clear evidence that the combined area will benefit from greatly improved north – south connectivity for the following reasons:

- 1) Locations on the south coast (along the entire Dorset coastline, for example) will benefit considerably from improved north – south connectivity;
- 2) Given the importance of high-value / advanced engineering businesses within Dorset, improved north – south connectivity will a) improve access for commercial vehicle movements and b) improve access connectivity between businesses and workers;
- 3) Improve connectivity between key towns in Wiltshire (and points further afield) – for example, there is already evidence of agglomeration benefits between these towns on the A350 corridor in Wiltshire - these benefits will be enhanced considerably when corridors are improved;

- 4) Bath (and the BaNES area as a whole) will benefit from improved north – south connectivity through a) the benefits of eliminating the need for traffic to pass through the eastern part of Bath (as currently happens) and b) the benefits to businesses in Bath of being able to have much improved access to skilled workers on the A46 / A36 corridor;
- 5) In the Borough of Poole, enhanced north – south connectivity is essential to a) improve long-distance connectivity to points north (so as to take some of the pressure off the more traditional east – west linkages) and b) to act as an ‘enabler’ with respect to much-needed residential development away from the built-up areas. This will help relieve congestion in the urban areas;
- 6) The initial results from the business survey have indicated widespread frustration with existing transport infrastructure and especially north – south connectivity (businesses relying on the existing infrastructure typically have to build in contingencies in terms of additional delivery times – this adds to the businesses’ cost base and makes them less competitive in what is a very cost-focussed sector); and
- 7) For the overall area, improved north – south connectivity will also lessen the reliance on the more traditional east – west transport corridors (both road and rail) that have been relied upon in the past to deliver economic growth.

5

WIDER ECONOMIC IMPACT MODEL

5.1 INTRODUCTION

In this chapter, the technical approach to wider economic impact modelling is described. The approach follows accepted DfT WebTAG guidance and focuses on the agglomeration potential of improved north – south corridor connectivity.

The key features of this are:

- WebTAG Unit A2.1 (“Wider Impacts”) is used – this is the most up to date guidance focussing on the calculation of agglomeration improvements and related productivity improvements;
- Although a traffic model was not available for this analysis, the use of generalised journey time (GJT) data for both the current and future situation(s) has enabled the agglomeration calculations to be undertaken; and
- As well as complying with DfT guidance (and the formulae given in the guidance), a series of potential additional impacts have been calculated – these include, for example, estimates of the additional employment opportunities generated by the increased output per worker.

A static agglomeration model has been constructed to determine the wider impacts of better connectivity.

Given the economic geography of the study area and the distances involved, there is considerable scope for greatly enhanced journeys to / from work in the region. These journeys would be along corridors with good journey time (and journey reliability) characteristics. This makes the study area suitable for the use of the “Wider Impacts” guidance and the calculation of agglomeration improvements. More detail on this is provided below.

The model has been developed in accordance with Treasury Green Book and DfT WebTAG guidance (TAG Unit A2.1: Wider Impacts).

All results are presented in Chapter 6.

5.2 DEFINITION OF AGGLOMERATION (FROM WEBTAG UNIT A2.1)

It is important to understand the definition of agglomeration in this context. The term refers to the concentration of economic activity in a defined area whilst improvements in agglomeration can be measured by increased productivity (i.e. workers produced more GDP).

Based on the DfT methodology, one of the key inputs to this process is “generalised journey time” and how this changes when a transport infrastructure is improved. If a major corridor is improved, for example, journey times will be significantly better than they are today. Is it this change in generalised journey time (i.e. as well as the time element, other aspects of the journey will also be improved) that drives the improvements in agglomeration.

Transport can alter the accessibility of firms to other firms and workers, thus creating a virtuous circle where additional GDP per worker is generated as firms have much better access to the skills they need from a workforce. Similarly, workers can access a larger range of job opportunities.

Agglomeration impacts arise because firms derive productivity benefits from being close to one another and from being located in large labour markets. If transport investment brings firms closer

together and closer to their workforce this may generate an increase in labour productivity above and beyond that which would be expected from 'direct user benefits' alone.

Greater productivity in agglomerations arises from the fact that firms have access to larger product, input and labour markets. Knowledge and technology transfers are also important aspects of agglomeration effects.

These effects are already being seen in the study area where the A350 corridor acts as a strategic link enabling business to develop in key towns in Wiltshire and Dorset. In addition, the overall A46 / A36 corridor has the potential to provide improved connectivity between employment opportunities in Bath and the skilled workforce to the south east of the city.

5.3 MODEL STRUCTURE

A model has been developed to calculate the agglomeration benefits from improved north – south connectivity. Rather than look at a specific 'solution' (such as a fully engineered / costed corridor upgrade), the model is designed to calculate the wider impacts potential in a situation where there was improved connectivity compared to what there is today.

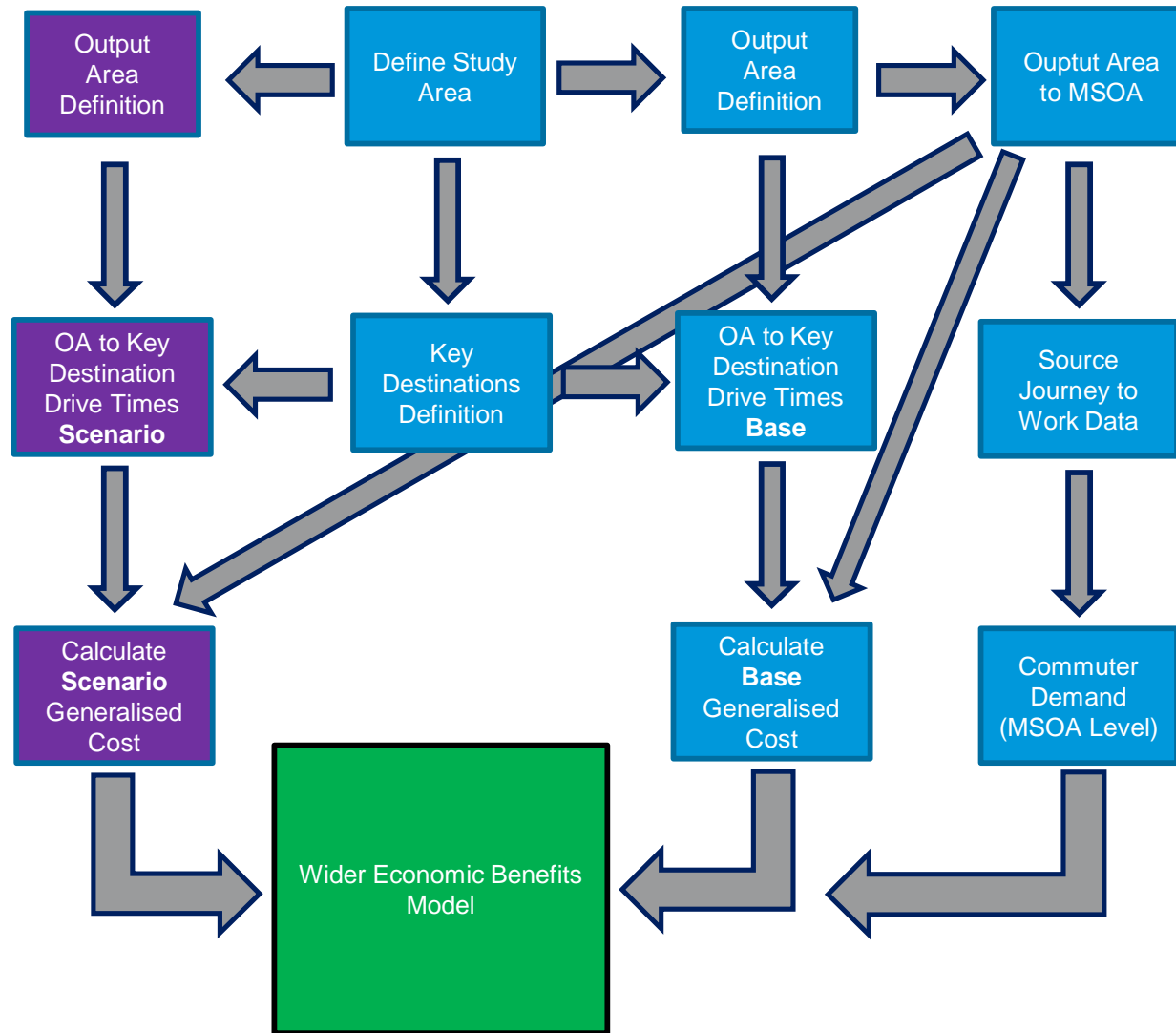
As well as being able to represent the study area, the "size" of the model has been built to within acceptable limits (to improve run times, for example).

Figure 5-1 overleaf is a schematic illustrating the key features of the model. The main definitions and terminology are explained below:

- Define the study area;
- In the absence of a transport model, use data at the ONS' Output Area (OA) and Middle Layer Super Output Area (MSOA) levels;
- Extract Census data from these datasets (e.g. journey to work data at the MSOA level);
- For each OA to key destination point, derive travel (drive) times and hence generalised journey time – this is undertaken for both the 'Base' (do nothing) and 'Scenario' (do something) options; and
- As the bottom section of Figure 5-1 shows, the calculated generalised journey time for the Base and Scenario options are then used to calculate the agglomeration improvements ('demand' data is also an input at this stage).

All calculation formulae within the 'Wider Economic Benefit' section of the model (to calculate effective densities and agglomeration impacts, for example) are those given in WebTAG Unit A2.1.

Figure 5-1 Wider Economic Benefits Model (Schematic)



5.4 STUDY AREA DEFINITION

The Study Area is a rectangular area defined by its North Eastern and South Western boundaries (see Figure 2-1). The definition of the study area in British National Grid Eastings and Northings is as follows:

- North Eastern extent: Easting: 450,000, Northing: 190,000; and
- South Western extent: Westing: 350,000, Northing 50,000.

The study area has been defined at Output Area (OA) level, this being the lowest level of definition available from census data. Much of the processing in the model is undertaken at Middle Layer Super Output Area (MSOA) level into which the OA data is aggregated.

The key statistics associated with the study area is as follows:

- Study area depth: 140km;
- Study area width: 100km;
- Area: 14,000km²
- Households: approximately 1.3 million;
- 10,799 Output Areas; and
- 449 Medium Layer Super Output Areas (MSOAs).

5.5 KEY DESTINATIONS DEFINITION

In order to reduce the model processing requirements, journey origins were modelled at MSOA level whilst a number of key destination points were defined for the 'end point' of a commuting journey. The critical details of the key destinations are in Table 5-1 overleaf.

The key destinations have been assumed to have an effective radius, where all the output areas within the effective radius are assumed to be "attached" to that destination. Any output areas which lie outside the effective radius of a particular key destination town/city are considered to be out of scope as journey destinations but remain in scope as journey origins. In this way, the number potential journey combinations (defined at MSOA level) is reduced from 449 x 449 [201,601] to 312 x 449 [140,088].

Another key point here is that all the destinations shown in Table 5-1 lie within the study area as this is the area where the wider impacts will be realised. As an example, the model is set up so that the benefits of improved connectivity (improved productivity via agglomeration impacts) accrue within the study area.

Table 5-1 Summary of Key Destinations in Study Area

KEY DESTINATION	LAD	BNG EASTING	BNG NORTHING	EFFECTIVE RADIUS
Salisbury	Wiltshire	414550	129980	5000
Blandford Forum	North Dorset	388500	106500	2000
Ringwood	New Forest	415248	105443	2000
Verwood (Airport)	East Dorset	408924	109072	2000
Fordingbridge	New Forest	414500	114500	1000
Shaftesbury	North Dorset	386500	122500	2000
Gillingham	North Dorset	380614	126418	2000
Warminster	Wiltshire	387447	145068	2000
Frome	Mendip	377748	148006	3000
Westbury	Wiltshire	387126	150895	3000
Amesbury	Wiltshire	415539	141776	2000
Tidworth	Wiltshire	423656	149013	2000
Calne	Wiltshire	399500	171500	2000
Ludgershall	Wiltshire	426526	150745	2000
Melksham	Wiltshire	390517	163502	3000
Chippenham	Wiltshire	392033	173243	5000
Malmesbury	Wiltshire	393500	187500	2000
Devizes	Wiltshire	400458	161098	2000
Swindon	Swindon	416500	185500	7000
Bath	Bath and North East Somerset	375048	164150	5000
Marlborough	Wiltshire	419076	169048	2000
Royal Wooton Bassett	Wiltshire	406872	182510	2000
Andover	East Hampshire	436336	145455	3000
Southampton	East Hampshire	441960	112440	5000
Bristol	Bristol, City of	359240	173020	10000
Newbury	West Berkshire	447176	167147	3000
Wells	Mendip	355040	145800	2500
Dorchester	West Dorset	368940	90300	2000
Yeovil	South Somerset	355580	116040	2500
Weymouth	Weymouth and Portland	367711	79527	3000
Bournemouth/Poole	Bournemouth Borough Council	408484	91086	10000

5.6 JOURNEY TO WORK DATA PROCESSING

As comprehensive highway modelling was not available for this work, the traffic data used in the model have been inferred from Census 2011 journey to work data. This data is a reported 'journey to work' which is split into separate modes according to the MSOA origin data¹².

The methods of travel to work cover the following:

- Work mainly at or from home;
- Underground, metro, light rail or tram;
- Train;
- Bus, minibus or coach;
- Taxi;
- Motorcycle, scooter or moped;
- Driving a car or van;
- Passenger in a car or van;
- Bicycle;
- On foot; and
- Other method of travel to work.

5.7 GENERALISED COST OF TRAVEL

The calculation of agglomeration benefits is based on a change in the cost of travel incurred by employees and businesses within a study area. The cost of travel is expressed in the form of Generalised Journey Time (GJT). GJT represents the cost of travel between two points and includes all elements of the cost of the journey, not just the direct travel time.

For this work, the generalised cost of travel comprises the following:

- **Journey time** - the direct cost of the time of travel on the road network between origin and destination;
- **Fuel cost** - to undertake the journey;
- **Non-fuel operating costs** - maintenance costs, insurance, depreciation etc.; and
- **Parking costs**.

It assumed for the purposes of this work that the project (i.e. corridor upgrade) will not change the road network nor the link lengths between different locations. The primary impact will therefore be on point to point journey time. Although fuel costs may be marginally impacted by the change in speed, this is expected to have only a marginal impact.

¹ The table used for the analysis is: *WU03UK Location of Usual Residence and Place of Work by Method of Travel to Work*

² The other metrics in the table are: *Place of work [MSOA level] and Usual Residence [MSOA Level]*

5.8 HOW THE MODEL CALCULATES WIDER IMPACTS

The model has been designed to assess the agglomeration impacts associated with better connectivity.

Based on DfT's WebTAG guidance, a key part of the agglomeration improvement calculation is Effective Density. This is an economic metric that links:

- **The volume of travellers involved in the analysis** - i.e. how many workers are effected?; and
- **The generalised cost of business and commuter travel from origin to destination** – i.e. the difficulty experienced by workers in reaching their place of employment and by businesses reaching each other.

As described above, demand between the MSOAs has been derived using Census 2011 Journey to Work data. Future demand has been derived based on Local Authority District (LAD) employment forecasts. Demand growth from the origin to the destination is based on forecast employment growth at the destination. Given that data on business travel was not available for this study, commuter travel has been used as a proxy for both commuter and business travel.

The 'base' journey times have been extracted at an Output Area (OA) level for all OAs within the study geography using GIS analysis. Within GIS, routes between OAs were assumed to have been chosen based on the quickest travel time. These have been converted into a Generalised Journey Time (GJT), combining the in-vehicle travel time with assumptions made on fuel cost.

All OAs have then been aggregated to a Medium Super Output Area (MSOA) level to determine a 'base' GJT value between all MSOAs.

To model corridor upgrades, the process is then repeated within GIS, but this time with the speeds of key corridors artificially increased where interventions are proposed. The outputs of this process are the new future GJTs between all MSOAs.

The 'effective density' calculations are made for both the 'base' and 'do something' scenarios with the key difference being the generalised journey times associated with the 'with' and 'without' corridor improvements. The improvements in journey times will effectively bring workers and businesses closer together via the reduction in journey times - this will result in an increase in economic activity.

The actual economic impact of the change in effective density is a change in productivity. Within WebTAG, productivity is assessed with respect to a number of different economic sectors. These sectors are:

- Manufacturing;
- Construction;
- Consumer Services; and
- Producer Services.

The change in productivity due to the change in effective density is calculated using an elasticity of productivity to effective density. This elasticity is given within the WebTAG guidance. Using values of GDP per worker (again, from the WebTAG dataset), and the calculated change in productivity, the overall agglomeration impact can be calculated.

5.9 MODELLING CORRIDOR SCENARIOS

To achieve the aim of quantifying the wider impacts currently being 'foregone', a series of modelling scenarios were evaluated. These were designed to calculate what the wider impacts would be if enhanced connectivity already existed in the study area. In other words, the modelling of enhanced connectivity on key north – south corridors has been used to calculate the benefits that are being realised at the moment.

Based on the research undertaken (and reported in Chapter 4), a series of interventions were developed based on the following two corridors:

- The “A350” corridor; and
- The “A36” corridor.

The A350 is one of the main corridors in the region and provides crucial north – south connectivity between the south coast in Dorset, Wiltshire and points north, including important interchange with the M4 at Junction 17.

The A46 / A36 provides a direct link between north west Hampshire (including the Southampton conurbation), Wiltshire and Bath. The corridor is also paralleled to a large extent by the rail line linking Southampton, Salisbury, Warminster, Trowbridge and Bath.

In the case of the A350, journey times (and journey reliability) for cars and in particular, HGVs, are relatively poor due to single lane carriageway conditions, narrow road widths and bottlenecks.

On this basis, the two following corridor improvement scenarios were considered:

- Scenario1: Relief of congestion black-spots at Beanacre and Westbury; and
- Scenario 2: Dualling of the A350 throughout.

5.10 ANALYSIS OF THE GIS DATA

WSP | Parsons Brinckerhoff's GIS team produced drive times between the study MSOAs and 31 key destinations in the study area. This data was initially produced from a network provided by ESRI which contains congestion data with the drive times therefore reflecting “real” drive times experienced by travellers.

In the absence of detailed highway modelling, the corridor improvement scenarios used a re-run of the GIS drive times with certain link speeds enhanced to reflect the improved network.

To achieve this, a bespoke network was built using Ordnance Survey (OS) road classification data containing link speeds for each road in the study area. This bespoke network can be selectively enhanced to reflect network improvements³.

To incorporate congestion into the drive times, the bespoke networks for the 'base' position are subtracted from the ESRI drive time data to isolate the congestion effects. These congestion

³ Note, however, that the bespoke network does not include congestion effects

effects can then be added to the both the 'base' and 'scenario' bespoke networks to allow congestion impacts to be included.

Figure 5-2 below shows how the bespoke network has been developed (and how congestion impacts have been taken into account). The figure shows the following three key elements:

- Blue boxes: use of ESRI data for drive times (and isolation of congestion impacts);
- Purple boxes: development of bespoke network (for both 'base' and 'scenarios'); and
- Green boxes: development of both 'base' and 'scenario' networks with congestion impacts included.

Figure 5-2 Development of Bespoke Network (Schematic)

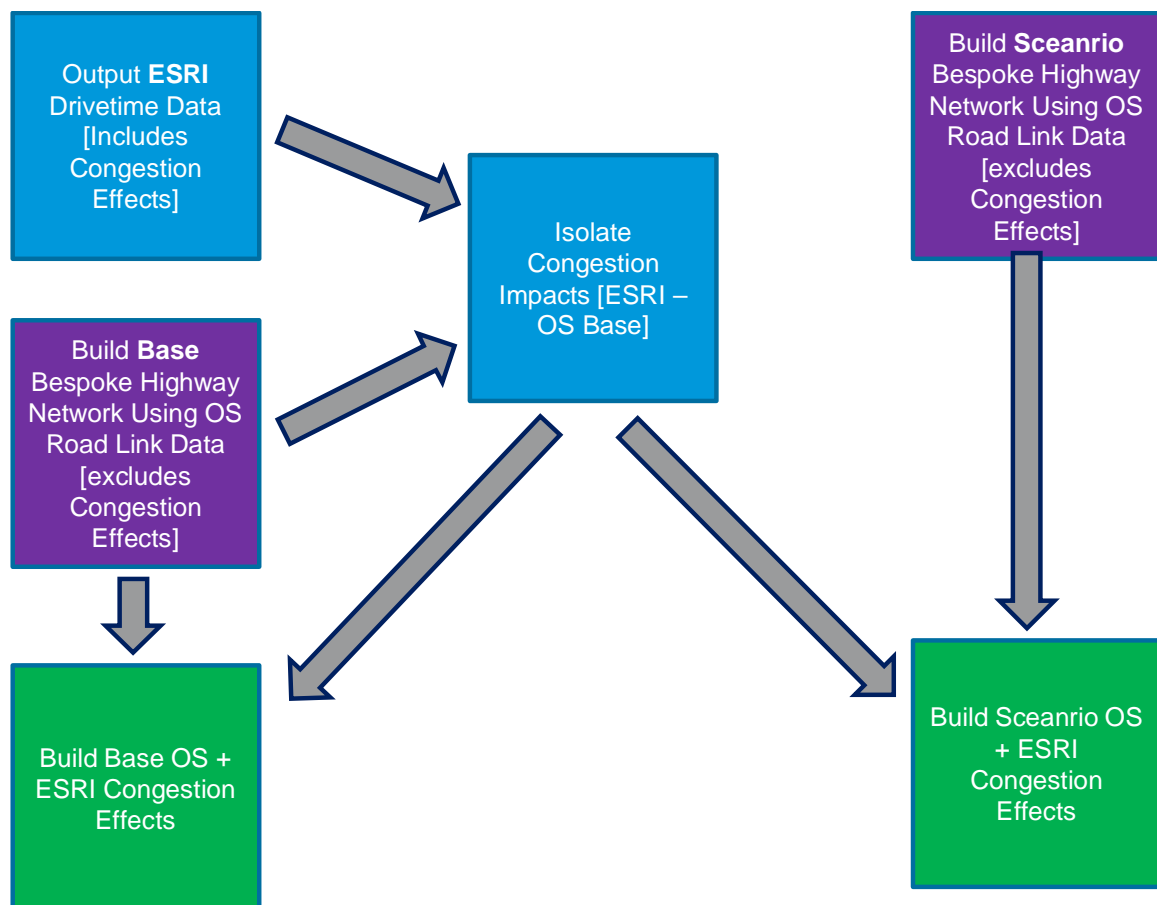
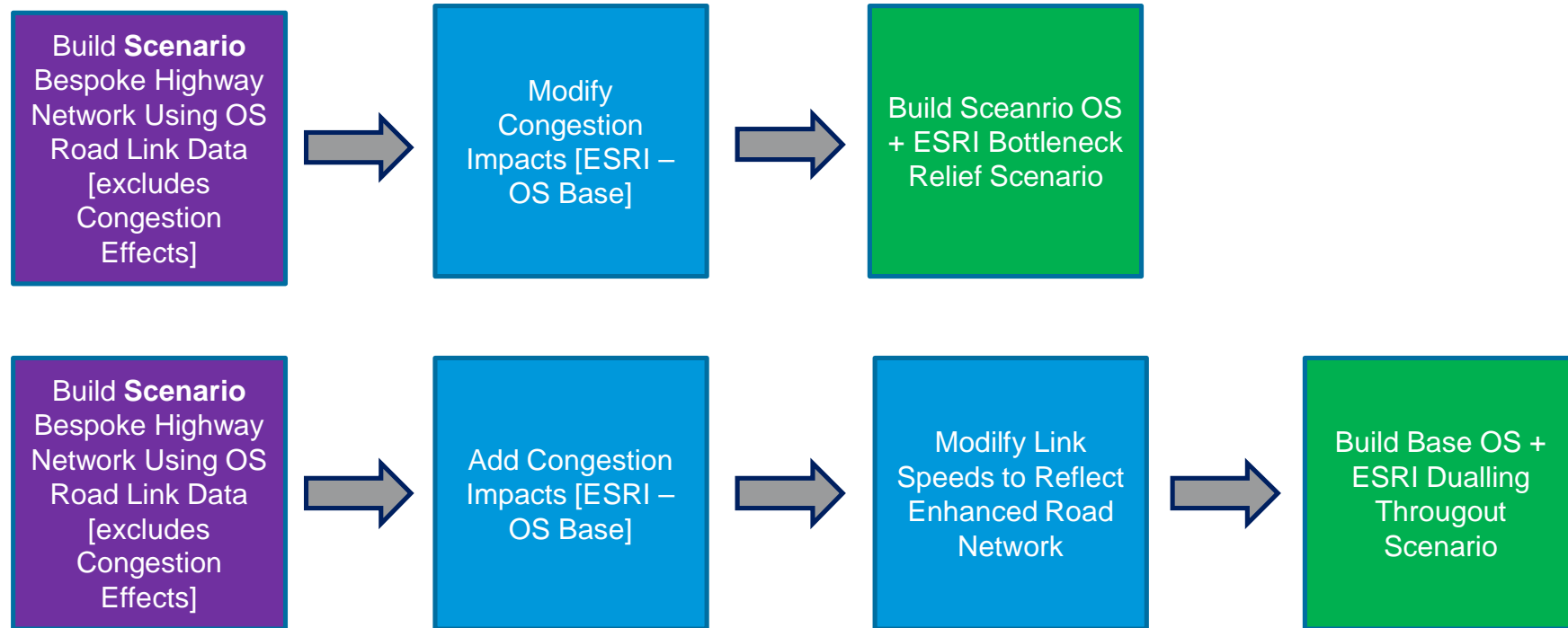


Figure 5-3 overleaf contains similar information about this process albeit this time displayed in more 'longitudinal' format.

Figure 5-3 Development of Bespoke Network – Version 2 (Schematic)



6

ECONOMIC POTENTIAL

6.1

INTRODUCTION

This chapter contains the results of wider impact analysis based on the approach set out in Chapter 5. A series of wider impacts have been derived and these are summarised below:

- **Agglomeration impacts:** using DfT WebTAG guidance, these are in monetary terms and represent the gain in productivity (GDP per worker) due to better north – south connectivity; and
- **A series of additional economic benefits:** although not covered in WebTAG Wider Impacts guidance, other impacts have been taken into account. These include:
 1. Additional employment supported by the increase in agglomeration-related GDP / GVA (covering direct, indirect and induced employment)
 2. Any potential tourism-related benefits (using, where possible, the outcome from the business survey)
 3. Indicators of “UK plc” benefits from improved connectivity from long-distance goods / HGV movements (from the West Midlands to the south coast)

The chapter also contains a summary discussion of data quality and other economic factors such as *additionality* (*additionality is the extent to which something happens as a result of an intervention that would not have occurred in the absence of the intervention*).

6.2

AGGLOMERATION BENEFITS – INITIAL TEST RESULTS

Prior to the main modelling work, a series of tests were undertaken to ‘sense check’ that the approach produced realistic results. At this test stage, corridor improvement impacts were considered in two ways:

- The impact of an *increase* in drive times; and
- The impact of a *decrease* in drive times.

This approach enabled us to quantify the potential economic impact of different journey time assumptions and what the region will gain / lose in the absence of better north – south connectivity.

As an example of this process, the following was tested:

- An overall **2% increase** in drive time across the study area (i.e. traffic speed is slowed by 2%): results in a £783 million disbenefit over 60 years (2016-2076);
- An overall **5% increase** in drive time across the study area (i.e. traffic speed is slowed by 5%): results in a £2 billion disbenefit over 60 years (2016-2076);
- An overall **2% decrease** in drive time across the study area (i.e. traffic speed is increased by 2%): results in a £779 million benefit over 60 years (2016-2076);
- An overall **5% decrease** in drive time across the study area (i.e. traffic speed increased by 5%): results £2 billion benefit over 60 years (2016-2076).

The results demonstrated the robustness of the approach as the economic impact of both the increase and decrease in speeds (and hence travel time) is broadly similar.

The results also show the magnitude of wider impacts when traffic speeds are increased across the study area.

6.3 AGGLOMERATION BENEFITS – MAIN WORK

To demonstrate the magnitude of the benefits currently being 'forgone', the model was run for three scenarios: **Scenario a)** average journey time improvements on the entire length of the A36 in the study area were capped so that they could not be more than 5% faster compared to today, **Scenario b)** average journey time improvements on the entire A350 corridor from the south coast to the M4 interchange at Junction 17 were capped so that they could not be more than 5% faster than they are today and **Scenario c)** average journey time improvements across **both** corridors (representing overall north – south corridor connectivity) were capped so that they were not more than 5% faster compared to what they are today.

The 5% capped improvement compared to today is based on what is observed on different types of roads and in this case, represents the magnitude of change if the existing roads operated to unconstrained 'A' road standards (i.e. there would be no bottlenecks and / or restrictions compared to what is there today).

The results are summarised below with the values representing discounted⁴ benefits over the standard 60-year DfT appraisal duration:

- **Scenario a):** £7.3 billion of wider (agglomeration) impacts over 60 years;
- **Scenario b):** £12.2 billion of wider (agglomeration) impacts over 60 years; and
- **Scenario c):** £20.5 billion of wider (agglomeration) impacts over 60 years.

6.4 SENSE CHECKING AND SENSITIVITY TESTING

The results presented above can be seen as the Central Case agglomeration improvements that could be achieved. As part of the modelling work, an extensive sense-checking and sensitivity testing exercise was undertaken. This covered:

⁴ Discount rates are 3.5% per annum for the first 30 years of the 60-year appraisal period and 3% for the remaining 30 years.

- Functional checking of processes and formulae;
- Output sense checking;
- Testing of different journey time improvement assumptions; and
- Final check of economic assumptions and calculation formulae.

This was an important exercise as it also enabled testing of different journey time improvement assumptions.

As an example, the results presented in 6.3 are based on average journey times being up to 5% faster than they are today. Other scenarios tested included 1) what would be possible if average journey times could be up to 10% faster than today? (seen as the High Case) and 2) what would be possible if average journey times were up to 2.5% faster than today (the Low Case).

The results of these sensitivities are shown below:

- **High Case - Scenario c), overall impact @ 10% average reduction in journey times:** £33 billion of wider (agglomeration) impacts over 60 years; and
- **Low Case - Scenario c), overall impact @ 2.5% average reduction in journey times:** £12.4 billion of wider (agglomeration) impacts over 60 years.

For the Low Case improvement of 2.5%, this is very close to the observed 2.6% improvement when a B road is upgraded to A road standards.

6.5 OTHER ECONOMIC BENEFITS

The agglomeration impacts described above are based on the DfT's accepted "Wider Impacts" guidance. The output of this is the monetary value of an increase in agglomeration-related productivity – in other words, with improved transport connectivity, each worker in a defined area produces more Gross Domestic Product (GDP).

As well as being a quantifiable monetary impact in its own right, the increased GDP will support additional employment in the area and this impact will be increased through employment multiplier effects (i.e. direct employment will support indirect employment in support / supply businesses whilst the expenditure of new direct and indirect employees will generate induced employment).

Although these impacts are not included in the Wider Impacts guidance, they can be considered as add-on benefits demonstrating how additional GDP (or GVA) from agglomeration improvements can have several other positive effects.

Direct employment impacts are based on the following:

- The annual additional GVA divided by the amount required to support each worker in the area (this is based on recent ONS data);
- The direct employment impacts also reflect the proportion of GVA spent on employee incomes – again taken from recent ONS data – and the proportion of GVA 'spend' retained in the area; and
- Indirect and induced employment impacts are calculated by applying standard employment multipliers to the direct employment totals.

Taking the overall corridor impact described in 6.3 above, annual additional GDP is approximately £342 million. Based on 35% of this being retained in the region, 55% being spent on workers'

incomes (thus supporting employment) and approximately £75,000 of additional GDP being required to support each worker, approaching 900 new direct jobs will be generated.

Once indirect (1.3) and induced (1.2) employment multipliers are applied, total new employment would be almost 1,400 with “UK plc” also gaining from the additional personal income taxation revenues these employees would generate.

The additional GDP from agglomeration will also mean further gains for UK plc in that companies will be generating more profits - and hence more corporation taxation revenues - as their workers are more productive and generate additional GDP.

Corporation taxation benefits are calculated by applying the proportion of GDP representing corporate profits (based on discussions with ONS in December 2015) and the corporation tax rate to the uplift in GDP.

Taking the above example again, the additional annual £342 million GDP generated would mean a potential annual gain of £16.5 million in terms of corporation tax revenues. Over time, this annual gain would be recurring each year.

All of these additional economic benefits are indicative but are nevertheless important as they show the additional benefits that could be gained over and above the WebTAG-based agglomeration impacts.

7 OPTIONS ASSESSMENT AND REFINEMENT

7.1 INTRODUCTION

This chapter reflects initial feedback from DfT whereby a list of potential options is considered. The listing uses the DfT's Early Assessment and Sifting Tool (EAST) with the intention being that in future work on corridor options, proper Cost Benefit Analysis (CBA) work will be undertaken.

This subsequent work will include 'traditional' transport economics impacts (such as journey time savings from traffic modelling) and the wider impacts based on the modelling work.

This approach has the advantage that the local authorities and LEPs are engaged at the long-listing and short-listing stage before the full modelling work is undertaken. This will significantly reduce the risks involved.

7.2 DFT'S EAST TOOL

EAST is a decision support tool developed to quickly summarise and present evidence on options in clear, consistent format. It gives decision-makers high level information to inform early views of how options perform and compare.

Although the tool does not make recommendations and is not used for final funding decisions, it does provide an initial view of how options perform. In the case of improved north – south connectivity, this high level approach is relevant given that the focus at this stage has been on identifying the 'problem' of poor connectivity rather than any specific, engineered solution.

On this basis, the tool can be used to:

- Help refine options by highlighting adverse impacts / unanticipated consequences;
- Compare options (across modes and geographical areas etc.);
- Identify trade-offs between objectives;
- Filtering the number of options (i.e. eliminate corridor concepts that are not feasible); and
- Identify key uncertainties and areas where further appraisal is required.

EAST is also designed to be consistent with DfT's Transport Business Case principles as the topics covered when assessing the economic impact of schemes are the same as those in full Transport Business Cases.

7.3 EARLY EAST ANALYSIS

To provide an early indication of how some corridor concepts perform using EAST, a series of draft responses has been prepared. These are shown overleaf and can be used as a basis for internal reviews as well as discussions with DfT.

Figure 7-1 EAST: A350 Corridor Upgrade

Early Assessment and Sifting Tool (EAST) - Expanded Print View		
Option Name/No.	A350 Corridor Upgrade	
Date	14/07/2016	
Description	A complete upgrade of the A350 corridor (in Dorset and Wiltshire) to full dual carriageway standard	
Strategic		
Identified problems and objectives	To significantly improve north - south connectivity between the south coast in Dorset, Wiltshire and points north, including the M4 corridor at Junction 17 and areas further to the north	
Scale of impact	5. Significant impact	Given the likely scale of this improvement, impacts will be significant
Fit with wider transport and government objectives	5. High	Proposal will help enhance connectivity in the area and will generate agglomeration benefits as businesses and workers will be brought closer together in terms of journey times. There are also potential benefits for commercial vehicle traffic (including long-distance commercial traffic between, say, the south coast and the West Midlands). There will also be benefits for specific sectors that are important in the region, especially tourism
Fit with other objectives	5. High	Fits very well with the strategic transport objectives of Dorset, Wiltshire and Bath & North East Somerset (as well as the relevant LEPs and other local authorities such as Borough of Poole) - enhanced north to south connectivity is essential for the region in terms of supporting continued economic growth in a number of key sectors and to reduce the relative peripherality of the south coast in Dorset
Key uncertainties	The upgrade is not being proposed as a "solution" at the moment but is primarily being considered in terms of the potential wider economic impacts that could be generated	
Degree of consensus over outcomes	5. Majority	All relevant parties and authorities in the region (county councils, borough councils and the LEPs) support this
Economic		
Economic growth	5. Green	Via mechanisms such as agglomeration improvements (as well as the additional economic impacts mentioned above), the corridor upgrade will enhance economic growth through improved productivity and through support to essential (and growing) sectors, such as the high-value engineering companies that are in the area
Carbon emissions	3. Amber	These are not quantified or considered yet so are given a 'neutral' score here
Socio-distributional impacts and the regions	4. Amber/green	The 'negative' impacts such as the disruption associated with the major works & any adverse environmental impacts will be more than counterbalanced by the gains in connectivity and the various economic benefits these generate
Local environment	3. Amber	For the reasons given under 'carbon emissions' above, impacts such as air quality, noise, heritage and streetscape / urban environment have not been considered yet
Well being	4. Amber/green	Improved corridor will lessen incidence of accidents on the existing A350 as well as improving connectivity and hence reducing severance
Expected VM category	3. Medium 1.5-2	Scored as "Medium" for time being given lack of BCR work at this stage
Managerial		
Implementation timetable	7. 10+ years	This is very much a long-term concept project, with implementation unlikely within the next 10 years
Public acceptability	3	Given a mid-range "3" score for now as there could be challenges from the public in terms of disruption during construction as well as perceptions of adverse environmental impacts. Balancing these will be public acceptance of the connectivity and economic benefits generated
Practical feasibility	2	This is a major corridor upgrade concept and the 'practical' aspects of this have not been considered at this stage
What is the quality of the supporting evidence?	3	This is at 'concept' stage and apart from collation of economic data from the study area (a business survey is also being undertaken), no additional supporting evidence has been collated at this stage
Key risks	The risks are those associated with the magnitude of the corridor upgrade and the impact of the extensive planning, funding and physical works aspects that will need to be realised before it becomes operational	
Financial		
Affordability	3	Depending on the scale of the corridor upgrade, the affordability of the project will be one of the key issues to be addressed in the planning / feasibility stage
Capital Cost (£m)	10. 1000+	Major project likely to exceed £1 billion by some margin
Revenue Costs (£m)	Don't know	Not known at this stage
Cost profile	Not known at this stage	
Overall cost risk	2	
Other costs	This is given a relatively high score at this stage given that the scheme has not been defined yet	
Commercial		
Flexibility of option	5. Dynamic	The upgrade could be 'scaled back' to just elimination of key bottlenecks on the route (such as those at Beanacre and Westbury)
Where is funding coming from?	Likely to come from central Government funding via Highways England (HE) with possible supporting funding from the LEPs - "PPP"-type funding could also be considered if the upgraded corridor is classified as a shadow toll road	
Any income generated? (£m)	No	

Figure 7-2 EAST: A46 / A36 Corridor Upgrade

Early Assessment and Sifting Tool (EAST) - Expanded Print View		
Option Name/No.	A36 Corridor Upgrade	
Date	15/07/2016	
Description	A complete upgrade of the A36 corridor linking north west Hampshire with Bath. The corridor passes through Wiltshire	
Strategic		
Identified problems and objectives	The A36 is one of the key transport corridors in Wiltshire and provides a direct link into the city of Bath. The A46 / A36 route through Bath provides a direct link between the A36 and the M4 (and points north) but is severely constrained by having to pass through the eastern part of Bath city centre. An upgraded A36 will also facilitate much improved connectivity between workers and jobs in this corridor	
Scale of impact	5. Significant impact	An improved corridor will have significant agglomeration benefits as workers and jobs will effectively be brought closer together
Fit with wider transport and government objectives	5. High	Agglomeration improvements will improve connectivity in this corridor, particularly to Bath from the corridor in Wiltshire
Fit with other objectives	5. High	There is a good fit with other objectives, especially in terms of facilitating co-ordinated development in the corridor
Key uncertainties	Viability / feasibility of upgrading the A36 corridor through areas of special scientific interest and any related environmental impact concerns	
Degree of consensus over outcomes	4	The A36 is one of the key north - south corridors in the region and has long been seen as warranting much improved connectivity
Economic		
Economic growth	5. Green	Will assist growth via improved connectivity (agglomeration benefits from better connections between workers and jobs)
Carbon emissions	3. Amber	Environmental impacts not yet assessed
Socio-distributional impacts and the regions	5. Green	Upgraded A36 corridor will help unlock
Local environment	3. Amber	Environmental impacts not yet assessed
Well being	4. Amber/green	Will enable people to have better access to a range of goods, services, people and places
Expected VfM category	3. Medium 1.5-2	No early VfM analysis undertaken to date
Managerial		
Implementation timetable	7. 10+ years	Given scale of corridor proposal, this is unlikely to be completed within the next ten years
Public acceptability	5. High	Given the current A36 / A46 traffic issues towards the eastern area of Bath city centre, corridor improvements here will have public acceptability (although note the environmental issues just to the south east of Bath)
Practical feasibility	3	The corridor concept is at an early stage of consideration and its "practical feasibility" has yet to be considered
What is the quality of the supporting evidence?	3	There is good quality data assembled from local authority and LEP sources whilst an initial 'agglomeration' improvement model has been developed in the absence of a traffic model
Key risks	Largely associated with the scale of the A36 corridor improvement and the magnitude of the works associated with it (and the risks associated with the planning, feasibility and the mitigation factors associated with environmental impacts)	
Financial		
Affordability	3	Project affordability has yet to be analysed
Capital Cost (£m)	10. 1000+	Major project likely to exceed £1 billion
Revenue Costs (£m)	05. 25-50	These are just initial 'running cost' estimates at this stage
Cost profile	No cost profile yet	
Overall cost risk	2	
Other costs	Compensation and mitigation measure costs	
Commercial		
Flexibility of option	5. Dynamic	At this early stage, the scheme has not been developed although there is flexibility to pursue a less extensive upgrade if this has a greater level of feasibility / affordability
Where is funding coming from?	Likely to be from central Govt with additional funding from local authorities and LEPs (and maybe from the private sector if a concession-type approach is used)	
Any income generated? (£m)	No	

Figure 7-3 EAST: Rail Upgrade on Salisbury – Westbury – Trowbridge – Bath Corridor

Early Assessment and Sifting Tool (EAST) - Expanded Print View		
Option Name/No.	Wiltshire Rail Corridor Upgrade	
Date	18/07/2016	
Description	Almost paralleling the road A36 corridor, the rail corridor between Salisbury, Warminster, Westbury, Trowbridge and then on to the GWML and Bath is currently subject to relatively long journey times and infrequent services - an upgraded corridor would significantly improve connectivity in this key corridor	
Strategic		
Identified problems and objectives	As with any major rail upgrade, the procedure for implementing this involves a long, detailed process involving several parties (Network Rail, TOCs, funders, local stakeholders etc.). However, the objectives and benefits of the scheme align with regional and national objectives (raising connectivity and productivity)	
Scale of impact	5. Significant impact	Likely to be significant when potential connectivity improvements are taken into account
Fit with wider transport and government objectives	5. High	Aligns well with wider transport and government objectives (achieves corridor improvement enhancements with potential modal shift from road to rail)
Fit with other objectives	4	Fits well with other objectives (regional development, regional growth plans etc.)
Key uncertainties	As above - long timescales to develop and implement major rail improvements (funding issues also uncertain)	
Degree of consensus over outcomes	4	Proposed upgrade will achieve several local and regional objectives so degree of consensus regarding outcomes is likely to be high
Economic		
Economic growth	5. Green	Will assist economic growth through increased productivity and the support of new employment opportunities (as well as positive tourism impacts)
Carbon emissions	4. Amber/green	Given a relatively high score given the carbon emissions impacts of modal shift from road to rail if this rail corridor is improved (although trains are likely to continue to be diesel-powered, albeit with new generations of trains having lower levels of emissions)
Socio-distributional impacts and the regions	4. Amber/green	These are likely to be positive, especially given the modal shift from road to rail and the accident reductions that are likely to occur
Local environment	3. Amber	With potential modal transfer from road to rail, there will be environmental benefits through lower emissions and noise - also, modal transfer will mean less road traffic through smaller towns and villages on the corridor
Well being	4. Amber/green	Well being improved through improved safety from lower level of road accidents & the enabling of people to enjoy access to a range of goods, services, people and places
Expected VIM category	3. Medium 1.5-2	No early VIM work undertaken to date
Managerial		
Implementation timetable	7. 10+ years	Given long timescales for rail corridor upgrades of this type, implementation will be in the long term
Public acceptability	5. High	The advantages of this proposal is that it will offer corridor and connectivity improvements whilst potentially inducing modal switch from road to rail
Practical feasibility	2	Several parties will need to be involved with the planning and feasibility stage - this will add to project complexity & timescales (the project may need to be considered in either NR's Control Period 6 (2019 - 2024) or CP7 (2024 - 2029) - services will also need to be incorporated in the franchise in operation at the time of planned opening (GWR at the moment)
What is the quality of the supporting evidence?	1. Low	Scored as "1" here to reflect scheme in the very early stages of development
Key risks	As stated above, key risks are centred around two main issues: 1) the large number of organisations that need to be involved at the planning / feasibility as well as the long timescales involved and 2) risks centred around funding	
Financial		
Affordability	2	Affordability will be very closely linked to NR's plans for the two forthcoming Control Periods and the extent to which other funding can be sourced (from LGFs etc.) - new rolling stock - if required - will also form part of any future franchise agreement and the provision of rolling stock within that
Capital Cost (£m)	10. 1000+	Major project likely to exceed £1 billion
Revenue Costs (£m)	07. 100-250	This is an estimate at this stage - running costs will be captured via NR's track access charging regime (with rolling stock operating costs captured through the franchise agreement and associated OpEx)
Cost profile	No cost profile developed at this stage	
Overall cost risk	2	
Other costs		
Commercial		
Flexibility of option	4	Different scales of rail corridor improvement are possible and thus there will be flexibility in what is proposed
Where is funding coming from?	Government funding through Network Rail's Control Period process (with possible additional funding from local authorities / LEPs (via LGF etc.)	
Any income generated? (£m)	Yes	08. 250-500

Figure 7-4 EAST: A338 Corridor Upgrade

Early Assessment and Sifting Tool (EAST) - Expanded Print View		
Option Name/No.	A338 Corridor Upgrade	
Date	20/01/2017	
Description	The A338 links Bournemouth in Dorset with points north, passing through Ringwood (A31 interchange), Salisbury, interchange with the A303 before becoming the A346 and interchanging with the M4 at J15	
Strategic		
Identified problems and objectives	From initial consultation with stakeholders, the A338 is not perceived as one of the principal north-south corridors in the study area (compared to the A36 and A350, for example). Despite this, it remains one of the potential corridors for improvement and is included here at the "long listing" stage	
Scale of impact	5. Significant impact	Likely to be significant when potential connectivity improvements are taken into account
Fit with wider transport and government objectives	4	Although this proposed corridor upgrade meets wider transport objectives, it has not been given the same degree of consideration as other corridors (the A350, for example)
Fit with other objectives	4	Fits well with other objectives (regional development, regional growth plans) - although possibly not to the same degree as some of the other proposed corridors
Key uncertainties	Has not received as much focus as other proposed north - south corridor upgrades (possibly because compared to the A350, the A338 is not perceived as a major freight route for	
Degree of consensus over outcomes	4	Proposed upgrade will achieve several local and regional objectives so degree of consensus regarding outcomes is likely to be high
Economic		
Economic growth	5. Green	Will assist economic growth through increased productivity and the support of new employment opportunities (as well as positive tourism impacts)
Carbon emissions	4. Amber/green	Given a relatively high score given the carbon emissions impacts of modal shift from road to rail if this rail corridor is improved (although trains are likely to continue to be diesel-powered, albeit with new generations of trains having lower levels of emissions)
Socio-distributional impacts and the regions	3. Amber	Will help achieve various connectivity objectives, although these are more likely to be focussed on passenger movements (rather than freight)
Local environment	2. Red/amber	Likely to be some negative impacts through increased traffic levels (as well as the impact of higher speeds)
Well being	4. Amber/green	Likely to be 'well being' benefits via better connectivity (enabling people to enjoy access to a range of activities)
Expected VFM category	4. Low 1-1.5	N/A yet as no VFM analysis undertaken
Managerial		
Implementation timetable	7. 10+ years	Long term project
Public acceptability	3	There is likely to be public acceptability although not possibly to the same extent as that for corridors such as the A350
Practical feasibility	3	Feasibility will depend on the extent of the works undertaken - given a 'neutral' score at the present time
What is the quality of the supporting evidence?	2	The evidence collated to date has been largely local and regional economic data rather than scheme specific data
Key risks	This is a 'concept' corridor upgrade at this stage and has not been subject to further detailed analysis at this stage	
Financial		
Affordability	2	More detailed 'affordability' analysis will be required if the scheme / concept is to be taken forward
Capital Cost (£m)	10. 1000+	Major project likely to exceed £1 billion
Revenue Costs (£m)	06. 50-100	These are estimates at this stage
Cost profile	No cost profiling undertaken to date	
Overall cost risk	2	
Other costs	Planning / Feasibility / Mitigation costs etc.	
Commercial		
Flexibility of option	4	The scale of any proposed works can be flexible depending on what is eventually proposed
Where is funding coming from?	Likely to be from Government funds (via Highways England) as well as local Government and LEP funds	
Any income generated? (£m)	No	

8 CONCLUSIONS

The objective of this study has been to focus on the wider economic benefits currently being foregone due to a lack of north – south connectivity in the study area.

At the moment, GVA per head in Wiltshire (at £19,771) is below the national average with the 'gap' between the UK average and that in Wiltshire growing over time. This is especially noticeable in recent years where Wiltshire's GVA per head has 'flatlined' compared to continued growth across the UK. Even in the recovery period after the last recession, GVA per head in Wiltshire has not returned to the previous growth trajectory.

There is a similar picture in Dorset where productivity (GVA per head) is considerably less than the national average. Even in the more economically active (and urbanised) Bournemouth and Poole area, GVA per head is still below the national average.

As well as these differentials with the national average, the gap has been growing noticeably over time. This is clear as the differential in 1997 (£2,600 per head) is significantly less than the difference in 2014 (over £5,200 per head).

As better connectivity will help close the 'productivity gaps' in both Wiltshire and Dorset, the economic potential of this needs to be tested and this is why DfT's recognised wider impacts methodology has been used to evaluate the economic potential of improved connectivity.

The Bath and North East Somerset (BaNES) area will also benefit from improved north – south connectivity in different ways. Firstly, improvements to the A46 / A36 will form a part of long-term plans to reduce traffic in the east of the city via improvement to the key link to the M4 and points north and south of Bath. Also, the city's large number of small and medium-sized enterprises will benefit considerably from improved A46 / A36 connectivity as this will enable businesses to draw on a wider pool of suitably qualified staff to the south east of Bath.

As reported in 4.7, results from a business survey also show how companies in the area are very much aware of corridor capacity constraints in the form bottlenecks, regular delays and a general lack of certainty as to how long journeys will take on key north – south links. Delays are adding to firms' costs as the impact of journey time uncertainty has to be built in to transport schedules. This in turn reduces firms' competitiveness in what is already a very price and cost sensitive sector.

Based on DfT guidance, a series of wider impacts have been calculated and a model has been built that enables these to be quantified.

The model was run for three scenarios: **Scenario a)** what would the study area gain if average journey times were improved (e.g. lowered) on the A46 / A36?, **Scenario b)** what would the area gain if average journey times were improved on the A350? and **Scenario c)** compared to today, what is the potential wider impact gain if average journey times were improved on both corridors?.

The results are summarised below with the values representing discounted benefits over the standard 60-year DfT appraisal duration:

- **Scenario a)**: £7.3 billion of wider (agglomeration) impacts over 60 years;
- **Scenario b)**: £12.2 billion of wider (agglomeration) impacts over 60 years; and
- **Scenario c)**: £20.5 billion of wider (agglomeration) impacts over 60 years.

Agglomeration improvements represent the total impact of improved productivity on GDP. Based on data available from sources such as the Office of National Statistics (ONS), it is possible to estimate how many additional jobs could be supported. When indirect and induced employment is included, up to 1,400 new jobs could be supported, for example.

Other potential gains will be those to “UK plc” in the form of increased revenues from personal income taxation of these new workers as well as additional corporation tax revenues as firms will be able to produce more economic output (and hence profit) per worker.

Improving north – south corridor connectivity will also ‘unlock’ several much-needed development sites in the study area, including strategic residential sites throughout the study area. Improved north – south corridors will therefore provide the necessary capacity and general journey reliability characteristics that will enable these to go ahead. The land value gains are an economic benefit that can be assessed as part of the ongoing work and are recognised by DfT as a potential benefit.

Based on the analysis undertaken up to this point, there is a strong case for further work and the areas where additional analysis could be undertaken are as follows:

- With more focus on specific corridors and how these could unlock development sites, the benefits associated with dependent development can be calculated;
- With more corridor-specific information available, more detailed capital cost estimates can be provided;
- Early work on ‘conventional’ economic impacts can also be undertaken (monetised journey time savings and accident reductions); and
- High level Environmental impact assessment work can also commence.

Appendix A

TITLE

APPENDIX A-1

TITLE
