

New or improved rail
lines – Evaluation case
studies of local
economic impacts

Swindon Case Study
January 2018

Department for Transport Rail
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Prepared by:

Steer Davies Gleave
28-32 Upper Ground
London SE1 9PD

+44 20 7910 5000
www.steerdaviesgleave.com

Prepared for:

Department for Transport Rail Group
33 Horseferry Road
London
SW1P 4DR

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Executive Summary

Background

The Swindon case study is part of a Department for Transport (DfT) ex-post evaluation study considering the economic impacts of investments made in new or improved railway lines. Swindon was selected as a baseline case study to enable a review of the situation prior to improvements along the Great Western Main Line being implemented. The scale and timing of the frequency and journey time improvements, delivered through electrification of the route and the introduction of new Hitachi high-speed rolling stock, means that there is potential to identify a series of local economic impacts.

Swindon is in the South West of England, approximately equidistant between Cardiff and London, complementing the five other case studies within the project that are in the South East, South West and East Midlands. The other case studies are for Bromsgrove (where the service improvements have not yet been delivered), Corby, Leamington Spa and Falmouth (where investment has been delivered) and Oxford (which involves both baseline and retrospective elements).

Within each of the six case studies, three central hypotheses are being tested. Each is tailored specifically to the case study in question, and the hypotheses in the Swindon case are as follows:

1. That increased service frequency, reduced journey times and a reduction in crowding at Swindon will make rail travel more convenient for local people, encouraging additional rail trips, some generated and some captured from other modes;
2. That improvements to the Great Western Main Line will lead to increased connectivity with London, South Wales and the West of England making Swindon a more attractive place to
 - i) live;
 - ii) work; and/or
 - iii) locate a business.(investment and employment effects).
3. That businesses located near to Swindon station will benefit from improved access to potential employees, customers, and suppliers, resulting in greater productivity (productivity effects).

In this report we:

- examine the socio-economic characteristics and market for rail travel in Swindon;
- identify comparison areas to allow us to better isolate impacts from the rail improvement versus other factors;
- explore the baseline conditions in Swindon, and the comparison areas, in terms of rail service provision as well as a variety of socio-economic indicators;
- identify pre-intervention economic trends and conditions;
- provide an indication of how post implementation economic impacts might arise; and
- make recommendations for follow-up research.

Economic, socio-demographic and transport context (Chapter 2)

Swindon has a population of approximately 220,000 residents, and is located in the county of Wiltshire approximately 75 miles west of London. Swindon railway station is located in the

middle of the town, immediately north of the town centre, and is located along the Great Western Main Line, the primary rail route between London, Bristol and South Wales. Services are operated by Great Western Railway, and link the town directly to London, with between 4 and 5 trains per hour (tph). Services also link the town to Bristol and Bath (2tph), Cardiff and Swansea (2tph / 1tph) and Cheltenham (1tph). Limited local services link Swindon to Melksham and Westbury in Wiltshire, approximately every two hours.

Employment in Swindon fell significantly following the late-2000s recession, losing a greater proportion of employment than both the South West and the national average. However, the economy has recovered strongly, with employment above the previous 2009 level. Employment growth in Wiltshire, however, has been weaker, with total employment still below a 2009 peak. The economy within Swindon is largely self-contained, with limited commuting to elsewhere, and is home to several large employers, including Honda and Nationwide.

Comparison areas (Chapter 3)

Comparison areas are used within the evaluation to disaggregate the effects of the rail investment from more general trends, such as increasing rail use nationally. Three comparison areas were used for the Swindon case study: Ipswich, Basingstoke and Tonbridge. Selecting comparison areas for the Swindon case study was challenging, since few locations are comparable to the town, being located on a main line to London with similar journey times and frequencies to London, as well as similar socio-economic characteristics. Therefore, Ipswich, Basingstoke and Tonbridge were selected to act as a 'basket' of comparison areas to be comparable to Swindon. Each has similar frequencies and journey times to London, although passenger numbers and commuter flows from each station do vary.

Expected outcomes of the transport intervention (Chapter 4)

Following the completion of the infrastructure improvements along the Great Western Main Line, we would expect station patronage to increase, and to grow closer in line with the national average in future. Additional rail demand at Swindon may arise through existing rail users travelling more frequently, trips shifting from other modes, or newly generated journeys which take advantage of the opportunities presented by the enhanced rail service.

Since usage of services at Swindon currently appears to originate more from leisure trips as opposed to commuting trips, relative to the national average, it is likely that the majority of newly-generated trips are likely to be for leisure purposes. Frequency and journey time enhancements may also be expected to generate a small increase in commuting trips to Bristol, Reading and London, although in the medium-term it would be expected that employment within Swindon will continue to be largely self-contained with comparatively little long-distance out-commuting. Overall, the rail improvements at Swindon are likely to have an incremental rather than transformational impact on the accessibility of the town, and hence would not necessarily be expected to deliver a step-change in rail patronage.

Attractiveness of Swindon and subsequent economic impacts (Chapter 5)

It is likely that the scale of the improvements at Swindon will result in a small increase, if any, in the attractiveness of the town, especially as a place to live. Evidence suggests that individuals value the benefits of rail connectivity, and station users at Swindon report the location of the station as an important factor when choosing where to live, and the improved accessibility of the station would be expected to make the town – in particular the areas with

close proximity of the railway station – a more desirable place to live. This could have consequent impacts on local property prices, although it is noted that many residents in Swindon interviewed in the residents survey do not report rail services as being particularly important to them.

Businesses may also find Swindon a more desirable place to locate, especially for those that regularly rely on rail for access to clients and customers, such as within Central London. Pre-existing Swindon firms may also benefit from a small increase in productivity, where they benefit from a reduced time spent travelling by their employees or alternatively better access to customers and new markets.

Proposal for further work (Chapter 6)

It is recommended that post-implementation work should include:

- use of Office of Rail and Road (ORR) rail use data to establish the transport impacts of the investment;
- use of the BSD (or BRES) to identify impacts on employment and productivity by sector; and
- primary research to measure the attitudinal and behavioural impacts on passengers, local people, and local businesses.

1 Introduction

1.1 This report sets out the baseline position for the Swindon case study, which forms part of a wider study into the economic impacts of investment in new or improved rail lines. In total, six case study reports have been produced and are supplemented by an Executive Summary document and a Technical Report. Swindon was selected as a baselining case study, designed to review the current situation prior to implementation of service improvements being delivered as part of the current Great Western Main Line upgrade. The focus of this report is the baseline conditions at Swindon, though reference is also made to hypothesised impacts of the improvements, to be tested through ex-post monitoring and evaluation.

1.2 This introductory chapter provides some brief background to the wider project and to this case study. Further information about the project and the methodological approach being used can be found in the accompanying Technical Report. This chapter is followed by chapters which:

- provide a brief overview of socio-economic characteristics and market for rail travel in Swindon (Chapter 2);
- introduce the chosen comparison areas (Chapter 3);
- explore the baseline conditions in terms of rail service provision (Chapter 4);
- set out the pre-intervention economic trends and conditions (Chapter 5); and
- draw out key implications for suggested follow up research (Chapter 6).

Overall aims of the project

1.3 The purpose of this project is to generate evidence to increase understanding of the economic impacts of rail infrastructure investments, including the relationship between the provision of improved rail services and economic growth. DfT commissioned the project to start to build an evidence base in this area, for which there is currently limited ex-post evaluation evidence available. This project tests the insights that can be gained by using a case study approach to build a detailed and rich narrative of the particular context in which the new or improved rail lines are being delivered, and how this relates to any observed behavioural and economic impacts. The relative strengths and limitations of a case study approach are discussed further in the accompanying Technical Report.

1.4 We investigate first the evidence for behavioural change (e.g. demand response) as a precursor to economic impacts, before considering the potential economic impacts. Given that this is an innovative and methodologically challenging area, we aim to first build an evidence base across a small number of case studies on any potential economic effects, without going so far as to then explicitly address questions of additionality and displacement within this

study (i.e. questions around whether any increased economic activity is newly generated or displaces from elsewhere).

- 1.5 Within each of the case studies, three central hypotheses are being tested. Each is tailored specifically to the case study in question, and the hypotheses in the Swindon case are as follows:
1. That improved rail services will, by making rail travel more convenient for local people, encourage additional rail trips including some generated trips and some captured from other modes.
 2. That the new service, and enhanced connectivity it offers, will make the local area a more attractive place to:
 - i. live;
 - ii. work; and / or locate a business.
(investment and employment effects).
 - iii. That businesses located within the station catchment area with improved services will benefit from improved access to potential employees, customers, and suppliers, resulting in greater productivity (productivity effects).
- 1.6 Each case study has been purposely selected to include different transport interventions that will deliver different outputs under different circumstances and lead to a diversity in the scale, nature and distribution of economic outcomes that may be realised. The remainder of this report considers the specific features of the Swindon case study.

The Swindon Case Study

Why was Swindon chosen as a case study?

- 1.7 Swindon was selected as a baseline case study since:
- the scale of the improvements to the Great Western Main Line at Swindon, including electrification, new rolling stock, frequency enhancements and faster journey times, are significant and have the potential to generate economic impacts that could be detected through ex-post monitoring and evaluation; and
 - the timing of the service improvements fits with the project timescale.

What are the key features, aims and timeline for the upgrade to the Great Western Main Line, and the associated service improvements at Swindon?

- 1.8 Swindon is located along the Great Western Main Line, and the station is served by regular InterCity services between London, Reading, Bristol, Cheltenham, South Wales and the West Country, operated by Great Western Railway. It is also served by infrequent local services operating between Swindon, Chippenham, Melksham and Westbury.
- 1.9 These services are shown on the map in Figure 1.1.

Figure 1.1: Services at Swindon



Source: Great Western Railway

- 1.10 Swindon is expected to benefit significantly from the series of improvements to the Great Western Main Line, which includes electrification between London, Bristol and Swansea, and new Hitachi Super Express Trains (SETs), to deliver: increased capacity, frequency enhancements and faster journey times. Several stations along the Great Western corridor, including Oxford, Reading, London Paddington and Bristol Temple Meads are also expected to receive significant improvements (although not at Swindon). Crossrail will significantly improve the accessibility of London Paddington to the rest of the capital from December 2018, and would hence be expected to lead to journey time savings to those travelling from Swindon to central London and destinations to the east of London.

- 1.11 These improvements are discussed in detail below¹.

Electrification

- 1.12 In July 2009, the then-Government committed to the electrification of the Great Western Main Line between London, Oxford, Bristol, Cardiff and Swansea. In 2015 / 2016, the

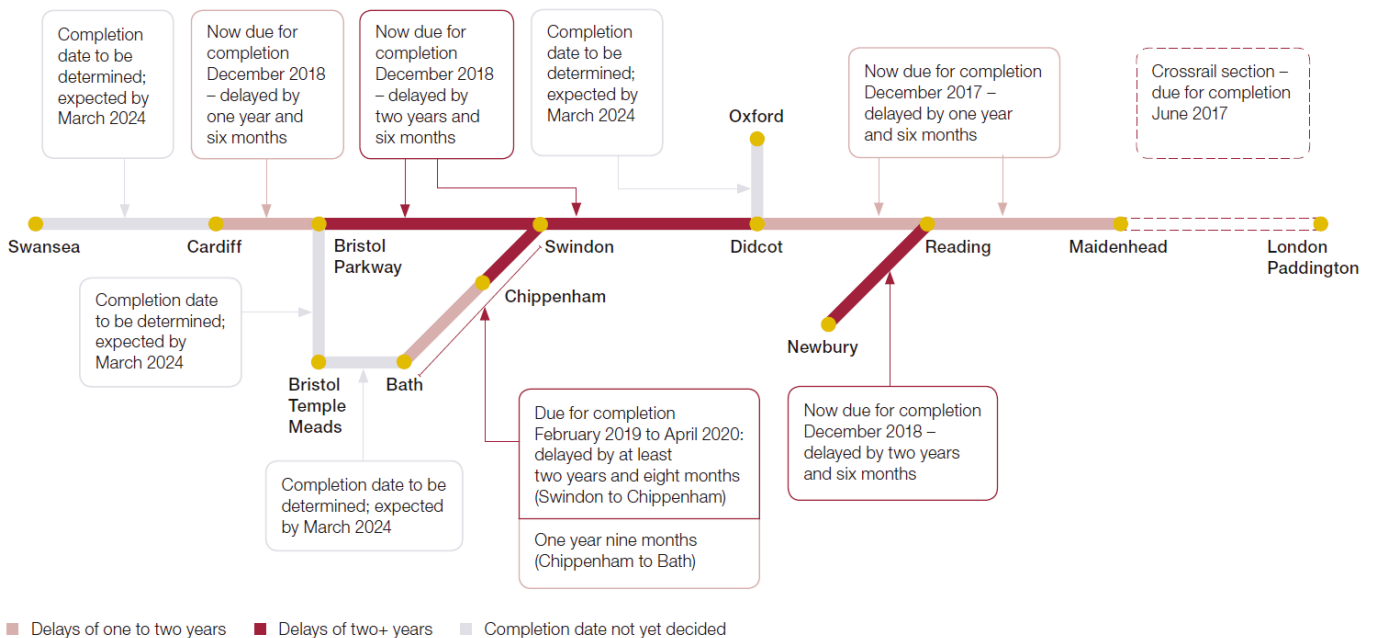
¹ The details in this section were correct at time of analysis in December 2017. Actual service patterns and improvements are to be confirmed and may be subject to change.

timetable to electrify the route was revised by Network Rail after it had become clear that elements of the programme were costing more and taking longer than expected. Network Rail now expects electrification of the core route between London and Cardiff to be delivered by December 2018, with other sections of the route from Swindon to Bristol via Bath and Didcot to Oxford due for completion between 2020 and 2024. Figure 1.2, published by the National Audit Office in November 2016, illustrates the broad current timetable for electrification of the route. It should be noted, contrary to the diagram, that electrification between Cardiff and Swansea was subsequently cancelled in 2017.

Figure 1.2: Current Timetable for electrification of the Great Western Main Line, November 2016

Current timetable for electrification between London and Swansea, and delays compared with plans in September 2014

Network Rail expects to electrify the section of the main line between Cardiff and London by December 2018; the branch to Oxford has been delayed by at least three years



Source: National Audit Office

Rolling Stock

- 1.13 Existing services through Swindon (except the local Swindon – Melksham – Trowbridge service) are largely operated by InterCity 125 High Speed Trains (HSTs), originally introduced in the 1970s. While these have been heavily refurbished in recent years, they do not offer a level of comfort associated with modern stock, and retain passenger-operated ‘slam doors’.
- 1.14 New Hitachi ‘Super Express Trains’ were introduced into service in October 2017, and are progressively replacing the existing InterCity rolling stock. These trains are bi-mode multiple units, and offer an enhanced level of comfort and additional seating capacity. Ten carriage trains on peak services will provide 580 standard class seats, compared to the 504 standard class seats on a high-capacity HST today².

² Great Western Railway Franchise Stakeholder Brochure, September 2015

Crossrail

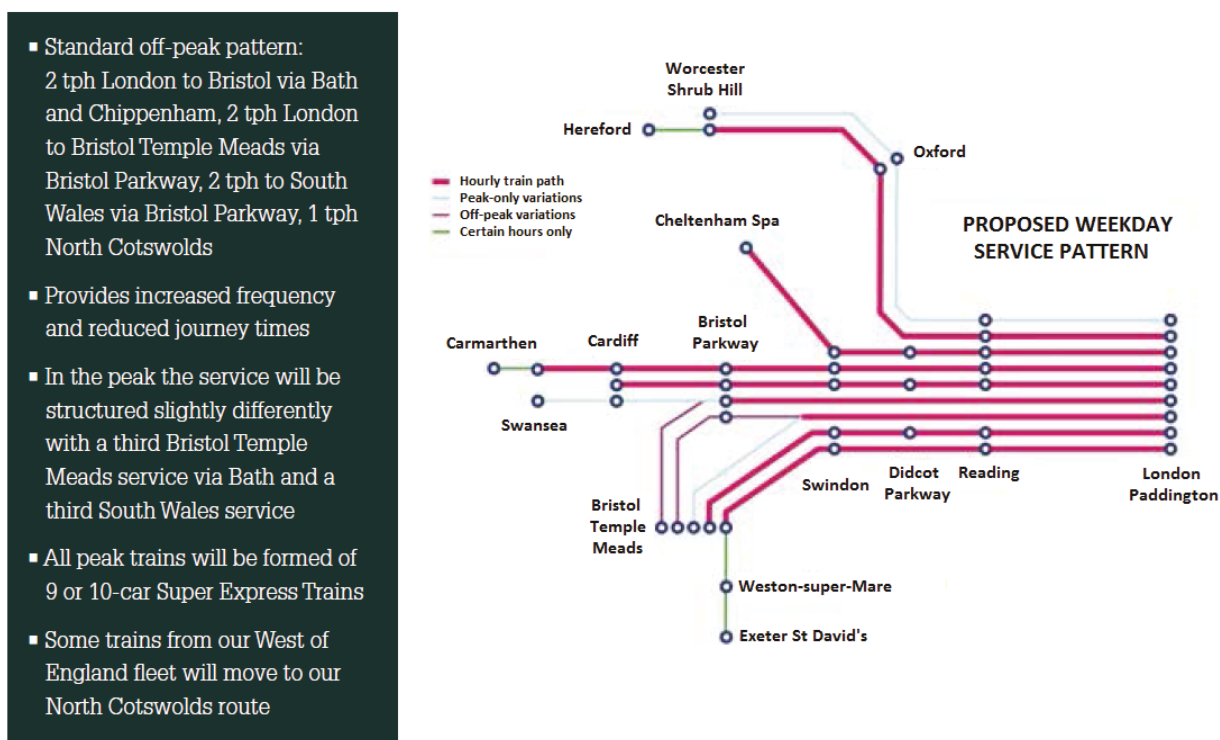
1.15 30%³ of passengers from Swindon travel to London Paddington, which is located on the western edge of Central London with comparatively poor connectivity to the rest of the capital in comparison to other London railway termini. Crossrail, opening progressively from May 2017, will provide a new underground railway linking Paddington directly with the West End, the City and Canary Wharf from December 2018. This will deliver significant journey time savings to those travelling from Paddington to elsewhere in London. Journey times from Paddington to Liverpool Street, for example, are expected to fall from 19 to 10 minutes⁴.

Timetable Enhancements

1.16 Services through Swindon are expected to benefit from increased frequencies and reduced journey times on all main line services from the timetable change in December 2018⁵.

1.17 Figure 1.3 outlines the improvements to service frequency. The frequency of trains between Swindon and London is expected to increase to a consistent five trains per hour all day, representing a significant increase especially towards the start and end of service.

Figure 1.3: Great Western Main Line Future Timetable (from December 2018)



Source: Great Western Railway, September 2015

³ Origin – Destination Matrix, Department for Transport, 2014-15

⁴ <http://www.crossrail.co.uk/route/>; Transport for London Journey Planner; sourced 03/04/2017

⁵ Great Western Railway Franchise Stakeholder Brochure, September 2015

- 1.18 It should be noted that exact journey times for journeys from Swindon (such as London – Swindon or Swindon – Bristol) have not been confirmed. Based on the 2015 plans for the improvements, and assuming that journey time savings are evenly spread across the Great Western Main Line, a passenger to London would have been expected to benefit from a saving of approximately 7 – 10 minutes. However, there have been significant modifications to the plans since 2015, which may affect the projected journey time savings.

Summary

- 1.19 Swindon is expected to benefit from a series of improvements as a result of the upgrade of the Great Western Main Line, as summarised in Table 1.1. It should be noted that the phased approach of the enhancements (such as gradual improvements in journey times as electrification is completed) will create complexity in identifying potential economic impacts, and this will need to be considered in any ex-post work at Swindon.

Table 1.1: Summary of key service enhancements at Swindon

Improvement	Details	Date
New intercity rolling stock	Additional capacity, increased passenger comfort	October 2017 onwards (new trains currently entering service)
Journey time savings	Approximately 7 – 10 minute saving on a Swindon-London journey, as well as limited time savings on journeys elsewhere; though these figures are subject to change	December 2018
Improved frequencies	Consistent five trains per hour to London, more 'first and last' trains	December 2018
Crossrail	Improved accessibility to destinations from Paddington	December 2018

2 Economic, socio-demographic and transport context

Introduction

- 2.1 This chapter sets out the socio-economic and transport context of the case study, providing an overview of the geography of Swindon and how it compares to the wider region.

Overview of Swindon

Where is Swindon, and what is the geography of the town?

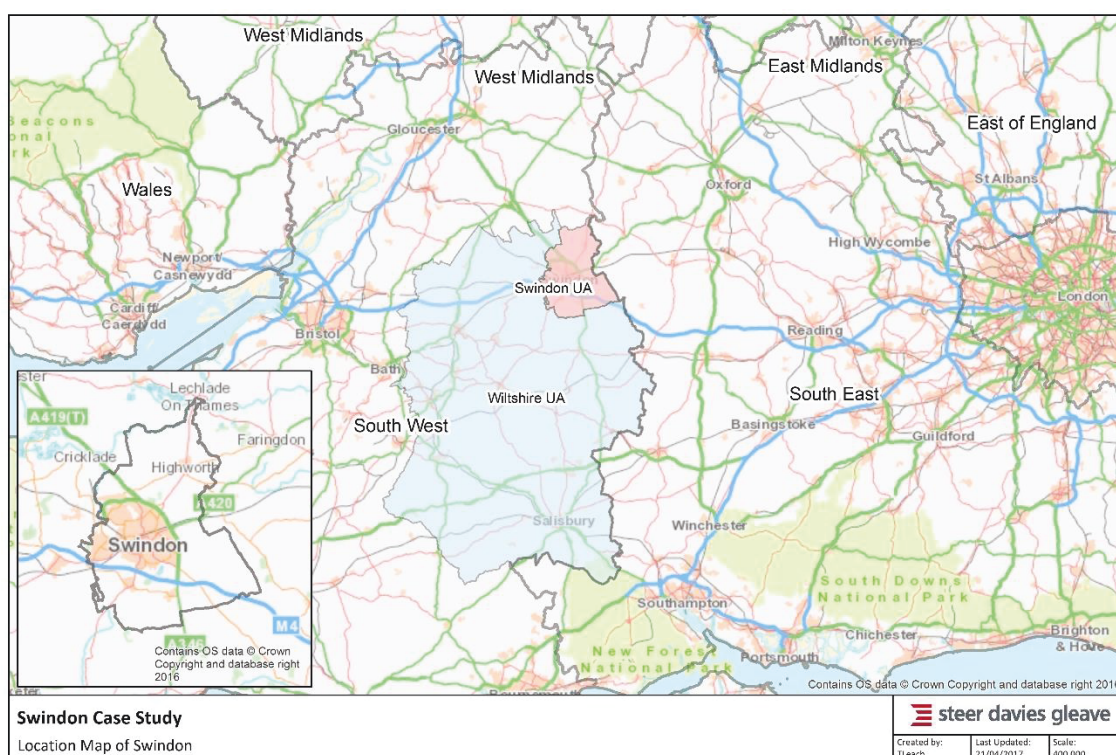
- 2.2 Swindon is a large town in the county of Wiltshire, South West England, with a population of approximately 220,000⁶ people, approximately 75 miles west of London. It is the largest settlement in Wiltshire, an otherwise rural county home to a series of market towns and villages, including Chippenham, Trowbridge and Marlborough. Oxford, Reading, Gloucester, Bath and Bristol form the only large employment centres within 40 miles of the town.
- 2.3 Administratively, the town forms a unitary authority of the same name, which includes the town in addition to several small settlements to the north, south and east, including Highworth, Wroughton and Bishopstone. It lies on both the Great Western Main Line and the M4 corridor, the key transport links between London, Bristol and South Wales, and hence is well-served by strategic transport infrastructure.
- 2.4 Figure 2.1 overleaf outlines the location of Swindon, with the Swindon unitary authority area highlighted in pink.

⁶ Mid-Year Population Estimates, Office for National Statistics (2015), ONS

Transport networks in and around Swindon

- 2.5 Swindon is located along the M4 motorway corridor approximately equidistant between Reading and Bristol, and links the town to London, South Wales, and the South East of England. The A419 forms the only other dual carriageway link serving Swindon, and connects the town to Gloucester and the M5, and onwards to the West Midlands. Connections to the rest of Wiltshire, and to Oxford, are limited to single carriageway roads, and often pass through numerous towns and villages.

Figure 2.1: Location of Swindon



- 2.6 Peak travel speeds along the M4 corridor are generally between 61 – 70 mph between J12 (Reading West) and J19 (Bristol/M32)⁷ and hence the motorway is less affected by regular peak-time congestion than elsewhere in the country, although there remain specific problems with excess delay along sections of the corridor. Limited improvements are expected at both motorway junctions serving Swindon, involving widening of the roundabout and approach roads at Junction 15 (to be completed by 2020) and Junction 16 (to be completed by 2018) as part of local transport initiatives, together with smart motorway schemes within Bristol and east of Reading⁸.
- 2.7 The town is also well-served by rail services along the Great Western Main Line. Eastbound, approximately 4/5 trains per hour (tph) run to London Paddington, with a journey time of approximately one hour. Westbound, two trains per hour run to Chippenham, Bath and Bristol

⁷ London to Wales Route Strategy, Highways England, April 2014

⁸ London to Wales Route Strategy, Highways England, April 2014

Temple Meads, two trains per hour to Cardiff Central (of which one continues to Swansea), and one train per hour to Gloucester and Cheltenham. Two-hourly local services also run to Westbury via Chippenham, Melksham and Trowbridge. Swindon railway station is well-located within the middle of the town, and immediately north of the town centre.

- 2.8 Swindon has a small bus station, serving routes within Swindon, Wiltshire and Oxfordshire. It is also well-served by the National Express coach network, with approximately forty daily coach departures, including frequent links to Heathrow Airport.

How does Swindon’s economy compare to the wider region?

- 2.9 Overall, the labour market within Swindon⁹ is strong, with approximately 78% of working-age population of Swindon in work and an unemployment rate of approximately 4%, compared to the national average of 74% and 5% respectively¹⁰. Employment in Swindon fell more rapidly during the late-2000s recession than in both England and the wider South West, but recovered strongly since 2012, and now reflects the England and South West trend.
- 2.10 Wiltshire has fared less well, with a fall in the employment rate of 6% from 2009 to 2012, and the county has still not recovered to its pre-recession level. The South West has closely followed the same trend as England, and its employment rate has followed a similar level of growth since 2013.

⁹ It should be noted that all economic analysis within this section refers to the local authority of Swindon, which is largely analogous with the urban area of the town but also includes a number of other small villages (such as Highworth and Wroughton).

¹⁰ Table LI01 Local Labour Market Indicators, Office for National Statistics, year to September 2016

2.11 Figure 2.2 outlines these trends, showing the change in total employment since 2007. Table 2.1 outlines the employment rate within Swindon, Wiltshire, the South West and England during this period.

Figure 2.2: Employment Index in Swindon Local Authority



Source: Annual Population Survey, Office for National Statistics (accessed 2017)

Table 2.1: Employment Rate (16-64) of Swindon Local Authority

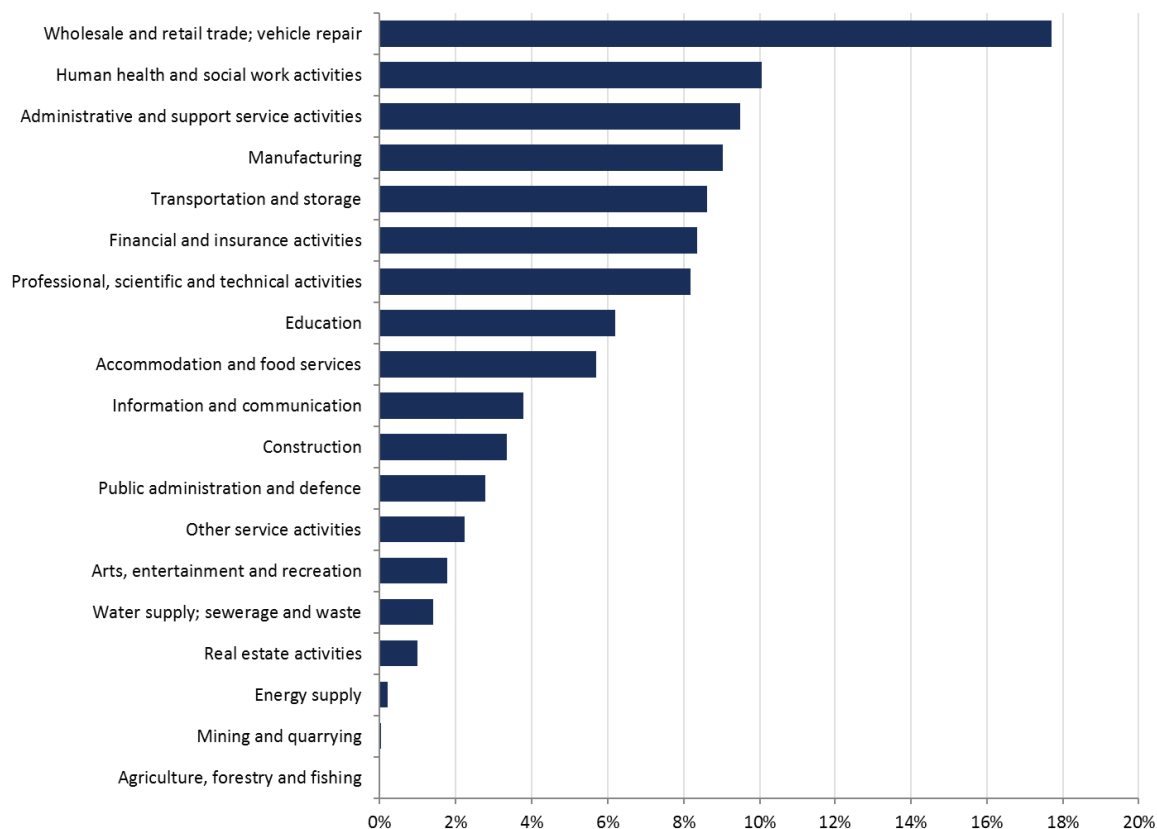
Area	2009	2010	2011	2012	2013	2014	2015
Swindon	77.3%	76.7%	73.4%	72.9%	75.9%	77.2%	77.4%
Wiltshire	80.4%	77.1%	76.0%	74.4%	74.9%	79.0%	79.2%
South West	74.4%	73.7%	73.6%	73.7%	74.7%	76.0%	77.3%
England	70.8%	70.3%	70.0%	70.8%	71.5%	72.5%	73.8%

Source: Annual Population Survey, Office for National Statistics (accessed 2017)

2.12 Swindon is also home to several large employers across a variety of sectors. It is the location of the head offices of several companies, including the Nationwide Building Society, Zurich Financial Services, npower, W H Smith and the National Trust. Car manufacturers Honda and BMW/Mini both have large production plants in the area.

2.13 Figure 2.3 below outlines the key employment sectors within Swindon, based on Business Register and Employment Survey (BRES) data. The largest sector for employment is in the Wholesale, Retail and Repair Trade for Vehicles (18%). This is followed by Human Health and Social Work (10%) and Administrative and Support Service (9%).

Figure 2.3: Employment by industry in Swindon Local Authority (2015)



Source: Business Register and Employment Survey, Office for National Statistics (accessed 2017)

2.14 Several of these sectors would be expected to benefit from agglomeration effects if the accessibility of Swindon improved. Firms and workers within high-skill, high-value service sectors (such as Finance and Insurance, and Professional, Scientific and Technical Activities), together with Advanced Manufacturing (such as car manufacturing at the Honda plant) benefit disproportionately from agglomeration effects, such as improved labour market accessibility and greater knowledge-sharing, that deliver significant productivity benefits to firms. These sectors account for a greater proportion of employment in Swindon than the national average – 8% are employed in financial and insurance activities, for example, compared to 4% across Great Britain – which would suggest the economy of Swindon *could* benefit from agglomeration effects within key sectors.

- 2.15 Census data highlights the primary method of travelling to work for Swindon residents, as indicated in Table 2.2. The data shows that driving is overwhelmingly the most common mode of commuting, and that rail's mode share is comparatively low, although this is not an unusually low figure. The low mode share of rail does suggest that commuting out of Swindon is relatively rare, as rail is generally associated with longer-distance commuting.

Table 2.2: Method of Travel to Work for Residents, Swindon Local Authority, 2011

Mode	Swindon	Percentage ¹¹
Underground, metro, light rail, tram	86	0.1%
Train	1,452	1.4%
Bus, minibus or coach	9,356	8.9%
Taxi	507	0.5%
Motorcycle, scooter or moped	1,177	1.1%
Driving a car or van	69,539	66.1%
Passenger in a car or van	6,747	6.4%
Bicycle	4,667	4.4%
On foot	11,063	10.5%
Other method of travel to work	552	0.5%

Source: ONS Census Travel to Work, 2011 (accessed 2017)

- 2.16 Car ownership is also considerably greater than the national average, with 78% of households having access to a car or van, greater than the national average of 74%. Approximately 73% of Swindon residents travel to work by car, compared to 1.4% by rail, compared to the national average of 66% and 5.6% respectively¹²

¹¹ The percentage figures are of those who commute to work, and are thus both in employment and do not work primarily from home.

¹² 2011 Census, Office for National Statistics. Modal share data considers the proportion travelling by car / rail divided by those in work who do not work at home.

2.17 Census data also suggests that the labour market of Swindon is largely self-contained within the Local Authority, with little outbound commuting. Table 2.2 shows the most common places of work of all employed residents living in Swindon at the time of the 2011 Census. A clear majority of commuting trips are local to the authority, with 74% of employed residents within Swindon also working there. 8% of workers commute to elsewhere in Wiltshire, and only 2% commute to London.

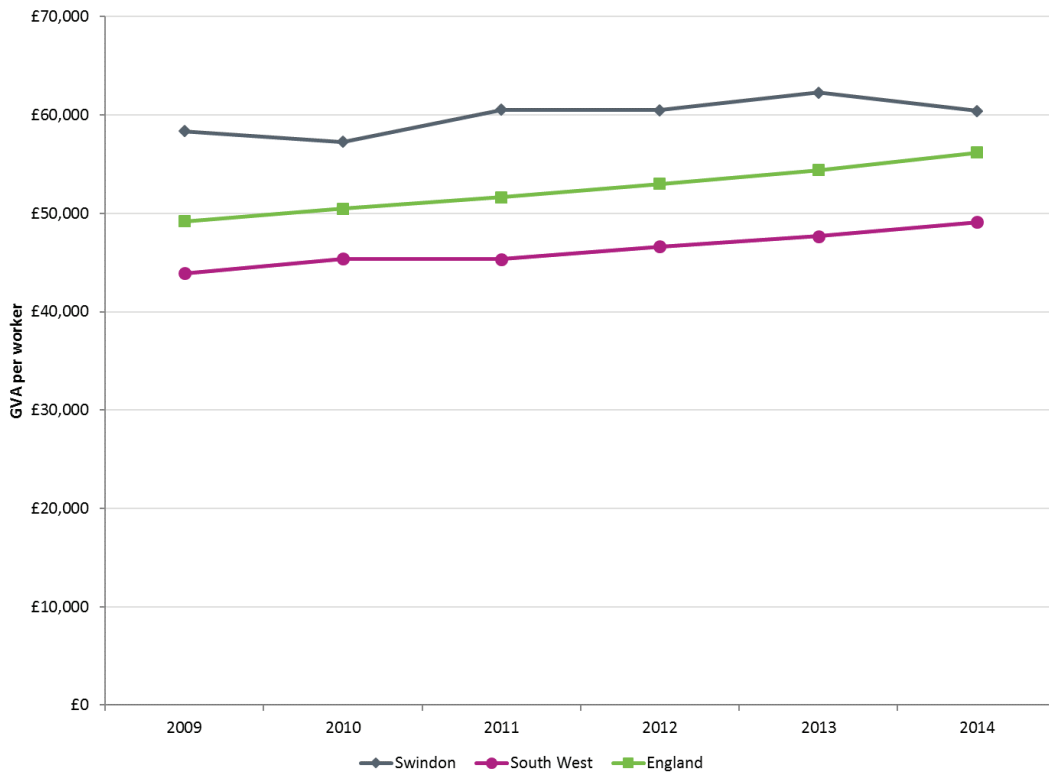
Table 2.3: Top 10 destinations for work for employed residents of Swindon local authority, 2011

Rank	Place of Work	Number of Workers	Percentage of Employed Residents in Swindon
1	Swindon	68,153	74%
2	Wiltshire	7,174	8%
3	Vale of White Horse	2,552	3%
4	West Berkshire	1,778	2%
5	Cotswold	1,776	2%
6	Winchester	1,480	2%
7	London (all boroughs)	1,266	1%
8	Reading	663	1%
9	Oxford	658	1%
10	West Oxfordshire	655	1%

Source: 2011 Census, Office for National Statistics (accessed 2017)

2.18 Levels of Gross Value Added per worker (GVA) within Swindon are also high, reflecting the high-value sectors outlined in Figure 2.3. GVA per worker refers to the total value of goods and services generated by each worker within a given region or sector of the economy. GVA per worker within the local authority of Swindon has broadly increased since 2009, and the total output per worker is considerably greater than both the rest of the South West region and the English average. Figure 2.4 outlines this trend.

Figure 2.4: GVA per worker of Swindon Local Authority



Source: Regional GVA by Local Authority and Annual Population Survey, Office for National Statistics (accessed 2017)

Rail usage at Swindon

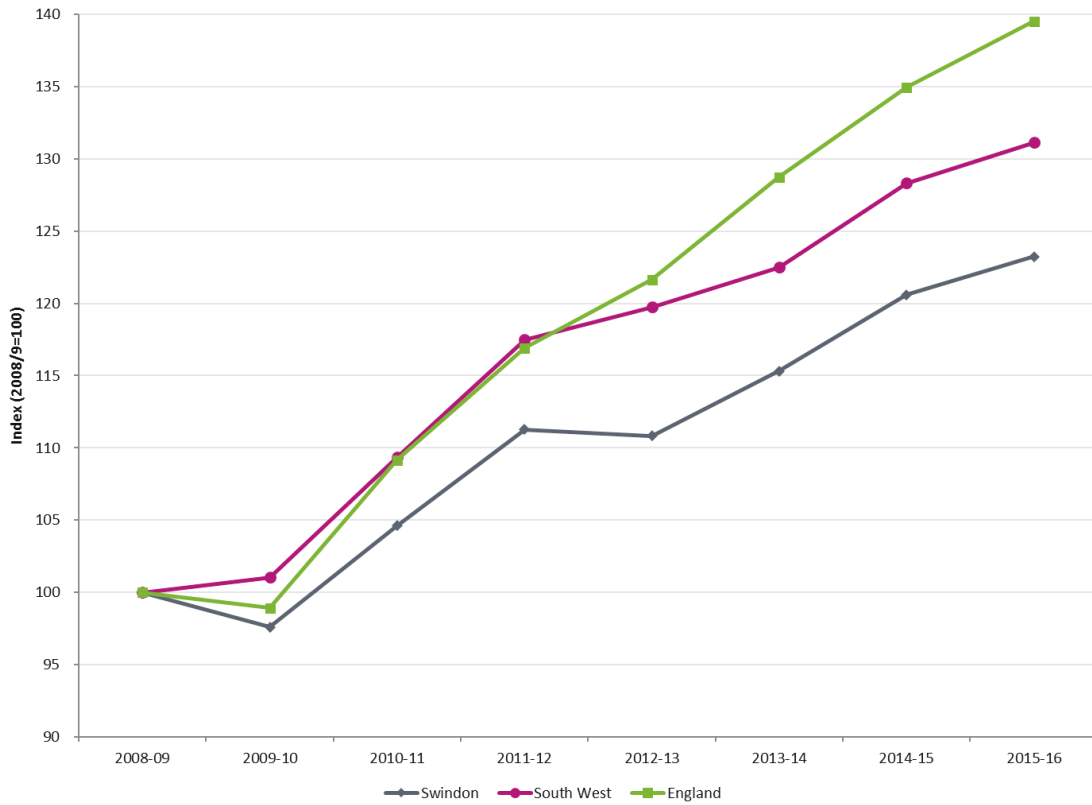
What have been the recent trends in usage of rail services at Swindon station?

2.19 ORR data indicates that Swindon station has approximately 3.6 million entries and exits per year, or approximately 12,000 per day, with 28% of journeys undertaken on season tickets, considerably less than the national average of 38%¹³. While this proportion is only a proxy measurement of commuting flows at Swindon, it does indicate that the proportion of commuting journeys at Swindon is likely to be less than the national average.

¹³ Office for Rail and Road, Estimates of Station Usage, 2015-16

2.20 Figure 2.5 outlines the recent trends in passenger numbers at Swindon, together with the South West and England average.

Figure 2.5: Index of station usage, 2008/09 to 2015/16



Source: National Rail Trends and Estimates of Station Usage, ORR (accessed 2017)

2.21 Patronage at Swindon has increased by approximately 23% since 2008/09, less than the regional average and considerably less than the national average. Weaker growth in patronage at Swindon could also reflect the lack of any large-scale service improvements along the core Great Western route in recent years, increases in crowding levels on trains stopping at Swindon, together with the comparatively low proportion of journeys undertaken for commuting purposes from Swindon.

- 2.22 Table 2.4 outlines the key origins and destinations of journeys of trips to and from Swindon, based on ORR data. Trips are overwhelmingly concentrated on the core Great Western route between London, Bristol and Cardiff, and intermediate stations; few journeys involve trips elsewhere on the rail network or appear to involve a change of train. Broadly, this reflects the destinations reported by Swindon station users in our survey¹⁴, although only 17.5% of users surveyed reported travelling to London Paddington in contrast to the ticket sales data.

Table 2.4: Top 10 stations for journeys to/from Swindon

Rank	Destination	Percentage of Journeys
1	Paddington	30.4%
2	Bath Spa	10.8%
3	Bristol Temple Meads	8.6%
4	Chippenham	6.4%
5	Reading	4.6%
6	Didcot Parkway	3.6%
7	Bristol Parkway	3.2%
8	Cardiff Central	2.8%
9	Oxford	2.3%
10	Gloucester	1.4%

Source: Origin-Destination Matrix, DfT, 2014-15 (accessed 2017)

- 2.23 Evidence from the station user survey suggested that most passengers at Swindon use the station relatively frequently, but not daily. 58% of station users used the station at least monthly, with 34% using the station at least weekly. Only 12.5% of users reported using Swindon station “most days” (5+ days a week), almost all of whom were travelling for commuting purposes. However, it is important to note that the survey results have not been weighted, and as such this proportion is likely to be lower than the true figure.

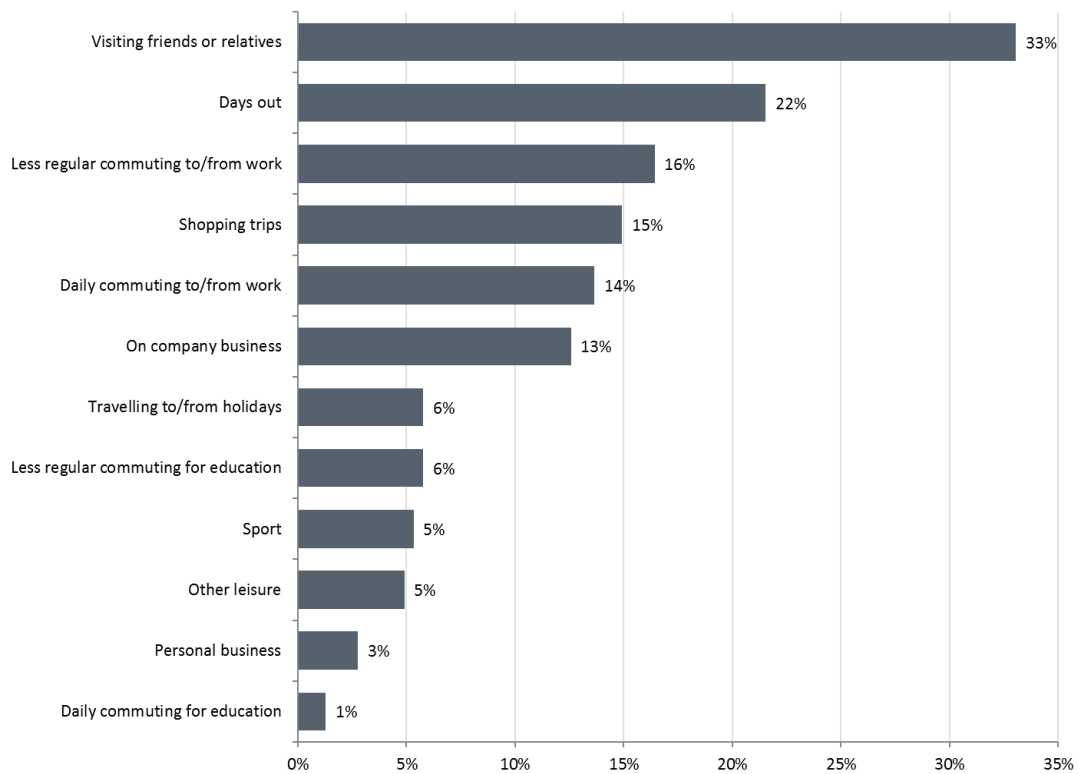
¹⁴ The station user survey was undertaken between 7am and 7pm weekdays and 10am and 2pm on Saturdays. Interviews were spread across these time periods and, since the data has not been re-weighted to account for higher volumes of usage in the peak, while all types of user will be represented, commuters will be under-represented. This effect can be seen by the lower proportion of daily commuters in the passenger survey (14%) compared season ticket holders in the 2015-16 ORR station usage data (28%). When undertaking the post-implementation surveys, it would be appropriate to weight both the before and after data using ORR ticket type data or time of day to help ensure the results are representative of the mix of types of passenger, and that difference between the two waves are not due to sampling differences. Further details on the surveys are available in the accompanying Technical Report.

How do people currently use rail services at Swindon station, for what purpose and how satisfied are people with them?

2.24 Figure 2.6 outlines the proportion of journeys by purpose for station users travelling by rail from Swindon, based on evidence gathered from a survey of station users taken across the AM, PM and off-peak.

2.25 Respondents were asked to list all the journey purposes they tend to use Swindon station for, and hence the totals sum to greater than 100%. Notably, only a small proportion of station users reported using Swindon station to travel to work, with 14% of respondents reporting using the station for daily commuting and 16% using the station for less regular commuting to and from work. 13% of users reported using the station for business purposes, while much larger proportions of station users reported using Swindon for leisure purposes, such as shopping or visiting family or friends.

Figure 2.6: Swindon Station User Survey – for which journey purposes do you use this station?



Source: Swindon station user surveys (2016). Base= respondents not first time users of station (n=469).

2.26 Overall, this suggests that use of the station is more orientated towards leisure trips, rather than those for commuting or business, in contrast to the national average where 56% of trips are for commuting or business, with only 31% for leisure or shopping purposes¹⁵. While the survey may underestimate the proportion of trips undertaken for business and commuting purposes, since it was not weighed by passenger numbers by time period (more commuting

¹⁵ Department for Transport National Travel Survey Statistics, Table NTS0409, England, 2015

trips would be expected in the busier AM peak, for example), it is still likely that the proportion of trips for commuting and business trips is less than the national average.

2.27 Broadly, station users surveyed were satisfied with the station and the services available. Regarding the station facilities:

- overall, 79% of users were 'very' or 'fairly' satisfied with the station facilities;
- users were especially satisfied by the station's location within the town, with 82% of users 'very' or 'fairly' satisfied; and
- satisfaction levels were lowest with the car parking available at Swindon, with only 58% 'very' or 'fairly' satisfied of those who expressed an opinion to the question (58% of respondents answered 'Don't know' or 'No opinion', most likely because they did not arrive by car and hence had no experience of the parking available).

2.28 Satisfaction levels were comparable regarding the train services, since:

- regarding the trains 'overall', 77% of respondents were 'very' or 'fairly' satisfied;
- 82% were 'very' or 'fairly' satisfied with the service frequencies available from Swindon;
- users were less satisfied by the punctuality of the train service (67% 'very' or 'fairly' satisfied), and in particular with the level of crowding; and
- only 60% of users were 'very' or 'fairly' satisfied that there is 'sufficient room for all passengers to sit/stand', with 9% 'very dissatisfied' with the level of capacity available. Dissatisfaction with the capacity available was also slightly higher amongst those who used the train for commuting purposes.

Summary

2.29 The employment rate in Swindon has broadly followed the South West England and England trend since 2009, and whilst the trend growth has outperformed Wiltshire consistently, the overall employment rate remains below Wiltshire. Swindon's labour market appears to be largely self-contained, with almost three-quarters of Swindon residents commuting within the local authority area.

2.30 Employment is disproportionately concentrated within the Wholesale and Retail Trade, and Repair of Motor Vehicles. GVA per worker is higher than the regional and national averages, although fell slightly between 2013 and 2014.

2.31 Rail patronage growth at Swindon has been below the regional and national averages since 2009, although satisfaction levels with the station and with levels of service amongst station users have consistently been high. The main exception to this was with parking, but even in this area more than half of station users were satisfied with the provision available.

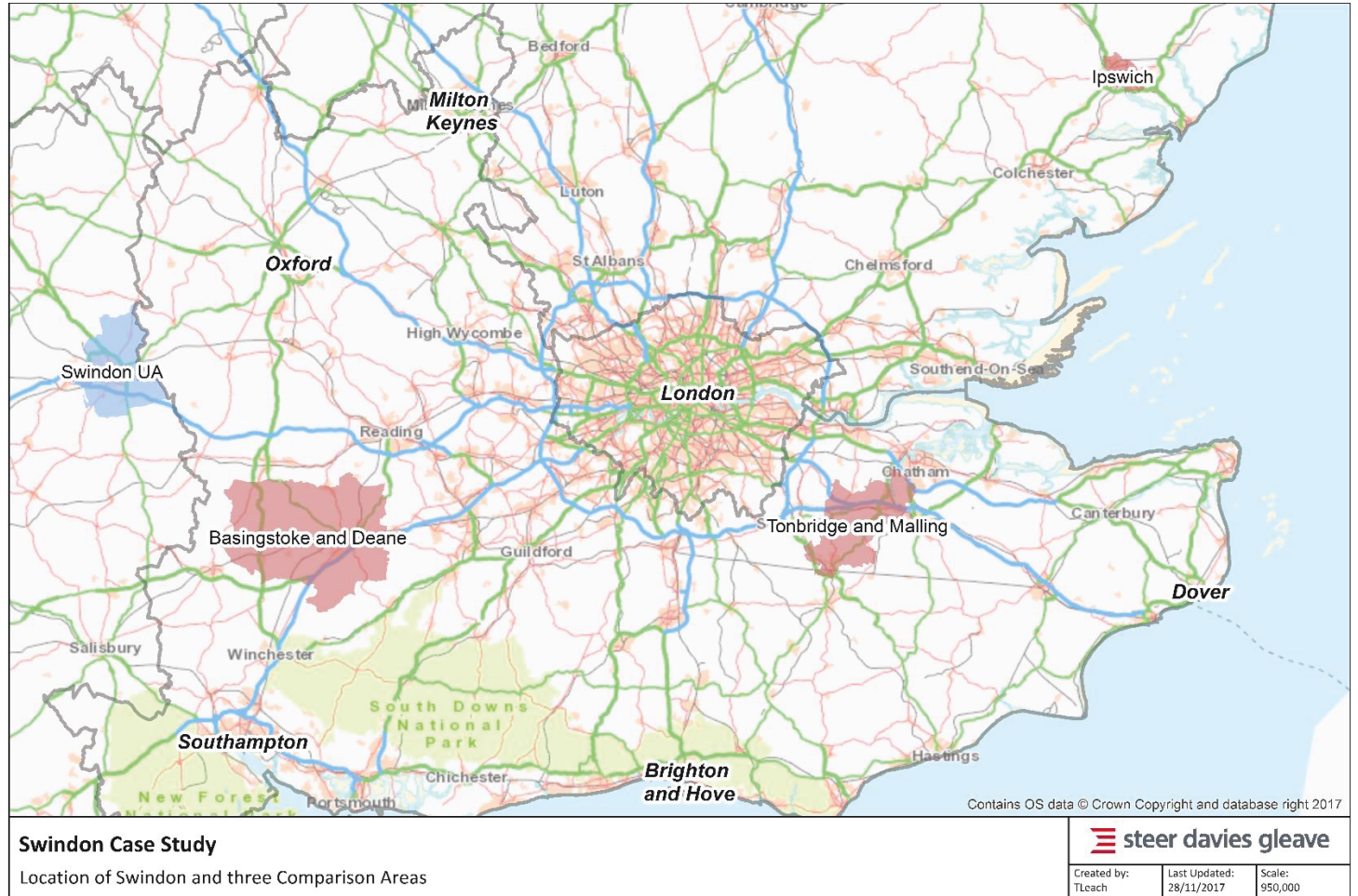
2.32 Station user surveys suggest that commuting is not a primary motive for trips at Swindon, although the sample was not weighted for peak and off-peak journeys.

3 Comparison Areas

Introduction

- 3.1 Comparison areas are used within the evaluation to support the isolation of the effects of the rail investment from more general transport and economic trends, such as increasing rail use nationally. This chapter introduces the comparison areas used within the Swindon case study, justifies their selection and identifies any relevant differences between the comparison areas and the Swindon intervention area.
- 3.2 Comparison areas and stations were selected based on their transport provision characteristics, especially distance, service frequency and journey time to London, together with their local demographics, to ensure that they represented comparable areas to Swindon. Three comparison areas were selected for this case study: Tonbridge, Ipswich and Basingstoke. They are illustrated in Figure 3.1 below.

Figure 3.1: Location of Swindon, Basingstoke and Deane, Tonbridge and Malling, and Ipswich



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Selection of the comparison areas

How (and why) were the comparison areas selected?

- 3.3 Each comparison area was selected to be as similar in transport provision and local geography to Swindon as possible, as well as being unaffected by major changes to services or improvement works over the same time period as Swindon. Areas were selected on the basis of:
- similar distance, and journey time, to London;
 - comparable population and economy to Swindon;
 - location on an inter-city corridor, serving other significant destinations away from London; and
 - a lack of service enhancements or infrastructure improvements that would be difficult to disaggregate from wider trends.
- 3.4 Few areas fit all of these requirements, and hence a ‘basket’ of areas were used that better represent underlying trends in rail use in a town comparable to Swindon more so than any one town in particular. Peterborough station was initially included within this ‘basket’ but was discounted as it is likely to benefit from the Thameslink Programme, which will result in enhanced services linking the city to London and onwards to the City of London, Gatwick Airport and the South Coast. It was felt that scale of these impacts would outweigh any benefit of including Peterborough in the basket of comparison stations.

How do rail services of the treatment and comparison areas compare?

- 3.5 Swindon, as discussed in Chapter 1, is served by approximately five trains per hour to London, with a journey time of approximately one hour, on inter-city-type rolling stock. It is also linked to several other large towns and cities by frequent services, including Bristol, Cardiff, Reading and Swansea.
- 3.6 Basingstoke is served by approximately five ‘fast’ trains per hour to London Waterloo, with a journey time of between 45 and 55 minutes, as well as two ‘slower’ trains per hour with a journey time of 1 hr 12 mins, and two opportunities to travel to London Paddington with a change in Reading in approximately 55 minutes. It also has direct services to several major towns and cities, including Southampton, Portsmouth, Bournemouth, Oxford and Birmingham, and hence is felt to have a comparable level of service to Swindon. It is not expected to benefit from any major changes to services over the next ten years, besides an incremental increase in train capacity and limited journey time savings¹⁶.
- 3.7 Ipswich is served by fewer services to London, with two ‘fast’ services to London Liverpool Street taking approximately 1 hr 10 mins, together with a ‘semi-fast’ service taking 1 hr 22 mins. Rolling stock is comparable to that at Swindon, based on locomotive-hauled Mk 3 coaching stock. It is also served by services to Peterborough, Norwich and Cambridge, as well as

¹⁶ Journeys between Salisbury and Waterloo, and Southampton and Waterloo, are expected to become 11 and 8 minutes faster respectively under the new South Western franchise. It would therefore be expected that Basingstoke would experience a benefit from these changes as an intermediate stop on these routes.

significant local rail network serving Suffolk. Under the new East Anglia franchise, it is expected to benefit from new rolling stock, which will replace all existing trains serving the town by the end of 2020, minor improvements to journey times along the London – Ipswich – Norwich corridor (one train per day will link the town to London in less than 60 minutes by May 2019¹⁷), and a doubling of frequency on the regional Ipswich – Stowmarket – Peterborough route.

- 3.8 Tonbridge is better served by services to London than Swindon, with approximately six trains per hour to London Charing Cross, taking approximately 45 – 50 minutes, together with an hourly service to London Victoria taking approximately one hour. It is also linked to a number of other large towns within Kent, including Hastings, Tunbridge Wells, Ashford, Dover and Maidstone, but lacks services to elsewhere in the South East and the rest of the country. Services have also been affected by the recent upgrade at London Bridge station, which has affected the services available at the station, with up to two-thirds of London services unable to call at London Bridge and a deterioration in service reliability. Work is expected to be completed by 2018.

¹⁷ East Anglia Franchise Invitation to Tender, Department for Transport, 17 September 2015

3.9 Table 3.1 below summarises these service patterns, together with the total number of passengers and proportion of journeys using a season ticket.

Table 3.1: Summary of rail service provision and station usage

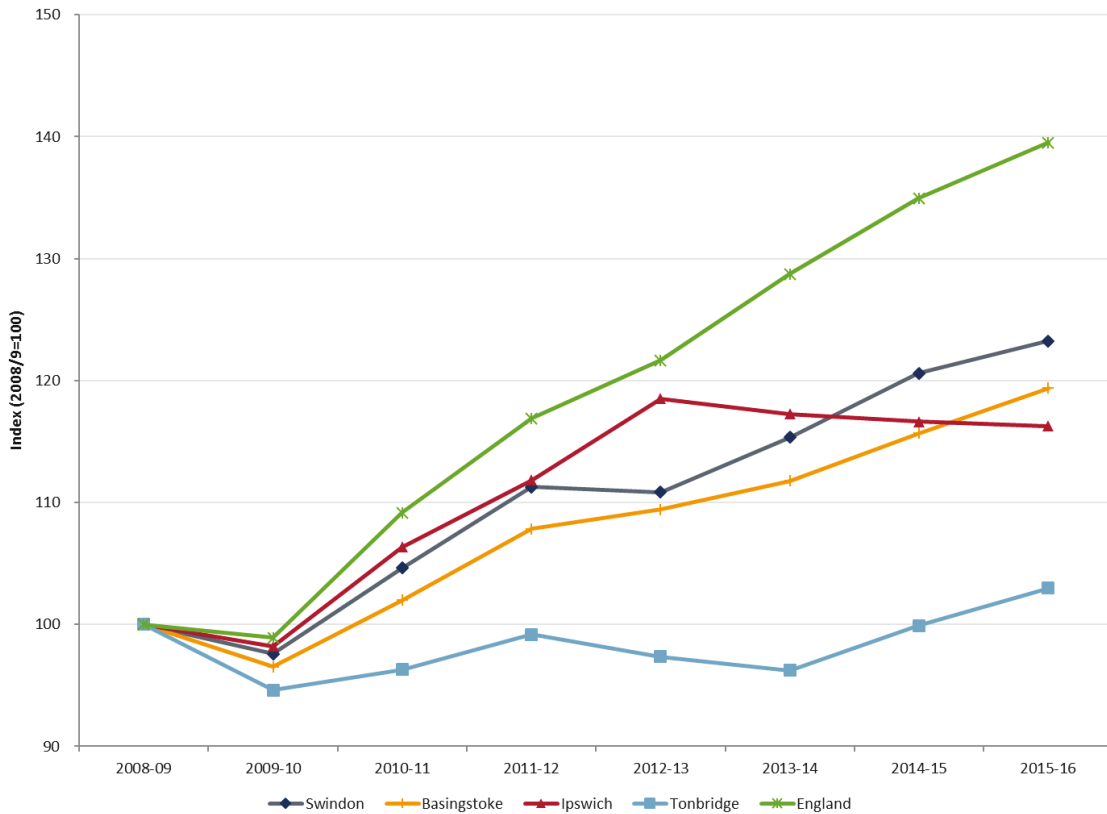
Station	Typical time to London (minutes)	Services departing for London between 7:00 and 7:30	Total entries and exits per annum (2015/16)	Percentage of journeys undertaken on season tickets (2015/16)
Swindon	56-68	3	3.58 million	28%
Basingstoke	44-74	4	5.74 million	40%
Ipswich	64-86	3	3.28 million	34%
Tonbridge	38-63	4	4.34 million	54%

Source: National Rail Enquiries, Office for Rail and Road, Estimates of Station Usage, 2015-16 (accessed 2017)

3.10 Passenger numbers at all three comparison stations are within approximately 25% of those at Swindon, except for Basingstoke which has approximately 60% more passengers. Swindon also has a considerably smaller proportion of passengers travelling on season tickets than elsewhere, which can be considered as a proxy for the proportion of journeys undertaken for commuting purposes at each station.

3.11 Figure 3.2 outlines the change in rail patronage at Swindon, together with the comparison stations, since 2009/10. Patronage has broadly increased at the same rate within Swindon, and Basingstoke, although growth has been significantly weaker in Tonbridge, potentially a result of the disruption caused by improvement works at London Bridge station. Patronage at Ipswich grew rapidly following 2009, although has experienced a steady decline since 2012/13. Growth at all stations has been less than the England average, especially since 2012/13.

Figure 3.2: Trends in station patronage at Swindon, Basingstoke, Ipswich and Tonbridge



Source: National Rail Trends and Estimates of Station Usage, ORR (accessed 2017)

Comparison of socio-economic characteristics

3.12 Table 3.2 below outlines the size of Swindon, relative to the comparison areas of Tonbridge, Basingstoke and Ipswich, in terms of resident population.

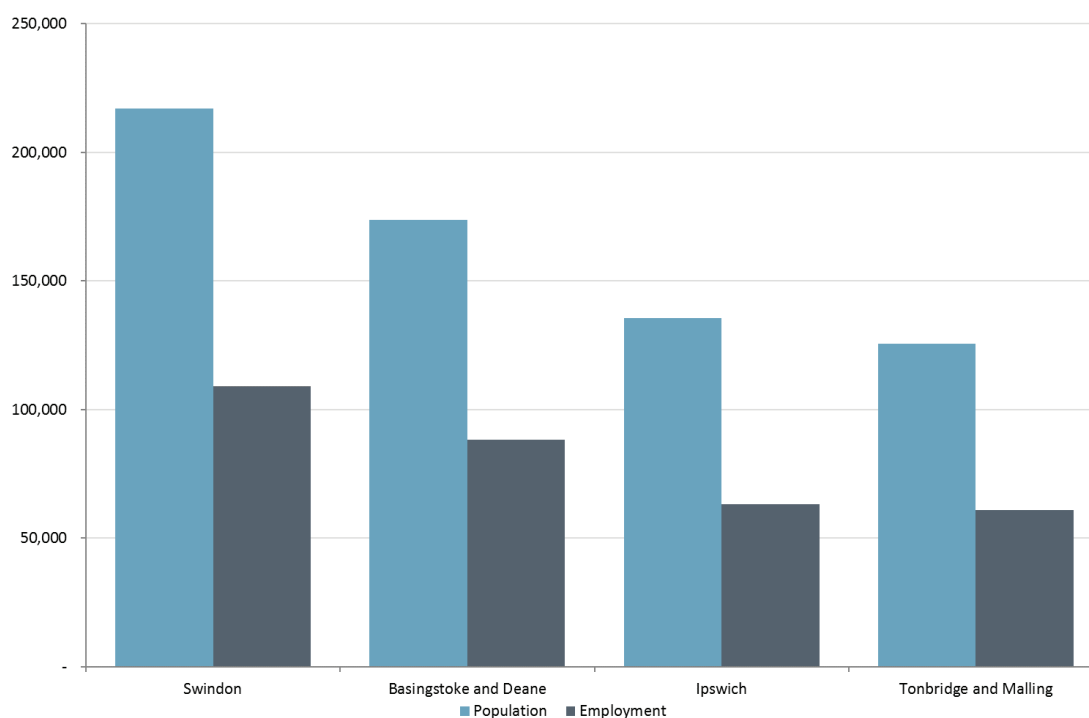
Table 3.2: Population within given distance catchments of Swindon, Ipswich, Tonbridge and Basingstoke stations

Station	< 1 km	1km – 2km	2km – 5km
Swindon	17,700	39,500	139,200
Basingstoke	13,600	25,200	69,600
Ipswich	12,100	37,000	101,200
Tonbridge	12,800	9,700	42,800

Source: MOSAIC Population Estimates (postcode level), 2015. MOSAIC is a consumer classification system, developed by Experian, and source of local population data. Accessed 2017.

- 3.13 Each station has a comparable population surrounding it within a one-kilometre catchment, although approximately 4,000 more people are located within 1km of Swindon station, reflective of the denser terrace streets that are immediately adjacent to the station. Swindon and Ipswich form the largest settlements overall, followed by Basingstoke and Tonbridge, although it is noted that all are comparable in that they represent towns with significant commuter flows to London, within the Home Counties.
- 3.14 Figure 3.3 below summarises the population and employment of the constituent local authority of Swindon, and each comparator area. The proportion of population to employment within each local authority district is comparable amongst the four locations.

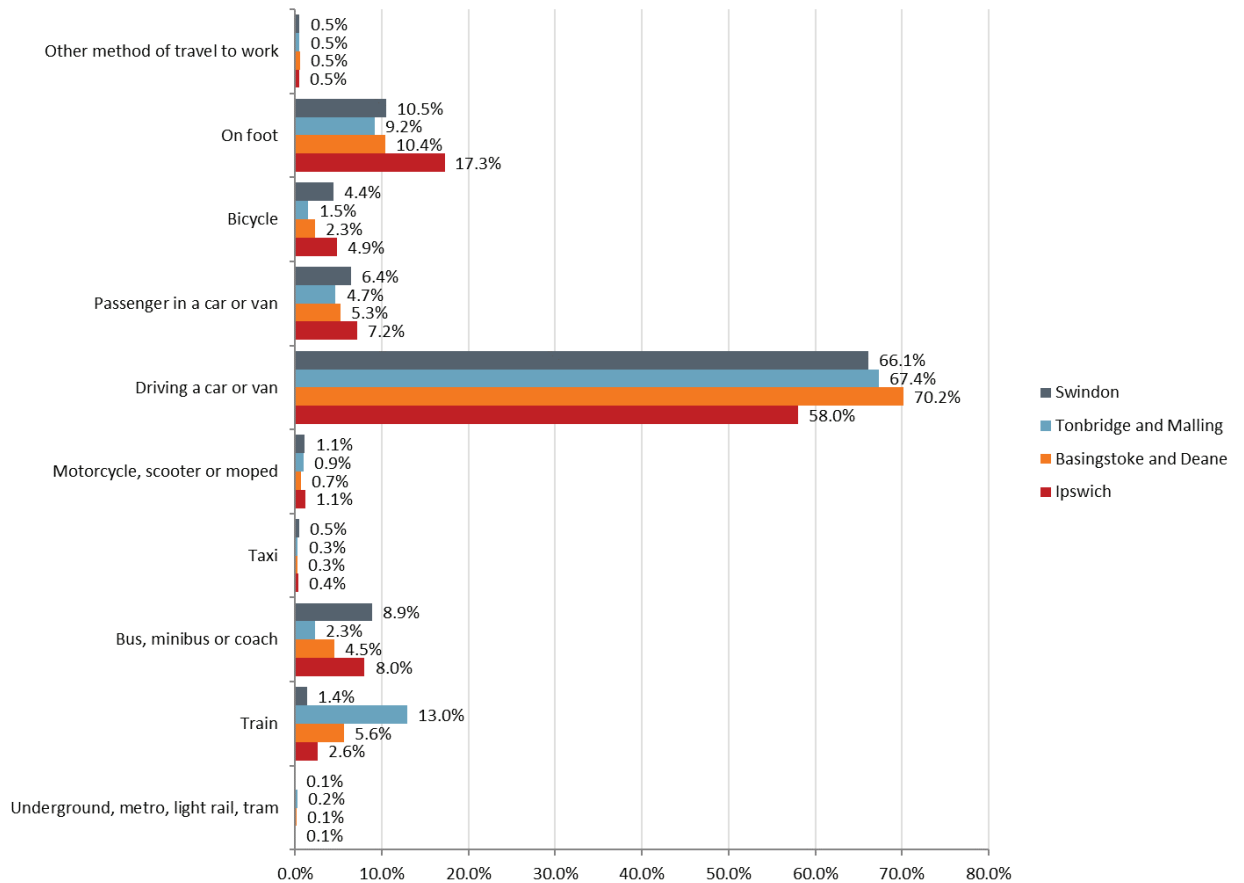
Figure 3.3: Population and Employment at Local Authority Level (2015)



Source: Annual Population Survey and Population Estimates, Office for National Statistics (accessed 2017)

3.15 Figure 3.4 indicates the method of travel to work in Swindon, and the three comparison areas, at local authority level. The data suggests that there are broad similarities in terms of commuting mode share across all four areas, although there are some variations, such as at the level of rail commuting in Tonbridge and Malling being more than double that of any of the other areas, and the high level of commuting on foot in Ipswich.

Figure 3.4: Method of Travel to Work at Local Authority level, 2011



Source: ONS Census 2011, Travel to Work data (accessed 2017)

3.16 Table 3.3 indicates the most common workplace locations of residents of both Swindon, and the three comparison areas. The data highlights that Swindon’s commuter population is considerably more likely to work locally than in any of the three comparison areas. It also makes clear that the proportion of the local population working in London is only comparable to that of Ipswich, with the London-bound commuting populations representing a much larger share of the total employed population in Basingstoke and especially Tonbridge.

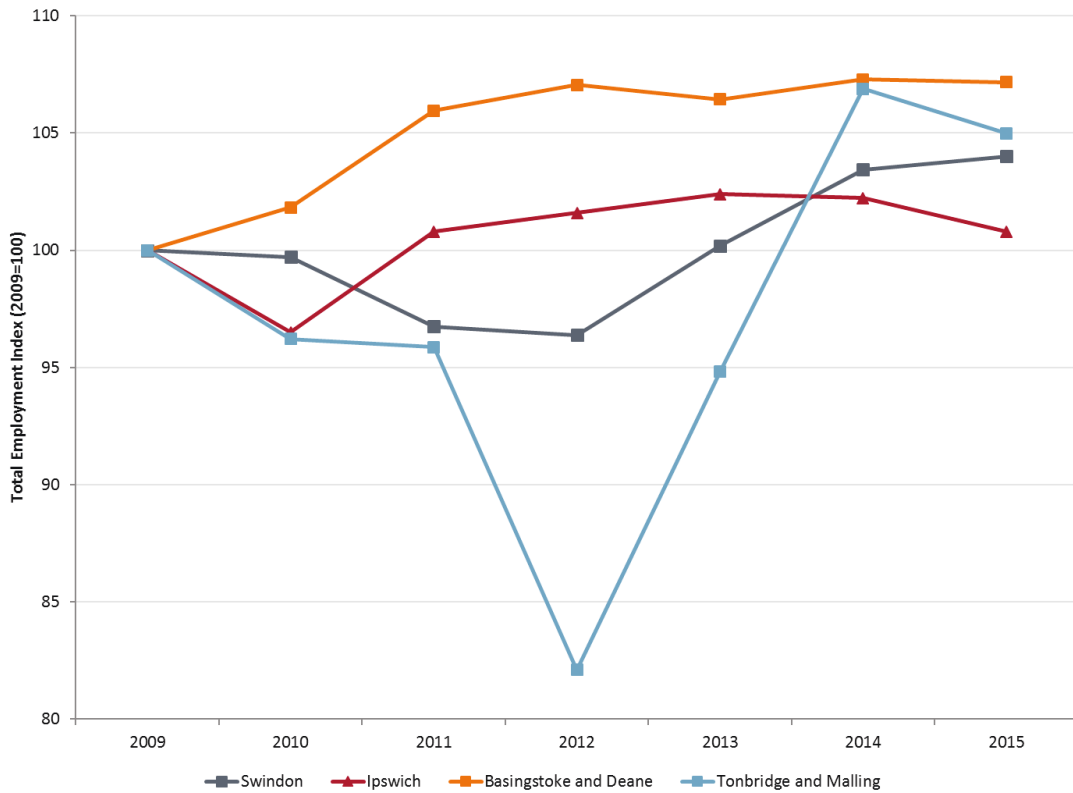
Table 3.3: Top 10 outbound commuting destinations for case study area and comparison area residents, by local authority, 2011

Rank	Origin: Swindon			Origin: Basingstoke and Deane			Origin: Ipswich			Origin: Tonbridge and Malling		
	Destination	Commuters Number	%	Destination	Commuters Number	%	Destination	Commuters Number	%	Destination	Commuters Number	%
1	Swindon	68,153	73.6%	Basingstoke and Deane	42,909	58.5%	Ipswich	34,626	62.0%	Tonbridge and Malling	17,501	36.5%
2	Wiltshire	7,174	7.7%	West Berkshire	7,670	10.4%	Suffolk Coastal	7,268	13.0%	London (combined)	9,745	20.3%
3	Vale of White Horse	2,552	2.8%	London (combined)	4,282	5.8%	Mid Suffolk	3,857	6.9%	Maidstone	5,471	11.4%
4	West Berkshire	1,778	1.9%	Hart	2,894	3.9%	Babergh	3,633	6.5%	Tunbridge Wells	4,261	8.9%
5	Cotswold	1,776	1.9%	Reading	2,006	2.7%	Colchester	1,315	2.4%	Sevenoaks	3,378	7.0%
6	Winchester	1,480	1.6%	Winchester	1,429	1.9%	London (combined)	1,149	2.1%	Medway	2,523	5.3%
7	London (combined)	1,266	1.4%	Test Valley	1,302	1.8%	St Edmundsbury	746	1.3%	Dartford	918	1.9%
8	Reading	663	0.7%	Rushmoor	1,213	1.7%	Braintree	447	0.8%	Gravesham	520	1.1%
9	Oxford	658	0.7%	Wokingham	1,145	1.6%	Tendring	406	0.7%	Swale	489	1.0%
10	West Oxfordshire	655	0.7%	Bracknell Forest	882	1.2%	Chelmsford	210	0.4%	Ashford	369	0.8%

Source: ONS Census 2011, Travel to Work data (accessed 2017)

3.17 Figure 3.5 below shows the trends in the employment levels in Swindon, together with each comparison area, since the late-2000s recession. Swindon has seen a net increase in employment since 2009, despite a fall between 2010 and 2011. Employment in Tonbridge fell sharply in 2012, but recovered rapidly and by 2015 was approximately 5% greater than its pre-recession level, comparable to Swindon. Basingstoke and Ipswich have followed a pattern of slower, but more stable, growth in employment since 2009 and 2010 respectively. The employment levels in all four districts has recovered fully since the late-2000s recession, and is above their 2009 level.

Figure 3.5: Total Employment Index at Local Authority level 2009-2015



Source: Annual Population Survey, Office for National Statistics (accessed 2017)

3.18 Table 3.4 outlines the employment rate within each comparison area. Except Ipswich, each district has a strong labour market, with a considerably higher proportion of the working-age population in employment than the England average.

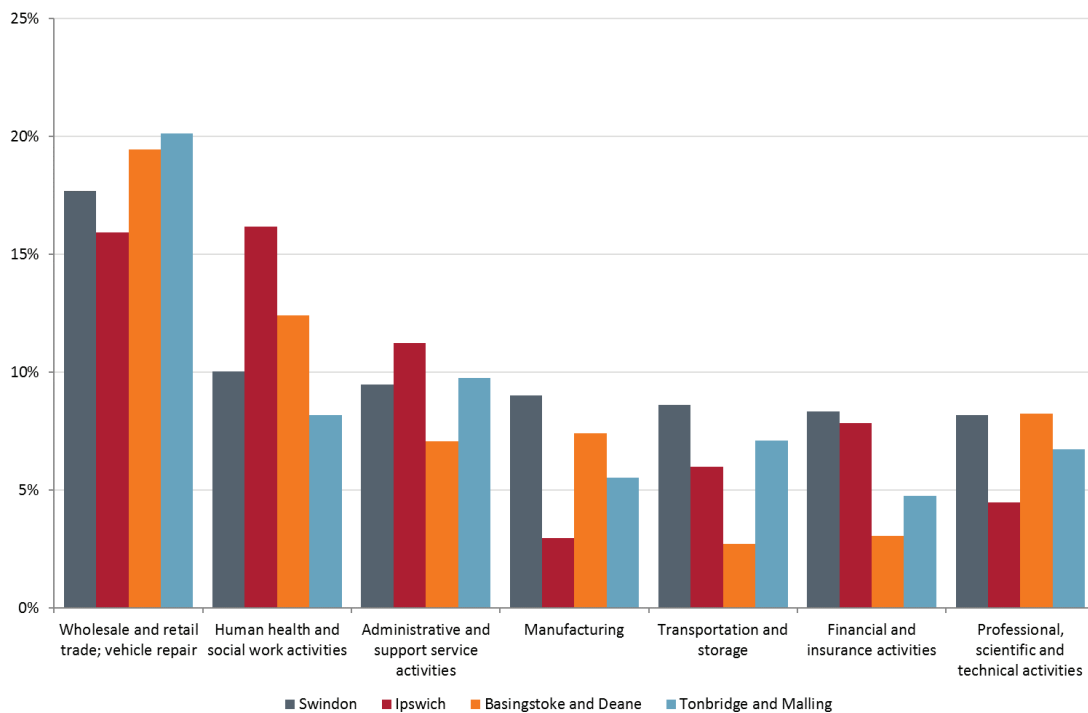
Table 3.4: Employment Rate by Local Authority, 2015

Local Authority	Employment Rate (16-64)
Swindon	77.4%
Basingstoke and Deane	81.7%
Ipswich	73.2%
Tonbridge and Malling	81.3%
England	73.8%

Source: Annual Population Survey, Office for National Statistics (accessed 2017)

3.19 Figure 3.6 compares the sectoral composition of Swindon and the comparison areas. The sectors focused on are the largest seven employment sectors in Swindon.

Figure 3.6: Comparison of employment sectors



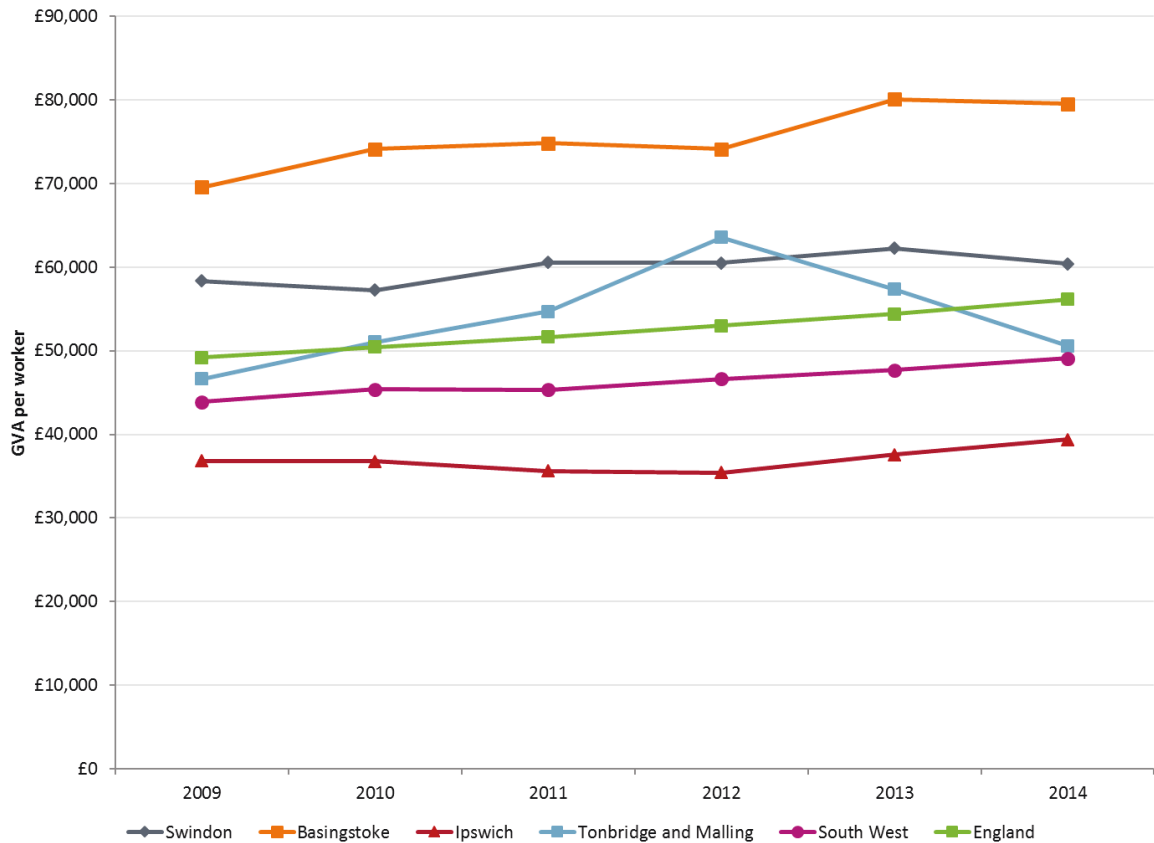
Source: Business Register and Employment Survey, Office for National Statistics, 2014 (accessed 2017)

3.20 All areas have high percentages of employees in the Wholesale, Retail and Vehicle sector, although the proportion of the workforce in this sector is slightly less in Swindon than in two of the three comparison areas. Swindon has an especially high proportion of the workforce employed in Manufacturing, Transport and Storage, and Financial and Insurance Activities. Healthcare in Swindon accounts for a smaller proportion of the workforce than in Ipswich and

Basingstoke, and Education only accounts for 6%, compared to 10% in Tonbridge, 9% in Basingstoke and 8% in Ipswich.

3.21 Figure 3.7 indicates the levels of GVA per worker in Swindon, the three comparison areas, the South West, and England. It is evident that there is significant variation between the areas, although only Tonbridge and Malling offer evidence of a sustained fall in GVA per worker in recent years. The remaining areas are all relatively stable, and similar in terms of trajectory; a slight rise relative to 2009 is shared by the comparison areas and the national and South West averages.

Figure 3.7: GVA per worker, 2009-14



Source: Regional GVA by Local Authority and Annual Population Survey, Office for National Statistics (accessed 2017)

Summary

3.22 The three comparison areas all differ from Swindon to some extent in terms of rail service, with all of them having a greater proportion of season ticket travellers. Ipswich is both further from London and has a less frequent service, while Tonbridge is both nearer and has a more frequent service. Basingstoke has a similar level of service, but greater variation in journey times.

3.23 Patronage growth has varied between each station relative to 2008-09, though all four stations have experienced lower growth on this metric than England as a whole.

3.24 The population of all four areas is relatively similar within 1km of the station, though the population within a wider radius varies significantly.

- 3.25 The ratio of population to employment is comparable across all four locations. While the trends in employment have varied since 2009, all four locations have now recovered to a level above the 2009 level. Only Ipswich has rates of employment below the national average.
- 3.26 In terms of commuting destinations, Swindon has a much higher proportion of residents working locally than any of the comparison areas, and the London-bound commuting population is only comparable to that of Ipswich.
- 3.27 There are some variations in the sectoral composition of employment, but in all four areas, the Wholesale, Retail and Vehicle sector is the largest. Swindon has an especially high proportion of the workforce employed in Manufacturing, Transport and Storage, and Financial and Insurance Activities, compared to the three comparison areas.
- 3.28 GVA per worker varies significantly between the areas, though the trajectory between 2009 and 2014 was similar for all except Tonbridge.

4 Expected Behavioural Impacts of the Transport Intervention

Introduction

- 4.1 This chapter revisits the evidence presented in the previous two chapters to discuss further the baseline situation regarding the provision and use of rail transport for Swindon, together with the three comparison stations. It also considers the effects that might be expected from the electrification, re-signalling and, most importantly, associated change in service pattern at Swindon.
- 4.2 In terms of the hypotheses proposed, this chapter is focused on hypothesis one: “increased service frequency, reduced journey times and a reduction in crowding at Swindon will make rail travel more convenient for local people, encouraging additional rail trips, some generated and some captured from other modes.”

Comparison of trends in station use

How does rail use differ between the treatment and comparison areas?

- 4.3 Table 4.1 indicates the top ten most popular destinations from Swindon, and the three comparison stations. For each station, London represents the most popular destination, although it is notable that the proportion of combined London journeys at Swindon is the lowest of the four stations. Other than their relationship to London, however, the geographical spread of the comparators prevents further meaningful comparisons being drawn.

Table 4.1: Top 10 destinations from Swindon, Basingstoke, Ipswich and Tonbridge, 2014-15

Rank	Swindon		Basingstoke		Ipswich		Tonbridge	
	Destination	Proportion	Destination	Proportion	Destination	Proportion	Destination	Proportion
1	London Paddington	30.4%	London Waterloo	36.0%	London Liverpool Street	40.7%	London Charing Cross	22.6%
2	Bath Spa	10.8%	Reading	8.7%	Colchester	9.7%	London Cannon Street	14.6%
3	Bristol Temple Meads	8.6%	Winchester	5.4%	Stowmarket	7.4%	Tunbridge Wells	12.3%
4	Chippenham	6.4%	Andover	4.5%	Norwich	4.7%	London Bridge	6.9%
5	Reading	4.6%	Farnborough (Main)	4.0%	Felixstowe	3.9%	Sevenoaks	6.3%
6	Didcot Parkway	3.6%	Hook	3.5%	Manningtree	3.2%	High Brooms	4.9%
7	Bristol Parkway	3.2%	Fleet	3.2%	Chelmsford	2.5%	London Waterloo (East)	4.0%
8	Cardiff Central	2.8%	Southampton Central	2.5%	Bury St.Edmunds	2.2%	Paddock Wood	3.2%
9	Oxford	2.3%	Bramley (Hampshire)	1.9%	Cambridge	1.5%	Edenbridge Town	2.4%
10	Gloucester	1.4%	Reading West	1.7%	Diss	1.3%	Orpington	1.9%

Source: Origin-Destination Matrix, ORR, 2014-15 (accessed 2017)

Expected impacts of rail improvements

How is the transport intervention anticipated to affect the convenience of the rail service? (Hypothesis 1)

- 4.4 Following the introduction of the enhanced timetable, improved rolling stock, and faster journey times, we would expect rail travel from Swindon to become more convenient in absolute terms and relative to other modes, and hence rail patronage is hypothesised to increase. Growth in patronage at Swindon (as outlined in Chapter 2) has been below the national average for several years, although broadly in line with growth at the comparison stations of Basingstoke and Ipswich. Following completion of the scheme, growth may start to exceed those of Ipswich and Tonbridge, and become closer to the national average.
- 4.5 It is unlikely, however, that patronage will reach the absolute level observed in Basingstoke (2.8 m entries and exits per annum), due to differences in the market for travel between Swindon and Basingstoke. Basingstoke has a significantly greater commuting market, reflected in the higher number and proportion of season ticket users, and will remain a more frequent, faster service to London than Swindon following the improvements.

- 4.6 Season ticket prices from Swindon to London may deter growth in the commuting market from Swindon to London, even following the improvement in services following the completion of the Great Western route upgrade. Twelve-month season tickets between Swindon and London are currently priced at £8,436, compared to £4,272 at Basingstoke, £4,168 at Tonbridge and £6,324 at Ipswich, despite broadly comparable journey times and frequencies from each city. Although the rail improvements will make Swindon a more attractive place to commute from, the impact of this on commuting patronage is likely to be suppressed in the absence of a change to season ticket prices which brings the cost of commuting from Swindon to London closer to that of comparable towns a similar distance to London.
- 4.7 Nevertheless, the improvements are likely to lead to changes in trip patterns amongst existing residents and businesses within Swindon. Additional trips would be expected to be generated for leisure purposes, as well as for business travellers and commuters that regularly use rail. Evidence from both the station user survey, and a series of business and resident interviews, was used to develop an understanding of *why* passengers travel by train, key *barriers* to increased rail use, and hence whether the upgrades will increase the convenience of rail and result in increased rail patronage following the improvements. These factors are discussed in turn below.

Overcrowding

- 4.8 Within the station user survey, the level of crowding was identified as the aspect of the existing service that station users were least satisfied about. While 60% of users were ‘very’ or ‘fairly’ satisfied that there is ‘sufficient room for all passengers to sit/stand’, 14% were neither satisfied nor dissatisfied, and 22% were either ‘fairly’ or ‘very’ dissatisfied with the level of crowding. Within the qualitative research amongst residents – including those who use the rail service less frequently and not at all – crowding was consistently identified as a problem at Swindon, across all routes. One leisure user, travelling between Swindon and Exeter, commented that:

“...I would say that 90% of the time the carriages are uncomfortably full with people stood for the length of the journey.”

- 4.9 Swindon is ultimately located on the core railway route between two capital cities and services are often full upon arrival into Swindon, in both directions. Although frequent, the rail service at Swindon may be unattractive because people perceive they cannot get a seat. Since the service enhancements outlined in Chapter 1 are expected to lead to a significant increase in train capacity, it is likely that one of the key negative aspects of travelling by train from Swindon is relieved, an effect that could be assessed through evaluation of passenger load factors on trains as they pass through Swindon. Rail travel from Swindon would therefore be expected to result in increasing satisfaction with the train service, leading to increased rail patronage.

Satisfaction with current services

- 4.10 Aside from crowding, station users were generally satisfied with the frequency and speed (journey time) of travelling by rail from Swindon. Broadly, this is reflected in the residents’ interviews: the majority of those who mentioned frequency or journey time were happy with the service provided. One semi-retired respondent offers an example:

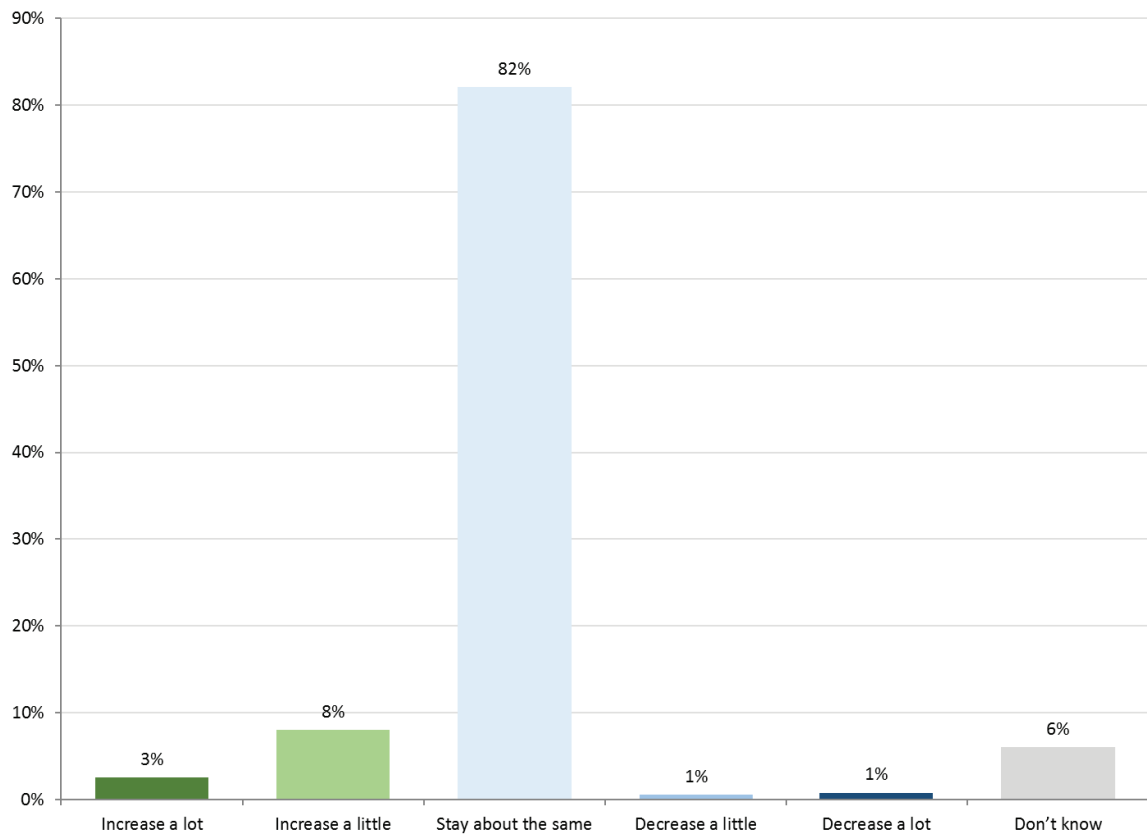
“As a fairly regular train traveller, I have found that services...meet my needs, certainly in terms of frequency and journey times.”

- 4.11 It is hence unlikely that the improvements at Swindon will trigger a fundamental change in the level of convenience associated with travelling by rail, since existing passengers are already satisfied with the level of service provided. Instead, there is likely to be an incremental increase in patronage amongst those users who previously found that the train nearly – but not quite – fitted their needs, and hence didn’t travel or instead travelled by alternative modes. Some individuals did note that recent improvements already delivered (in this case the frequency and journey time improvements between Swindon and Cheltenham) had encouraged them to travel more by train:

“...the service is much better now. The reduction in journey times is a big advantage to me personally and it has encouraged me to use the rail services more often than previously ... you are usually guaranteed a train now, this was not always the case prior to the improvements.”

4.12 Evidence from the station user survey also suggested that the improvements would lead to a small, incremental increase in rail usage amongst existing station users. Figure 4.1 outlines the extent to which existing users are expecting to change the amount they travel by train, following the improvements to services at Swindon. The great majority do not think that their level of rail patronage will change as a result of the improvements.

Figure 4.1: Change in rail patronage following service improvements, station user survey



Source: Swindon station user surveys (2016). Base=all respondents (n=513).

4.13 Within the resident and business qualitative research, there was some evidence that those within Swindon might make more use of rail if the changes materialise:

“...if I found that services had genuinely changed for the better then I would perhaps be persuaded to opt travelling by rail more often.”

4.14 Counter to this though, several respondents felt that external factors, such as changes in personal employment, were more likely to influence their rail usage. One commuter added:

“...the improvements are unlikely to have any real impact on my travel behaviour as I have little choice; I need to use the rail services to get into central London as there is no other way for me to get there.”

Summary

4.15 Overall, the rail improvements at Swindon would be expected to lead to an increase in the convenience of travelling by rail, especially where they are able to deliver substantial

additional capacity and alleviate current overcrowding problems. Satisfaction with journey times and frequencies is already high, and hence further improvements in these areas are less likely to increase the overall demand for travelling by rail based on current responses.

- 4.16 Evidence from both resident interviews and the station user survey suggests that a small, incremental increase in rail trips would be expected to be associated with the improvements at Swindon, potentially increasing the growth in rail travel above that for the comparison areas. These additional trips would be likely to be generated predominately from leisure passengers, reflecting the small proportion using the station for commuting purposes, unless other barriers to increased commuting (such as ticket prices) are addressed. Large-scale changes in the patronage of rail services at Swindon, or in the London commuting market, is not expected to be a result of the service improvements, although the alleviation in crowding may lead to some changes in travel patterns and improve the passenger experience for existing users.

Measuring the change in rail usage

- 4.17 This section briefly discusses how the change in rail patronage could be measured, since changes in travel behaviour, such as increased rail usage, can act as a precursor to economic impacts.

How might this change be measured?

- 4.18 To provide a clear assessment of the impact of the service improvements at Swindon, it will be necessary to gather data on rail patronage at Swindon, and the comparison stations. Periodic¹⁸ rail ticket sales data for journeys to/from Swindon, as well as Tonbridge, Ipswich and Basingstoke, is available from the LENNON database which stores transactions details of all rail tickets that have been sold. Ticket types, including the proportion travelling on season tickets, can be assessed to better understand any long-term changes in the proportion of travellers who use rail for commuting purposes.
- 4.19 An alternative to using LENNON data would be to use data provided by the ORR in the form of annual Station Usage Statistics, and the Origin Destination Matrix (ODM). While these data are only provided annually, they have the advantage of taking into account all ticket types including those issued by the local authority. More information about the ORR data is available in the Technical Report.
- 4.20 In parallel with data on rail usage it will be necessary to capture information on events and disruption affecting rail services and rail usage. This could be captured from formal sources such as Network Rail’s Schedule 4 and Schedule 8 reporting requirements, or crowd-sourced using Application Programming Interface (API) feeds from public-facing websites such as the National Rail Enquiries ‘service disruption’ page, and associated Twitter feeds.
- 4.21 Finally, since ticket sales data does not identify underlying behavioural changes (such as route switching or mode switching), further station user surveys would further understanding of how travel patterns and journeys have changed after enhancements. These should be as brief as possible to maximise response rates, but should maintain comparability with the baselining

¹⁸ The rail industry financial year is split into thirteen periods, each lasting four weeks.

study presented in this report to enable robust comparison of results collected before and after the improvements.

Summary

- 4.22 It would be expected that the rail intervention would make travel from Swindon more convenient, leading to patronage growth. However, this effect is likely to be offset to some extent by the high season ticket prices at Swindon relative to those from stations in comparable areas.
- 4.23 The aspect of station service that existing station users were least satisfied with was the level of crowding. Increases in capacity would be expected to improve customer satisfaction with this element of service, again potentially leading to increased patronage. In terms of frequency and journey time, however, station users are already highly satisfied with current levels of service, and as such, the expected patronage increases due to these improvements would be small.

5 Expected Economic Impacts of Transport Intervention

Introduction

- 5.1 This chapter considers the potential economic impacts expected to be associated with both the rail improvements at Swindon and any consequent impacts on rail patronage identified in Chapter 4. It should be noted that the degree of change in rail patronage is likely to impact on the likelihood of identifying economic impacts – if the change to rail patronage is limited, this is likely to limit the potential to identify economic effects (such as changes in house prices).

Expected Economic Impacts

Introduction

- 5.2 Businesses, individuals and workers value the benefits of improved transport connectivity, and hence significant improvements in connectivity can deliver a series of impacts on local economies. Our hypotheses suggest that the connectivity improvements at Swindon have the potential to make the town a more attractive place to i) live ii) work and / or iii) locate a business (hypothesis 2), as a result of better accessibility to London, Bristol and South Wales.
- 5.3 Hypothesis 3 proposes that businesses within the station catchment area will benefit from improved productivity, as a result of improved access to employees, customers and suppliers. Where businesses rely on the connectivity offered by rail for their success, faster, more frequent and reliable journeys will enable them to save time while travelling, access new markets and could lead to productivity and profitability gains.
- 5.4 These potential impacts are set out in more detail in the following section. Evidence from the station user survey, together with qualitative interviews with local residents and businesses¹⁹ are used to indicate the extent to which these economic impacts might be realised.

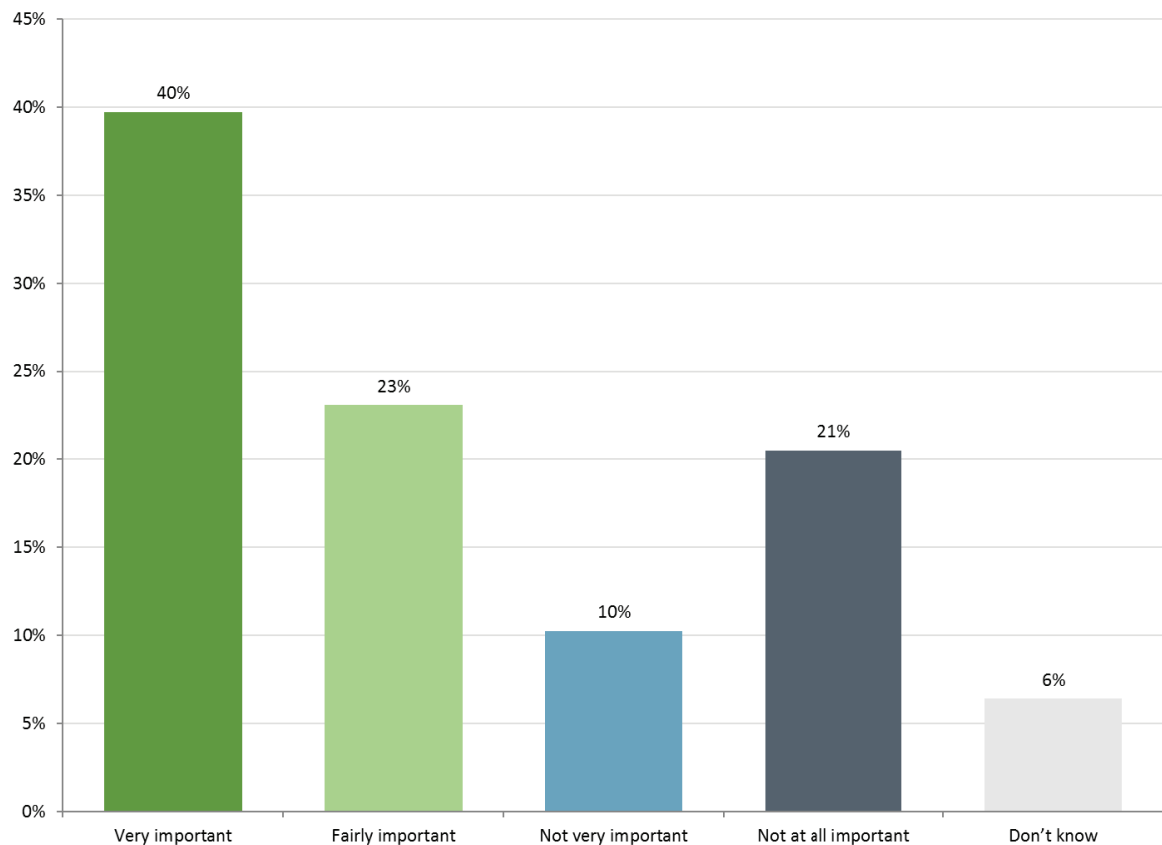
¹⁹ Qualitative resident interviews were carried out by contacting telephone numbers at random from households within 6km of the station. For the business interviews, a sampling frame provided by Sample Solutions was used, also with businesses based within 6km of Swindon station, with a mix of company sizes (based on number of employees) and sectors sampled

Hypothesis 2i) Improvements to the station and services will make Swindon a more attractive place to live;

5.5 This hypothesis relies on the premise that the quality of local rail services is one of the key factors which influence where people choose to live, and therefore improvements in rail services at Swindon will result in more people looking to move to the area.

5.6 Primary research amongst both station users and residents at Swindon provides some evidence for this hypothesis, although it is unclear the extent to which rail improvements will make Swindon a more attractive place to live. Services at Swindon was reported to be a ‘very’ or ‘fairly’ important factor in the decision when moving to the current address amongst 63% of existing station users, as illustrated in Figure 5.1. Amongst those who travel by rail daily, this figure was even greater, at 88% of daily rail users.

Figure 5.1: Station user survey, “When moving to your current address, to what extent was the service from Swindon station important to you?”



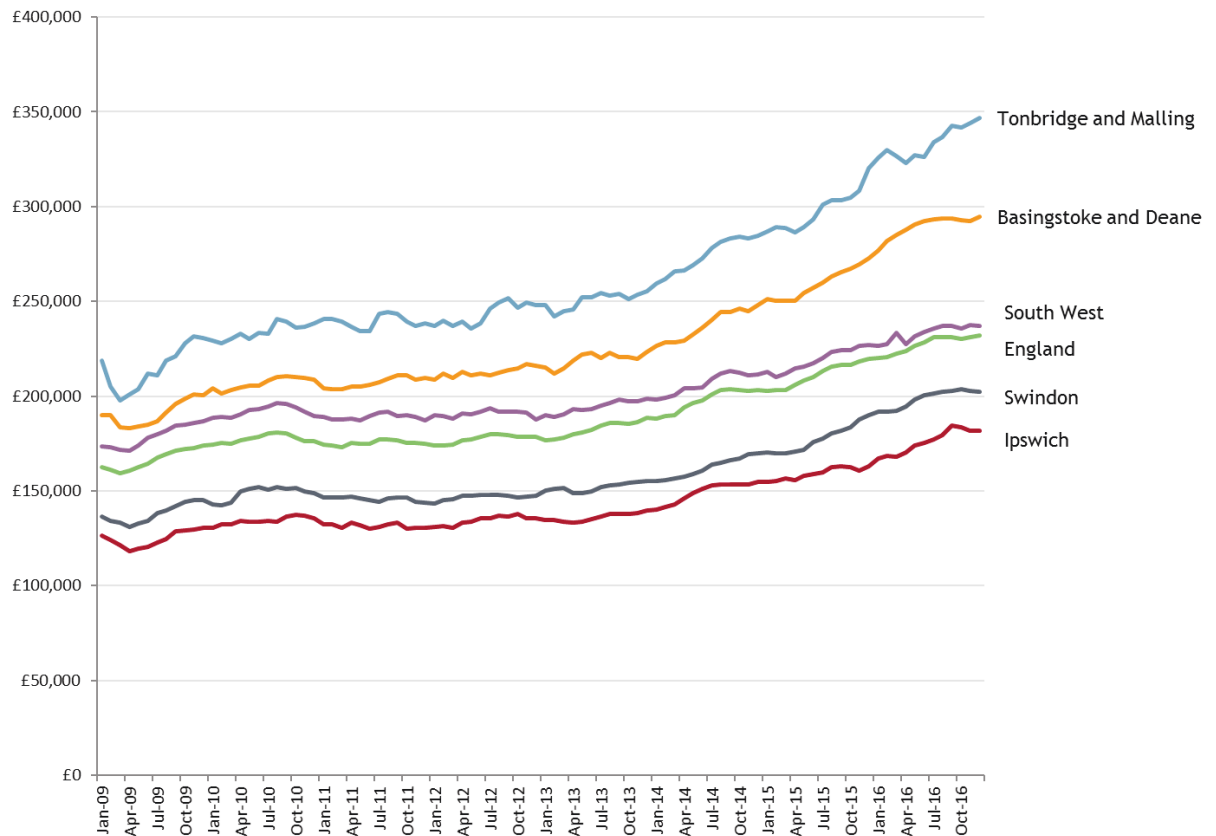
Source: Swindon station user surveys (2016). Base=respondents that started using the station since moving to the area (n=78).

5.7 This indicates that the rail connectivity at Swindon is valued by rail passengers, to the extent that they consider the rail services available at Swindon when moving address. Service enhancements at Swindon could therefore be expected to make the town a more attractive place to live, at least among those who currently travel regularly by rail.

5.8 Figure 5.2 represents the recent property price trends at Swindon, with the comparator areas of Basingstoke and Deane, Tonbridge and Malling, and Ipswich included along with the South

West regional and England national averages. This data is from the Land Registry and the geography is at the local authority level, although in future research, it would be possible to isolate the property price changes to specifically defined neighbourhoods, or distances from the station. The rail intervention at Swindon could increase the attractiveness of residential investment in the town relative to the comparators shown here, due to the benefits of increased rail connectivity. Figure 5.2 indicates that previously, the trend in Swindon house prices has been similar to that observed in the comparison areas.

Figure 5.2: Property Price Trends in Swindon and comparators (local authority level), Jan 2009-Dec 2016



Source: Land Registry (accessed 2017)

5.9 Evidence from local resident interviews, however, highlight how amongst the wider population in Swindon (including those who travel less often or not at all by rail), the availability of services at Swindon was only one of a number of considerations when moving house. Most interviewees used rail infrequently (less than once a week to a few times a year), and did not consider proximity to a station as either important or a contributing factor in determining where to live. One semi-retired male reported:

“The availability of rail services would not have had any influence on my decision to live in Swindon...I use the railway system far more often and much more widely now, due to my current work.”

5.10 Another respondent, who worked full time, added:

“Rail services were not really an issue when choosing where I live although I do use the trains, albeit in a very limited way, for both work and leisure.”

- 5.11 Although some respondents did view the proximity of railway links as an important factor when moving, they were in the minority. It is therefore unlikely that improvements to services of the nature planned will make a large-scale difference to the attractiveness of Swindon as a place to live, though it could have a marginal impact on those who do value accessibility to the rail network.
- 5.12 Commuters in particular would be expected to value being located in close proximity to rail services the most (as they typically make journeys more frequently, and place a greater value on their time). Car availability within Swindon, at 79% of households²⁰, is also above the national average, and hence a majority of the town’s population have a clear alternative to the use of rail for their travel to work.
- 5.13 Overall, the improvements to the Great Western Main Line are likely to lead to a small improvement, if any, in the attractiveness of the town, which will be focused on those who regularly use rail, especially for commuting. Service Improvements could therefore be expected to result in a minor increase in property prices in Swindon compared to elsewhere (including the comparator areas of Ipswich, Tonbridge and Basingstoke), which would be expected to be focused on the neighbourhoods immediately surrounding Swindon station. These effects could be captured through a detailed assessment of Land Registry ‘price paid’ data²¹, as discussed in Chapter 6.
- 5.14 While for some individuals the attractiveness of a place to work is directly attributable to its connectivity by rail, in the case of Swindon, less than 2% of residents within Swindon currently commute by rail, significantly less than the national average of 10%²².

Hypothesis 2ii) Improvements to the station and services will make Swindon a more attractive place to work;

- 5.15 Evidence from the series of business interviews in Swindon also highlighted this, with very few firms reporting or even mentioning staff commuting to work during their interviews. One electronics firm reported:
- “We probably use the rail services no more than five or six times a year and we would choose to drive whenever we can. None of our staff commute by rail, everyone drives to work.”*
- 5.16 While one firm reported that some staff commuted from London and Bristol to Swindon for work, and hence that rail services were important to their business, they appeared to be in a minority. It should be noted that the services available at Swindon are predominately inter-city

²⁰ 2011 Census, Office for National Statistics

²¹ Land Registry ‘price paid’ data includes the price paid for every residential dwelling in the UK at the time of sale, and is available at the level of individual addresses (it is not aggregated at larger geographies such as local authorities). This means it is ideal to evaluate price change within specific areas.

²² Department for Transport, Transport Statistics Great Britain, 2016

in nature, linking Swindon to large towns and cities some distance away, rather than more local links to nearby towns and villages (Royal Wootton Bassett, for example, the nearest town to Swindon has no rail station).

- 5.17 Few individuals are also likely to be willing to commute for extended periods (and at high cost) from Reading, Bristol or London to Swindon, especially considering that the employment market in Swindon is not ‘unique’ in the sense of offering jobs that are unlikely to be found elsewhere and hence attract long-distance commuting flows.²³ The service enhancements expected at Swindon are not expected to improve local connectivity – they primarily benefit long-distance flows to London, Bristol and South Wales – and hence are unlikely to lead to a significant change in the attractiveness of Swindon as a place to work.
- 5.18 Although a high proportion of existing station users reported that the service from Swindon was ‘very’ or ‘fairly’ important when changing jobs (76% of station users, and 79% of those travelling for commuting purposes), this is likely to reflect those who commute from Swindon to elsewhere (especially London), who greatly value being close to Swindon station, rather than those who commute *to* Swindon from elsewhere.

Hypothesis 2iii) Improvements to the station and services will make Swindon a more attractive place to *locate a business*;

- 5.19 This hypothesis states that businesses value the benefits of rail connectivity in connecting them to clients, markets and customers, and hence improvements to rail services could be expected to make a location a more desirable place to locate a business.
- 5.20 While the improvements to the Great Western Main Line are expected to make Swindon a more attractive place to locate a business, this effect is likely to be concentrated on those industries which regularly use rail for business purposes.
- 5.21 Interviews with businesses within Swindon highlighted that the majority of businesses interviewed did not feel particularly dependent on the rail network, instead preferring to travel by car. One insurance broker noted that:
- “The main limitations involve commuting north, where we have clients based in Edinburgh. They would rather drive rather than take a train to Birmingham since it takes more than two hours.”*
- 5.22 An electronics firm added that:
- “We probably use the rail services no more than five or six times a year and we would choose to drive whenever we can”*
- 5.23 Some businesses were, however, at least partly dependent on rail services, which was usually determined by the location of their clients and customers. An insurance company, for example, welcomed the good links to multiple destinations as their client base was spread geographically:

²³ Certain jobs in Central London, for example, often attract lengthy commuting journeys as they are only found in a few locations in the country, and often have significantly higher salaries than jobs located elsewhere (such as investment banking), neither of which apply to the town of Swindon.

“For businesses we use would London Paddington and Bristol is the most accessible for our clients based there however, we do have a lot of clients in Wales and the surrounding border areas.”

5.24 This was particularly true of the hospitality industry, with two respondents highlighting the importance for their guests in particular:

“The most important role of the rail services and Swindon railway station, from the sole point of view of this business, is to deliver our guests.”

5.25 Businesses who interact regularly with clients and markets in London in particular appeared to be more likely to regularly use rail for business purposes, and hence value the benefits of rail connectivity. Some firms identified that they would be at a competitive disadvantage if rail services were not as comprehensive as other parts of the country, indicating the importance of accessibility to a good railway service at Swindon.

5.26 Service enhancements at Swindon would therefore be expected to improve the attractiveness of the town to locate a business for those firms for whom business travel and customer accessibility are especially important. While it is difficult to identify specific sectors from the interview evidence²⁴, this is likely to apply most to:

- firms in the hospitality industry, whose customers are often visiting Swindon from elsewhere;
- professional services firms (such as law) who disproportionately travel to clients or other offices elsewhere, especially those firms whose client / office travel is to areas well-served by the rail network and poorly served by road (such as Central London or Bristol City Centre);
- firms with ‘back office’ service functions, or business divisions within firms that do not need to be located with a large city on the same site as the core business but still require good links to the head office of the core business.

5.27 Since these firms could find Swindon a more attractive place to locate, this could be expected to lead to a small increase in the overall density of firms in Swindon, and an increased desirability for business premises with good access to the station at Swindon. If this occurs ex-post, business interview evidence would be likely to show that an increasing proportion of firms use rail regularly, and view rail accessibility as important to the overall success of their business. Conversely, companies that do not undertake large volumes of business travel, or where travel involves the movement of physical goods, such as manufacturing firms, are less likely to find Swindon a more attractive place to locate a business.

²⁴ Since only 20 business interviews were conducted, it is not possible to identify any distinct sectors which are particularly reliant on rail connectivity, and hence more likely to locate in Swindon following the improvements to the train service.

Hypothesis 3) Businesses located near to the station with improved service from electrification, will benefit from improved access to potential employees, customers, and suppliers, resulting in greater productivity;

- 5.28 This hypothesis states that businesses which routinely use rail travel for access to clients and markets would be expected to benefit from improved railway services, since they would have the effect of bringing them closer to their customers and markets. Firms would be expected to benefit from:
- reduced travelling costs, since employees would spend less time travelling to customers, and hence able to use the time originally spent travelling for more productive purposes;
 - an ability to reach new clients and attract new employees, whose location was previously too costly to interact with;
 - increased ‘effective density’ (agglomeration), with increased competition within labour and export markets, additional face-to-face interactions between firms, and greater knowledge-sharing and cooperation.
- 5.29 All of these factors would be expected to increase the productivity of firms, lead to more efficient market outcomes, and potentially lead to increased business profitability.
- 5.30 Within Swindon, as highlighted in the previous section, while the majority of firms do not routinely use rail for business purposes (and hence would not be expected to benefit from increased productivity due to these effects), a significant minority of firms in Swindon – especially those with client relations in large city centres – could be expected to benefit from increased productivity.
- 5.31 However, it should be noted that interviews with businesses in Swindon suggested that even amongst those firms that do regularly use rail for business travel, the majority did not think that the service enhancements would lead to increased interactions with clients or significantly impact on their business. One consultancy reported that they expect that:
- “...electrification of the railways will not have any impact on our collaboration with clients”.*
- 5.32 Businesses tended to report that even while they valued the improvements, they would not make a significant difference to the operations of their business, and hence most likely their business's productivity or profitability:
- “...even with the resultant faster journey times, which would be welcome, it probably would not make a significant difference to me or the business.”*
- 5.33 Only a few businesses reported that they expected collaboration with clients and suppliers to improve:
- “I am not aware of the electrification of the Great Western Main Line or any other future planned improvements, but I would expect this to benefit our business if it improves links with both existing clients and future potential customers.”*
- 5.34 One would therefore expect that, while the service enhancements may lead to improved access to suppliers, customers and markets, the overall impact on the productivity of firms in Swindon is likely to be limited. Firms which depend on rail (most likely where a high proportion of staff time is spent travelling) would be expected to benefit from increased productivity, but since from interview evidence these firms appear to be small in number

within Swindon, any overall effect for the economy in Swindon as a whole would be expected to be limited. It should be noted, however, that due to the qualitative nature of the work with a small number of businesses interviewed it is not possible to identify the proportion of businesses that would be expected to benefit.

- 5.35 Were the hypothesis to be correct, firms within the specific sectors which rely on rail in close proximity to the station might be expected to become increasingly reliant on rail travel for business purposes, with customers, suppliers and business interactions more concentrated in areas best served by the rail network. This could be established through additional interview and survey evidence in the years ahead.

Summary

- 5.36 It seems possible that the improvements will lead to a small improvement in the attractiveness of Swindon as a place to live; this effect could be captured through analysis of house price data from the Land Registry.
- 5.37 The effects on Swindon’s attractiveness as a place to work are likely to be highly limited, as Swindon does not have the sort of unique employment market which attracts long-distance commuter flows, and the impact on commuting would be expected to be primarily focused on outbound rather than inbound commuting.
- 5.38 The improved rail connectivity would be expected to increase the likelihood of businesses locating in Swindon in sectors where customer accessibility is particularly important, such as hospitality and professional services, as well as “back-office” service functions.
- 5.39 The evidence suggests that the impact on business productivity in Swindon is likely to be limited, with few firms reporting that rail connectivity is an important factor in their business.

6 Proposal for Future Work

6.1 The context for assessing the benefits of the improvements to the Great Western Main Line is that the benefits will be realised over several years, and are generally incremental improvements on what is already a reasonable service. The qualitative research has also indicated that there is no clear understanding of what the enhancements will mean, limiting individuals and businesses ability to foresee effects.

6.2 In terms of the timing of the improvements, in summary:

- New Hitachi high-speed trains began to be introduced in October 2017, with increased seating capacity;
- Electrification is expected to be delivered between London and Bristol Parkway by December 2018;
- Timetable improvements, delivering faster journey times, are planned for the December 2018 timetable change.

6.3 However, this timetable of improvements remains subject to change, and it is presently unclear how this uncertainty will impact on the improvements to Swindon services specifically.

6.4 In this chapter, we highlight the expected impacts based around the core hypotheses, and a more detailed proposal for primary data collection. For the Swindon case study the timing of any ex-post work should allow for a period in which all the improvements (new trains, electrification, and new timetable) have had a chance to settle down.

Hypothesis 1: That improved rail services at Swindon will, by making rail travel more convenient for local people, encourage additional rail trips including some generated trips and some captured from other modes

6.5 To test the effect of improved convenience on rail patronage, primary research can be used to identify the level of awareness and impact on attitudes and behaviour of the improved services at Swindon. ORR station usage data can be used to quantify any changes in station usage at Swindon and comparison stations (to enable underlying factors to be accounted for). Analysis of the ORR's Origin Destination Matrix²⁵ can be used to provide further detail on any changes in trip flows and broad ticket types (seasons versus non-seasons).

²⁵ The Origin Destination Matrix is calculated each year by the ORR based on LENNON data and other sources. It provides a more reliable and consistent source of data than unprocessed LENNON data which is affected by issues such as non point-to-point tickets, travelcards and seasons of various types.

6.6 Primary research can be used to provide some further descriptive information concerning the changes in station usage observed, such as the types of trips that have been generated, and the profile of the people making them, including where they live and work. It can also provide information on the source of the new rail trips and, for example, any mode switching effects. These in turn can generate wider benefits which could be explored, such as an increase in physical activity attributed to people walking as part of their journey instead of using car.

6.7 Given these aims of the primary research, there will be value in undertaking research amongst local residents and businesses, as well as Swindon station users. Including the wider resident and business populations in the research will provide useful context in terms of, for example, awareness and attitudes regarding local rail services (and the improvements) and mode share information.

6.8 One further role of the primary research is in helping to dis-aggregate the effects of different improvements, particularly those associated with new trains and timetable improvements. This can be done, for example, by comparing the changes in opinion ratings between different aspects of the local rail services such as the comfort of the trains, ease of finding a seat, journey times, and frequency of services.

Hypothesis 2i: That improvements to the station and services will make Swindon a more attractive place to live

6.9 The rail improvements are expected to make it easier for people to travel between Swindon and London, Reading, Bristol, Cheltenham, South Wales and the West Country. These should be reflected in the rail patronage data (see Hypothesis 1 above), the number of rail commuters living in Swindon. It may impact on the housing market in Swindon, evidence for which could be seen in housing market indicators such as volume of transactions and house prices, although it is unlikely that there will be a profound impact. The Land Registry is the most reliable source of data on house prices, though it is based on transactions. While it is not appropriate to undertake analysis of this data at the baseline stage due to the requirement for specifying important parameters such as the in-scope postcodes and housing types, at the post-implementation stage it would be appropriate to undertake time-series analysis using information from the primary research to define key parameters and focus the analysis. This time-series analysis would need to go back sufficiently far in time to provide a baseline position and include any anticipation effects. It would also be appropriate to use the basket of comparison areas to account for background trends.

Hypothesis 2ii: That improvements to the station and services will make the affected area a more attractive place to work

6.10 By improving the connectivity of Swindon to other key centres and places to commute from, there may be an increase in employment in Swindon. Data on employment levels can be sourced from the Business Register and Employment Survey (BRES), or the Business Structure Database (BSD). A key advantage of the BSD is that is highly disaggregated so the analysis can be concentrated on the spatial area affected by the rail improvements (that is, the Swindon catchment area). Both sources provide a breakdown by industry type (SIC) which will be useful for understanding the types of business which are affected most by the rail improvements.

6.11 A sectoral analysis will be useful to explore which sectors are most (and least) affected.

Hypothesis 2iii: That improvements to the station and services will make the affected area a more attractive place to locate a business

- 6.12 Improved connectivity of Swindon may encourage new businesses to move to the area, and existing businesses to expand. An employers' survey can be used to provide an indicator of the effect of the rail improvements on the attractiveness of Swindon as a place to locate a business. The BSD can be used to monitor the number of businesses based in Swindon, as well as the number of employees. An alternative source for the number of businesses is the Inter-Departmental Business Register (IDBR), though like the BRES, this data is only available down to Middle Layer - Super Output Area (MSOA).

Hypothesis 3: Businesses located within the station catchment area with improved services will benefit from improved access to potential employees, customers, and suppliers, resulting in greater productivity

- 6.13 Primary research with employers based in Swindon can be used to provide descriptive information concerning whether employers have looked to take advantage of the rail improvements, and whether they have seen benefits in terms of the ease of recruiting employees and keeping connected with customers and suppliers. This can be used to explore the extent to which the improvements in services have started to generate agglomeration benefits, and productivity improvements.
- 6.14 To quantitatively assess productivity impacts, one option would be to use the BSD to undertake Difference-in-Difference (D-i-D) analysis²⁶. This would involve quasi-experimental analysis in which outcomes are compared over time and between the treatment area (Swindon) and comparison areas (Tonbridge, Ipswich and Basingstoke). Analysis could be undertaken for several outcome indicators such as employment, turnover and productivity (turnover per employee). Comparisons could be made by business sector to indicate which sectors have been most affected, and could be informed by the econometric analysis already undertaken for the retrospective case studies as part of this project.

Suggestions for ex-post primary data collection

- 6.15 Primary data collection is proposed amongst three sample groups:
- station users;
 - residents living within the station's catchment area; and
 - businesses based within the station's catchment area.
- 6.16 The questions asked within these surveys should focus on testing the hypotheses put forward for the effects of the investment at Swindon though in addition, questions will need to be included which capture the basic characteristics of survey participants, and which can be used to ensure the samples are broadly representative (or if necessary can be used to re-weight the samples). The sample sizes for the primary research should be sufficient to ensure that changes between the pre and post surveys and differences between the intervention and comparison areas can be detected with a reasonable level of confidence.

²⁶ Further details concerning this approach are available in the accompanying Technical Report

Suggestion for ex-post secondary data collection and econometric analysis

- 6.17 We recommend accessing a detailed data source able to be disaggregated by both sector and to small spatial areas, such as the BSD, which is available through either the ONS Virtual Microdata Laboratory or the UK DataService Secure DataLab. However, other databases are available and a full investigation as to the most appropriate source should be considered. This source would need data related to the years leading up to both the introduction of new trains in 2017 and to the enhanced timetable in 2018, and in the period that followed. Commuting patterns and other information taken from the 2021 census could also be analysed.
- 6.18 A variety of econometric methods might be applied, including difference-in-difference approach, or a panel data method, such as a fixed or variable effects regression. These would be used to attempt to answer the three questions posed in the hypotheses.

Table 6.1: Recommended primary research content

Hypothesis	Rail user survey (Swindon)	Residents survey (Residents of the Swindon, catchment areas)	Business survey (Businesses located in the Swindon catchment areas)
<p>1. RAIL CONVENIENCE: That an improved rail service at Swindon will, by making rail travel more convenient for local people, encourage additional rail trips including some generated trips and some captured from other modes</p>	<p>Questions on the use and convenience of rail in order to make comparisons with the baseline (and with the comparator stations). For example:</p> <ul style="list-style-type: none"> • When started using the station and reasons for doing so (to pick up reasons associated with the improvements) • Changes in use of rail and reasons (to pick up reasons associated with the improvements) • Satisfaction with experiences of local rail services from the station (to pick up the effects of the improved services from the station) 	<p>Questions on the use and convenience of rail in order to make comparisons with the baseline (and with the comparator stations). For example:</p> <ul style="list-style-type: none"> • Changes in use of different modes (to identify mode switching and trip generation effects) • Reasons for using preferred station (to pick up reasons associated with the improvements and distinguish between improvements to the trains and to the services) • Awareness of the improvements (to identify any lagged effects due to low awareness of improvements) 	<p>Questions on the use and convenience of rail in order to make comparisons with the baseline (and with the comparator stations). For example:</p> <ul style="list-style-type: none"> • Use of rail for different purposes (employees travelling to work, business meetings, customer visits etc.) • Awareness of the services from Swindon (to identify any lagged effects due to low awareness of improvements) • Satisfaction with local rail services from the station (to pick up the effects of the improved services from the station)
<p>2. ATTRACTIVE PLACE: improvements to the local line will make Swindon a more attractive place to –</p> <ol style="list-style-type: none"> Live work, and to locate a business 	<p>Questions exploring the influence of rail on where rail travellers choose to live and work in order to make comparisons with the baseline (and with the comparator stations). For example:</p> <ul style="list-style-type: none"> • When moved to current address and Importance of rail when choosing where to live • When started current job and importance of rail when changing jobs • Satisfaction with experiences of local rail services 	<p>Questions exploring the influence of rail on where local people choose to live and work in order to make comparisons with the baseline (and with the comparator stations). For example:</p> <ul style="list-style-type: none"> • When moved to current address and Importance of rail when choosing where to live • When started current job and Importance of rail when choosing where to work • Satisfaction with experiences of local rail services 	<p>Questions exploring the influence of rail on where businesses choose to locate in order to make comparisons with the baseline (and with the comparator stations). For example:</p> <ul style="list-style-type: none"> • When moved to current address and Importance of rail when choosing where to locate • Importance of rail to future location decision

Hypothesis	Rail user survey (Swindon)	Residents survey (Residents of the Swindon, catchment areas)	Business survey (Businesses located in the Swindon catchment areas)
<p>3. IMPROVED BUSINESS ACCESS: Businesses located near to the station with improved services will benefit from improved access to potential employees, customers, and suppliers, resulting in greater productivity</p>			<p>Questions exploring how the local services are used by businesses to identify the influence of rail on improving access to potential employees, customers, and suppliers. For example</p> <ul style="list-style-type: none"> • Importance of rail to the business for particular purposes including access for employees and customers • Views on connectivity with other key locations such as London, Reading, Bristol

A Current and Expected Train Service Provision at Swindon

A.1 This short annex presents details of the current and future train service at Swindon, including service frequency, journey times, rolling stock and levels of crowding.

Current Services

A.2 Services are currently exclusively run by Great Western Railway, as part of their intercity services between London, Bristol, Cheltenham and South Wales. Services run broadly to the following pattern:

- 2tph between Cardiff, Newport, Bristol Parkway, Swindon, Didcot (some), Reading and London Paddington, of which 1tph is extended to/from Swansea;
- 2tph between Bristol Temple Meads, Bath, Chippenham, Swindon, Didcot (some) Reading and London Paddington;
- 1tph between Cheltenham, Gloucester and Swindon, of which 1 train per 2 hours is also extended to London;
- 1 train per 2 hours between Swindon, Chippenham, Melksham, Trowbridge and Westbury.
- Occasional services also extend to Pembrokeshire, Weston-Super-Mare and Exeter / Plymouth.

A.3 Services change slightly during peak-periods, with small changes in journey times and stopping patterns, but the basic structure of the service does not change. It should be noted that while the core London – Swindon – Bristol / Cardiff service is largely unchanged over the past decade, the service between Swindon and Westbury has increased from only a couple of trains per day pre-2013 to the current one train per two-hour service. Journey times between Swindon and Cheltenham / Gloucester were also improved in May 2015, together with a minor improvement to the frequency.

A.4 All services, except for the local service between Swindon and Westbury, were operated by InterCity 125 High Speed Trains (HSTs) prior to October 2017, originally introduced in the 1970s. Most services are currently operated by these trains today, although a small number are operated by new Hitachi Super Express trains which are currently being introduced to service. While these have been heavily refurbished in recent years, they do not offer a level of comfort associated with modern stock, and retain passenger-operated 'slam doors'.

A.5 Journey times are approximately one hour to London Paddington, 65 minutes to Cardiff Central, and 40 minutes to Bristol Temple Meads.

Future Services

- A.6 Following the timetable enhancements expected as part of the upgrade of the Great Western Main Line, the standard peak and off-peak timetable at Swindon is expected to change slightly to²⁷:
- 2tph between Cardiff, Newport, Bristol Parkway, Swindon, Didcot (1tph), Reading and London Paddington, of which 1tph is extended to/from Swansea;
 - 2tph between Bristol Temple Meads, Bath, Chippenham, Swindon, Didcot (1tph), Reading and London Paddington;
 - 1tph between Cheltenham, Gloucester, Swindon, Didcot, Reading and London Paddington;
 - 1 train per 2 hours between Swindon, Chippenham, Melksham, Trowbridge and Westbury.
- A.7 In effect, this will result in a consistent five trains per hour to London, up from a standard pattern of 4 trains per hour in one hour and 5 trains per hour in the subsequent hour. Two additional limited stop trains will also operate between London Paddington and Bristol / Cardiff, which will not call at Swindon, and offer a significant increase in capacity in services along the Great Western route.
- A.8 All services (except the local Wiltshire service) will be operated by Hitachi Super Express trains. These bi-mode trains are currently being introduced into service, and offer an enhanced level of comfort and additional seating capacity. Ten carriage trains on peak services provide 580 standard class seats, compared to the 504 standard class seats on a high-capacity HST today²⁸.
- A.9 While exact journey time savings have not been confirmed, a passenger from Swindon to London is expected to benefit from a time saving of approximately 7 – 10 minutes in December 2018.

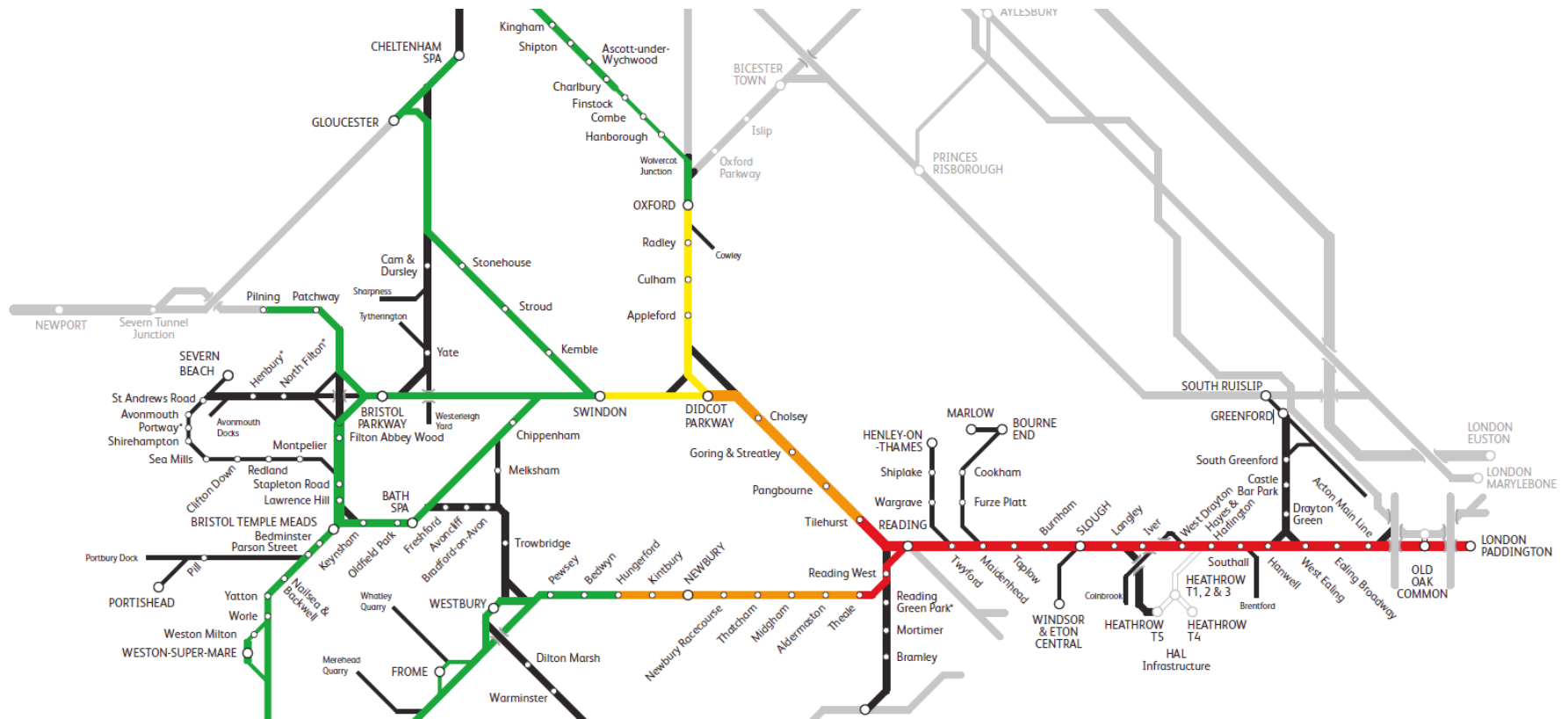
Crowding Levels

- A.10 Detailed information regarding current levels of crowding on services at Swindon is not currently available. It is reported that services do experience high levels of crowding, especially in peak periods, with standing all the way to London not uncommon. While the introduction of new trains and enhanced frequencies is expected to alleviate overcrowding, it should be noted that current Network Rail forecasts still expect significant levels of crowding to continue in the future.
- A.11 Figure A1 outlines forecast levels of peak crowding in 2023, based on 2019 baseline capacity (following the upgrades described in this report).

²⁷ The details in this section were correct at time of analysis in December 2017. Actual service patterns and improvements are to be confirmed and may be subject to change.

²⁸ Great Western Railway Franchise Stakeholder Brochure, September 2015

Figure A.1: Average load factor on Main Line services arriving into London Paddington in the high peak hour (08:00 – 08:59) with 2023 estimated demand and 2019 baseline capacity



- Key**
- Less than 70% load factor
 - Greater than 70% and up to and including 85% load factor
 - Greater than 85% and less than 100% load factor
 - 100% or greater load factor

Load factors are calculated as average load factors across the service group from the On Train Departure at each station, the 2019 base rolling stock assumption and number of services that call at each station

Source: Network Rail – Western Route Study (final), 2015

CONTROL INFORMATION

Prepared by	Prepared for
Steer Davies Gleave 28-32 Upper Ground London SE1 9PD +44 20 7910 5000 www.steerdaviesgleave.com	Department for Transport Rail Group 33 Horseferry Road London SW1P 4DR
SDG project/proposal number	Client contract/project number
22961201	
Author/originator	Reviewer/approver
Jake Cartmell	Tony Duckenfield
Other contributors	Distribution
Rosie Nolan Tom Leach	<i>Client:</i> Lorraine Pearson <i>SDG:</i> Study team Steven Finch
Version control/issue number	Date
Version 4	April 2017



