

# Transformative impacts of transport investment

Case study report

Department for Transport

April 2023



**FINAL REPORT**

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## EXECUTIVE SUMMARY

### Context

Scheme promoters for transport infrastructure projects routinely cite the potential for the project to lead to the economic or social transformation of an area, as part of the strategic case for intervention. It is commonly argued that the potential for economic or social transformation goes beyond what is typically captured using traditional transport appraisal techniques. For example, the Department for Transport's (DfT) Transport Appraisal Guidance (TAG) generally advises that approaches that assume land use is fixed are considered more robust, whereas transport interventions that transform a local area will by definition lead to changes in land use.<sup>1</sup>

The potential for transformational change is cited in the case for High Speed 2 and Northern Powerhouse Rail and the business case suggests that traditional cost-benefit appraisal may underplay benefits of this nature for such schemes.<sup>2</sup> This argument extends to smaller, more localised transport interventions, such as those supported through the Transforming Cities Fund – part of the government's Industrial Strategy to improve productivity and prosperity through investment in public and sustainable transport programmes.

Despite many proposed transport investments being labelled as 'transformational' there exists little evidence on how such impacts materialise, and how local conditions and complementary investments and policies work with a new transport investment to deliver benefits not captured in a standard appraisal. There is also relatively little assurance around estimated impacts due to the limited availability of ex-post evaluation evidence in the UK transport sector.

The Government objective to level up prosperity across the UK is likely to involve changes in the size and structure of local economies, therefore understanding the dynamics of change and the impacts from land use change is of significant importance.

### Scope

In this context, the DfT commissioned CEPA and Arup to address the current evidence gap. The project has three components:

- 1. Literature review.** With the support of an academic advisory panel, we undertook a literature review to establish the theoretical foundations of how transport investments interact with the wider context surrounding the investment, to lead to economic or social transformation.<sup>3</sup> The literature review confirmed that this is an area with a very limited evidence base and that contextual factors are rarely analysed. The literature review also established a working definition for transformational impacts – See Box 1 below.
- 2. Case studies.** Fifteen rail and road scheme case studies to provide insights into how the context surrounding a scheme may have affected whether it was transformational, based on indicators such as patronage, productivity, employment, population growth, and housing.
- 3. Qualitative Comparative Analysis (QCA).** Using data compiled from the case studies, we analysed whether common conditions exist that enable transformational change with respect to a specific outcome variable (e.g. health and wellbeing, housing access, and economic output, employment and productivity). Using the QCA approach, we sought to identify a series of necessary and/or sufficient conditions that determine whether a scheme is ultimately transformational or not.

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<sup>1</sup> The definition of transformation we use in this study is broader than the definition typically used elsewhere, such as the Green Book. A fuller definition of transformation, as used in this study, is provided in Section 1.1.

<sup>2</sup> See also: Douglas Oakervee (2019), "Oakervee review of HS2".

<sup>3</sup> Members of our academic advisory panel include Dan Graham, Imperial College London and Steve Gibbons, London School of Economics.



The focus of this report is on the second component – the case studies. The literature review and the QCA reports are appended separately.

### Box 1: Transformational impacts defined

For the purposes of this study, we use the definition set out below.

A scheme is considered ‘transformational’ if there is empirical proof of a step-change in **any** of the following three metrics:

- A. The change in the transportation system leads to a step-change in connectivity and/or effective density, which manifests itself in a significantly increased usage of the transport network.
- B. The scheme leads to dynamic clustering<sup>4</sup> and/or land use change which can be empirically identified by a significant change in sectoral employment shares or land use shares.
- C. The scheme leads to increases in at least one of the following four metrics: employment, productivity per worker/firm, number of homes and/or land and property values.

This definition can be applied to both small and large projects (though the geographic scope over which the change is seen is likely to vary).

## Methodology

The evidence base for the case studies is built on three sources of information:

- **Desk based research (all case studies)**

We undertook desk-based research on the scheme context, inputs, and outcomes using (where available) the business case(s) for the scheme and any evaluation studies that were conducted. We also used a wide range of other sources to supplement our understanding of the scheme, including NAO reports, media articles, project monitoring reports from scheme sponsors and local authorities, academic studies, and parliamentary hearings.

We also built a **Theory of Change (ToC)** for each case study as a series of logic maps visually depicting how we expect each transport scheme to lead to outcomes and impacts that were stated as objectives of the scheme in the business case or other relevant sources. These are speculative ToCs based on our understanding of the scheme and a theoretical view of the potential relevance of different contextual factors. ToCs do not reflect actual outcomes or impacts and as such, some of the outcomes included in our ToCs failed to materialise.

The purpose of each of the case study ToCs is to test the logic to see whether it is supported by evidence from the case studies. These individual ToCs supported the development of a set of overarching ToCs for each outcome area and formed the basis of our QCA. For the QCA, we used these overarching ToCs to develop a series of hypotheses for how local context might interact with a transport investment, to lead to a transformational outcome. We then used the outcomes and context data collected from the case studies to test these hypotheses using QCA.

- **Primary research (a subset of case studies)**

For three of our case studies, we used Level 1 Scientific Method Scale primary quantitative analysis to provide context and indicative evaluation outcomes using publicly available datasets on NOMIS provided by the Office of National Statistics.<sup>5,6</sup> NOMIS provides high quality data on population, employment and industry change and aggregate data on productivity, wages, and deprivation. We created tailored

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<sup>4</sup> Benefits that arise through close location of businesses and/or people.

<sup>5</sup> Level 1 Scientific Method Scale refers to either (a) a cross-sectional comparison of treated groups with untreated groups, or (b) a before-and-after comparison of treated group, without an untreated comparison group. No use of control variables in statistical analysis to adjust for differences between treated and untreated groups or periods.

<sup>6</sup> NOMIS official labour market statistics, available [online](#).

datasets for the case studies to identify outcome areas (in which the intervention occurred) and control areas (counterfactual) and studied in time and space how the transport opening changed (or did not change) the outcome areas.

- **Stakeholder interviews (all case studies)**

We interviewed a mix of scheme promoters, local authorities / local enterprise partnerships, academics, and land developers. The objective of the interviews, as far as practicable, was to obtain information that is directly relevant to determining the outcomes and surrounding context for each of our case studies.

Our approach to the interviews was to develop a first draft of each case study prior to speaking with interviewees to ensure that the interviews were well informed and focussed on the gaps in the desk-based research. We also used the interviews to test our initial findings and hypotheses.

*Limitations to our approach*

There have been challenges with both accessing historical documents (e.g. original business cases) and scheme evaluations (in part because historically transport schemes are not systematically evaluated). Additionally, it has proven difficult to identify interviewees when many of those who were closely involved in scheme development have since moved to employment elsewhere. The quantity and quality of available information therefore varied across our case studies. We found that more information tended to exist for the most high-profile schemes in our sample. For a few case studies, a more robust quantitative evaluation of their impacts already exists, but this is not generally the case. It is even more of a challenge to identify relevant contextual information, which is often not considered at all in the evaluations we examined (unless it was used to understand why certain outcomes did not materialise). We have tried to reflect the quality of available evidence in the drafting of the case studies.

Our case studies show that judgement is required to classify projects as ‘transformational’ or not. Although our literature review identified a clear definition of what is considered transformational for the purposes of this study, we have made certain judgements about the spatial scale at which that should be considered (e.g. sub-city area, town, city region or wider regional scale). In general, we considered whether the scheme was transformational at the scale most relevant for the size of the transport intervention, noting that the impacts may vary in different places.

Readers should interpret our findings within the context of the scope of our work – specifically whether there are common conditions which enable transformational change. Our findings should not be interpreted as definitive judgements on whether the projects were ‘good investments’, represent value for money or were overall successful in delivering on their objectives.

**Findings**

Below we summarise the key findings from the case study research including whether interventions achieved their intended outcomes. We look at five outcome areas: employment, productivity, housing, regeneration, and environment.

Greater Manchester Metrolink	Outcome	Key findings
<p>Greater Manchester Metrolink the light rail (tram) system in Greater Manchester. The first three phases opened between 1992 and 2013.</p>	Employment	<ul style="list-style-type: none"> <li>• Current evidence on the impact on employment is inconclusive. An overall positive effect is likely but also marginal in the context of background growth in employment across Greater Manchester.</li> </ul>
<p>Metrolink has greatly improved public transport connections across Greater Manchester.</p>	Productivity	<ul style="list-style-type: none"> <li>• Some statistical evidence of a positive productivity impact in the Greater Manchester regional centre. But also evidence of a negative statistical impact on the satellite towns (Ashton, Oldham, Rochdale).</li> <li>• Overall aggregate impact likely to be positive.</li> </ul>
<p>The impacts appear to have been</p>	Housing	<ul style="list-style-type: none"> <li>• No quantitative impact found on new housing units but a positive impact on house prices was found.</li> </ul>

Greater Manchester Metrolink	Outcome	Key findings
<p>Salford, but more diffuse over the wider city-region.</p> <p>It is difficult to show that Metrolink was 'materially transformational', distinct from other factors that have contributed to economic regeneration over 30 years.</p>		<ul style="list-style-type: none"> <li>Metrolink serves several areas which were allotted for housing market renewal in the 2000s.</li> </ul>
	Regeneration	<ul style="list-style-type: none"> <li>Regeneration of Manchester city centre and Salford Quays was already underway before Metrolink.</li> <li>Some stakeholders perceive that it was important to the success of regeneration schemes in the East Manchester corridor and Rochdale town centre.</li> </ul>
	Environment	<ul style="list-style-type: none"> <li>Significant carbon savings against a counterfactual where additional journeys were made by car.</li> </ul>

Jubilee Line Extension	Outcome	Key findings
<p>Opened in 1999, extending the original line from Green Park to Stratford.</p> <p>Widely recognised to have contributed to the regeneration and success of the Canary Wharf development.</p> <p>Transformation has gradually spilled over to neighbouring station zones.</p>	Employment	<ul style="list-style-type: none"> <li>Evidence suggests that it led to increases in employment along the length of the line. But this increase may have benefited migrants into the area rather than the incumbent population.</li> </ul>
	Productivity	<ul style="list-style-type: none"> <li>Econometric analysis suggests that it led to a significant increase in average firm productivity in the zones around the JLE stations.</li> </ul>
	Housing	<ul style="list-style-type: none"> <li>Some evidence that it may have accelerated residential development. Between 1997-99, the corridor between Bermondsey and Canning Town experienced a disproportionately high volume of development.</li> </ul>
	Regeneration	<ul style="list-style-type: none"> <li>The JLE was a key factor in catalysing regeneration at certain sites along the route, particularly between Bermondsey and Canning Town.</li> </ul>
	Environment	<ul style="list-style-type: none"> <li>Estimates suggest that 3,000 trips switched from car to public transport each day for the morning peak period.</li> </ul>

Nottingham Express Transit	Outcome	Key findings
<p>The 2-line tram network in the city of Nottingham, with each line opening in 2004 and 2015, respectively.</p> <p>Our analysis suggests that there is some evidence of transformation along the line of route, particularly for Phase 2.</p>	Employment	<ul style="list-style-type: none"> <li>NET Phase 2 had a positive impact on employment. Employment growth within 1km of tram stations was higher than that found across Nottingham.</li> <li>Our analysis indicates a significant change in land use as the sectoral mix of the catchment area has changed towards 'other' sectors (non-retail, manufacturing, or business services).</li> </ul>
	Productivity	<ul style="list-style-type: none"> <li>No evidence of direct productivity impacts found.</li> </ul>
	Housing	<ul style="list-style-type: none"> <li>Multiple studies found an increase in residential property values along the Line 1 corridor.</li> <li>There is qualitative evidence in the literature that suggests NET has influenced property developers' views on potential sites and encouraged further housing development across the city, but robust quantitative evidence is not available.</li> </ul>
	Regeneration	<ul style="list-style-type: none"> <li>No direct evidence found on regeneration impacts, but in conjunction with other significant local investments,</li> </ul>

Nottingham Express Transit	Outcome	Key findings
		the line may have contributed to the regeneration of the South Side regeneration area.
	Environment	<ul style="list-style-type: none"> <li>The evidence shows that more than 30 percent of passengers switched from car to tram as their main mode of travel following Phase 2.</li> </ul>

High Speed 1	Outcome	Key findings
<p>The high-speed rail line connecting London to the Channel Tunnel with domestic services serving Kent. Opened in 2009.</p> <p>Route was selected to catalyse regeneration in Stratford alongside the 2012 Olympic Games, and to facilitate the expansion of Ebbsfleet to relieve housing affordability pressures in the South East.</p> <p>The greatest impacts appear to have been around Kings Cross and Stratford – although this is where the change in transport connectivity is smallest.</p> <p>The impacts across Kent appear to be less significant, or to have not yet materialised in the data.</p>		
	Employment	<ul style="list-style-type: none"> <li>Employment growth across the corridor was lower than other comparator transport corridors. But impact may have been masked by the slower than expected recovery from the 2008-09 recession.</li> <li>Strong employment growth found around Stratford station. More recent studies suggest employment effect around Kings Cross is gaining momentum.</li> </ul>
	Productivity	<ul style="list-style-type: none"> <li>No evidence of direct productivity impacts found. Large share of employment growth in the corridor appears to have been in less productive sectors.</li> </ul>
	Housing	<ul style="list-style-type: none"> <li>Early delivery of new housing at Kings Cross and Stratford is good but HS1 contribution is likely to be indirect and/or weak.</li> <li>Transformation of Ebbsfleet has yet to occur as new developments stalled. Ebbsfleet Development Corporation set up in 2015 to accelerate delivery.</li> </ul>
	Regeneration	<ul style="list-style-type: none"> <li>Regeneration around Stratford has been significant. HS1 contribution is likely to be indirect, although London and Continental Railways (LCR) had a role in developing new office projects and de-risking the investment opportunity there.</li> <li>No regeneration impacts found in Kent.</li> </ul>
	Environment	<ul style="list-style-type: none"> <li>No impacts found but some estimates claim a significant reduction in carbon emissions</li> </ul>

High Speed Rail Network Spain	Outcome	Key findings
<p>High Speed Network in Spain with branches from Madrid to Seville and Barcelona opening in 1988 and 2008, respectively.</p> <p>Madrid to Seville</p> <p>Did not deliver transformational impacts to most areas served, but there is some evidence that HSR contributed to renewal and land use change in Madrid and Seville.</p> <p>There was a lack of government coordination in terms of strategy</p>		
	Employment	<ul style="list-style-type: none"> <li>The <b>Madrid-Seville</b> line led to a migration of highly skilled commuters to Madrid from Ciudad Real, as well as from the North of Madrid, but on a smaller scale.</li> </ul>
	Productivity	<ul style="list-style-type: none"> <li>No evidence of direct productivity impacts found.</li> </ul>
	Housing	<ul style="list-style-type: none"> <li>Robust evidence linking the Madrid-Seville line to housing is limited, stakeholder interviews suggest some brownfield sites were developed into residential development in Ciudad Real.</li> </ul>
	Regeneration	<ul style="list-style-type: none"> <li>The literature describes a complex process of local urban regeneration in the areas surrounding the Madrid Atocha station. This process was facilitated by the railway operator's ownership of the land around the station, helping to bypass land purchase and planning obstacles.</li> </ul>

High Speed Rail Network Spain	Outcome	Key findings
<p>and land-use policy, to deliver an integrated, urban development plan for the cities/towns served by HSR. This resulted in significant variation in the scale of complementary investment and planning across cities/towns.</p>	<p>Environment</p>	<ul style="list-style-type: none"> <li>Limited evidence of regeneration in Seville.</li> <li>The literature describes major urban renewal and inward investment in Ciudad Real after the station opened in 1992, but other cities on the line failed to capitalize in the same manner.</li> <li>Some evidence to suggest that the line successfully encouraged modal shift.</li> <li>Between 1991 and 1994 the share of air traffic in the corridor fell from 40 to 13 percent, and that of car and bus from 44 to 36 percent, while rail increased from 16 to 51 percent.</li> </ul>

High Speed Rail Network Spain	Outcome	Key findings
<p><u>Madrid to Barcelona</u></p> <p>No evidence of transformational impact on most areas served.</p> <p>The evidence around the Barcelona–Madrid line shows a positive impact on GVA and labour productivity, but not employment.</p> <p>There was a lack of government coordination in terms of strategy and land-use policy, to deliver an integrated, urban development plan for the cities/towns served by HSR. This resulted in significant variation in the scale of complementary investment and planning across cities/towns.</p>	<p>Employment</p> <p>Productivity</p> <p>Housing</p> <p>Regeneration</p> <p>Environment</p>	<ul style="list-style-type: none"> <li>Little impact on unemployment was observed after the opening of HSR. But unemployment in Aragon was already lower than the national average and lower than in Catalonia and Madrid.</li> <li>Unemployment in Catalonia dropped from 10 percent to just over 6 percent from 2004 to 2006 during the construction of the extension line from Lleida to Tarragona (both cities in Catalonia).</li> <li>Findings show positive impacts on Gross Value Added (GVA) likely due to improved labour productivity, as well as the number of businesses locating to the areas served by HSR.</li> <li>Stakeholders perceive that productivity gains observed in the intermediate cities were the result of better connectivity for major firms with regional offices in these cities, and possibly entry of some high productivity firms.</li> <li>Robust evidence linking the line opening to significant housing development was not found.</li> <li>There were originally plans to build new housing in Zaragoza, but this stalled due to the 2008-09 financial crisis.</li> <li>Our literature review found little urban regeneration planning, expansion or redevelopment of the station or other complementary investments in Barcelona.</li> <li>But the arrival of HSR in Zaragoza was used to catalyse urban and socio-economic transformation of the city and was integrated into local plans.</li> <li>Stakeholder interviews suggest that Guadalajara might have been a good location for commuters. But the location of the HSR station outside the city centre means that any new developments and regeneration projects observed within the city are unlikely to be attributable to HSR.</li> <li>The line successfully encouraged significant modal shift from air travel to HSR.</li> </ul>



High Speed Rail Network Spain	Outcome	Key findings
		<ul style="list-style-type: none"> <li>• The number of air passengers decreased from 345,000 to 269,000 from 2007 to 2008 (year of Madrid-Barcelona line opening), a decline of 22 percent.</li> <li>• By 2009, a year after the opening of the line, a third of air traffic along the route had switched to rail</li> </ul>

West Coast Mainline	Outcome	Key findings
<p>Multi-year programme to address a backlog of maintenance and renewal works on the line running between London and Glasgow. The scheme opened in phases between 2004 and 2008.</p> <p>The upgrades trebled capacity on the WCML and reduced journey times to Manchester by 40 mins (or ~20%).</p> <p>This encouraged modal shift such that rail captured some of the aviation market.</p> <p>Coupled with the redevelopment of Manchester Piccadilly station, the WCML upgrades helped to catalyse investment in new office developments close to Piccadilly.</p> <p>But in other towns and cities there is little evidence of land use change or induced development.</p>	<p><b>Employment</b></p> <ul style="list-style-type: none"> <li>• There is limited evidence of the scheme directly attracting employment and thus significantly impacting the local labour market.</li> <li>• Following the completion of Phase 1 and Phase 2, between 2004 and 2007 employment showed little change or even a slight decline for some NW regional areas served by WCML, including Manchester South (-1.5%) and Merseyside (-0.1%).</li> <li>• Only Liverpool (2.1%), Halton and Warrington (collectively 2.5%) and Cheshire East (4.6%) experienced employment growth in the same period.</li> <li>• But we did not find robust evidence directly linking this to the WCML upgrade.</li> </ul> <p><b>Productivity</b></p> <ul style="list-style-type: none"> <li>• From 1998 to 2004 (completion of Phase 1), GVA per head increased (relative to national average) in the metropolitan areas of Greater Manchester South and Liverpool.</li> <li>• But non-metropolitan areas such as Lancaster and Blackpool saw a decline in productivity between 1998 and 2004.</li> <li>• One possible explanation is that WCML attracted more highly skilled workers to the metropolitan areas.</li> </ul> <p><b>Housing</b></p> <ul style="list-style-type: none"> <li>• No evidence of housing impacts found across the cities and towns served.</li> </ul> <p><b>Regeneration</b></p> <ul style="list-style-type: none"> <li>• Our research found limited evidence to link the WCML upgrades to regeneration impacts.</li> <li>• But the WCML, coupled with the station redevelopment, induced major investment around Manchester Piccadilly station, catalysed the station redevelopment and the creation of high-quality mixed-use office and commercial development.</li> <li>• In late 2004, Liverpool Vision was unveiled, with a proposed new look for Liverpool Lime Street station including new public space, hospitality space and new offices.</li> <li>• Plans for the redevelopment of Birmingham New Street station were also underway in 2006,<sup>7</sup> capitalising and (accommodating) on the improved connectivity and subsequent increase in passenger numbers.</li> </ul>	

<sup>7</sup> Department for Transport (May 2006) West Coast Main Line Progress Report

West Coast Mainline	Outcome	Key findings
	Environment	<ul style="list-style-type: none"> <li>The WCML upgrades helped to shift modal choices from road and air travel to rail, particularly on the key London–Manchester route.</li> <li>In 2005, one year after Phase 1 was completed, rail pax per month increased by 96%, and air pax declined by 6%.</li> <li>Rail share of the market between Glasgow and London grew from 8% to 20% between 2009 and 2017.</li> </ul>

Borders Railway	Outcome	Key findings
<p>Reopening the line between Edinburgh and the regions of Midlothian and the Scottish Borders. Involved constructing 30 miles of new track and 7 new stations.</p> <p>Although passenger usage of the new line has exceeded the original expectations, we found insufficient evidence to suggest that this has yet to be translated into any transformational economic and/or land use impacts.</p>	Employment	<ul style="list-style-type: none"> <li>Primary research suggests that the Borders Railway had a modest positive impact on employment, as the stations in ‘urban’ and ‘semi-urban’ areas experienced a significant increase in employment following the scheme’s opening relative to comparator areas.</li> </ul>
	Productivity	<ul style="list-style-type: none"> <li>No evidence of direct productivity impacts found.</li> </ul>
	Housing	<ul style="list-style-type: none"> <li>New housing is being built in the corridor but so far, the number completed is less than the 10,000 originally envisaged.</li> <li>An urban expansion is planned around the new station at Shawfair, but as at Spring 2021, only 1,000 of 4,000 new homes had been built.</li> </ul>
	Regeneration	<ul style="list-style-type: none"> <li>Regeneration was not an objective of this scheme.</li> </ul>
	Environment	<ul style="list-style-type: none"> <li>User surveys suggest that the railway led to a significant modal shift from car to rail, saving more than an estimated 36,000 annual single car trips.</li> </ul>

Edinburgh Glasgow Improvement Programme	Outcome	Key findings
<p>Improvements to reduce capacity constraints, improve connectivity to the airport, and a redevelopment of Glasgow Queen Street Station.</p> <p>The programme completed in 2020 but the results are so far obscured by the impact of Covid-19 on travel. It is too early to conclude whether the overall programme has been transformational.</p>	Employment	<ul style="list-style-type: none"> <li>It is too early to identify any employment impacts associated with the programme, due to Covid-19.</li> </ul>
	Productivity	<ul style="list-style-type: none"> <li>It is too early to identify any productivity impacts associated with the programme, due to Covid-19.</li> <li>Future research would be valuable, because of the theoretical benefits of an integrated labour market.</li> </ul>
	Housing	<ul style="list-style-type: none"> <li>No housing impacts associated with the scheme.</li> </ul>
	Regeneration	<ul style="list-style-type: none"> <li>The scheme is perceived to have contributed to some improvements in the Queen Street Station area, but so far, the impacts are limited.</li> </ul>
	Environment	<ul style="list-style-type: none"> <li>Partial route electrification is expected to reduce carbon emissions, as is a shift in modal share.</li> <li>But these impacts are yet to be evaluated and as such there is no quantitative evidence available.</li> </ul>

### Reading Station Redevelopment

The redevelopment of Reading station was completed in 2014. It addressed bottlenecks in the infrastructure which had been constraining the performance of the Great Western Main Line, lengthened platforms and increased station capacity.

The investment was perceived by the town council to be important in wider efforts to reduce road congestion and facilitate Reading's continued economic growth. But it is difficult to disentangle the impacts from the anticipatory effects of Crossrail services.

Outcome	Key findings
Employment	<ul style="list-style-type: none"> <li>No evidence found on the impact of the station redevelopment on employment.</li> </ul>
Productivity	No evidence found on the impact of the station redevelopment on productivity.
Housing	No evidence found on the impact of the station redevelopment on housing.
Regeneration	Stakeholders perceive that the station redevelopment played an important role in catalysing the redevelopment of the area surrounding the station and catalysed private investment in local commercial real estate.
Environment	No evidence found on the impact of the station redevelopment on the environment.

### Kirkstall Forge

A new rail station which opened in 2016 on the line running between Leeds and Shipley. The station is part of a 23-acre mixed use development, where early progress is good although it is not yet fully built-out.

The station was key to site viability, but any impacts over a wider geographic area appear to be minimal.

Outcome	Key findings
Employment	<ul style="list-style-type: none"> <li>Our analysis suggests that the Kirkstall Forge station had a positive impact on employment.</li> <li>But the evidence does not indicate a transformative impact, as the sectoral shares did not change significantly.</li> </ul>
Productivity	<ul style="list-style-type: none"> <li>No evidence of direct productivity impacts found.</li> </ul>
Housing	<ul style="list-style-type: none"> <li>There are plans to provide up to 1,450 new homes at the Kirkstall Forge site. Planning permission for the first phase obtained in June 2021, but no homes have been completed at the time of writing.</li> </ul>
Regeneration	<ul style="list-style-type: none"> <li>Kirkstall Forge itself is a former industrial site. The new station made the site viable for development.</li> <li>No evidence of any impact on regeneration beyond the site of the station and associated development.</li> </ul>
Environment	<ul style="list-style-type: none"> <li>It is estimated that the station has resulted in 13,000 fewer car journeys per annum.</li> </ul>

### Corby New Station and Rail Service

A new rail station which opened in 2009. It was claimed that Corby was one of the largest towns in Europe without a rail station.

Corby has experienced strong population growth over the past 20 years and is perceived to be overcoming some of the legacy

Outcome	Key findings
Employment	<ul style="list-style-type: none"> <li>The evidence suggests there was a small increase in employment in the retail sector, but we cannot conclusively attribute that to the new station given background employment growth in Corby over the same period.</li> </ul>
Productivity	<ul style="list-style-type: none"> <li>The opening of Corby station, and commencement of new rail services, was not found to have had any notable impacts upon business productivity in Corby, which is likely to be a result of the relatively limited reliance businesses have on rail connectivity.</li> </ul>



Corby New Station and Rail Service	Outcome	Key findings
<p>issues associated with a former steelwork's town.</p> <p>Corby's rejuvenation is partly due to local leadership which sought to grow the town and invested to improve the town centre and its amenities. The rail station is one of many contributing factors.</p>	Housing	<ul style="list-style-type: none"> <li>Housing development in Corby was strong both before and after 2009, which was influenced by local and regional planning policies and land availability.</li> <li>The station is unlikely to have played a key role in housing growth but has made the town more attractive to London-bound commuters.</li> </ul>
	Regeneration	<ul style="list-style-type: none"> <li>The station was important to the perception of the town centre. A string of high-profile regeneration projects have since been developed.</li> <li>There are further plans to invest in areas of the town that have yet to undergo redevelopment.</li> </ul>
	Environment	<ul style="list-style-type: none"> <li>No estimates found on the impact of the station and rail service on the environment, but some evidence of modal shift away from car and bus travel</li> </ul>

Falmouth Rail Improvements	Outcome	Key findings
<p>A new passing loop which opened in 2009 on the branch of the rail line connecting the coastal town of Falmouth to Truro, which allowed the service frequency to double.</p> <p>Although Falmouth experienced faster employment growth compared to the comparator location, there is no evidence to suggest that the impacts were transformational.</p>	Employment	<ul style="list-style-type: none"> <li>There is evidence to suggest that employment grew in Falmouth relative to comparator areas, despite the recession. The scheme may have contributed to this, though attribution is challenging.</li> </ul>
	Productivity	<ul style="list-style-type: none"> <li>No evidence of direct productivity impacts found.</li> </ul>
	Housing	<ul style="list-style-type: none"> <li>Student housing continued to grow. This investment was not additional, but the rail line enabled it to be distributed on a wider geographical basis.</li> </ul>
	Regeneration	<ul style="list-style-type: none"> <li>Falmouth Town Council is working on a series of green investments; they believe obtaining approval / funding for these would have been more challenging in the absence of the service.</li> </ul>
	Environment	<ul style="list-style-type: none"> <li>There was an increase in leisure rail patronage, but according to survey data, this did not represent a modal shift for most users.</li> <li>No evidence found of modal shift for commuters.</li> </ul>

Great Yorkshire Way	Outcome	Key findings
<p>A 7km dual carriageway link which runs from the M18, just north of Rossington, to Robin Hood Airport Doncaster Sheffield. Opened in phases between 2016 and 2018.</p> <p>The scheme is perceived to be a success, having won regional planning awards for promoting economic development. It has successfully enabled the delivery of a large housing development,</p>	Employment	<ul style="list-style-type: none"> <li>The GYW scheme is part of a wider regeneration strategy and acted as a catalyst for a variety of investments. It is reported the scheme has delivered over 1,000 new jobs.</li> <li>The scheme reached its Regional Growth Fund employment targets within 18 months of opening.</li> </ul>
	Productivity	<ul style="list-style-type: none"> <li>The jobs created have thus far been predominantly low-skilled, limiting productivity improvements.</li> </ul>
	Housing	<ul style="list-style-type: none"> <li>The Pheasant Hill Park housing development, linked to the scheme, is continuing to develop new homes (~520 sold as of June 2021, of 1,200 consented).</li> </ul>

Great Yorkshire Way	Outcome	Key findings
<p>logistics and employment site, and improved the opportunities available to local residents who were previously poorly connected.</p>	Regeneration	<ul style="list-style-type: none"> <li>The Great Yorkshire Way enabled the delivery of iPort (6m sq. ft of employment space once fully built) Phoenix Hill Park, the continued growth of the local airport and a large investment in the Yorkshire Wildlife Park (a major regional tourist attraction).</li> <li>Local stakeholders perceive that it has helped to improve opportunities to Rossington residents.</li> </ul>
	Environment	<ul style="list-style-type: none"> <li>No evidence of environmental impacts found.</li> </ul>

Markham Vale	Outcome	Key findings
<p>200 ha business park adjacent to M1 J29A, which opened in 2009. In 2017, a new link road opened to connect the northern plots of the park to the highway network.</p> <p>It successfully unlocked the Markham Vale development, but we did not find evidence of any wider impacts.</p>	Employment	<ul style="list-style-type: none"> <li>2,236 full time jobs had been created at Markham Vale as of 2019.</li> </ul>
	Productivity	<ul style="list-style-type: none"> <li>Our research did not find any evidence on productivity impacts.</li> <li>Tenants at the business park include logistics businesses, as well as manufacturing firms ranging from the aerospace to health sectors. These firms may pay higher than average wages for the region.</li> </ul>
	Housing	<ul style="list-style-type: none"> <li>Housing was not a targeted impact under the Markham Vale scheme.</li> </ul>
	Regeneration	<ul style="list-style-type: none"> <li>The Markham Vale scheme has remediated and reclaimed brownfield land on the site of a former coalfield.</li> </ul>
	Environment	<ul style="list-style-type: none"> <li>The regeneration of the Markham Vale site involved environmental landscaping and the creation of habitats for plants and wildlife.</li> </ul>

A46 Newark to Lincoln and Newark to Widmerpool	Outcome	Key findings
<p>Two SRN dualling schemes around Newark. Newark to Lincoln opened in 2003, and Newark to Widmerpool in 2012.</p> <p>Schemes aimed to address congestion and safety issues, improve journey reliability and links between the A1 and M1.</p> <p>The overall effects are not 'transformational', but this may reflect lower ambitions relative to other case studies covered in this report.</p>	Employment	<ul style="list-style-type: none"> <li>New employment sites have been supported by the schemes, but we did not find any evidence that the net impact on regional employment was positive.</li> <li>Overall, the schemes have not had a 'transformational' effect on the local area, but this may reflect lower ambitions relative to other schemes examined in this report.</li> </ul>
	Productivity	<ul style="list-style-type: none"> <li>No evidence of direct productivity impacts found. Further research on this topic would be useful because of the intended benefits for freight users.</li> </ul>
	Housing	<ul style="list-style-type: none"> <li>The Newark to Lincoln scheme helped to unlock a 1,000-unit housing and commercial development on a former airfield, now Witham St Hughs.</li> <li>The same scheme attracted large employers to the new Teal Park business park south of Lincoln.</li> </ul>
	Regeneration	<ul style="list-style-type: none"> <li>No evidence of an impact on regeneration in the local towns found.</li> </ul>
	Environment	<ul style="list-style-type: none"> <li>No evidence of environmental impacts found.</li> </ul>

## Case study and QCA themes

Based on the 15 case studies, we prepared an initial synthesis of the conditions which may enable transformational change, or which appear to generate supportive outcomes from a local economic development perspective. These themes were tested further as part of the QCA and include:

- **Physical transformation in the form of new or refurbished developments is noticeable and can emerge relatively quickly following a transport scheme** (e.g. where the scheme was critical to the commercial viability of the new development). Examples of this include: Great Yorkshire Way; Markham Vale; Kirkstall Forge station; Reading station; and the Jubilee Line Extension. But this is not universally the case, and in some examples the necessary conditions for new development were not present, e.g. HS1 at Ebbsfleet.
- **Economic transformation is more challenging to identify, in part because it requires good data and robust analytical methodology.** But such transformation generally takes longer, and the length of time it takes to realise economic transformation makes attributing the impact of the transport investment more challenging. Examples of this might include: WCML Upgrade Programme; Manchester Metrolink; Nottingham Express Transit; the Jubilee Line Extension (excluding Canary Wharf); and HS1 across Kent.
- **The outcomes appear to vary in those cases where the intervention affects a wider geographical area.** For example, the impacts of Metrolink appear to be more positive in the regional centre, whereas the impacts in the satellite towns and suburbs have been less pronounced and may take much longer to materialise. The high speed rail case studies (in both the UK and Spain) also suggest that the impacts are less pronounced outside of the large cities.
- **It is rare to find transport investments which, in isolation, change or reverse underlying economic or transport trends.** We find case studies where transport investments have accelerated or slowed background economic trends, e.g. by accelerating commercial development in an area where there was already strong underlying demand. For example, regeneration was already well underway in Salford Quays before Metrolink arrived in 2000, and Salford was growing faster than most other Manchester boroughs when the MediaCityUK spur opened. Likewise, the Jubilee Line Extension helped to transform London's Docklands, but built on the contribution of the LDDC, enterprise zone policies, and the DLR amongst other investments. While it is possible that an improvement in transport provision can act as an enabler to transformation, such improvements are unlikely to be a sufficient condition unless background economic trends are already favourable to transformation.

Through the QCA, we found that the strength of background economic growth was often a necessary condition for achieving a transformational outcome. This finding suggests that improvements in transport connectivity were better at accelerating underlying economic trends than reversing them. This finding is supported by the qualitative evidence we collected as part of our case study analysis, where we observed that the most successful schemes have been those that took place in areas that were already deemed to be growing.

- **Where a change in transport accessibility improves the 'industrial or commercial competitiveness' of the treated area, we would expect to see a change in the sectoral composition of employment.** The sectoral composition of employment would favour firms that require and value good transport accessibility to the labour market, to customers or to suppliers. We did not find many examples within our case study sample where this change in sectoral composition occurred.
- **Transformation seemingly requires private investment to be levered in – potentially at a level several times the level of the original public investment.** This suggests that transformation may require a coordinated programme of investment and that the impacts may become larger the more that programme is integrated with the existing public transport network. Transport investment targeted at unlocking sites for private investment and/or development may stand a better chance of success, but also depend on delivery

by private developers over whom the responsible public authority may have fewer levers (see examples of “stalled developments” around Reading Station, the Borders Railway, and the HS1 station at Ebbsfleet).

- **It is more common to find evidence of place-based transformation than it is to find evidence of people-based transformation.**<sup>8</sup> For example, it is much easier to find evidence that a transport investment led to new developments, or positive economic effects in a particular area, than it is to find evidence that the incumbent population of the area directly benefitted from the investment. This is partly down to people-based effects being more challenging to identify than place-based effects, though the few case studies that do have robust strategies for identifying people-based effects found limited evidence of transformation.
- **Case study evidence suggests that travel patterns are subject to significant levels of inertia.** In response to new transport links, commuting patterns adapt slowly. For example, in Corby the introduction of a new railway station has not (yet) changed commuting patterns, which is still car dominated. There is an increase in commuter trips to neighbouring Kettering, but most of those journeys are still made by car.<sup>9</sup> In Manchester commuting by public transport remained lower in areas that did not have pre-existing patterns of commuting towards the city centre.<sup>10</sup> Survey data also suggested access to leisure sites was more of a driver than access to employment.<sup>11</sup>
- **The *perceived* success of the respective light-rail schemes is associated with: an existing culture of public transport usage and integration of light-rail networks with other public transport modes.** For example, in response to opening of NET, Nottingham’s bus network was redeveloped to act as a feeder service to the tram network. Additionally, Park and Ride facilities have been seen as valuable additions by scheme sponsors and evaluators. But some survey evidence from Manchester suggests that many Park and Ride users would have taken public transport regardless.
- **Despite economic or social transformation being highlighted as key strategic objectives for all of our case studies, we have not been able to find many instances of benefits realisation strategies being systematically developed to ensure the benefits ultimately materialise.** It is not necessarily the existence of a benefits realisation plan that matters, as that will not in and of itself determine the success of a scheme. What seems to matter is the overall coherence of the local economic development strategy to realise the benefits that a transport investment brings through better connectivity. This is difficult to judge objectively and often the ‘strategy’ must be pieced together from several separate documents and local plans. The best indication of coherence might be general agreement on the vision amongst local stakeholders and investors, and a partnership approach with involvement from the private sector.

We see this in some of our cases such as the opening of Corby rail station, but in other cases, our review of the material suggests that the transport scheme was developed in isolation to any local economic planning. One of the additional schemes we included within our QCA, the first phase of Sheffield Supertram, provides perhaps the most notable example of a lack of alignment in vision amongst the various stakeholders. The literature we reviewed suggests this was a key factor in the objectives of the scheme failing to be realised.

- **Where the barriers to land use change / regeneration are particularly deep or complex, public support needs to be targeted (and potentially large) and it may also require ambitious policies that facilitate regeneration.** Successful examples where such complexities were overcome include the London Docklands, Stratford, Kings Cross and Salford Quays. In each case the sites had legacy challenges stemming from their former industrial uses, lacked the supporting infrastructure for development, and required extensive site assembly to coordinate action. Very significant sums of public money had to be

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<sup>8</sup> “People-based transformation” refers to changes that are targeted directly at individuals, e.g. training to improve employability. “Place-based transformation” refers to changes that are embedded in the physical environment of a geographical area.

<sup>9</sup> SDG Evaluation of Corby.

<sup>10</sup> Arup Metrolink Phase 3 Evaluation.

<sup>11</sup> Arup Study – Wythenshawe survey.

invested in these sites to build new infrastructure, purchase and assemble land, encourage development and facilitate change. It also required new governance structures, with a dedicated agency responsible for delivery and coordination with private investors and landowners.

An unsuccessful example would be Ebbsfleet, where the challenges associated with the former quarry sites may have been underappreciated at the outset but are gradually being addressed by the Ebbsfleet Development Corporation.

Our QCA found a weak association between taking discrete action to redevelop areas benefitting from improved transport links, and achieving a transformational outcome. We also observe that this works best when the actions are taken well in advance of scheme opening, which appears to create virtuous cycle, and also works better when regeneration actions and transport developments are fully integrated.

- **Often there is a public sector organisation with vision that backs and drives a scheme, such as in Corby or Doncaster (the Great Yorkshire Way).** But that vision must be rooted in commercial reality for it to be attractive to private investors. Where the vision goes beyond physical transformation and targets structural or economic transformation, a wider range of actors need to be considered. For example, successfully developing a creative or advanced manufacturing cluster may require a base ecosystem of similar firms, and supporting institutions such as hospitals, universities and other assets that create spill over effects. Of the cases we reviewed, this was most successfully achieved in Phase 2 of Manchester Metrolink through the MediaCity development in Salford. This is also being developed at smaller scale through the Great Yorkshire Way scheme, where the area is being developed as a logistics hub,
- **Many of the evaluations we have reviewed primarily focus on areas that are directly affected by a transport intervention and therefore, exclude areas that are affected indirectly through transport connections and the wider transport network.** This is a particular challenge for roads-based evaluations where the effects can be very diffuse across the wider roads network. For example, the A46 improvement schemes may have benefitted transport-intensive firms based in Scunthorpe, Grimsby and Immingham, despite being more than 40 miles from the site of intervention. Another example of this is the Jubilee Line Extension where the initial passenger growth was from people travelling on trains into Waterloo and then taking the Jubilee Line eastwards. However, the evaluation evidence we examined did not look at what happened in Southwest London or Surrey.
- **Transport strategic cases tend to focus on commuter or business travel but our case studies suggest that shopping and leisure passenger growth has been underestimated at the appraisal stage.** This suggests that scheme promoters should consider whether increased leisure travel could support regeneration, levelling up or well-being ambitions or undermine them. If a scheme helps people access town centres then leisure travel could contribute to achieving regeneration ambitions. Conversely, it also means people can access an out-of-town shopping centre at the expense of a town centre.
- **The QCA found that a combination of latent demand for housing in a satellite area - evidenced by high levels of housing deprivation - and action taken to facilitate housing regeneration, can work collectively to transformation the area in favour of more residential activity.** In other words, transport investment can be used to unlock housing developments in an area. Whether this ultimately eases housing pressures in the area is less clear, and depends on whether housebuilding activity keeps pace with increases in demand to live in the area.
- **A more qualitative analysis of the cases found a weak association between the integration of other transport modes with the transport scheme, and achieving a transformational outcome.** Many of the more successful cases within our dataset have had integrated park and ride facilities. And as we note in the previous section, one of the potential reasons for Nottingham Express Transit's success relative to Sheffield Supertram, is the better integration between the bus and tram networks.





## 1. INTRODUCTION

Scheme promoters for transport infrastructure projects routinely cite the potential for the project to lead to the economic or social transformation of an area, as part of the strategic case for intervention. It is commonly argued that the potential for economic or social transformation goes beyond what is typically captured using traditional transport appraisal techniques. For example, the Department for Transport's (DfT) Transport Appraisal Guidance (TAG) generally advises that approaches that assume land use is fixed are considered more robust, whereas transport interventions that transform a local area will by definition lead to changes in land use.<sup>12</sup>

The potential for transformational change is cited in the case for High Speed 2 and Northern Powerhouse Rail and the business case suggests that traditional cost-benefit appraisal may underplay benefits of this nature for such schemes.<sup>13</sup> This argument extends to smaller, more localised transport interventions as well, such as those supported through the Transforming Cities Fund – part of the government's Industrial Strategy to improve productivity and prosperity through investment in public and sustainable transport programmes.

Despite many proposed transport investments being labelled as 'transformational' there exists little evidence on how such impacts materialise, and how local conditions and complementary investments and policies work with a new transport investment to deliver benefits not captured in a standard appraisal. There is also relatively little assurance around estimated impacts due to the limited availability of ex-post evaluation evidence.

The Government objective to level up prosperity across the UK is likely to involve changes in the size and structure of local economies, so understanding the dynamics of change and the impacts from land use change is now more important than ever.

In this context, the DfT commissioned CEPA and Arup to address the current evidence gap. The project has three components:

1. **Literature review.** With the support of an academic advisory panel, we undertook a literature review to establish the theoretical foundations of how transport investments interact with the wider context surrounding the investment, to lead to economic or social transformation.<sup>14</sup>
2. **Case studies.** Fifteen rail and road scheme case studies to provide insights into how the context surrounding a scheme may have affected whether it was transformational, based on indicators such as patronage, productivity, employment, population growth, and housing.
3. **Qualitative Comparative Analysis (QCA).** Using data compiled from the case studies, we analysed whether common conditions exist that enable transformational change with respect to a specific outcome variable (e.g. health and wellbeing, housing access, and economic output, employment and productivity). Using the QCA approach, we sought to identify a series of necessary and/or sufficient conditions that determine whether a scheme is ultimately transformational or not.

### 1.1. TRANSFORMATIONAL IMPACTS DEFINED

A key output of the literature review is the proposed definition of transformational change which we have applied in the preparation of the case studies. For the purposes of this study, we use the definition set out below:

A scheme is considered 'transformational' if there is empirical proof of a step-change in **any** of the following three metrics:

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<sup>12</sup> The definition of transformation we use in this study is broader than the definition typically used elsewhere, such as the Green Book. A fuller definition of transformation, as used in this study, is provided in Section 1.1.

<sup>13</sup> See also: Douglas Oakervee (2019), "Oakervee review of HS2".

<sup>14</sup> Members of our academic advisory panel include Dan Graham, Imperial College London and Steve Gibbons, London School of Economics.

- A. The change in the transportation system leads to a step-change in connectivity and/or effective density, which manifests itself in a significantly increased usage of the transport network.
- B. The scheme leads to dynamic clustering<sup>15</sup> and/or land use change which can be empirically identified by a significant change in sectoral employment shares or land use shares.
- C. The scheme leads to increases in at least one of the following four metrics: employment, productivity per worker/firm, number of homes and/or land and property values.

This definition can be applied to both small and large projects (though the geographic scope over which the change is seen is likely to vary).

The full literature review is appended to this report as a separate document.

## 1.2. CASE STUDIES

We identified and agreed a set of 15 rail and road project case studies with DfT which are listed below in Table 1-1 below. The case studies were selected based on satisfaction of multiple criteria, including that they should cover both rail and road transport modes and should not be overly concentrated on a particular city or region.<sup>16</sup>

The case studies are also used to inform and test our Theory of Change framework (See Section 1.3 below).

*Table 1-1: List of transport schemes examined for the case study research*

LIGHT RAIL / METRO / RAIL	
<ul style="list-style-type: none"> <li>• <b>Greater Manchester Metrolink</b> – The light rail (tram) transport system in Greater Manchester. The network now has eight lines which radiate from Manchester city centre.</li> <li>• <b>Jubilee Line Extension (JLE)</b> – To Stratford via Canary Wharf opened in 1999. The first significant addition to the London Underground network since 1979. The project involved building six new stations and enlarging or rebuilding five existing stations.</li> <li>• <b>Nottingham Express Transit (NET)</b> – New light rail (tram) transport network with two lines and subsequent new route extensions.</li> <li>• <b>High Speed 1 (HS1)</b> – The high-speed rail line that connects London with the Channel Tunnel, and then onwards to the continental Europe rail network. Domestic stations on the Southeastern Network also served by high-speed services.</li> <li>• <b>High Speed Rail Network Spain</b> – The development of two significant lines as part of the Spanish High Speed Rail Network – the Madrid-Seville line opened in 1992 and the Madrid-Barcelona line opened in 2008.</li> <li>• <b>West Coast Main Line update (WCML)</b> – A series of track upgrades and introduction of new rolling stock that allowed speeds of 125 mph along most of the line and substantial increases in capacity for both passenger and freight trains. Completed in 2008.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Edinburgh – Glasgow Improvement Programme (EGIP)</b> – Infrastructure programme to reduce capacity constraints between Scotland’s two largest cities, enable more services, and improve journey times. Included a redevelopment and extension of Glasgow Queen Street, coinciding with an investment in station regeneration and an extension of Buchanan Galleries shopping centre.</li> <li>• <b>The Borders Railway</b> – Reopening the rail line connecting Edinburgh with the regions of Midlothian and the Scottish Borders. The project was the longest domestic railway built in the UK in over 100 years, and involved constructing 30 miles of new track and seven new stations.</li> <li>• <b>Reading Station redevelopment</b> – Major redevelopment to address infrastructure bottlenecks and expand station capacity. Reading Council undertook further work on the station building, with the aim of improving the concourses and area surrounding the station.</li> <li>• <b>Kirkstall Forge new station</b> – Suburban rail station opened in 2016, positioned on the lines running between Leeds and Shipley, which unlocked an associated large mixed-use development.</li> <li>• <b>Falmouth rail improvements</b> – New passing loop enabled a doubling of services serving Falmouth</li> </ul>

<sup>15</sup> Benefits that arise through close location of businesses and/or people.

<sup>16</sup> We avoided a focus on London, as this might have limited the applicability of any findings or conclusions to other UK towns and cities.



## LIGHT RAIL / METRO / RAIL

- **Corby new station and rail service** – New rail station to serve the town of Corby. Passenger services to London included in East Midlands franchise. from one to two trains per hour. A capacity increase followed two years thereafter.

## ROADS

- **Great Yorkshire Way** – 7km dual carriageway linking the M18, just north of Rossington, to Robin Hood Doncaster Sheffield Airport. Part of a wider regeneration effort, considered a catalyst for investment, job creation and better housing in Doncaster, as well as better connectivity in the South Yorkshire region.
- **Markham Vale** – a 200-hectare business park which opened in 2009 with direct access to the M1 motorway via the construction of junction J29A. In 2017, the Seymour Link Road opened, connecting the northern plots of Markham Vale to the highway network, to bring the land into productive economic use.
- **A46 improvements around Newark** – Major A-road and important freight link from Grimsby and Immingham, Lincolnshire to the East Midlands and the South West. Two schemes, completed almost a decade apart, were intended to boost the regional economy by relieving the congestion and safety-related issues along the route; improve journey time reliability for freight operators; and unlock land for new housing development.

The other criteria for selecting case studies included whether:

- the original business case for the scheme was in part based on the ‘transformational’ impacts that might result from the intervention, or the scheme was perceived to have had a transformational outcome;
- the project was completed and open to traffic during the period 1995 to 2015, with some flexibility either side. We considered that this was important, to increase the likelihood of obtaining useful information to develop the case studies as it allowed time for the expected economic impacts to materialise; and
- the availability of information, with a focus on obtaining the original business case and the existence of evaluations of the scheme.

It is important to note that this study is based on extant data, and until recently evaluations for transport investments in the UK were not routinely conducted. As a result, we are limited by data availability. We have filled gaps – to the extent possible – via targeted stakeholder interviews and primary research, but even in combination this is not a substitute for full scheme ex-post evaluation which is far more resource intensive than this project budget permits. The sources for our evidence base are described in more detail in the subsection below.

## 1.3. METHODOLOGY

### 1.3.1. Case studies

The evidence base for the case studies is built on three sources of information:

- **Desk based research (all case studies)**

We undertook desk-based research on the scheme context, inputs, and outcomes using (where available) the business case(s) for the scheme and any evaluation studies that were conducted. We also used a wide range of other sources to supplement our understanding of the scheme, including NAO reports, media articles, project monitoring reports from scheme sponsors and local authorities, academic studies, and parliamentary hearings.

- **Primary research (a subset of case studies)**

For the NET, Kirkstall Forge, and Borders Railway case studies, we used Level 1 Scientific Method Scale primary quantitative analysis to provide context and indicative evaluation outcomes using publicly available

datasets on NOMIS. NOMIS provides high quality data on population, employment and industry change and aggregate data on productivity, wages, and deprivation. We created tailor-made datasets for the case studies to identify outcome areas (in which the intervention occurred) and control areas (counterfactual) and studied in time and space how the transport opening changed (or did not change) the outcome areas.

- **Stakeholder interviews (all case studies)**

We interviewed a mix of scheme promoters, local authorities / local enterprise partnerships, academics, and land developers. The objective of the interviews, as far as practicable, was to obtain information that is directly relevant to determining the outcomes and surrounding context for each of our case studies.

Our approach to the interviews was to develop a first draft of each case study prior to speaking with interviewees to ensure that the interviews were well informed and focussed on the gaps in the desk-based research. We also used the interviews to test our initial findings and hypotheses. The full list of organisations we interviewed is included in Appendix A.

### 1.3.2. Theories of change

We present a Theory of Change (ToC) for each case study as a series of logic maps visually depicting how we expect each transport scheme to lead to outcomes and impacts that were stated as objectives of the scheme in the business case or other relevant sources. These are speculative ToCs based on our understanding of the scheme and a theoretical view of the potential relevance of different contextual factors. ToCs do not reflect actual outcomes or impacts and as such, some of the outcomes included in our ToCs failed to materialise.

The ToCs are theoretical and represent diagrammatically what we would expect to see given the nature of the transport scheme and the surrounding context. The purpose of each of the case study ToCs is to test the logic to see whether it is supported by evidence from the case studies. These individual ToCs will support the development of a set of overarching ToCs for each outcome area and form the basis of our Qualitative Comparative Analysis (QCA) analysis.

For the QCA, we used these overarching ToCs to develop a series of hypotheses for how local context might interact with a transport investment, to lead to a transformational outcome. We then used the outcomes and context data collected from our 15 case studies to test these hypotheses using QCA.

**Theories of Change**

The ToC developed for each case study is split into four components reflecting the (i) Inputs and Activities; (ii) Outputs; (iii) Outcomes; and (iv) Impacts. Typically, a ToC has five components with Inputs and Activities separately presented. For our purposes with the focus being on the *Outputs* and *Outcomes* it made sense to combine the first two components. We have also included the *Context* that we consider may be relevant at a theoretical level.

A ToC describes “how change is assumed to come about through intervention in a prevailing situation.”<sup>17</sup> The ToC is presented in a diagram showing the connections between the interventions and outcomes. The components of a results chain for a ToC are defined briefly in Figure 1-1.

*Figure 1-1: Components of a results chain in a ToC defined*

```

graph LR
    A[Inputs  
Financial, human and material resources used] --> B[Activities  
Actions taken or work performed to transform inputs into outputs]
    B --> C[Output  
Products, capital goods and services resulting in changes relevant to outcomes]
    C --> D[Outcomes  
Likely or achieved short-term and medium term effects]
    D --> E[Impact  
Positive and negative, long-term effects produced (intended or unintended)]
  
```

*Source: OECD*

<sup>17</sup> UK AID Connect. Guidance Note: Developing a Theory of Change.

### **1.3.3. QCA**

Through the QCA we develop the case study findings further by undertaking a more structured analysis of the case studies to identify common contextual factors that may be able to explain whether a scheme ends up being transformational or not. In simple terms, in the QCA codes the contexts and outcomes of each scheme in binary terms; where 1 means a contextual factor was present and 0 means it was not, and 1 means a certain outcome was achieved and 0 means it was not. The coding involved our professional judgement because the available data was limited in quantity and quality, and for several of the contextual factors we relied on the subjective views gathered from stakeholder interviews, rather than empirical evidence.

An analysis of the coded dataset tells us whether any contextual factors, or combinations of contextual factors, act as necessary or sufficient conditions for achieving a certain outcome. In other words, the analysis helps to identify what background characteristics to a scheme or complementary policies applied alongside a scheme, are necessary or helpful for achieving transformation. But, due to limitations in the empirical evidence, the analysis may generate hypotheses rather than demonstrating firm links between contextual factors and outcomes. Practically the challenge is that often the dataset does not lead to straightforward conclusions - so you find that contextual factors lead to an outcome in some cases and do not in other cases making it difficult to derive a conclusion. This may be because the contextual factor is genuinely not relevant, but often it is because the coding is imperfect because the source evidence is imperfect.

As we show in the detailed case studies, whether a scheme can be considered transformational depends on both the outcome metrics you consider, and on whether you consider place-based transformation or people-based transformation. As a result, our conclusions on the importance of different contextual factors differ depending on the type of transformation a scheme is aiming to achieve.

### **1.3.4. Limitations to the methodology**

There have been challenges with both accessing historical documents (e.g. original business cases) and scheme evaluations (in part because transport schemes are not systematically evaluated). Additionally, identifying interviewees when many of those who were closely involved in scheme development have since moved to employment elsewhere, has proven difficult. The quantity and quality of available information therefore varied across our case studies. We found that more information tended to exist for the most high-profile schemes in our sample. For a few case studies, more robust quantitative evaluation of their impacts already exists, but this is not generally the case. We have tried to reflect the quality of available evidence in the drafting of the case studies.

Our case studies also show that judgement is required to classify projects as 'transformational' or not. Although our literature review identified a clear definition of what is considered transformational for the purposes of this study, we have made certain judgements about the spatial scale at which that should be considered (e.g. sub-city area, town, city region or wider regional scale). In general, we considered whether the scheme was transformational at the scale most relevant for the size of the transport intervention, noting that the impacts may vary in different places.

Readers should also interpret our findings within the context of the scope of our work – specifically whether there are common conditions which enable transformational change. Our findings should not be interpreted as definitive judgements on whether the projects were 'good investments', represent value for money or were overall successful in delivering on their objectives. We focus on transformative effects.

## 2. FINDINGS

In this section we summarise the findings from each case study and then discuss themes which emerged from our research and were tested as part of the QCA analysis.

### 2.1. CASE STUDIES SUMMARY

Table 2-1 below summarises key findings from the case study research including whether interventions achieved their intended outcomes. We look at five outcome areas: employment, productivity, housing, regeneration, and environment.

Table 2-1: Summary of initial case study findings

Greater Manchester Metrolink	Outcome	Key findings
<p>Greater Manchester Metrolink the light rail (tram) system in Greater Manchester. The first three phases opened between 1992 and 2013.</p>	Employment	<ul style="list-style-type: none"> <li>• Current evidence on the impact on employment is inconclusive. An overall positive effect is likely but also marginal in the context of background growth in employment across Greater Manchester.</li> </ul>
<p>Metrolink has greatly improved public transport connections across Greater Manchester.</p>	Productivity	<ul style="list-style-type: none"> <li>• Some statistical evidence of a positive productivity impact in the Greater Manchester regional centre. But also evidence of a negative statistical impact on the satellite towns (Ashton, Oldham, Rochdale).</li> <li>• Overall aggregate impact likely to be positive.</li> </ul>
<p>The impacts appear to have been greatest in central Manchester and Salford, but more diffuse over the wider city-region.</p>	Housing	<ul style="list-style-type: none"> <li>• No quantitative impact found on new housing units but a positive impact on house prices was found.</li> <li>• Metrolink serves several areas which were allotted for housing market renewal in the 2000s.</li> </ul>
<p>It is difficult to show that Metrolink was ‘materially transformational’, distinct from other factors that have contributed to economic regeneration over 30 years.</p>	Regeneration	<ul style="list-style-type: none"> <li>• Regeneration of Manchester city centre and Salford Quays was already underway before Metrolink.</li> <li>• Some stakeholders perceive that it was important to the success of regeneration schemes in the East Manchester corridor and Rochdale town centre.</li> </ul>
	Environment	<ul style="list-style-type: none"> <li>• Significant carbon savings against a counterfactual where additional journeys were made by car.</li> </ul>

Jubilee Line Extension	Outcome	Key findings
<p>Opened in 1999, extending the original line from Green Park to Stratford.</p>	Employment	<ul style="list-style-type: none"> <li>• Evidence suggests that the JLE led to increases in employment along the length of the line. But this increase may have benefited migrants into the area rather than the incumbent population.</li> </ul>
<p>Widely recognised to have contributed to the regeneration and success of the Canary Wharf development.</p>	Productivity	<ul style="list-style-type: none"> <li>• Econometric analysis suggests that it led to a significant increase in average firm productivity in the zones around the JLE stations.</li> </ul>
<p>Transformation has gradually spilled over to neighbouring station zones.</p>	Housing	<ul style="list-style-type: none"> <li>• Some evidence that it may have accelerated residential development. Between 1997-99, the corridor between Bermondsey and Canning Town experienced a disproportionately high volume of development.</li> </ul>
	Regeneration	<ul style="list-style-type: none"> <li>• The JLE was a key factor in catalysing regeneration at certain sites along the route, particularly between Bermondsey and Canning Town.</li> </ul>

Jubilee Line Extension	Outcome	Key findings
	Environment	<ul style="list-style-type: none"> <li>Estimates suggest that 3,000 trips switched from car to public transport each day for the morning peak period.</li> </ul>

<b>Nottingham Express Transit</b> The 2-line tram network in the city of Nottingham, with each line opening in 2004 and 2015, respectively.  Our analysis suggests that there is some evidence of transformation along the line of route, particularly for Phase 2.	Outcome	Key findings
	Employment	<ul style="list-style-type: none"> <li>NET Phase 2 had a positive impact on employment. Employment growth within 1km of tram stations was higher than that found across Nottingham.</li> <li>Our analysis indicates a significant change in land use as the sectoral mix of the catchment area has changed towards 'other' sectors (non-retail, manufacturing, or business services).</li> </ul>
	Productivity	<ul style="list-style-type: none"> <li>No evidence of direct productivity impacts found.</li> </ul>
	Housing	<ul style="list-style-type: none"> <li>Multiple studies found an increase in residential property values along the Line 1 corridor.</li> <li>There is qualitative evidence in the literature that suggests NET has influenced property developers' views on potential sites and encouraged further housing development across the city, but robust quantitative evidence is not available.</li> </ul>
	Regeneration	<ul style="list-style-type: none"> <li>No direct evidence found on regeneration impacts, but in conjunction with other significant local investments, the line may have contributed to the regeneration of the South Side regeneration area.</li> </ul>
Environment	<ul style="list-style-type: none"> <li>The evidence shows that more than 30 percent of passengers switched from car to tram as their main mode of travel following Phase 2.</li> </ul>	

<b>High Speed 1</b> The high-speed rail line connecting London to the Channel Tunnel with domestic services serving Kent. Opened in 2009.  Route was selected to catalyse regeneration in Stratford alongside the 2012 Olympic Games, and to facilitate the expansion of Ebbsfleet to relieve housing affordability pressures in the South East.  The greatest impacts appear to have been around Kings Cross and Stratford – although this is where the change in transport connectivity is smallest.	Outcome	Key findings
	Employment	<ul style="list-style-type: none"> <li>Employment growth across the corridor was lower than other comparator transport corridors. But impact may have been masked by the slower than expected recovery from the 2008-09 recession.</li> <li>Strong employment growth found around Stratford station. More recent studies suggest employment effect around Kings Cross is gaining momentum.</li> </ul>
	Productivity	<ul style="list-style-type: none"> <li>No current evidence of direct productivity impacts. Large share of employment growth in the corridor appears to have been in less productive sectors.</li> </ul>
	Housing	<ul style="list-style-type: none"> <li>Early delivery of new housing at Kings Cross and Stratford is good but difficult to attribute solely to HS1.</li> <li>Transformation of Ebbsfleet has taken longer to occur as new developments stalled. Ebbsfleet Development Corporation set up in 2015 to accelerate delivery.</li> </ul>
	Regeneration	<ul style="list-style-type: none"> <li>Regeneration around Stratford has been significant. HS1 contribution is likely to be indirect, although London and Continental Railways (LCR) had a role in developing new office projects and de-risking the investment opportunity there.</li> </ul>

High Speed 1	Outcome	Key findings
The impacts across Kent appear to be less significant, or to have not yet materialised in the data.		<ul style="list-style-type: none"> <li>No regeneration impacts found in Kent.</li> </ul>
	Environment	<ul style="list-style-type: none"> <li>No impacts found but some estimates claim a significant reduction in carbon emissions</li> </ul>

High Speed Rail Network Spain	Outcome	Key findings
<p>High Speed Network in Spain with branches from Madrid to Seville and Barcelona opening in 1988 and 2008, respectively.</p> <p><u>Madrid to Seville</u></p> <p>Did not deliver transformational impacts to most areas served, but there is some evidence that HSR contributed to renewal and land use change in Madrid and Seville.</p> <p>There was a lack of government coordination in terms of strategy and land-use policy, to deliver an integrated, urban development plan for the cities/towns served by HSR. This resulted in significant variation in the scale of complementary investment and planning across cities/towns.</p>	Employment	<ul style="list-style-type: none"> <li>The <b>Madrid-Seville</b> line led to a migration of highly skilled commuters to Madrid from Ciudad Real, as well as from the North of Madrid, but on a smaller scale.</li> </ul>
	Productivity	<ul style="list-style-type: none"> <li>No evidence of direct productivity impacts found.</li> </ul>
	Housing	<ul style="list-style-type: none"> <li>Robust evidence linking the Madrid-Seville line to housing is limited, stakeholder interviews suggest some brownfield sites were developed into residential development in Ciudad Real.</li> </ul>
	Regeneration	<ul style="list-style-type: none"> <li>The literature describes a complex process of local urban regeneration in the areas surrounding the Madrid Atocha station. This process was facilitated by the railway operator's ownership of the land around the station, helping to bypass land purchase and planning obstacles.</li> <li>Limited evidence of regeneration in Seville.</li> <li>The literature describes major urban renewal and inward investment in Ciudad Real after the station opened in 1992, but other cities on the line failed to capitalize in the same manner.</li> </ul>
	Environment	<ul style="list-style-type: none"> <li>Some evidence to suggest that the line successfully encouraged modal shift.</li> <li>Between 1991 and 1994 the share of air traffic in the corridor fell from 40 to 13 percent, and that of car and bus from 44 to 36 percent, while rail increased from 16 to 51 percent.</li> </ul>

High Speed Rail Network Spain	Outcome	Key findings
<p><u>Madrid to Barcelona</u></p> <p>No evidence of transformational impact on most areas served.</p> <p>The evidence around the Barcelona–Madrid line shows a positive impact on GVA and labour productivity, but not employment.</p> <p>There was a lack of government coordination in terms of strategy and land-use policy, to deliver an integrated, urban development plan for the cities/towns served by HSR.</p>	Employment	<ul style="list-style-type: none"> <li>Little impact on unemployment was observed after the opening of HSR. But unemployment in Aragon was already lower than the national average and lower than in Catalonia and Madrid.</li> <li>Unemployment in Catalonia dropped from 10 percent to just over 6 percent from 2004 to 2006 during the construction of the extension line from Lleida to Tarragona (both cities in Catalonia).</li> </ul>
	Productivity	<ul style="list-style-type: none"> <li>Findings show positive impacts on Gross Value Added (GVA) likely due to improved labour productivity, as well as the number of businesses locating to the areas served by HSR.</li> <li>Stakeholders perceive that productivity gains observed in the intermediate cities were the result of better connectivity for major firms with regional offices in these</li> </ul>



High Speed Rail Network Spain	Outcome	Key findings
<p>This resulted in significant variation in the scale of complementary investment and planning across cities/towns.</p>		<p>cities, and possibly entry of some high productivity firms.</p>
	Housing	<ul style="list-style-type: none"> <li>• Robust evidence linking the line opening to significant housing development was not found.</li> <li>• There were originally plans to build new housing in Zaragoza, but this stalled due to the 2008-09 financial crisis.</li> </ul>
	Regeneration	<ul style="list-style-type: none"> <li>• Our literature review found little urban regeneration planning, expansion or redevelopment of the station or other complementary investments in Barcelona.</li> <li>• But the arrival of HSR in Zaragoza was used to catalyse urban and socio-economic transformation of the city and was integrated into local plans.</li> <li>• Stakeholder interviews suggest that Guadalajara might have been a good location for commuters. But the location of the HSR station outside the city centre means that any new developments and regeneration projects observed within the city are unlikely to be attributable to HSR.</li> </ul>
	Environment	<ul style="list-style-type: none"> <li>• The line successfully encouraged significant modal shift from air travel to HSR.</li> <li>• The number of air passengers decreased from 345,000 to 269,000 from 2007 to 2008 (year of Madrid-Barcelona line opening), a decline of 22 percent.</li> <li>• By 2009, a year after the opening of the line, a third of air traffic along the route had switched to rail</li> </ul>

West Coast Mainline	Outcome	Key findings
<p>Multi-year programme to address a backlog of maintenance and renewal works on the line running between London and Glasgow. The scheme opened in phases between 2004 and 2008.</p> <p>The upgrades trebled capacity on the WCML and reduced journey times to Manchester by 40 mins (or ~20%).</p> <p>This encouraged modal shift such that rail captured some of the aviation market.</p> <p>Coupled with the redevelopment of Manchester Piccadilly station, the WCML upgrades helped to catalyse investment in new office developments close to Piccadilly.</p>	Employment	<ul style="list-style-type: none"> <li>• There is limited evidence of the scheme directly attracting employment and thus significantly impacting the local labour market.</li> <li>• Following the completion of Phase 1 and Phase 2, between 2004 and 2007 employment showed little change or even a slight decline for some NW regional areas served by WCML, including Manchester South (-1.5%) and Merseyside (-0.1%).</li> <li>• Only Liverpool (2.1%), Halton and Warrington (collectively 2.5%) and Cheshire East (4.6%) experienced employment growth in the same period.</li> <li>• But we did not find robust evidence directly linking this to the WCML upgrade.</li> </ul>
	Productivity	<ul style="list-style-type: none"> <li>• From 1998 to 2004 (completion of Phase 1), GVA per head increased (relative to national average) in the metropolitan areas of Greater Manchester South and Liverpool.</li> <li>• But non-metropolitan areas such as Lancaster and Blackpool saw a decline in productivity between 1998 and 2004.</li> <li>• One possible explanation is that WCML attracted more highly skilled workers to the metropolitan areas.</li> </ul>

West Coast Mainline	Outcome	Key findings
<p>But in other towns and cities there is little evidence of land use change or induced development.</p>	Housing	<ul style="list-style-type: none"> <li>No evidence of housing impacts found across the cities and towns served.</li> </ul>
	Regeneration	<ul style="list-style-type: none"> <li>Our research found limited evidence to link the WCML upgrades to regeneration impacts.</li> <li>But the WCML, coupled with the station redevelopment, induced major investment around Manchester Piccadilly station, catalysed the station redevelopment and the creation of high-quality mixed-use office and commercial development.</li> <li>In late 2004, Liverpool Vision was unveiled, with a proposed new look for Liverpool Lime Street station including new public space, hospitality space and new offices.</li> <li>Plans for the redevelopment of Birmingham New Street station were also underway in 2006,<sup>18</sup> capitalising and (accommodating) on the improved connectivity and subsequent increase in passenger numbers.</li> </ul>
	Environment	<ul style="list-style-type: none"> <li>The WCML upgrades helped to shift modal choices from road and air travel to rail, particularly on the key London–Manchester route.</li> <li>In 2005, one year after Phase 1 was completed, rail pax per month increased by 96%, and air pax declined by 6%.</li> <li>Rail share of the market between Glasgow and London grew from 8% to 20% between 2009 and 2017.</li> </ul>

Borders Railway	Outcome	Key findings
<p>Reopening the line between Edinburgh and the regions of Midlothian and the Scottish Borders. Involved constructing 30 miles of new track and 7 new stations.</p> <p>Although passenger usage of the new line has exceeded the original expectations, we found insufficient evidence to suggest that this has yet to be translated into any transformational economic and/or land use impacts.</p>	Employment	<ul style="list-style-type: none"> <li>Primary research suggests that the Borders Railway had a modest positive impact on employment, as the stations in ‘urban’ and ‘semi-urban’ areas experienced a significant increase in employment following the scheme’s opening relative to comparator areas.</li> </ul>
	Productivity	<ul style="list-style-type: none"> <li>No evidence of direct productivity impacts found.</li> </ul>
	Housing	<ul style="list-style-type: none"> <li>New housing is being built in the corridor but so far, the number completed is less than the 10,000 originally envisaged.</li> <li>An urban expansion is planned around the new station at Shawfair, but as at Spring 2021, only 1,000 of 4,000 new homes had been built.</li> </ul>
	Regeneration	<ul style="list-style-type: none"> <li>Regeneration was not an objective of this scheme.</li> </ul>
	Environment	<ul style="list-style-type: none"> <li>User surveys suggest that the railway led to a significant modal shift from car to rail, saving more than an estimated 36,000 annual single car trips.</li> </ul>

<sup>18</sup> Department for Transport (May 2006) West Coast Main Line Progress Report



### Edinburgh Glasgow Improvement Programme

Improvements to reduce capacity constraints, improve connectivity to the airport, and a redevelopment of Glasgow Queen Street Station.

The programme completed in 2020 but the results are so far obscured by the impact of Covid 19 on travel. It is too early to conclude whether the overall programme has been transformational.

Outcome	Key findings
Employment	<ul style="list-style-type: none"> <li>It is too early to identify any employment impacts associated with the programme, due to Covid-19.</li> </ul>
Productivity	<ul style="list-style-type: none"> <li>It is too early to identify any productivity impacts associated with the programme, due to Covid-19.</li> <li>Future research would be valuable, because of the theoretical benefits of an integrated labour market.</li> </ul>
Housing	<ul style="list-style-type: none"> <li>No housing impacts associated with the scheme.</li> </ul>
Regeneration	<ul style="list-style-type: none"> <li>The scheme is perceived to have contributed to some improvements in the Queen Street Station area, but so far, the impacts are limited.</li> </ul>
Environment	<ul style="list-style-type: none"> <li>Partial route electrification is expected to reduce carbon emissions, as is a shift in modal share.</li> <li>But these impacts are yet to be evaluated and as such there is no quantitative evidence available.</li> </ul>

### Reading Station Redevelopment

The redevelopment of Reading station was completed in 2014. It addressed bottlenecks in the infrastructure which had been constraining the performance of the Great Western Main Line, lengthened platforms and increased station capacity.

The investment was perceived by the town council to be important in wider efforts to reduce road congestion and facilitate Reading's continued economic growth. But it is difficult to disentangle the impacts from the anticipatory effects of Crossrail services.

Outcome	Key findings
Employment	<ul style="list-style-type: none"> <li>No evidence found on the impact of the station redevelopment on employment.</li> </ul>
Productivity	No evidence found on the impact of the station
Housing	No evidence found on the impact of the station redevelopment on housing.
Regeneration	Stakeholders perceive that the station redevelopment played an important role in catalysing the redevelopment of the area surrounding the station and catalysed private investment in local commercial real estate.
Environment	No evidence found on the impact of the station redevelopment on the environment.

### Kirkstall Forge

A new rail station which opened in 2016 on the line running between Leeds and Shipley. The station is part of a 23 acre mixed use development, where early progress is good although it is not yet fully built out.

The station was key to site viability, but any impacts over a wider

Outcome	Key findings
Employment	<ul style="list-style-type: none"> <li>Our analysis suggests that the Kirkstall Forge station had a positive impact on employment.</li> <li>But the evidence does not indicate a transformative impact, as the sectoral shares did not change significantly.</li> </ul>
Productivity	<ul style="list-style-type: none"> <li>No evidence of direct productivity impacts found.</li> </ul>
Housing	<ul style="list-style-type: none"> <li>There are plans to provide up to 1,450 new homes at the Kirkstall Forge site. Planning permission for the first phase obtained in June 2021, but no homes have been completed at the time of writing.</li> </ul>

### Kirkstall Forge

geographic area appear to be minimal.

Outcome	Key findings
Regeneration	<ul style="list-style-type: none"> <li>• Kirkstall Forge itself is a former industrial site. The new station made the site viable for development.</li> <li>• No evidence of any impact on regeneration beyond the site of the station and associated development.</li> </ul>
Environment	<ul style="list-style-type: none"> <li>• It is estimated that the station has resulted in 13,000 fewer car journeys per annum.</li> </ul>

### Corby New Station and Rail Service

A new rail station which opened in 2009. It was claimed that Corby was one of the largest towns in Europe without a rail station.

Corby has experienced strong population growth over the past 20 years and is perceived to be overcoming some of the legacy issues associated with a former steelwork's town.

Corby's rejuvenation is partly due to local leadership which sought to grow the town and invested to improve the town centre and its amenities. The rail station is one of many contributing factors.

Outcome	Key findings
Employment	<ul style="list-style-type: none"> <li>• The evidence suggests there was a small increase in employment in the retail sector, but we cannot conclusively attribute that to the new station given background employment growth in Corby over the same period.</li> </ul>
Productivity	<ul style="list-style-type: none"> <li>• The opening of Corby station, and commencement of new rail services, was not found to have had any notable impacts upon business productivity in Corby, which is likely to be a result of the relatively limited reliance businesses have on rail connectivity.</li> </ul>
Housing	<ul style="list-style-type: none"> <li>• Housing development in Corby was strong both before and after 2009, which was influenced by local and regional planning policies and land availability.</li> <li>• The station is unlikely to have played a key role in housing growth but has made the town more attractive to London-bound commuters.</li> </ul>
Regeneration	<ul style="list-style-type: none"> <li>• The station was important to the perception of the town centre. A string of high-profile regeneration projects have since been developed.</li> <li>• There are further plans to invest in areas of the town that have yet to undergo redevelopment.</li> </ul>
Environment	<ul style="list-style-type: none"> <li>• No estimates found on the impact of the station and rail service on the environment, but some evidence of modal shift away from car and bus travel</li> </ul>

### Falmouth Rail Improvements

A new passing loop which opened in 2009 on the branch of the rail line connecting the coastal town of Falmouth to Truro, which allowed the service frequency to double.

Although Falmouth experienced faster employment growth compared to the comparator location, there is no evidence to suggest that the impacts were transformational.

Outcome	Key findings
Employment	<ul style="list-style-type: none"> <li>• There is evidence to suggest that employment grew in Falmouth relative to comparator areas, despite the recession. The scheme may have contributed to this, though attribution is challenging.</li> </ul>
Productivity	<ul style="list-style-type: none"> <li>• No evidence of direct productivity impacts found.</li> </ul>
Housing	<ul style="list-style-type: none"> <li>• Student housing continued to grow. This investment was not additional, but the rail line enabled it to be distributed on a wider geographical basis.</li> </ul>
Regeneration	<ul style="list-style-type: none"> <li>• Falmouth Town Council is working on a series of green investments; they believe obtaining approval / funding for these would have been more challenging in the absence of the service.</li> </ul>

Falmouth Rail Improvements	Outcome	Key findings
	Environment	<ul style="list-style-type: none"> <li>• There was an increase in leisure rail patronage, but according to survey data, this did not represent a modal shift for most users.</li> <li>• No evidence found of modal shift for commuters.</li> </ul>

Great Yorkshire Way	Outcome	Key findings
<p>A 7km dual carriageway link which runs from the M18, just north of Rossington, to Robin Hood Airport Doncaster Sheffield. Opened in phases between 2016 and 2018.</p> <p>The scheme is perceived to be a success, having won regional planning awards for promoting economic development. It has successfully enabled the delivery of a large housing development, logistics and employment site, and improved the opportunities available to local residents who were previously poorly connected.</p>	Employment	<ul style="list-style-type: none"> <li>• The GYW scheme is part of a wider regeneration strategy and acted as a catalyst for a variety of investments. It is reported the scheme has delivered over 1,000 new jobs.</li> <li>• The scheme reached its Regional Growth Fund employment targets within 18 months of opening.</li> </ul>
	Productivity	<ul style="list-style-type: none"> <li>• The jobs created have thus far been predominantly low-skilled, limiting productivity improvements.</li> </ul>
	Housing	<ul style="list-style-type: none"> <li>• The Pheasant Hill Park housing development, linked to the scheme, is continuing to develop new homes (~520 sold as of June 2021, of 1,200 consented).</li> </ul>
	Regeneration	<ul style="list-style-type: none"> <li>• The Great Yorkshire Way enabled the delivery of iPort (6m sq. ft of employment space once fully built) Phoenix Hill Park, the continued growth of the local airport and a large investment in the Yorkshire Wildlife Park (a major regional tourist attraction).</li> <li>• Local stakeholders perceive that it has helped to improve opportunities to Rossington residents.</li> </ul>
	Environment	<ul style="list-style-type: none"> <li>• No evidence of environmental impacts found.</li> </ul>

Markham Vale	Outcome	Key findings
<p>200 ha business park adjacent to M1 J29A, which opened in 2009. In 2017, a new link road opened to connect the northern plots of the park to the highway network.</p> <p>It successfully unlocked the Markham Vale development, but we did not find evidence of any wider impacts.</p>	Employment	<ul style="list-style-type: none"> <li>• 2,236 full time jobs had been created at Markham Vale as of 2019.</li> </ul>
	Productivity	<ul style="list-style-type: none"> <li>• Our research did not find any evidence on productivity impacts.</li> <li>• Tenants at the business park include logistics businesses, as well as manufacturing firms ranging from the aerospace to health sectors. These firms may pay higher than average wages for the region.</li> </ul>
	Housing	<ul style="list-style-type: none"> <li>• Housing was not a targeted impact under the Markham Vale scheme.</li> </ul>
	Regeneration	<ul style="list-style-type: none"> <li>• The Markham Vale scheme has remediated and reclaimed brownfield land on the site of a former coalfield.</li> </ul>
	Environment	<ul style="list-style-type: none"> <li>• The regeneration of the Markham Vale site involved environmental landscaping and the creation of habitats for plants and wildlife.</li> </ul>

### A46 Newark to Lincoln and Newark to Widmerpool

Two SRN dualling schemes around Newark. Newark to Lincoln opened in 2003, and Newark to Widmerpool in 2012.

Schemes aimed to address congestion and safety issues, improve journey reliability and links between the A1 and M1.

The overall effects are not 'transformational', but this may reflect lower ambitions relative to other case studies covered in this report.

Outcome	Key findings
Employment	<ul style="list-style-type: none"> <li>• New employment sites have been supported by the schemes, but we did not find any evidence that the net impact on regional employment was positive.</li> <li>• Overall, the schemes have not had a 'transformational' effect on the local area, but this may reflect lower ambitions relative to other schemes examined in this report.</li> </ul>
Productivity	<ul style="list-style-type: none"> <li>• No evidence of direct productivity impacts found. Further research on this topic would be useful because of the intended benefits for freight users.</li> </ul>
Housing	<ul style="list-style-type: none"> <li>• The Newark to Lincoln scheme helped to unlock a 1,000-unit housing and commercial development on a former airfield, now Witham St Hughs.</li> <li>• The same scheme attracted large employers to the new Teal Park business park south of Lincoln.</li> </ul>
Regeneration	<ul style="list-style-type: none"> <li>• No evidence of an impact on regeneration in the local towns found.</li> </ul>
Environment	<ul style="list-style-type: none"> <li>• No evidence of environmental impacts found.</li> </ul>

Source: Summary of CEPA and Arup analysis of various data sources – further detail is provided in each case study.

## 2.2. THEMES FROM THE CASE STUDIES AND QCA

### 2.2.1. Case studies

Based on the 15 case studies, we prepared an initial synthesis of the conditions which may enable transformational change, or which appear to generate supportive outcomes from a local economic development perspective. These themes were tested further as part of the QCA, include:

- **Physical transformation in the form of new or refurbished developments is noticeable and can emerge relatively quickly following a transport scheme** (e.g. where the scheme was critical to the commercial viability of the new development). Examples of this include: Great Yorkshire Way; Markham Vale; Kirkstall Forge station; Reading station; and the Jubilee Line Extension. But this is not universally the case, and in some examples the necessary conditions for new development were not present, e.g. HS1 at Ebbsfleet.
- **Economic transformation is more challenging to identify, in part because it requires good data and robust analytical methodology.** But such transformation generally takes longer, and the length of time it takes to realise economic transformation makes attributing the impact of the transport investment more challenging. Examples of this might include: WCML Upgrade Programme; Manchester Metrolink; Nottingham Express Transit; the Jubilee Line Extension (excluding Canary Wharf); and HS1 across Kent.
- **The outcomes appear to vary in those cases where the intervention affects a wider geographical area.** For example, the impacts of Metrolink appear to be more positive in the regional centre, whereas the impacts in the satellite towns and suburbs have been less pronounced and may take much longer to materialise. The high speed rail case studies (in both the UK and Spain) also suggest that the impacts are less pronounced outside of the large cities.
- **It is rare to find transport investments which, in isolation, change or reverse underlying economic or transport trends.** We find case studies where transport investments have accelerated or slowed background economic trends, e.g. by accelerating commercial development in an area where there was already strong underlying demand. For example, regeneration was already well underway in Salford Quays before Metrolink arrived in 2000, and Salford was growing faster than most other Manchester boroughs when the MediaCityUK spur opened. Likewise, the Jubilee Line Extension helped to transform London's Docklands, but built on the contribution of the LDDC, enterprise zone policies, and the DLR amongst other investments. While it is possible that an improvement in transport provision can act as an enabler to transformation, such improvements are unlikely to be a sufficient condition unless background economic trends are already favourable to transformation.

Through the QCA, we found that the strength of background economic growth was often a necessary condition for achieving a transformational outcome. This finding suggests that improvements in transport connectivity were better at accelerating underlying economic trends than reversing them. This finding is supported by the qualitative evidence we collected as part of our case study analysis, where we observed that the most successful schemes have been those that took place in areas that were already deemed to be growing.

- **Where a change in transport accessibility improves the 'industrial or commercial competitiveness' of the treated area, we would expect to see a change in the sectoral composition of employment.** The sectoral composition of employment would favour firms that require and value good transport accessibility to the labour market, to customers or to suppliers. We did not find many examples within our case study sample where this change in sectoral composition occurred.
- **Transformation seemingly requires private investment to be levered in – potentially at a level several times the level of the original public investment.** This suggests that transformation may require a coordinated programme of investment and that the impacts may become larger the more that programme

is integrated with the existing public transport network. Transport investment targeted at unlocking sites for private investment and/or development may stand a better chance of success, but also depend on delivery by private developers over whom the responsible public authority may have fewer levers (see examples of “stalled developments” around Reading Station, the Borders Railway, and the HS1 station at Ebbsfleet).

- **It is more common to find evidence of place-based transformation than it is to find evidence of people-based transformation.**<sup>19</sup> For example, it is much easier to find evidence that a transport investment led to new developments, or positive economic effects in a particular area, than it is to find evidence that the incumbent population of the area directly benefitted from the investment. This is partly down to people-based effects being more challenging to identify than place-based effects, though the few case studies that do have robust strategies for identifying people-based effects found limited evidence of transformation.
- **Case study evidence suggests that travel patterns are subject to significant levels of inertia.** In response to new transport links, commuting patterns adapt slowly. For example, in Corby the introduction of a new railway station has not (yet) changed commuting patterns, which is still car dominated. There is an increase in commuter trips to neighbouring Kettering, but most of those journeys are still made by car.<sup>20</sup> In Manchester commuting by public transport remained lower in areas that did not have pre-existing patterns of commuting towards the city centre.<sup>21</sup> Survey data also suggested access to leisure sites was more of a driver than access to employment.<sup>22</sup>
- **The *perceived* success of the respective light-rail schemes is associated with: an existing culture of public transport usage and integration of light-rail networks with other public transport modes.** For example, in response to opening of NET, Nottingham’s bus network was redeveloped to act as a feeder service to the tram network. Additionally, Park and Ride facilities have been seen as valuable additions by scheme sponsors and evaluators. But some survey evidence from Manchester suggests that many Park and Ride users would have taken public transport regardless.
- **Despite economic or social transformation being highlighted as key strategic objectives for all of our case studies, we have not been able to find many instances of benefits realisation strategies being systematically developed to ensure the benefits ultimately materialise.** It is not necessarily the existence of a benefits realisation plan that matters, as that will not in and of itself determine the success of a scheme. What seems to matter is the overall coherence of the local economic development strategy to realise the benefits that a transport investment brings through better connectivity. This is difficult to judge objectively and often the ‘strategy’ must be pieced together from several separate documents and local plans. The best indication of coherence might be general agreement on the vision amongst local stakeholders and investors, and a partnership approach with involvement from the private sector.

We see this in some of our cases such as the opening of Corby rail station, but in other cases, our review of the material suggests that the transport scheme was developed in isolation to any local economic planning. One of the additional schemes we included within our QCA, the first phase of Sheffield Supertram, provides perhaps the most notable example of a lack of alignment in vision amongst the various stakeholders. The literature we reviewed suggests this was a key factor in the objectives of the scheme failing to be realised.

- **Where the barriers to land use change / regeneration are particularly deep or complex, public support needs to be targeted (and potentially large) and it may also require ambitious policies that**

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<sup>19</sup> “People-based transformation” refers to changes that are targeted directly at individuals, e.g. training to improve employability. “Place-based transformation” refers to changes that are embedded in the physical environment of a geographical area.

<sup>20</sup> SDG Evaluation of Corby.

<sup>21</sup> Arup Metrolink Phase 3 Evaluation.

<sup>22</sup> Arup Study – Wythenshawe survey.



**facilitate regeneration.** Successful examples where such complexities were overcome include the London Docklands, Stratford, Kings Cross and Salford Quays. In each case the sites had legacy challenges stemming from their former industrial uses, lacked the supporting infrastructure for development, and required extensive site assembly to coordinate action. Very significant sums of public money had to be invested in these sites to build new infrastructure, purchase and assemble land, encourage development and facilitate change. It also required new governance structures, with a dedicated agency responsible for delivery and coordination with private investors and landowners.

An unsuccessful example would be Ebbsfleet, where the challenges associated with the former quarry sites may have been underappreciated at the outset but are gradually being addressed by the Ebbsfleet Development Corporation.

Our QCA found a weak association between taking discrete action to redevelop areas benefitting from improved transport links, and achieving a transformational outcome. We also observe that this works best when the actions are taken well in advance of scheme opening, which appears to create virtuous cycle, and also works better when regeneration actions and transport developments are fully integrated.

- **Often there is a public sector organisation with vision that backs and drives a scheme, such as in Corby or Doncaster (the Great Yorkshire Way).** But that vision must be rooted in commercial reality for it to be attractive to private investors. Where the vision goes beyond physical transformation and targets structural or economic transformation, a wider range of actors need to be considered. For example, successfully developing a creative or advanced manufacturing cluster may require a base ecosystem of similar firms, and supporting institutions such as hospitals, universities and other assets that create spill over effects. Of the cases we reviewed, this was most successfully achieved in Phase 2 of Manchester Metrolink through the MediaCity development in Salford. This is also being developed at smaller scale through the Great Yorkshire Way scheme, where the area is being developed as a logistics hub,
- **Many of the evaluations we have reviewed primarily focus on areas that are directly affected by a transport intervention and therefore, exclude areas that are affected indirectly through transport connections and the wider transport network.** This is a particular challenge for roads-based evaluations where the effects can be very diffuse across the wider roads network. For example, the A46 improvement schemes may have benefitted transport-intensive firms based in Scunthorpe, Grimsby and Immingham, despite being more than 40 miles from the site of intervention. Another example of this is the Jubilee Line Extension where the initial passenger growth was from people travelling on trains into Waterloo and then taking the Jubilee Line eastwards. However, the evaluation evidence we examined did not look at what happened in Southwest London or Surrey.
- **Transport strategic cases tend to focus on commuter or business travel but our case studies suggest that shopping and leisure passenger growth has been underestimated at the appraisal stage.** This suggests that scheme promoters should consider whether increased leisure travel could support regeneration, levelling up or well-being ambitions or undermine them. If a scheme helps people access town centres then leisure travel could contribute to achieving regeneration ambitions. Conversely, it also means people can access an out-of-town shopping centre at the expense of a town centre.
- **The QCA found that a combination of latent demand for housing in a satellite area - evidenced by high levels of housing deprivation - and action taken to facilitate housing regeneration, can work collectively to transform the area in favour of more residential activity.** In other words, transport investment can be used to unlock housing developments in an area. Whether this ultimately eases housing pressures in the area is less clear, and depends on whether housebuilding activity keeps pace with increases in demand to live in the area.
- **A more qualitative analysis of the cases found a weak association between the integration of other transport modes with the transport scheme, and achieving a transformational outcome.** Many of the more successful cases within our dataset have had integrated park and ride facilities. And as we note in the

previous section, one of the potential reasons for Nottingham Express Transit's success relative to Sheffield Supertram, is the better integration between the bus and tram networks.

In Sections 3 through 17 below, we present each of the scheme case studies in detail.

### **2.2.2. QCA**

We examined some of the themes outlined in the section above (those where there was sufficient data) in the QCA where we found some evidence that the context surrounding a transport intervention can act as a condition for whether the scheme is transformational or not. The most definitive conclusion we are able to draw is that a combination of latent demand for housing in a satellite area (as evidenced by high levels of housing deprivation) and action taken to facilitate housing regeneration, can work collectively to transformation the area in favour of more residential activity. In other words, transport investment can be used to unlock housing developments in an area. Whether this ultimately eases housing pressures in the area is less clear, and depends on whether housebuilding activity keeps pace with increases in demand to live in the area.

Our analyses of two other themes produces less definitive conclusions. We find that the strength of background economic growth is weakly associated with achieving a transformational outcome, suggesting that transport links help accelerate underlying economic trends. This conclusion is supported by the qualitative evidence we collected as part of our case study analysis, where we observed that the most successful schemes have been those that took place in areas that were already deemed to be growing.

We also find a weak association between taking discrete action to redevelop areas benefitting from improved transport links, and achieving a transformational outcome. We also observe that this works best when the actions are taken well in advance of scheme opening, which appears to create virtuous cycle, and also works better when regeneration actions and transport developments are fully integrated.

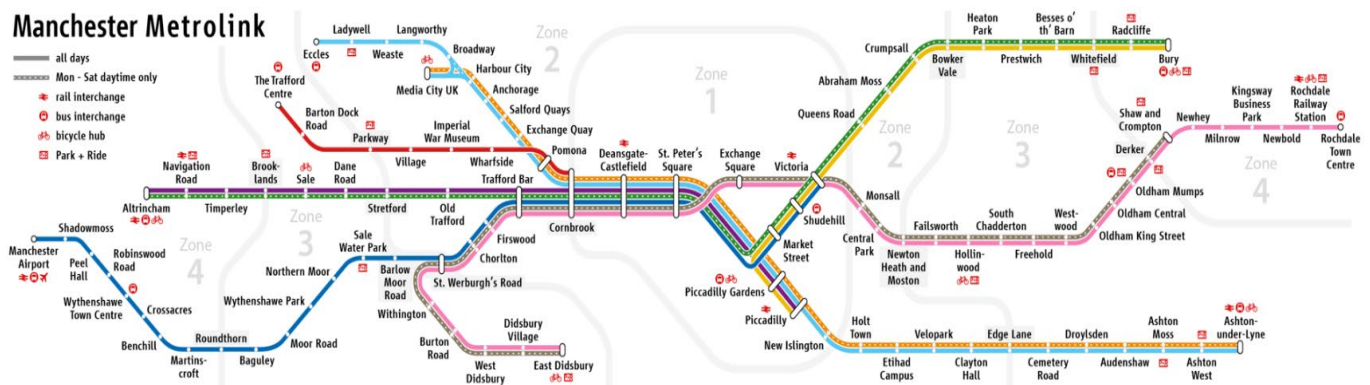
Finally, from a more qualitative analysis of the cases, we find a weak association between the integration of other transport modes with the transport scheme, and achieving a transformational outcome. Many of the more successful cases within our dataset have had integrated park and ride facilities. And as we note in the previous section, one of the potential reasons for Nottingham Express Transit's success relative to Sheffield Supertram, is the better integration between the bus and tram networks.

### 3. GREATER MANCHESTER METROLINK

#### Summary of key messages

- Metrolink greatly improved public transport connections across Greater Manchester, particularly improving access and journey times from the satellite towns to Manchester city centre but also improving travel within the central areas of the city region.
- As the Metrolink network expanded, Greater Manchester attracted and facilitated significant investment in economic and physical regeneration projects by the public and private sectors, spanning commercial, leisure and residential uses.
- There is qualitative evidence to show that Metrolink has supported the ‘transformation’ of some areas along the expanded routes. The new lines have directly benefited areas of relative deprivation which were a national priority for regeneration and renewal in the early 2000s (e.g. areas of East Manchester and Salford).
- There is quantitative evidence showing a positive impact on house prices, particularly in stronger market areas, and on the productivity of businesses in Manchester city centre.
- Current evidence on the impact on employment is inconclusive, but we think the overall impact is likely to be marginal against background growth in employment across Greater Manchester.
- Subsequent expansions of the Metrolink network – Phase 3 – improved access for residents to job opportunities outside their local area and in the city centre. But the evidence suggests that most of the business benefits have been realised in the centre and were less dispersed than local stakeholders hoped for.
- Local stakeholders in areas earmarked for regeneration noted that commitments to local Metrolink stops were fundamental to their efforts to attract new commercial and leisure investments, jobs and housing to the area. Without the scheme, these investments were at risk and the lost value to the city would have been significant.
- **The key contextual factors relevant to this scheme are:**
  - Business cycle: Manchester’s regional centre was well placed to benefit from the growth of service-based activities and knowledge intensive business services, given the city’s regional hub status.
  - Regeneration programme: Particular areas of Manchester have also benefited from sustained, long-term public and private investment in regeneration of the built environment, of a quantum greater than other UK cities (excluding London).
  - Stakeholder perception of cultural and knowledge assets: Manchester’s status also supports investment in key research and cultural assets which supported local growth, for example Salford Hospital; Salford University; MediaCityUK; 2002 Commonwealth Games.
  - Benefits realisation: Greater Manchester’s local authorities are noted for an established “collaborative” approach to local economic development and working collectively to secure funding for joint city-region priorities.

Figure 3-1: Greater Manchester Metrolink route map



### 3.1. SCHEME SUMMARY

Background information	
<b>Scheme type:</b>	New public transport network and subsequent new route extensions
<b>Type of transformational impact planned:</b>	<p><b>Residential impacts.</b> Some evidence from house prices that the scheme helped locations along the route become more attractive for commuting into the city centre.</p> <p><b>Labour demand impacts.</b> Some anecdotal evidence that the scheme helped Manchester city centre to become a more effective employment centre; and</p> <p><b>Consumer demand impacts.</b> Some evidence that Metrolink has led to changes which improve the attractiveness of the regional centre for retailing and leisure consumption.</p>
<b>Location:</b>	Northwest, England
<b>Geography:</b>	Intra-city, Urban periphery
<b>Promoter:</b>	Transport for Greater Manchester (TfGM), previously Greater Manchester Passenger Transport Authority (GMPTA) / Greater Manchester Passenger Transport Executive (GMPTE)
<b>Start of construction:</b>	Phase 1 – 1989 Phase 2 – 1997 Phase 3 – 2008
<b>Opening date:</b>	Phase 1 – 1992 Phase 2 – 2000 Phase 3 – 2014
<b>Cost:</b>	Phase 1 – £145m Phase 2 – £160m Phase 3 – £1,500m
<b>Sources of funding:</b>	Phase 1 – Mostly central government with financing from European Investment and European Regional Development Fund Phase 2 – Mostly private sector funding through developer contributions Phase 3 – GMPTE and central government funding package, with private sector contributions

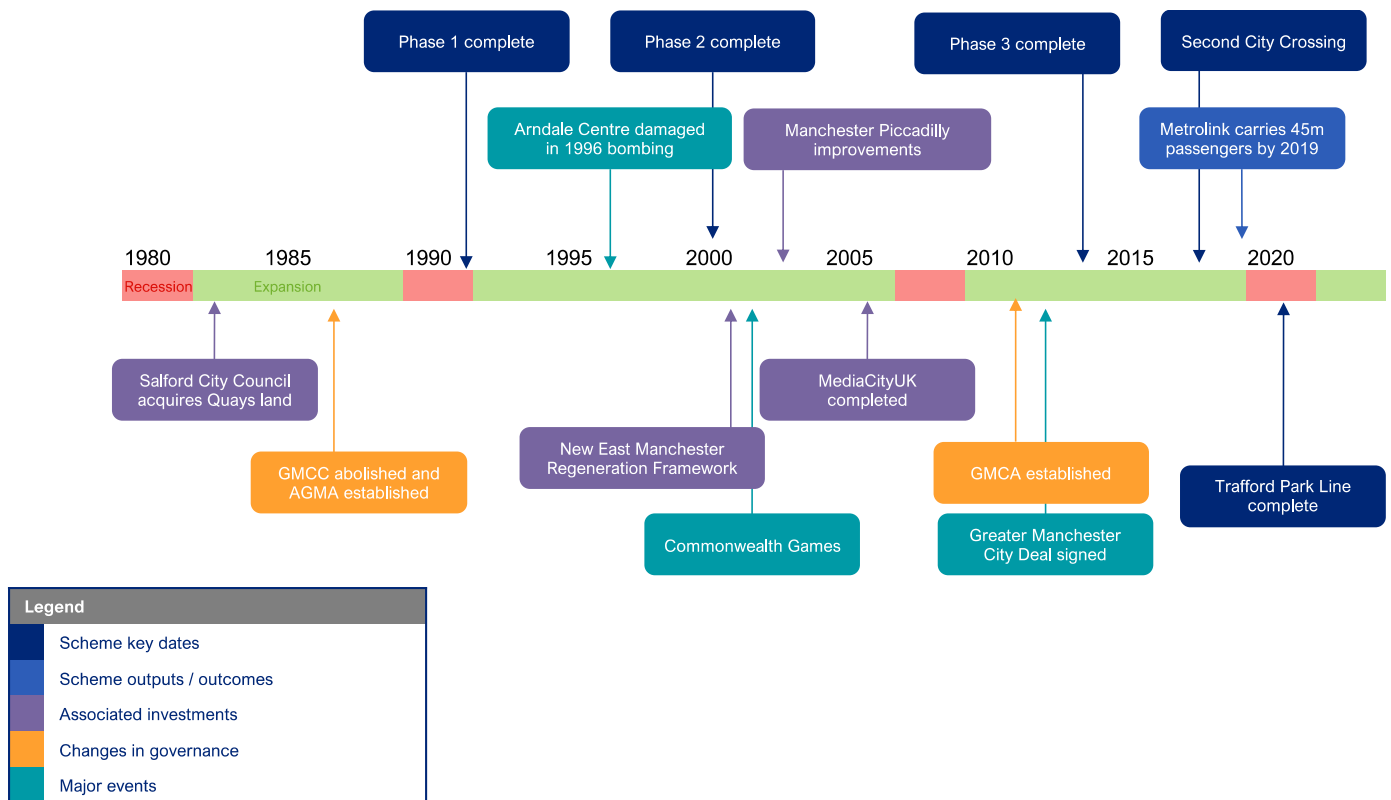
Metrolink is the light rail (tram) transport system in Greater Manchester. The network has six lines which radiate from Manchester city centre, and has been developed in three broad phases:

- **Phase 1** - the North–South line from Bury to Victoria and Altrincham to Piccadilly, opened in 1992.
- **Phase 2** - the 4-mile (6.4km) East – West line from Eccles, as part of the regeneration of Salford Quays, opened in 2000 and a spur line to the MediaCityUK site opened in 2010.
- **Phase 3** - the so-called ‘big bang’ expansion of the network, which was split into two phases:
  - **Phase 3a** (Rochdale to Victoria, via Oldham) - conversion of the 14-mile (23 km) Oldham Loop heavy rail line to light rail operation and adding several new tram stops; reopening the South Manchester Line (to St Werburgh’s Road); and building a new 4-mile (6.4 km) East Manchester Line as far as Droylsden. Phase 3a completed in 2013.
  - **Phase 3b** - construction of a new 9-mile (14 km) Airport Line to Manchester Airport and extending the new Phase 3a lines: the East Manchester Line to Ashton-under-Lyne and the South Manchester Line to East Didsbury. Phase 3b completed in 2013.

- New infrastructure was subsequently introduced in the form of a ‘Second City Crossing’ to alleviate congestion through Manchester City Centre (completed in 2017) and a new westwards extension to the Trafford Park Shopping Centre (completed in 2020).

The overall network objective was to improve the quantity and the quality of public transport across the Greater Manchester conurbation, particularly addressing relatively poor public transport access from the city centre to suburban areas, thereby contributing to the economic growth and development of the city region, and addressing growing congestion caused by high car usage. See Figure 3-2 for a detailed timeline of key dates associated with the Greater Manchester Metrolink Scheme.

Figure 3-2: Timeline for Greater Manchester Metrolink



### 3.2. THEORY OF CHANGE

Figure 3-3 below presents a logic map articulating the Theory of Change (ToC) for Phase 3a of Greater Manchester Metrolink. We have selected Phase 3a for our logic map as it involved a series of transport investments in areas that are relatively economically and socially deprived and as such, there is greater starting potential for a transformational outcome. However, the ToC can similarly be applied to Phases 1, 2, and 3b, with some variations.

**Inputs / Activities** – The Phase 3a extension of Metrolink created a new light rail operation from Manchester city centre to satellite towns within the Greater Manchester area (i.e. Rochdale and Oldham). Phases 1, 2, and 3b involved the creation of similar links between the city centre and satellite towns (e.g. Bury, Altrincham, Eccles). Each of the phases also involved the creation of new tram stops on several locations on route, which in the case of Phase 3a, included several locations within Oldham and Rochdale town centres.

**Outputs** – Based on the inputs and activities described above, we would expect two broad types of outputs. Firstly, we would expect the creation of a new light rail link to give residents of the satellite towns improved access to Manchester city centre and to stops on the wider tram network. The extent to which this is a substantial improvement will depend on the quality of existing public transport infrastructure, or on the combination of levels of car ownership and the quality of road access. We would also expect the creation or expansion of Metrolink to provide improved public transport access to various sites that have regeneration potential.

**The potential outcomes and impacts from improving access to Manchester city centre and stops on the wider tram network include:**

- Higher economic output, employment, and productivity through an extension of the Manchester city centre and Greater Manchester labour catchment, with:
  - Existing residents of the satellite towns gaining employment or moving to more productive jobs in Manchester city centre / Greater Manchester area
  - People moving to the satellite towns to take up employment opportunities in the Greater Manchester area.
- Changes in housing access through residents of other areas moving to the satellite towns, which could result in more housing development
- Improved health and wellbeing through better access to health and leisure services in the city centre, which we assume are superior and more plentiful than those offered in the satellite towns.

The second two impacts highlight the two key transformational impacts we expect could materialise as a result of Metrolink, with the city centre becoming a more effective employment centre and the satellite towns becoming more effective commuter locations. This could lead to a restructuring of economic activity and land use, with certain economic activities moving away from the satellite towns to the city centre, with the vacated land being turned into housing or repurposed for economic activities more suited to residential areas (e.g. supermarkets).

There are also potential for negative impacts. Insufficient housing development in the satellite towns could lead to existing communities being crowded out of the area once transport accessibility improves. Similarly, existing firms in the satellite towns may be unable to compete with firms in the city centre for their services and/or employees, leading to similar crowding out effects.

**By improving access to sites with potential for regeneration, we see another channel for achieving transformational outcomes and impacts.** Metrolink has improved public transport access to several sites or areas identified for redevelopment or regeneration. The regeneration of Salford Quays was a key part of Phase 2, while several sites were identified for regeneration within the Phase 3a business case.

The theory of how improved transport links can lead to the regeneration of an area, will depend partly on the type of land use envisaged:



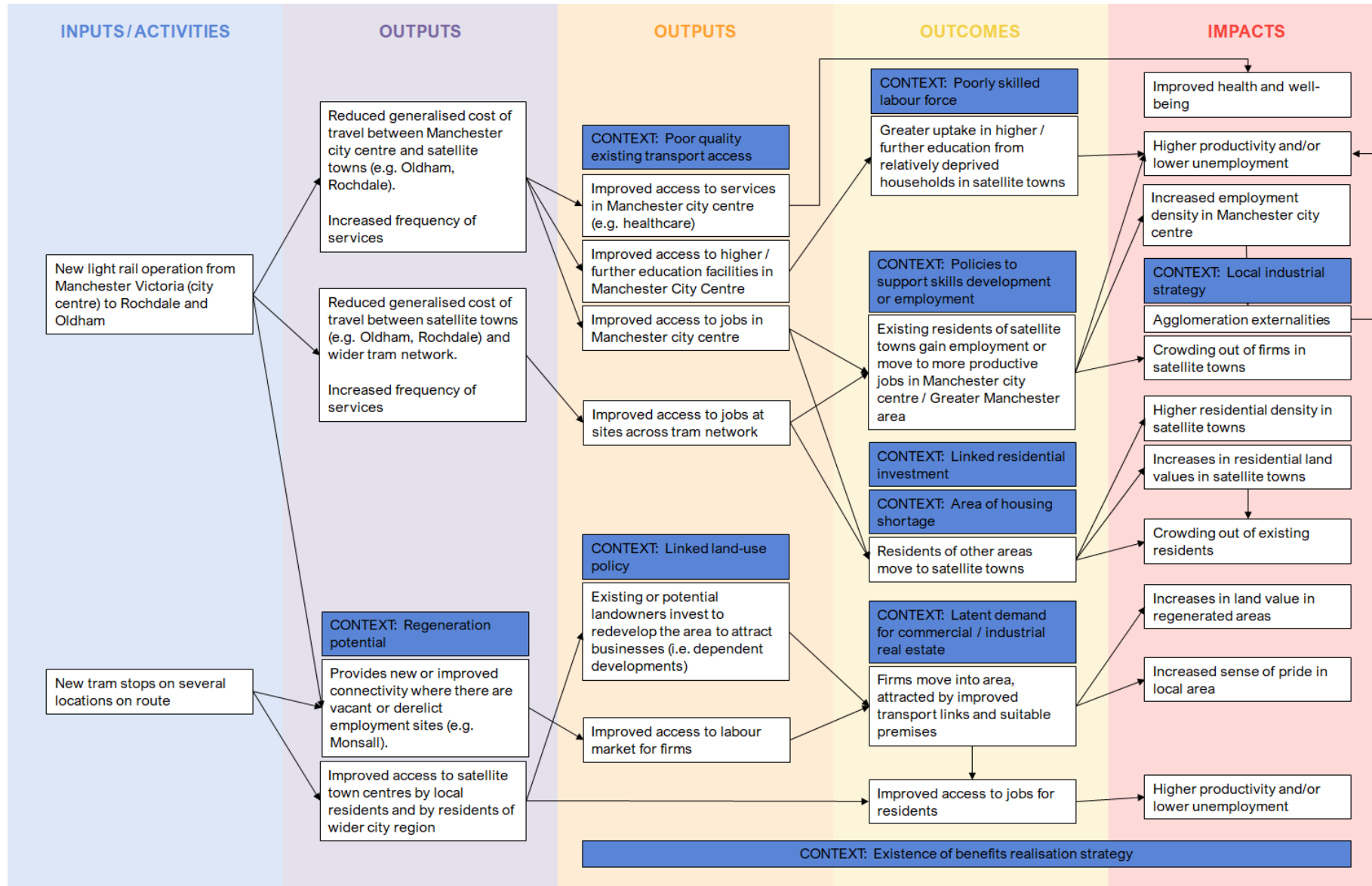
- For housing, accessibility to employment sites primarily, and retail/leisure and educational destinations secondly, is likely to drive activity. Improving access to sites identified for housing may induce further investment in housing, encouraging people to move into the area, driving further investment activity.
- For commercial developments, accessibility to the labour force and accessibility to customers are likely to be the most important. The former is of greater focus for office-based activities, and the latter for retail / leisure activities. Improving transport access to these locations may induce further investments to encourage firms to locate there, which may in turn provide improved employment options for residents. In the case of town centres, regeneration of an area may lead to an improved sense of pride in the local area, which can be argued to be a positive well-being impact.
- Finally, industrial developments are more likely to be driven by access to suppliers and customers, and to a lesser extent, access to the labour force. We consider this less relevant in the Metrolink context.

**Contexts.** A key contextual factor we consider to be relevant for achieving these outcomes is poor existing transport connectivity prior to the introduction of the scheme, either for the population of the area as a whole, or for a subset of the population (e.g. those without car access). For example, we note that Phase 3a replaced an existing heavy rail line, which possibly meant a limited incremental improvement in transport accessibility.

In the logic map below, we present other contextual factors that may act as conditions for some of these impacts to materialise. We consider the key contextual factors to be:

- **Complementary policies to support upskilling or job matching of residents in satellite towns.** It is possible that residents of the satellite towns need support to gain the jobs they now have access to following the introduction of Metrolink. This is especially likely to be the case if they do not already possess the skills that match the jobs available in the city centre.
- **Investments in housing.** If residents of other areas are to move to satellite towns and/or regenerated sites that now have improved access to the city centre, there may need to be a corresponding investment in new housing developments, both to avoid existing residents from being crowded out and to ensure the housing stock matches the needs of incoming residents.
- **Latent demand for housing.** If households are to move to satellite towns and/or regenerated sites, we envisage there needs to be 'push' factors as well as 'pull' factors, such as other locations facing housing pressures.
- **Latent demand for commercial real estate.** In areas that are being regenerated, partly through improved transport links from Metrolink, we would expect there to be a latent demand for commercial real estate within the wider region. This is to ensure the impact of firms moving into the area is genuinely additional rather than a displacement effect, where firms are moving away from other parts of the wider region.

Figure 3-3: Logic Map for Greater Manchester Metrolink Phase 3 – All impacts



### 3.3. SURROUNDING CONTEXT

It is widely recognised that Manchester has undergone a transformation from industrial decline in the 1970s to a position today where the city has a more modern, service- and knowledge-based economy with strong employment and population growth.<sup>23</sup> Since Metrolink Phase 2 opened in 2000, the Greater Manchester economy has grown by £22.5 billion (2018 prices) at an average annual growth rate of 2.0 percent compared to a UK average growth rate of 1.8 percent.<sup>24</sup> Employment in the city region has also increased by around 240,000 (21 percent) or 1.0 percent on average each year over the same period. This was slightly faster than the UK average of 0.9% per year.<sup>25</sup>

This turnaround over the past 20 years is due, in part, to a dedicated effort by local and national stakeholders to modernise Greater Manchester. The city region has attracted and facilitated significant investment in economic and physical regeneration projects by the public and private sectors, spanning commercial, leisure and residential uses. We note that investment in the Metrolink network has been delivered against a background of significant investment in Greater Manchester generally, including (but not limited to) the regeneration of Manchester Docks, the response to the 1996 bombing, the 2002 Commonwealth Games, the growth of Manchester Airport and Manchester's universities, and a wider drive to grow a hub of digital, creative and advanced manufacturing industries in the city.

Therefore, whilst Greater Manchester's ongoing transformation has been supported by significant investment in transport infrastructure – including Metrolink – and other assets, the available evidence leads us to conclude that it is difficult to attribute this transformation to Metrolink directly. The scheme is one of several contributing factors.

However, Greater Manchester's growth over the past 20 years is not evenly distributed, reflecting wider UK trends. GVA per head has grown around 1 percent faster on average per year in Manchester, Salford and Trafford, compared to Stockport and Tameside; and about 0.5 percent faster on average per year than Bolton and Wigan.<sup>26</sup>

#### 3.3.1. Characteristics of the area at time of investment

##### Business cycle

Metrolink Phase 1 (linking Altrincham and Bury to Manchester city centre) opened shortly after the early 1990s recession. Phases 2 and 3 opened during periods of economic growth, albeit that the 2008-09 financial crisis and UK government fiscal response delayed the decision to proceed with the Phase 3 extension. Whilst the economic cycle may have had short term effects on the realisation of outcomes linked to the network, it seems unlikely that it should have inhibited the realisation of transformative outcomes over the longer term.

In fact, as the regional economic hub of the North West, Manchester was relatively well placed to benefit from the economic shifts that accelerated during the 1990s and 2000s towards more service-based, knowledge-intensive activities, given its existing service economy and office market, its large labour pool and population, and its concentrations of critical growth assets (including its universities and airport).<sup>27</sup> This made Manchester a relatively attractive place for the private investment which was necessary to transform its economic potential. But it is important to note that this existing economic structure and distribution of assets has also resulted in city-centre focused development, whilst the smaller sub-regional centres have benefitted less from this transformation.

##### Quality of existing transport access

Prior to the introduction of Phase 1, Manchester was considered to have poor North-South rail connectivity due to the two main railway stations Victoria and Piccadilly being located outside the core city centre. Phase 1 of Metrolink was designed to alleviate that by connecting Bury to the north with Altrincham to the south. While this replaced two existing heavy rail lines connecting the two towns to Manchester, each line had a different terminus (Altrincham to

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<sup>23</sup> Greater Manchester Independent Prosperity Review (March 2019) "Reviewers' Report" available [online](#).

<sup>24</sup> ONS (May 2021) "Regional gross value added (balanced) by industry: city and enterprise regions" available [online](#).

<sup>25</sup> CEPA analysis of ONS Annual Business Inquiry employee analysis and ONS Business Register and Employment Survey data.

<sup>26</sup> CEPA analysis of ONS (December 2018) "Regional gross value added (income approach)" available [online](#).

<sup>27</sup> Greater Manchester Independent Prosperity Review (March 2019) "Reviewers' report" available [online](#).

Piccadilly and Bury to Victoria), making through connections difficult. Metrolink has improved accessibility by improving the frequency of service and offering competitive journey times to the city centre.

Salford Quays, which was connected to the Metrolink network as part of Phase 2, was poorly integrated into the public transport network prior to the scheme and had no rail connectivity. Whilst the Eccles line significantly improved connectivity, local stakeholders recognised that the MediaCity spur (which was built later) had a much smaller impact on connectivity to the MediaCityUK site itself.

Many of the locations connected to the Metrolink network as part of Phase 3 had existing heavy rail connectivity. But the stations were not well integrated into the broader transport network and the rail network suffered from insufficient capacity. Through our stakeholder interviews, a representative of TfGM noted that Wythenshawe (on the Airport line) was particularly disconnected from Manchester's main employment zones prior to the new line, and that it was perceived that it had improved the opportunities available to the local community. Conversely, a representative of Rochdale Borough Council noted that it is still quicker to travel from Rochdale to Manchester city centre via train, given the distance involved.

## Housing

Manchester has attracted a relatively young and educated workforce which favours city centre living. The growth in this demographic has supported the regeneration of areas around the city centre, helped to fuel the growth of the service-based economy, and provided a growing market for the new multi-occupancy residential developments being delivered in e.g. the Northern Quarter and Salford.

Beyond the city centre – and appealing to a more family-oriented demographic – there is a perceived shortage of housing in the Greater Manchester region, at least in more desirable locations. The 2009 Manchester Independent Economic Review (MIER) found evidence from house prices that there is “*an avoidable mismatch between supply and demand*” – i.e. that there are not enough homes in the places in the region where people want to live (particularly in the south of the city-region and North Cheshire) – and that this was a constraint to attracting and retaining the highly-skilled workforce that the city needs.<sup>28</sup> In these places, a shortage of stock may create upwards pressure on house prices. To the extent that Metrolink has unlocked new residential development, this may have relieved some of this pressure, but the evidence we found suggests that most of the new housing development has necessarily been at a higher density and is therefore less likely to be aimed at larger households.

The representative of Rochdale Borough Council noted a perceived shortage of more ‘aspirational’ housing stock in the borough, which had an impact on the town’s attractiveness as a place to live for higher income households.

## Commercial development

We were not able to identify indicators or existing literature which demonstrated that Manchester has recently exhibited significant constraints on the supply of commercial and office space that would suggest an “unleashing of demand” facilitated by Metrolink and improved accessibility between the city centre and underutilised fringe sites.

There is a long-standing debate in the UK about the impact of land use regulations (including growth boundaries or “green belts”) that restrict the supply and cost of new residential and commercial development. There is one such green belt that restricts urban development around Greater Manchester. One study produced before the 2008-09 financial crisis concluded that office space in Manchester was more expensive than in Manhattan (New York) and twice as expensive as San Francisco, in part because of these regulatory constraints.<sup>29</sup> Such a premium, if it existed, might demonstrate that there was pent-up demand in Manchester city centre for the expansion of commercial land uses. This expansion may in part have been facilitated by Metrolink connections to Salford, in particular, and other underutilised sites with regeneration potential around Greater Manchester.

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<sup>28</sup> Manchester Independent Economic Review (2009) “Reviewers’ report” available [online](#).

<sup>29</sup> Cheshire, P., and Hilber, C. (2008) “Office space supply restrictions in Britain: the political economy of market revenge” available [online](#). Given the impact of the GFC on UK real estate valuations, and the diverging fortunes of the North West compared to London (or indeed Manhattan and San Francisco), it seems unlikely that this premium still exists today.

But, whilst there may have been constraints which led to a sub-optimal provision of commercial and office uses in Manchester city centre over the past 20 years, we think this is less likely to be true of the satellite towns served by Metrolink around Greater Manchester.

### **Regeneration potential**

We were not able to find any robust, quantitative indicators to suggest that the areas served by Metrolink were in need of regeneration, but we know that there were a range of substantial regeneration initiatives underway, first in Manchester and Salford, and later in parts of inner East Manchester, which helped to facilitate Manchester's economic transformation.<sup>30</sup>

Several areas which are now served by Metrolink, particularly in Salford and East Manchester, were designated Housing Market Renewal Pathfinders between 2002–2011. These were particularly challenged areas with complex social problems – including depopulation, declining employment opportunities and a collapse in the local housing market. Combined with several large, underdeveloped and poorly connected post-industrial sites, the scale and complexity of these legacy issues required public sector intervention to kick-start regeneration.

Given many substantial projects were already underway before Metrolink arrived, we cannot say that Metrolink directly resulted in regeneration activity, but it has likely contributed to the subsequent success of those regeneration initiatives.

### **Underutilised skills**

We have not found evidence to suggest that Greater Manchester has “underutilised skills”, i.e. that there is skilled local labour sub-optimally allocated to low productivity industries. Given that Manchester is a net in-commuting city, instead we think it is more likely that there is shortage of skilled local labour required to supply jobs in the city.

Part of the rationale for intra-city transport improvements is to create a higher density of skilled labour. The MIER found that the Greater Manchester region contains a higher concentration of jobs in key knowledge-based industries than any comparable UK city region outside of London, and that employment growth has been strong, particularly in the ICT and business services sectors. But there was also evidence of a shortage of highly skilled workers that was preventing the region from establishing a “*self-reinforcing virtuous cycle*”, with Manchester losing a large proportion of young, mobile and highly skilled workers to London and the south-east.<sup>31</sup>

The MIER also suggested that Manchester still had a relatively high number of people lacking qualifications. Whilst one of Metrolink's aims is to improve the ‘effective density’ of the highly skilled labour pool in the region, there will still be a longer term need to increase the availability of high skilled jobs and the supply of skills.

## **3.3.2. Associated activities and actions alongside transport investment**

### **Benefits realisation**

We were not able to locate a benefits realisation strategy for any of the Metrolink phases, noting that Phases 1 and 2 were completed a long time ago, and at a time when benefits realisation plans were not routinely required as part of the business case development. We would assume that there exists in some form a benefits realisation plan for Phase 3, but we have not been able to locate it.

Nevertheless, we have found indirect evidence to suggest a coherent local economic development strategy to realise the benefits Metrolink could bring through better public transport connectivity. With the benefit of hindsight, Greater Manchester appears to have realised significant economic benefits off the back of this significant transport investment. One stakeholder we interviewed said that it was important that Greater Manchester realised the economic benefits of these projects, because the Combined Authority must service the financing costs. We also note that local financing arrangements (e.g. additional flexibility to borrow and invest, and the ‘Earn Back’ model)

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<sup>30</sup> For example, there was the Salford Urban Development Corporation, the Central Manchester Development Corporation, Trafford Park Development Corporation, and the Hulme City Challenge Partnership.

<sup>31</sup> Manchester Independent Economic Review (2009) “Reviewers’ report” available [online](#).



create an incentive for the authority to facilitate economic growth, thereby increasing local tax revenues, to achieve financial sustainability.

We think it is also reasonable to conclude that Manchester's economic performance is supported, in part, by a group of local councils (formally cooperating under the Greater Manchester Combined Authority since 2011<sup>32</sup>) with a long history of cooperation and are generally perceived to have a collective vision for regional success, and for integrating transport investment into a wider strategic plan for the city region. This collaboration, combined with a track record for successful delivery, has enabled Greater Manchester to make the case, successfully, for greater devolution of powers and funding from central government – particularly with regards to transport infrastructure. Local government in Manchester has been consistently supportive of economic development in the city centre, expanding public transport provision to tackle congestion, attracting private sector investment to deliver new commercial and residential developments, and of regenerating parts of the city which were perceived as 'failing'.

In addition, we interviewed representatives of Salford City Council who considered that the city's previous experience with urban regeneration companies meant that there was a perceived 'private sector mindset' with regards to economic development planning and a local focus on 'getting things done'.

## **Unlocking development**

We were not able to identify any notable land use policies which were specifically employed to unlock commercial or residential development opportunities related to Metrolink.

## **Regeneration programme**

As noted above, there has been an active programme of physical regeneration in Greater Manchester over the past 20 to 30 years, which has involved substantial investment by both the public and private sectors.<sup>33</sup>

The Phase 2 extension of Metrolink was associated with the earlier redevelopment of the Manchester Docks (now "Salford Quays"), a major regeneration and development plan drawn up by Salford and Trafford Councils, which benefitted from several hundred million pounds of public and private investment in the 1980s, 1990s and early 2000s. Latterly, this included the £550m MediaCityUK site – a 200-acre mixed-use property development with a focus on creative industries (and now home to the BBC) – and several high-rise residential developments.

Representatives of Salford City Council also highlighted the Exchange Quay development which has 472,000 sq. ft of modern Grade A office space, with a dedicated Metrolink tram stop, and the nearby Soapworks development.<sup>34</sup>

Associated with the regeneration of Manchester docks were specific land use policies. For example, Salford City Council purchased most of the Manchester docks site in the early 1980s to facilitate renewal, and a large proportion of the docks area was designated as an Enterprise Zone to encourage businesses to relocate to the area. The Council later created an Urban Regeneration Company in 2005, led by private business professionals, to take on the delivery of the project and lead on the negotiations with other private developers.

With regards to Metrolink, local stakeholders recognised that the MediaCity spur may not have been a material consideration in the BBC moving to the site but noted that it was nonetheless part of the negotiations. They also recognised that it was not possible to attribute the subsequent success and growth of the digital, creative and media cluster to Metrolink directly (ITV Granada and others subsequently moved to the site) but suggested that it benefitted Manchester's external profile and perception amongst investors, and that this had an economic value.

Many of the areas connected by Phase 3a of Metrolink's expansion were identified as economically and socially deprived, with opportunities for regeneration. However, we are not able to identify a specific regeneration programme that was implemented alongside the investment in Metrolink.

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<sup>32</sup> Greater Manchester Independent Prosperity Review (March 2019) "Reviewers' report" available [online](#).

<sup>33</sup> Examples of recent city centre real estate redevelopment projects can be found in this [blog](#), including NOMA, Spinningfields, Ancoats and New Islington.

<sup>34</sup> [www.exchangequay.com](http://www.exchangequay.com)



Phase 3b was associated with the regeneration of East Manchester, where one of the first designated urban regeneration companies was established in 1999 as a partnership between Manchester City Council, North West Development Agency and English Partnerships. The company led on the major strategic, physical regeneration of the area, and had a mandate to secure public and private resources of around £2bn to deliver a comprehensive, long-term programme. This programme included:

- completion of the SportCity complex on budget and in time for the 2002 Commonwealth Games, now subject of further commercial and residential development under the ‘Etihad Campus’ proposals;<sup>35</sup>
- construction of a new 180,000 sq. ft. supermarket store and new commercial centre for East Manchester;
- a £24m investment programme in the Ashton Canal corridor to provide a safe, attractive and accessible pedestrian route from the city centre, and to open up the development potential of key sites and buildings along the route;
- the Central Park Manchester development, including construction of 150,000 sq. ft. of new office space. The site was assembled through a Compulsory Purchase Order and remediated, and a new road system has been constructed to facilitate development, along with a Metrolink stop;
- three major new residential schemes with private sector partners, including the New Islington development. Cumulatively, these developments totalled over 2,500 new homes;
- an £80m capital investment programme in comprehensive modernisation and improvement of the existing local authority housing stock in Beswick, Openshaw and Clayton (over 3,000 homes) via a new public-private partnership; and
- a comprehensive programme of social improvements targeted at educational attainment, and investment in new educational facilities.

## Skills investment

We were not able to identify any notable skills policies which were specifically implemented alongside Metrolink to improve and/or better match the skills of the local labour force, and therefore raise productivity. However, we note that Greater Manchester Combined Authority has devolved powers over adult education and employment, which should give it some levers to influence skills investment over time.<sup>36</sup>

### 3.4. SCHEME OUTPUTS AND ASSOCIATED OUTCOMES

#### 3.4.1. Passenger growth compared to original forecasts

The expansion of the Metrolink network helped generate a significant increase in passenger numbers. In the ten years since 2010, the number of annual passenger journeys on the network more than doubled, rising from 19.2m in 2010 to 45.5m in 2019.<sup>37</sup>

Patronage on the line built in Phase 1 far outgrew the original demand forecasts, as shown in Table 3-1. Prior to the opening of Phase 2 in 1990, Metrolink carried almost twice as many passengers as the original heavy rail line.<sup>38</sup>

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<sup>35</sup> Manchester City Council (accessed August 2021) “Eastlands regeneration framework” available [online](#).

<sup>36</sup> Local Government Association (September 2020) “Experiences of employment and skills devolution: Greater Manchester Combined Authority” available [online](#).

<sup>37</sup> TfGM (31 December 2019) “A decade of progress” available [online](#).

<sup>38</sup> DfT (2021) “Light rail and tram statistics” available [online](#).

Table 3-1: Estimated annual Metrolink Phase 1 patronage (millions) by previous mode

Table 3-1: Estimated annual Metrolink Phase 1 patronage (millions) by previous mode				
Not travelled		2.5	2.3	0.2
Car	1.3	3.3	0.7	2.6
Bus	3.0	2.6	1.0	1.6
Rail	7.6	3.5	3.3	0.2
Other	0.0	0.2	0.3	-0.1
<b>Total</b>	<b>11.9</b>	<b>12.1</b>	<b>7.6</b>	<b>4.5</b>

Source: Table 2 in Knowles (1996) from the Metrolink Impact Rail User Survey 1993. Available [online](#).

Factors identified as contributing to this success include:

- The system offers journey times for most of its passengers which are shorter than the bus in both the peak and the off-peak, shorter than the car in the peak and about the same as the car in the off-peak. It provides as good if not better penetration of central Manchester than the bus and the car—thus reducing the time people must spend walking to and from their destinations.
- The service is frequent, reliable and safe - over 99 percent of contracted mileage is operated, and all stops have CCTV supervision from the control centre.
- The Metrolink service is well integrated with other public transport modes: physical integration exists at purpose-built interchanges at Altrincham and Bury—where the bus services in the area terminate at the Metrolink station. This is backed by day and period tickets valid on both modes.<sup>39</sup>
- It is fully accessible to enable travel for people in wheelchairs, with shopping trolleys and with children in prams. As a result, new users have been attracted to Metrolink which in the past either could not be made at all or had to be made by car.
- At the outer ends of the Phase 1 line there are two district centres, Bury and Altrincham, which gives a well-balanced traffic in both directions for most of the day.<sup>40</sup>

For Phase 2, we identified one source which found that passenger growth was lower than forecast in the immediate years following opening but noted that overall Metrolink patronage has grown substantially since. It was assumed that Phase 2 would have 6 million annual passengers approximately five years after opening, whereas passenger numbers for the first full year of opening was 3 million passengers. However, by 2010/11, patronage on Metrolink as a whole was seven percent higher than was originally forecast for the Phase 1 and Phase 2 lines.<sup>41</sup>

Demand has not yet grown as fast as predicted for Phase 3: it stood at ~70 percent of forecast patronage by 2018/19, although passenger numbers were steadily improving before the Covid-19 pandemic. This lower than forecast patronage was partly due to differences between the assumed service provision and the actual service provision; optimistic assumptions around the impact of new developments in Oldham and Rochdale; and slower

<sup>39</sup> Select Committee on Environment, Transport and Regional Affairs (October 1999) “The Greater Manchester Metrolink System: Memorandum by the Greater Manchester Passenger Transport Authority and Executive” available [online](#).

<sup>40</sup> Select Committee on Environment, Transport and Regional Affairs (October 1999) “The Greater Manchester Metrolink System: Memorandum by the Greater Manchester Passenger Transport Authority and Executive” available [online](#).

<sup>41</sup> DfT (2011) “Green light for light rail” available [online](#).

growth in the Manchester economy than originally forecast. However, even after accounting for these factors, there remains a difference between outturn and forecast patronage for the Oldham and Rochdale line.<sup>42</sup>

It is estimated that as a result of Metrolink over 2.5 million car journeys per year have been taken off the road network. This reduced traffic volumes on the main roads into Manchester which run parallel with the line, by between two percent and eight percent.<sup>43</sup>

From a transport output perspective, we can conclude that Phases 1 and 2 of Metrolink have both been successful whereas Phase 3 has been less successful to date.

### **3.4.2. Impact of transport investment on economic outcomes**

The network has been an overall success in terms of growing the number of journeys made by public transport in the Greater Manchester area. In this subsection, we consider whether there is evidence to demonstrate that Metrolink has also contributed to positive changes in the main outcomes of interest – employment, productivity and housing – as well as some other close proxies for economic change in Manchester.

#### **Population**

In common with many UK cities, the population of Greater Manchester was in steady decline during the 1980s and '90s: from 2.62m residents in 1981 to 2.52m by 2001. However, since 2001 the city region has seen significant population growth, reversing decades of decline. As of 2020, the population stood at 2.85m residents (or 13% growth since 2001 – broadly in line with the UK average).

We were not able to find any evidence that links Greater Manchester's population growth directly to the improvements in transport accessibility due to the Metrolink scheme. It is likely that Phases 1 and 2 made some contribution to boosting the attractiveness of Manchester and the city centre as a place to live. However, it is important to note that the recovery in city centre living precedes the opening of Metrolink Phase 3, and there are likely to be multiple likely contributory factors (for example, the wider trends in growing university attendance).

#### **Employment**

Since the early 1990s there has been significant background employment growth in the Greater Manchester region overall and in the local areas around Metrolink stations. For the lines constructed in all three phases, commuters made up a significant proportion of users though slightly lower for users of the Phase 3 lines than Phases 1 and 2.<sup>44</sup>

We found one paper which looked at Phases 1 and 2 and tried to quantify the wider employment effects using a “difference-in-difference” econometric approach to compare how ‘treatment’ areas (exposed to the intervention) performed over time relative to ‘control’ areas (outside the scope of intervention), controlling for certain time invariant area characteristics (“fixed effects”) that also influence employment.<sup>45</sup> The paper did not find any strong evidence to link Phase 1 (Bury and Altrincham to Manchester) to employment growth in the region. There was some evidence to suggest that Phase 2 (to Eccles via Salford) may have been more successful in generating employment impacts in Salford Quays, when comparing treatment areas (local areas in the vicinity of a Metrolink station) to control areas (other similar local areas in Manchester).

More recent work by Arup (2020) employed a similar “difference-in-difference” approach (in combination with other econometric methods designed to isolate the Metrolink effect) to the Phase 3 extensions over the period 2010–2018. Arup's findings suggest that, whilst the Phase 3 extensions to the Metrolink network have improved accessibility to jobs, there was no robust, statistically attributable impact on employment. This finding applied to both the Metrolink route as a whole, and for the central employment sites which were considered in more detail.

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<sup>42</sup> TfGM (March 2021) “Metrolink Phase 3: Monitoring and Evaluation Second Report” available [online](#).

<sup>43</sup> Select Committee on Environment, Transport and Regional Affairs (October 1999) “The Greater Manchester Metrolink System: Memorandum by the Greater Manchester Passenger Transport Authority and Executive” available [online](#).

<sup>44</sup> ITS Leeds (August 2017) “Needs Tailored Interoperable Railway – Wider economic benefits final report” available [online](#).

<sup>45</sup> ITS Leeds (August 2017) “Needs Tailored Interoperable Railway – Wider economic benefits final report” available [online](#).

However, the report noted that employment is less flexible, and it takes longer for that variable to be affected by changes in the transport system.<sup>46</sup>

A second study by Arup (2021) employed a similar “difference-in-difference” econometric approach (although without a change in accessibility variable, in this case) applied to a different ONS dataset. The study found that the impact of Phase 3 on employment was negative (-11.9%) on areas within 500 metres of a Metrolink station, over the period 2011–2018. The study also found that the impact on employment was negative across most local centres of employment (the Airport, Rochdale, Ashton, and Manchester Regional Centre) but was positive in Oldham.<sup>47</sup>

The two studies look at both employment and productivity effects and the findings are broadly consistent: Metrolink connectivity raises the profile of central areas but there is a negative effect on other treated areas, mainly in terms of productivity. There is some discrepancy in the employment results, and therefore the impact on employment at a local level is somewhat inconclusive. Moreover, whilst the treatment and control group design help to address the causal link to Metrolink, it does not consider the employment impacts on Greater Manchester as a whole.

In our exchange with representatives of Salford City Council they highlighted that there has been extraordinary growth in key employment and business indicators for the area over the past 20 years, including:

- **Development of a more diverse business base.** Jobs have been created across sectors, including an increasing specialisation in a digital, media and creative cluster. There are ~4,500 jobs at the BBC site alone, alongside ITV Granada, Dock10 Studios, and altogether around 250 digital, media and creative firms providing ~9,000 jobs in the area. The growth of this cluster has attracted other large firms to relocate: the “north-shoring” of TalkTalk from London to a new base at Soapworks, next to the Metrolink line being a notable example. Using ONS Business Counts data, Salford City Council estimates that the business base in the MediaCity/Salford Quays area has more than doubled in size from 1,115 businesses in 2016 to 2,715 businesses in 2021.<sup>48</sup>
- **Employment growth.** Salford City Council estimates that there are now 31,000 jobs based in the area altogether, which is one of the highest employment densities outside London and the South East.<sup>49</sup>

Overall, it seems plausible that Metrolink had only a relatively small impact on employment in the context of background employment growth across the Greater Manchester region as a whole, and the impact on employment may not yet have been fully realised where Phase 3 is concerned. Parts of the network – particularly the Phase 2 extension – may have more directly supported the growth in employment opportunities in and around Salford Quays and Media City (although it is difficult to find convincing counterfactual areas to test this hypothesis).

## Firm entry

We have not found any studies that looked at firm entry and exit in detail. Arup (2021) gathered data on the number of local (business) units as part of a wider evidence base to explore the link between transportation, employment and productivity. It found that the (net) number of local units (within 1km of new Metrolink stations) did not significantly change in response to Metrolink.<sup>50</sup> Unfortunately, this result does not tell us whether Metrolink generated any impact on business ‘churn’ – potentially as less productive businesses moved away and were replaced by new businesses – but did note that there appeared to be a small shift away from retail units towards manufacturing units.

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<sup>46</sup> Arup (November 2020) “Metrolink evaluation: Evaluation of employment and office rents impacts” unpublished.

<sup>47</sup> Arup (May 2021) “The Impact of Transportation on Employment and Productivity – report for the National Infrastructure Commission” unpublished.

<sup>48</sup> Using the area MSOA 028.

<sup>49</sup> ONS Business Register and Employment Survey data.

<sup>50</sup> Arup (May 2021) “The Impact of Transportation on Employment and Productivity – report for the National Infrastructure Commission” unpublished.

## Land value and property prices

There is robust evidence that some of the economic benefits of Metrolink have materialised in the form of higher land values, suggesting that Greater Manchester residents are willing to pay a modest premium to be close to a Metrolink station. Previous research found that the average uplift in house price within a 1 km catchment area of a Metrolink station was +6.3 percent on average. This varied across Metrolink lines, e.g. +10.5 percent in the higher-income South Manchester catchment; whilst it was lower or insignificant in East Manchester/Rochdale Line catchments.<sup>51</sup> The Airport Line was exceptional (+20.6 percent), perhaps in part because of the employment centres at both ends of the line and the associated opportunities of international connectivity.<sup>52</sup>

Table 3-2: Impact of new Metrolink stations on residential property values, 1995-2011

	Uplift within 1km of station
New Metrolink stations (1999 – 2017)	+6.3%
<i>Lines</i>	<i>Uplift within 1km of station</i>
Airport line	+20.6%
South Manchester line	+10.5%
East Manchester line	+7.5%
Eccles line	-3.4% (not statistically significant)
Rochdale line	-1.1% (not statistically significant)

Source: ITS Leeds (2019), Table ES6

## Productivity and wages

We were granted access to two existing studies that consider the link between Metrolink and changes in productivity, but neither of these studies are available in the public domain.<sup>53</sup> We note that TfGM, who commissioned one of these studies, does not consider that the econometric analysis employed isolated the impacts of Metrolink (i.e. was able to separate correlation from causation) with enough statistical robustness for any valid inferences to be made.

One of these two studies found a positive association between improved public transport accessibility due to Phase 3 and economic growth, although it could not separate out true cause and effect.<sup>54</sup> This study recommended further research into more direct measures of productivity, but it found that areas within 1km of the Metrolink stations experienced a strong average increase in office rents (as a proxy for productivity) of ~6.5 percent between 2010 and 2018, compared to what they would have been without the new Metrolink extension. This overall increase does not appear to have been evenly distributed in spatial terms. Some areas gained economic activity (particularly in Manchester city centre) whereas the smaller economic centres (particularly Oldham, Rochdale and Ashton) appeared worse off.<sup>55</sup> The results reported vary depending on the methodological approach adopted (it tested four different approaches), but the main results are shown below.

<sup>51</sup> ITS Leeds noted that parts of the Rochdale, East Manchester and Eccles lines serve areas of higher deprivation and relatively low income, and that low underlying levels of property demand may have constrained the growth in prices in these places.

<sup>52</sup> ITS Leeds (August 2019) “Land Value and Transport (Phase 2): Modelling and Appraisal” available [online](#).

<sup>53</sup> Arup (November 2020) “Metrolink evaluation: Evaluation of employment and office rents impacts” unpublished and Arup (May 2021) “The Impact of Transportation on Employment and Productivity – report for the National Infrastructure Commission”, unpublished.

<sup>54</sup> TfGM (March 2021) “Metrolink Phase 3: Monitoring and Evaluation Second Report” available [online](#).

<sup>55</sup> Arup (November 2020) “Metrolink evaluation: Evaluation of employment and office rents impacts”.

Table 3-3: Metrolink Phase 3: impact on office rents, 2010–2018

	% change in office rents
All areas within 1km	+6.5%
Greater Manchester regional centre	+7.8%
Oldham	-21%
Ashton	-14%
Rochdale	-11%

Source: Arup (2020)

Although it is inherently difficult to separate correlation from causation in such analysis, in our opinion this finding is broadly in line with both theory and recent evidence: a better connection between the regional centre and the smaller centres mainly benefits firms that are already located in the regional centre, as more productive firms in the regional centre could serve distant markets in smaller centres from their existing base.<sup>56</sup> But the overall impact of the Metrolink on the Greater Manchester region is likely to have been (and continue to be) positive.

The second study analysed productivity more directly, by looking at the change in output per worker over the period 2011–2018. The results showed that Metrolink did not have a statistically significant impact at less than 500m and a significant negative (-9.5%) impact for areas within 1km of a Metrolink station. The analysis of areas of special interest showed an increase in output per worker in the Airport, Greater Manchester Regional Centre and Rochdale areas, but a reduction in Ashton and Oldham. The results suggest a positive impact on the centre of Greater Manchester, but a negative impact on the satellite towns. Whilst this is broadly in line with the first study, it suggests a need for further research into the impact on productivity for Greater Manchester as a whole.

Table 3-4: Metrolink Phase 3: impact on output per worker, 2011–2018

Area	% change in output per worker
All areas within 1km	-9.5%
Greater Manchester regional centre	+20.5%
Airport	+22.4%
Oldham	-6.8% (not statistically significant)
Ashton	-8.7% (not statistically significant)
Rochdale	+23.3%

Source: Arup (2021)

We have not found any studies which considered the link between new Metrolink lines or stations and local wages.

## Housing

We did not have access to the original business cases for Phases 1 or 2, whilst the Phase 3 business case documentation does not refer to the scheme supporting any number of new homes. Likewise, we are not aware of any analysis in subsequent evaluations that has tried to attribute new homes to extensions of the Metrolink network.

Nonetheless, whilst Metrolink may not have directly stimulated new housing development in the short term, the improved connectivity is likely to have improved the economics of residential development at certain locations across Greater Manchester as the housing market improved over the last decade. There have been just under

<sup>56</sup> Again, we note that TfGM does not consider that the econometric growth was able to separate correlation from causation and robustly isolate the impacts of Metrolink. It considers that this is a problem with the analysis because the regional town centres in question were in decline over the period of analysis, with major reductions in public sector employment and retail activity, leading to knock on impacts on associated activity. Source: email exchange between CEPA and representatives of TfGM.



50,000 new homes completed in Greater Manchester over the last 9 years<sup>57</sup> - a significant number of which have been in the regional centre<sup>58</sup> and therefore must benefit from some accessibility benefits created by Metrolink. Access to the Metrolink network is frequently cited in new residential marketing material, and further extensions to the Metrolink network are cited as necessary to support Greater Manchester's future housing needs.<sup>59</sup>

Phase 2 also helped to improve the accessibility of previously underutilised land around Salford Quays which has subsequently seen further high-rise residential development. In previous work commissioned by local stakeholders, it was noted that the Phase 2 and 3 routes would run through several housing market renewal pathfinder areas which would be challenging to successfully regenerate, and where Metrolink (in combination with other interventions) has likely supported a significant volume of investment by private residential developers.<sup>60,61</sup> Anecdotal evidence, such as the importance of Metrolink to attracting new residents to East Manchester,<sup>62</sup> is less robust than the more quantitative analysis we have collected, but demonstrates that Metrolink was nonetheless an important factor in sustaining the momentum of Manchester's regeneration efforts.

### **Other perceived economic impacts**

In addition to the quantitative and qualitative evidence available in the existing literature, we also interviewed three local and combined authority organisations to gather their views on Metrolink's economic impact.

The representative of TfGM recognised that it was not possible to demonstrate that the MediaCity spur was a significant factor in the site's success without a robust counterfactual scenario but noted that the spur was something that the BBC argued strongly for. Moreover, Metrolink had a positive impact on Manchester's external profile, and that this 'confidence' effect had an economic value in terms of attracting investment. It was perceived that Phase 1 was particularly successful and that it had helped Bury and Altrincham maintain a status as relatively affluent relative to other neighbouring towns. TfGM had not yet been able to quantify a robustly positive impact in Wythenshawe in terms of employment and economic output but considered that this would take time to develop.

The representatives of Salford City Council recognised that central Salford had benefitted from its location close to the historical Manchester city centre, and the area was therefore well placed to accommodate growth as Greater Manchester's core expanded. They felt that this had helped to fuel the transformation of central Salford locations, but also noted that in future the City Council aims to achieve more equal growth across the authority area. They considered that the enormous economic transformation that has occurred in the Salford Quays/MediaCity area over the last 20 years would not have happened to the extent that it has without the Metrolink connection to Manchester city centre. They also noted that the line has been so successful that it has supported the economic and business cases for further network expansion.<sup>63</sup> Whilst noting that Metrolink had generated a significantly positive impact, they also cited Salford University, Salford Royal Hospital, cultural institutions (such as the Lowry) and the investment in regenerating the Salford Quays site during the 1980s as important "assets" which had helped Salford's strong recent growth, and encouraged a growing cluster of health, education, digital and media firms. They also noted that there had been billions of pounds of residential real estate investment and development activity in the area, resulting in the construction of thousands of housing units over the past 20 years at several sites within short walking distance of the Metrolink line; and believed that investor confidence in the area is particularly

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<sup>57</sup> MHCLG (accessed August 2021) "Live tables on housing supply: indicators of new supply – Table 255" available [online](#).

<sup>58</sup> Savills Research (2017) "Manchester: Where are the gaps?" available [online](#).

<sup>59</sup> Greater Manchester Combined Authority (August 2021) "Places for everyone: joint development plan document" available [online](#).

<sup>60</sup> Volterra (August 2008) "Economic benefits of the Metrolink extension" available [online](#), p3.

<sup>61</sup> Housing Market Renewal Pathfinders operated in areas of low housing demand between 2002 and 2011. The intention of the pathfinder strategy was to renew failing housing markets and reconnect them to regional markets, to improve neighbourhoods and to encourage people to live and work in these areas.

<sup>62</sup> Select Committee on Transport (February 2005) "Metrolink: the impact on regeneration of East Manchester" available [online](#).

<sup>63</sup> Email exchange between CEPA and representatives of Salford City Council, dated 9 November 2021.

strong, as supported by the recent acquisition of a controlling equity stake in the MediaCity development by a large UK commercial real estate development and investment firm.<sup>64</sup>

The representative of Rochdale Borough Council felt that Metrolink was important for the perception of Rochdale town centre, an effect which would likely have been reduced had the line terminated at the rail station. It was perceived that Metrolink had helped to lever in significant investment (such as the Rochdale Riverside Shopping and Leisure Centre) and generate momentum on other local development sites which had otherwise stalled.

### **3.5. SOURCES**

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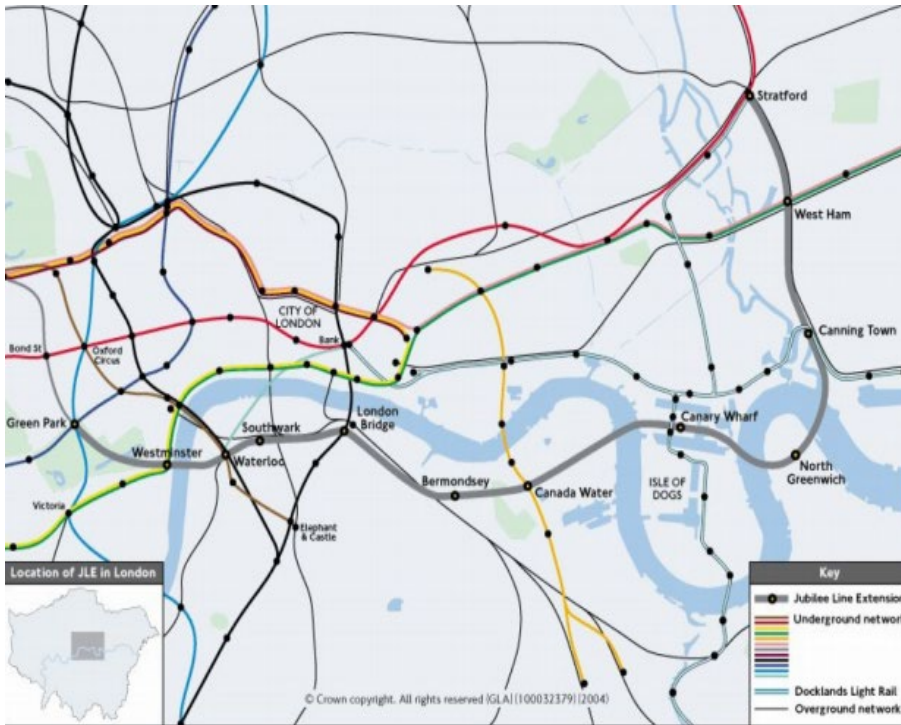
<sup>64</sup> Manchester Evening News (8 November 2021) “The ‘incredibly scarce’ opportunity bringing the world’s super-rich to Greater Manchester” available [online](#).

## 4. JUBILEE LINE EXTENSION

### Summary of key messages

- The primary aim of the Jubilee Line Extension (JLE) was to assist in the regeneration of the London Docklands. The catchment of the JLE has significant overlap with the area under the supervision of the London Docklands Development Corporation (LDDC), established in 1981 to develop policies for the regeneration of the Docklands, including flexible planning policies and tax advantages.
- Overall, the evidence suggests that the JLE had a transformational impact on the Docklands by improving accessibility to Central London and thus enabling the development and regeneration of the area. In particular, it is unlikely that development at Canary Wharf on the scale observed would have been possible without the JLE, as Canary Wharf had previously been limited by the capacity of the Docklands Light Railway.
- The JLE can also be credited as a catalyst for residential development around Bermondsey and Canada Water. The JLE played a significant role in facilitating the development of North Greenwich with the Millennium Dome and is likely to have been a contributory factor to development at Stratford as well as later commercial developments near Southwark and London Bridge stations. However, the areas around Canning Town and West Ham do not appear to have experienced the same uplift in development intensity in response to the JLE.
- The JLE helped integrate labour markets and widen access to jobs, enabling employment in the JLE corridor to increase by 15 percent between 1998 and 2000, versus 8 percent in Greater London as a whole. Most of the jobs gained were in knowledge intensive business and financial services. But it is likely that this increase in employment largely benefited migrants into the area rather than the incumbent local population, as the proportion of the local population in employment was unchanged following the opening of the JLE.
- **The key contextual factors relevant to this scheme are:**
  - Regeneration potential: the JLE aimed to assist with the regeneration of the London Docklands, which had gradually fallen into dereliction from the 1970s onwards.
  - Regeneration programme: the London Docklands Development Corporation created momentum in the regeneration of the Docklands, until it was dissolved in 1998.
  - Commercial development: a key motivation behind the construction of the JLE was to provide additional public transport at Canary Wharf, the development of which would have otherwise been constrained by the capacity of the Docklands Light Railway.

Figure 4-1: The JLE in relation to the London Underground, Docklands Light Rail and Overground networks



## 4.1. SCHEME SUMMARY

Background information	
<b>Scheme type:</b>	Extension of existing underground metro line
<b>Type of transformational impact planned:</b>	Residential impacts; labour demand impacts; consumer demand impacts
<b>Location:</b>	London, UK
<b>Geography:</b>	Intra-city
<b>Promoter:</b>	London Underground
<b>Start of construction:</b>	December 1993
<b>Opening date:</b>	Autumn 1999
<b>Cost:</b>	£3.864bn (2003 prices)
<b>Sources of funding:</b>	Mostly central government (£2.2bn) and London Transport (remainder) with c. £150m private sector contributions

The Jubilee Line Extension (JLE) was the first significant addition to the London Underground network since the completion of the original Jubilee Line<sup>65</sup> in 1979. Prior to the extension, the Jubilee Line terminated at Charing Cross. For the extension, the line from Green Park was rerouted to Westminster to travel eastward to Stratford via Waterloo and London Bridge. The project involved building six completely new stations (Southwark, Bermondsey, Canada Water, Canary Wharf, North Greenwich and Canning Town) and enlarging or rebuilding five existing stations (Westminster, Waterloo, London Bridge, West Ham and Stratford). Construction began in December 1993 and was completed in December 1999.<sup>66</sup>

The main objective of the JLE was to “assist in the regeneration of the Docklands”, a process which had begun with the establishment of the London Docklands Development Corporation in 1981. This was to be achieved by improving accessibility to the area and addressing capacity constraints of the Docklands Light Rail system, thus “unlocking one of Europe’s largest potential development areas [the Docklands]”.<sup>65</sup> The line crosses the Thames four times, helping to reduce the natural barrier of the river.

The JLE has its origin in the East London Rail Study of 1989, which was commissioned after Canary Wharf developers Olympia & York (O&Y) suggested that there should be an underground railway linking Canary Wharf with Waterloo in the west and Westcombe Park (just south of the Greenwich peninsula). This proposal was supported by a report by London Transport International concluding that the Docklands Light Railway would never be able to offer the anticipated capacity required by the Canary Wharf development. The East London Rail Study examined various options, each of which passed through Canary Wharf, and ultimately recommended the Westminster to Stratford route which became the JLE.<sup>67</sup> The Canary Wharf development was thus a key catalyst for the JLE. The final cost of the JLE was over £3.8bn,<sup>68</sup> of which £2.2bn came from central government funds, and most of the remainder from London Underground Limited.<sup>66</sup> O&Y originally agreed to contribute £400m to the JLE

<sup>65</sup> Jones et al (2004) “The Jubilee Line Extension Impact Study: Main Findings and Lessons Learnt”, Association for European Transport, available [online](#).

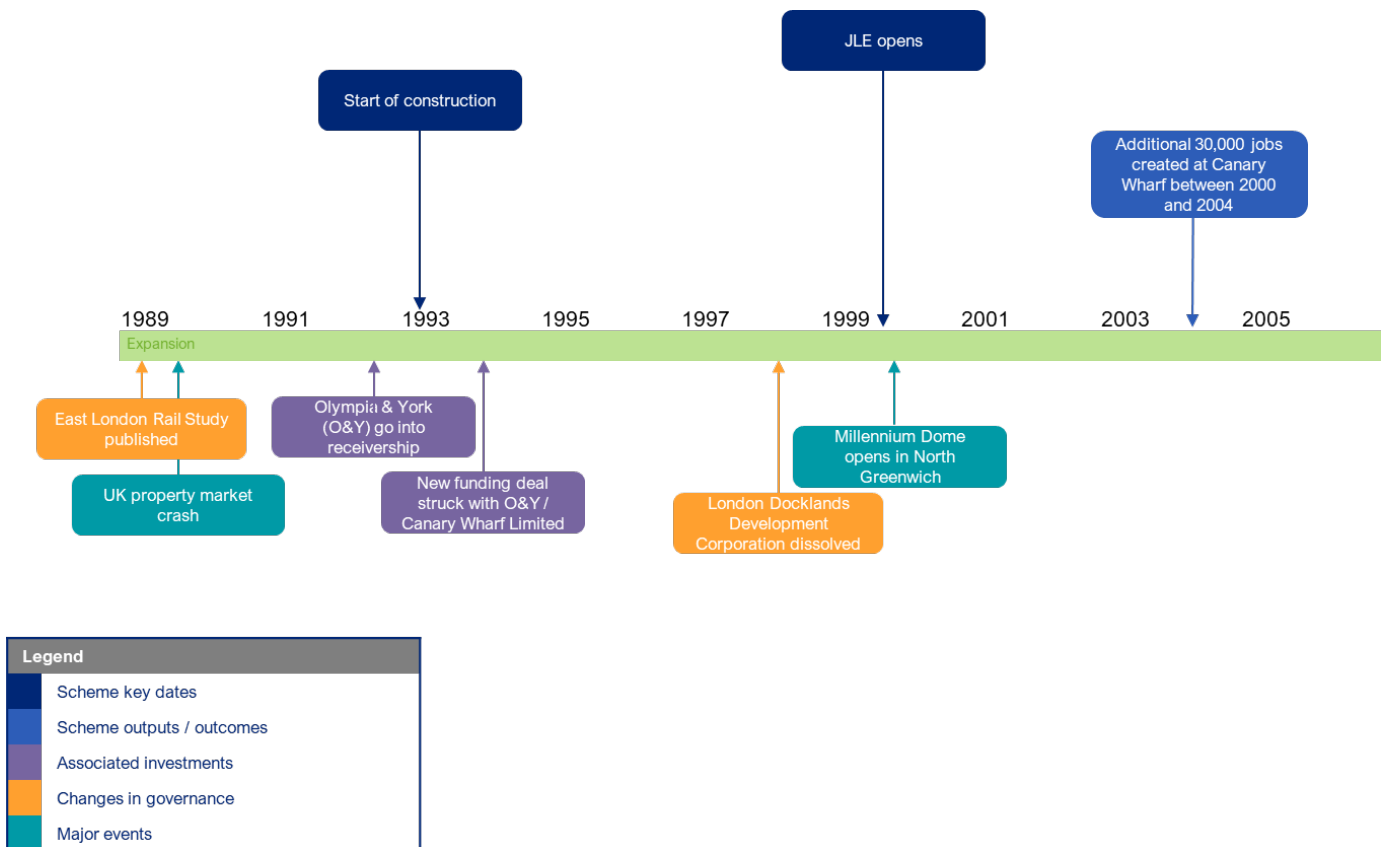
<sup>66</sup> OMEGA Centre, University College London “Jubilee Line Extension (JLE) Project Profile” available [online](#).

<sup>67</sup> Glover, J., Colin Buchanan & Partners (1990) “The East London Rail Study” in “The Transport Economist: Magazine of the Transport Economists Group” 17(2) available [online](#).

<sup>68</sup> Colin Buchanan and Partners (2011) “Reappraisal of the Jubilee Line Extension”.

project. However, O&Y were unable to pay the first instalment of £40m in March 1992 (due to the 1989 property market crash), and eventually the firm went into receivership in June 1992. Once O&Y had gone into administration, Heron Keys Development Limited (a joint venture between O&Y and Regalian Homes Limited) also reneged on its agreed contribution of £2.4m. This left the JLE project without its principal private sector backer. In October 1993, Canary Wharf Limited (CWL), now owned by a consortium of 11 banks, agreed to pay £98m up front with a further £300m staged over 25 years. As of November 2007, payments totalling £145m had been paid by CWL in contribution to the JLE project.<sup>66</sup> See Figure 4-2 for a detailed timeline of key dates associated with the Jubilee Line Extension.

Figure 4-2: Timeline for the Jubilee Line Extension





## 4.2. THEORY OF CHANGE

Figure 4-3 and Figure 4-4 below presents two logic maps articulating parts of the ToC for the JLE. The first logic map specifically considers transformational impacts that relate to changes in labour demand, while the second considers the transformation of residential locations.

**Inputs / Activities.** As shown in the logic map, the JLE extended Jubilee Line services eastwards through to Stratford, and resulted in new underground stations at Southwark, Bermondsey, Canada Water, Canary Wharf, North Greenwich and Canning Town.

**Outputs.** The key envisaged outputs of this were to:

- Provide residents of East London improved access to employment sites along the Jubilee Line. And provide residents other parts of London that can connect through interchanges at Waterloo, London Bridge and North Greenwich, similarly improved access.
- Improve access to residential areas that are sited along the expanded Jubilee Line.

**There are a number of potential outcomes and impacts from improving access to employment sites along the Jubilee Line.** There is a potential direct effect from existing residents being able to move to (higher paid) jobs located at these sites, which in turn lowers unemployment and/or increases average productivity. We consider this transmission mechanism is likely to only materialise if:

- the improvement in transport provision allows the residents to access jobs that would make them more productive than they currently were; or
- the improvement in transport provision encourages residents to invest in the requisite skills to access higher paid jobs; or
- the improvement in transport provision was implemented alongside specific policies to support people gaining the necessary skills to access higher paid jobs.

In addition to the direct effect, there are also indirect effects on employment or productivity by the introduction of the JLE encouraging more firms to locate at the employment sites given the larger labour catchment, and by the introduction of the JLE encouraging more investment in employment premises at the sites, to capitalise on the increased demand for office space. Both of these effects would increase the employment density of these locations, leading to agglomeration effects and further increasing employment opportunities. These indirect effects may rely on certain contextual factors such as there being a specific land-use policy to support the development of new employment premises, or there being latent demand for commercial or industrial real estate.

**Improving access to residential sites along the Jubilee Line could also lead to transformational impacts.** We anticipate that improved transport access would increase an area's attractiveness as a residential location. In the case of JLE, this means increasing the attractiveness of neighbourhoods on the extended line as residential locations.

If these neighbourhoods have cheap housing stock or cheap land to develop new housing, and the wider region has housing shortages (i.e. there exists a latent demand for housing), then we expect households to move into these neighbourhoods. This could result in the crowding out of existing residents if the supply of housing stock does not keep pace with demand.

Alternatively, the increased attractiveness of these neighbourhoods could induce investments in new housing, allowing greater residential density. This could in turn increase demand for businesses that provide services to residents, providing new employment opportunities. Or conversely, it could crowd out existing businesses where landowners find it more profitable to switch land use to residential purposes. Or there could be a combination of both effects.

**Contexts.** As with many other schemes, a key contextual factor is the quality of existing transport access. We expect areas that already had access to the London Underground network (e.g. Stratford and West Ham) will have benefited less than areas that did not. However, we also recognise that there may be network effects that work in the opposite direction, where gaining access to a second line on the London Underground network is more beneficial

We also consider the contextual factors introduced in the Manchester Metrolink ToC to also be relevant in the JLE context, namely complementary policies to support upskilling or job matching of residents in East London, investments in housing, and latent demand for housing and commercial real estate. In addition to these contextual factors, we also consider the following to be relevant:

- **Linked land use policy.** As JLE is linked to the regeneration of large areas, we consider it may be necessary to develop specific policy to aid the redevelopment of land and to support the investment needed in housing and in office premises.

Figure 4-3: Logic map for Jubilee Line Extension – Labour demand impacts

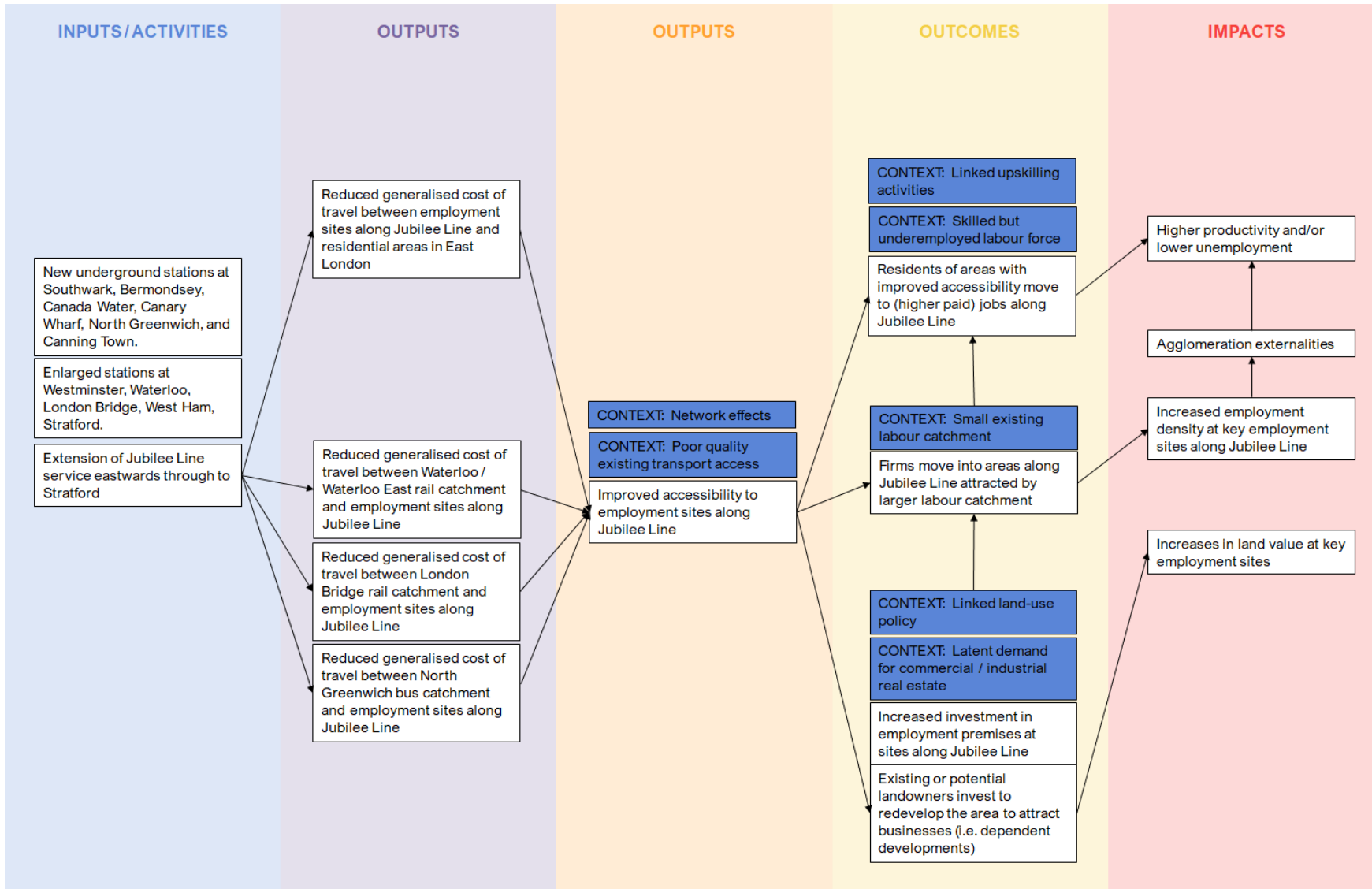
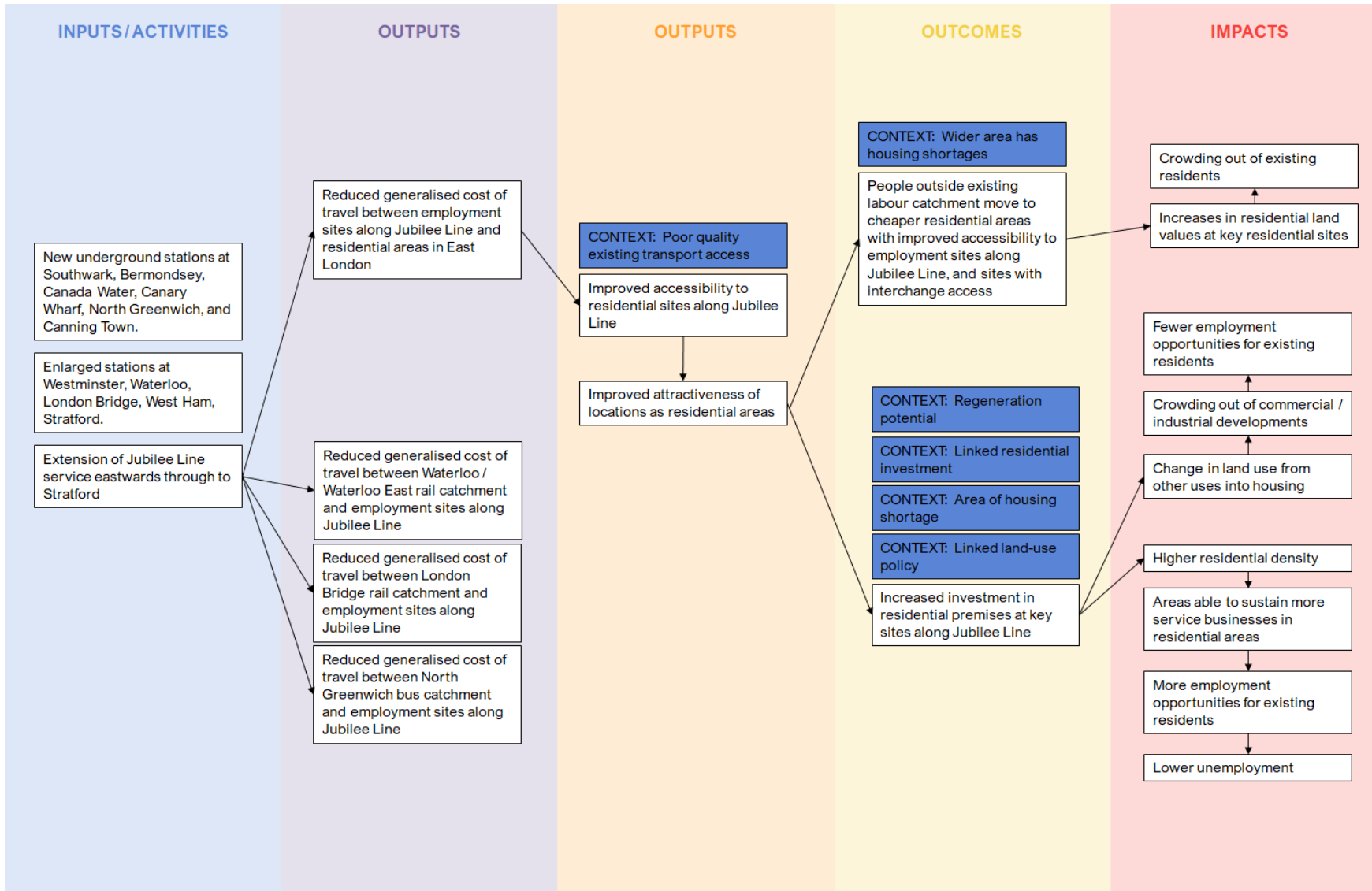


Figure 4-4: Logic map for Jubilee Line Extension – Residential impacts



### **4.3. SURROUNDING CONTEXT**

#### **4.3.1. Characteristics of the area at time of investment**

##### **Business cycle**

The deregulation of the UK financial markets under the Thatcher government in 1986 led to dramatic growth in London's financial services sector. The subsequent shortage of office space in the City of London was one of the drivers behind the Canary Wharf development, alongside government initiatives to regenerate the Docklands. While the 1989 property market crash initially threatened Canary Wharf's success (and led to the bankruptcy of developers Olympia & York), by the time the JLE opened in 1999 the property market had recovered, and London was in a period of strong economic growth. In 1999, London experienced growth in gross value added (GVA) of 4.7%, compared to 3.6% for England and 3.3% for the UK as a whole. In 2000, London's GVA growth rate increased to 6.8%, compared to 3.5% for both England and the UK as a whole.<sup>69</sup>

##### **Quality of existing transport access**

The quality of existing transport access prior to the opening of the JLE varied along the route. At the western end of the JLE, Westminster, Waterloo and London Bridge stations were already connected to the London Underground network, and both Waterloo and London Bridge are major termini for the National Rail network. While not previously connected to the London Underground network, Southwark station is located less than 10 minutes' walk away from Waterloo station. Further east, Canada Water was already connected to the London Overground network, while Canary Wharf and Canning Town were already connected to the Docklands Light Railway (DLR) network. Both West Ham and Stratford were already connected to both the DLR and Underground network. The JLE connected the neighbourhoods around Bermondsey, Canada Water, Canary Wharf, North Greenwich and Canning Town to the London Underground network for the first time.

##### **Housing**

As a major global city, demand for housing in London has been growing strongly since the 1980s, although this growth was in its early phase when the JLE was initially planned and proposed. According to the 2000 Index of Multiple Deprivation, all but two wards surrounding the JLE stations ranked in the 10 percent most deprived wards in England in the measure of housing deprivation. The two exceptions ranked in the 20 percent most deprived wards in England for housing deprivation.

##### **Commercial development**

A key motivation for the construction of the JLE was to provide additional public transport capacity at Canary Wharf. Had the JLE not been built, further commercial development at Canary Wharf would have been constrained by the capacity of the Docklands Light Railway.

##### **Regeneration potential**

The JLE runs through the London Docklands, which had gradually fallen into dereliction partly due to the emergence of containerisation in the 1960s and 1970s.<sup>70</sup> The dereliction of the Docklands is the key factor determining the regeneration potential of the areas around the JLE stations. The JLE Impact Study distinguishes the regeneration potential for each station catchment by those which require demolition and conversion of buildings to extract development potential, and those which include significant vacant or derelict land, or land that is in marginal

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<sup>69</sup> ONS, "Regional economic activity by gross value added (balanced)", available [online](#).

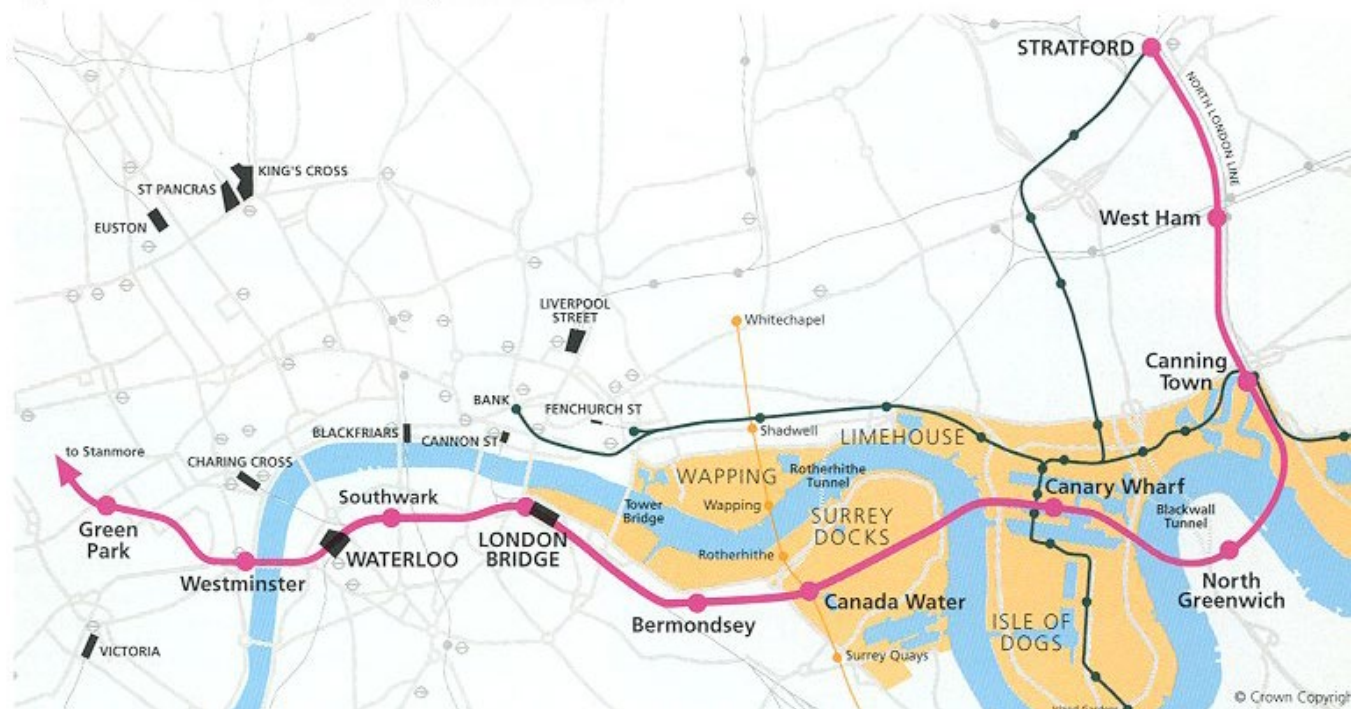
<sup>70</sup> Containerisation refers to the use of standardised shipping containers within the freight industry. The docks of London were not deep or large enough to accommodate the new large container ships; consequently London lost business to competing cities who could cater for such ships.

use (such as temporary car parks or scrap yards). Every station catchment east of and including Bermondsey was noted as having significant regeneration potential in this respect.<sup>71</sup>

The catchment of the JLE has significant overlap with the area under the supervision of the London Docklands Development Corporation (LDDC), established in 1981 to develop policies for the regeneration of the Docklands. The LDDC implemented more flexible planning policies and tax advantages<sup>72</sup> to enable commercial and residential development in the Docklands more quickly than other areas of London. The JLE stations of London Bridge, Bermondsey, Canada Water, Canary Wharf and Canning Town are all within or very close to the area under the control of the LDDC, as shown in Figure 4-5 below.

From 1994, the LDDC began a staged withdrawal, exiting Bermondsey in 1994, Beckton in 1995, the Surrey Docks in 1996, Wapping, Limehouse and the Isle of Dogs in 1997, and the Royal Docks in 1998. Although the LDDC was dissolved in 1998 and powers transferred to London Boroughs, the LDDC remains an important contextual factor for the JLE, in that the development initiated by the LDDC may have been further facilitated or accelerated by the construction of the JLE.

Figure 4-5: JLE in relation to the area managed by the London Docklands Development Corporation



Source: [lddc-history.org.uk](http://lddc-history.org.uk)

## Underutilised skills

The JLE runs through areas of significant historic deprivation, particularly towards the eastern end of the line which runs through the Docklands. The skills profile of the JLE corridor was quite varied. Data from the 1991 census shows across the JLE station catchments, the greatest concentrations of residents in low paid employment (e.g. sales assistants, machine operators) were found in Canning Town, West Ham and Stratford, suggesting that these catchments have a relatively lower skilled labour force. According to the 1995 Annual Employment Survey, half of all employment in Bermondsey was in the financial services sector.<sup>73</sup> According to the 2000 Index of Multiple Deprivation, almost all wards surrounding the JLE stations ranked in the 20 percent most deprived wards in

<sup>71</sup> Pharoah, T., (2003) "Jubilee Line Extension Development Impact Study" for Jubilee Line Extension Impact Study Unit, University of Westminster.

<sup>72</sup> Inside the Docklands Enterprise Zone, new buildings costs could be offset against tax liabilities (capital allowances), and there were 100% business rates exemptions.

<sup>73</sup> Jubilee Line Impact Study Unit "The Concepts and Methodological Framework for Assessing the Impacts of the JLE".



England across the measures of income, employment and education deprivation, apart from those around Westminster station. However, it is worth noting that the measures are based on residents of the ward and does not capture workers who may commute into the area to work. This is particularly relevant for the Westminster and Canary Wharf catchments, which should be regarded as economically highly performing, given the number of businesses and level of commercial development in these areas.

Table 4-1 below provides figures on job density from 2000 for each of the London boroughs through which the JLE runs. Westminster and Tower Hamlets (containing Canary Wharf) rank relatively highly among London boroughs for job density, reinforcing the picture that these areas are strong commercial centres. Newham is at the opposite end of the spectrum, ranking 30<sup>th</sup> among London boroughs for job density.

*Table 4-1: Job density (number of jobs per working age resident) in 2000*

Borough	Job density (2000)	Rank among the 33 London boroughs
Westminster	4.23	2 <sup>nd</sup>
Lambeth	0.73	13 <sup>th</sup>
Southwark	1.05	8 <sup>th</sup>
Greenwich	0.6	25 <sup>th</sup>
Tower Hamlets	1.15	6 <sup>th</sup>
Newham	0.5	30 <sup>th</sup>

*Source: London Datastore, Jobs and Job Density by borough*

### 4.3.2. Associated activities and actions alongside transport investment

#### Benefits realisation

Despite the JLE’s aims of assisting in the regeneration of the Docklands, there were (at least initially) no complementary policies or overarching strategy to ensure that these benefits were maximised. Rather, “it was assumed that local residents and businesses would benefit from regeneration along the route of the JLE”<sup>65, 68</sup> While the LDDC was an important driver of the regeneration of the Docklands, the organisation was dissolved in 1998 (before the JLE opened) and thus had no role in ensuring that the benefits of the JLE were realised.

#### Unlocking development

Between 1998 and 2002, the London Boroughs of Lambeth, Southwark, Tower Hamlets, Greenwich and Newham all implemented changes to their unitary development policies (UDPs).<sup>71</sup> While there appeared to be a general acceptance of the potential benefit of the JLE as a catalyst for development, the revisions did not generally lead to any policies relating specifically to the pattern or scale of development around the JLE stations themselves.<sup>65</sup> However, this varied by borough and station:

- **Waterloo and Southwark:** Lambeth and Southwark’s UDPs contain no special provisions relating to the Waterloo and Southwark JLE stations.
- **Bermondsey and Canada Water:** Southwark’s UDP contains a development brief for Canada Water.
- **Canary Wharf:** The JLE facilitated development at Canary Wharf at a much greater scale than would be achieved without the JLE by expanding public transport capacity. Thus, subsequent changes to the borough of Tower Hamlets’ planning policies, such as the masterplan for the Millennium Quarter (within the Canary Wharf catchment) can be attributed to the JLE.

- **North Greenwich:** Naturally, Greenwich’s UDP features significant provisions for the Millennium Dome, and the intention that the JLE station would be the centre of a “central business area” with predominantly commercial activity.<sup>74</sup>
- **West Ham, Canning Town and Stratford:** Each of the JLE station catchments in Newham were identified as ‘Priority Development Nodes’ with Stratford and Canning Town also being identified as ‘Major Opportunity Zones’.

## Regeneration programme

The LDDC was dissolved in 1998 and thus by the time the JLE opened, there was no formal regeneration programme operating in the area. However, the LDDC was important in generating regeneration momentum, which other bodies were able to continue after the JLE opened. The LDDC’s powers were transferred to the London Boroughs after its dissolution, enabling them to promote regeneration programmes in coordination with the Greater London Authority.

## Skills investment

According to the JLE Impact Study, there were no complementary policies to invest in skills (e.g. retraining local unemployed residents) alongside the scheme.<sup>65</sup>

### 4.4. SCHEME OUTPUTS AND ASSOCIATED OUTCOMES

#### 4.4.1. Passenger growth compared to original forecasts

Between 1998 and 2000, entries at JLE stations increased by 80 percent, compared with a reduction of 4 percent at other London Underground stations over the same period.<sup>75</sup> By 2004 the JLE carried over 158,000 passengers per day on the busiest section between Waterloo and Southwark, and more than 137,000 passengers per day on the section between Bermondsey and Canada Water.<sup>76</sup> It is estimated that in 2000 at least 3,273 private car trips per day were removed from the road network, implying that the JLE had a significant positive impact in reducing congestion, pollution and emissions arising from road transport.<sup>65</sup>

An early ‘re-appraisal’ of the JLE found that actual passenger volumes in 2000 were approximately 11 percent higher than forecast, at 430,000 passenger kilometres during the morning peak versus 390,000 in the Transport for London (TfL) Railplan model.<sup>77</sup> Figure 4-6 below shows the observed morning peak passenger flows for 2000 versus the forecast flows from TfL’s Railplan model. In general, the observed flows closely match the modelled flows. The most notable discrepancies are:

- flows lower than forecast eastbound between Westminster and London Bridge;
- flows higher than forecast eastbound between London Bridge and Stratford; and
- flows higher than forecast westbound between Canada Water and Green Park.

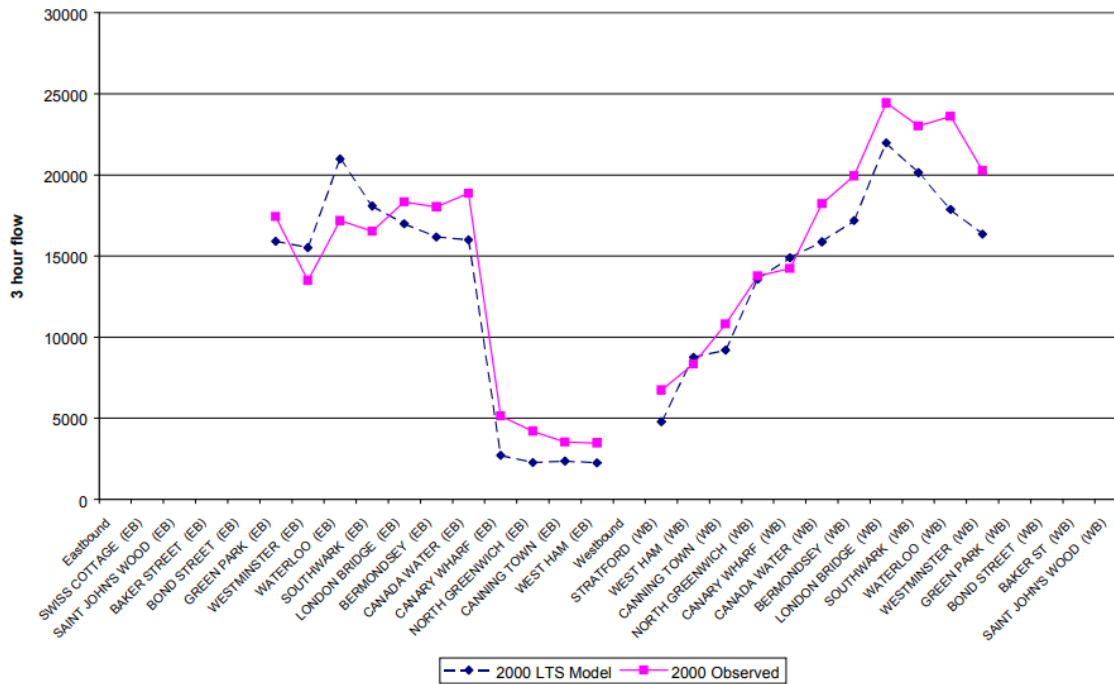
<sup>74</sup> Tim Pharoah, University of Westminster (2002) “Jubilee Line Extension Impact Study. Development Impact Study 2002. Task 2 UDP Policy update and review”

<sup>75</sup> Transport for London (December 2002) “Jubilee Line Impact Study – Transport Impacts Final Report”.

<sup>76</sup> Transport for London (2004) “The Jubilee Line Extension Impact Study: Main Findings and Lessons Learnt”.

<sup>77</sup> Colin Buchanan and Partners (December 2003) “Reappraisal of the Jubilee Line Extension”.

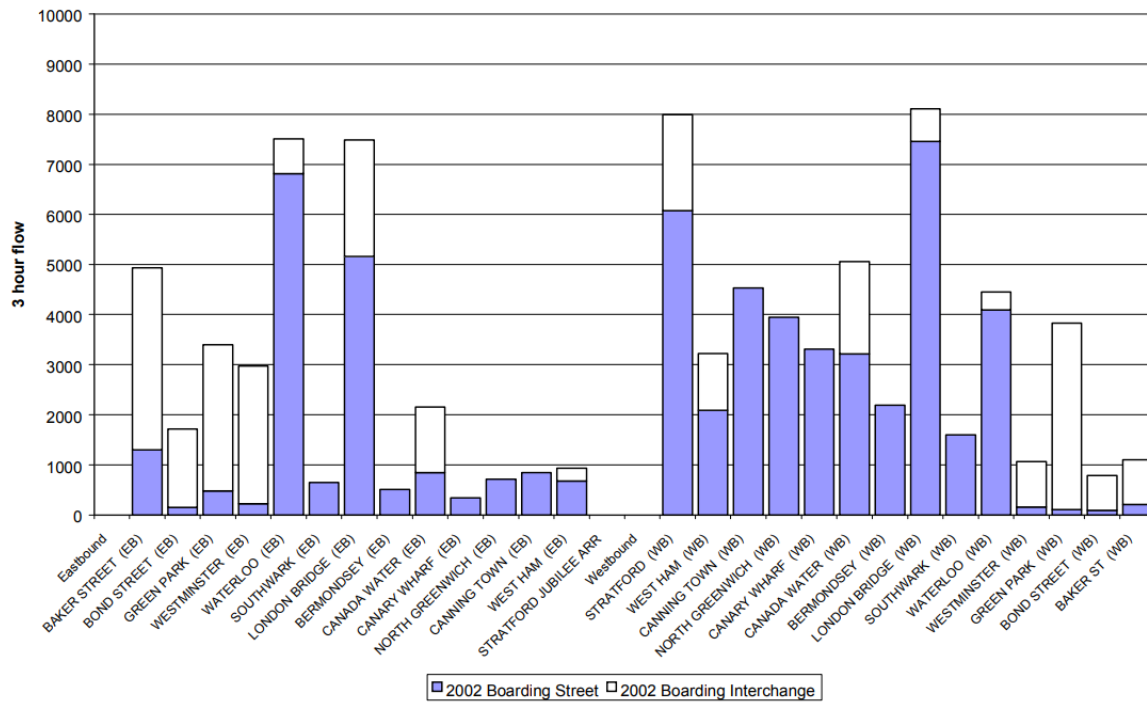
Figure 4-6: Morning peak flows (2000) observed versus Railplan model forecast



Source: Colin Buchanan and Partners (2011)

During the morning peak in 2002, the most heavily loaded sections of the JLE were between Canada Water and Canary Wharf eastbound, and between London Bridge and Westminster westbound.<sup>68</sup> Figure 4-7 below illustrates boardings at pre-existing (Baker Street to Green Park) and JLE station platforms for the morning peak in 2002, split by those boarding who entered the station from the street and those interchanging from another London Underground line. At National Rail stations, boarders counted from the street include those interchanging from National Rail services. The busiest station platforms were Waterloo and London Bridge (eastbound) and Stratford and London Bridge (westbound). This suggests that a significant proportion of morning peak patronage on the Jubilee Line consisted of commuters travelling in from outside of central London, given that Waterloo and London Bridge are major National Rail interchanges.

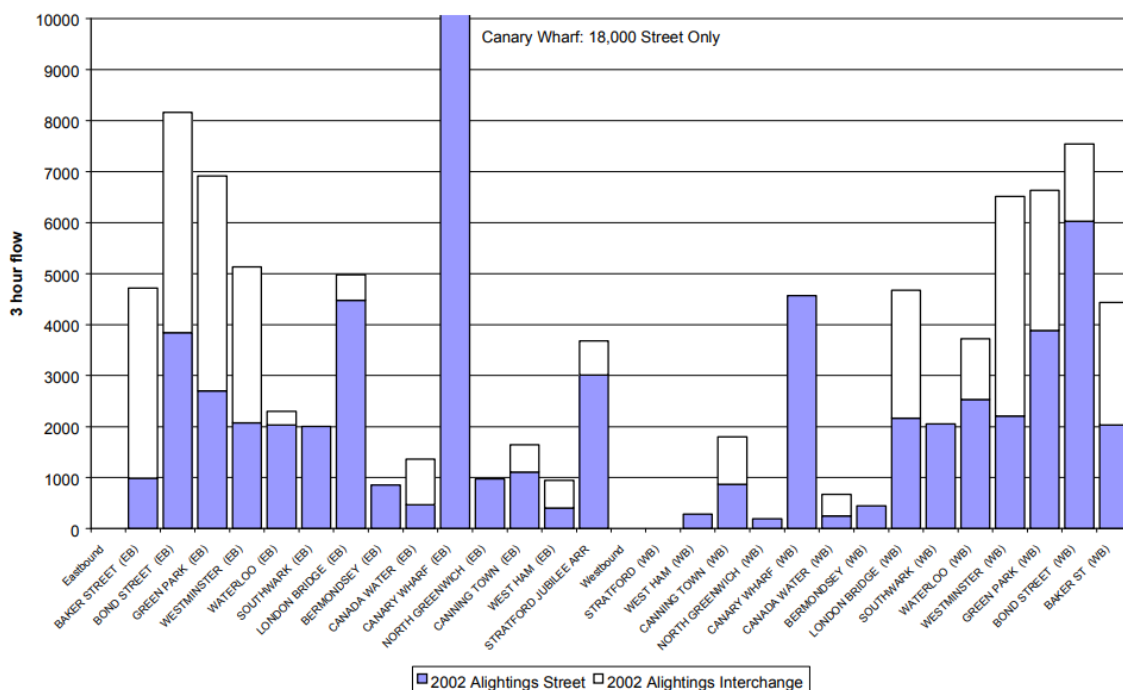
Figure 4-7: Morning peak boardings from street/mainline rail and London Underground interchange (2002)



Source: Colin Buchanan and Partners (2011)

Figure 4-8 below illustrates alighting from pre-existing (Baker Street to Green Park) and JLE station platforms, split by those alighting to street and those interchanging to other London Underground lines. Here, Canary Wharf stands out from the other stations – the numbers alighting from the Canary Wharf eastbound platform to street is three times higher than those alighting from the Bond Street westbound platform (the next highest figure). This reflects the close link between the JLE project and the Canary Wharf development, and the importance of the Canary Wharf station on the line.

Figure 4-8: Morning peak alighting to street and London Underground interchange



Source: Colin Buchanan and Partners (2011)

Modelling suggests that the JLE led to 3,000 trips transferring from car to public transport each day for the morning peak period. However, this change is marginal when compared to the effects of land use and economic changes, which were estimated to have resulted in an extra 137,000 trips being made on public transport each day in the morning peak period.<sup>76</sup>

#### **4.4.2. Impact of transport investment on economic outcomes**

##### **Population**

For the period 1981-1991, the JLE Corridor experienced marginally faster population growth than the Inner East London (IEL) reference area used in the Jubilee Line Extension Impact Study. For the period 1991-2001, significantly faster population growth was observed in the JLE Corridor, at 31.2 percent versus 10.7 percent in the IEL area. However, population growth varied throughout the JLE Corridor, being highest in the areas where the JLE provided access to the underground for the first time (i.e., between Bermondsey and Canning Town). The high level of vacant land available for residential development and the supportive policies of the LDDC may explain this growth, but the JLE “has clearly been a positive factor”.<sup>65</sup>

##### **Employment**

According to the JLE Impact Study, the JLE helped to integrate labour markets and provide wider access to jobs, as the extension brought an additional one million people within 60 minutes commuting distance of the average JLE station. North Greenwich, Canada Water and Bermondsey gained an extra two million people within 60 minutes commuting distance. There was a general perception by employers surveyed in the JLE Corridor that the JLE provided better integration into the regional rail-based transport network (enabling recruitment from a wider labour market) and helped to change the image of the area (aiding recruitment of higher calibre staff).<sup>65</sup>

Employment in the JLE Corridor increased by 15 percent from 373,000 in 1998 to 425,000 in 2000, versus 8 percent in Greater London as a whole. The JLE Corridor gained 32,400 more jobs in this period than it would have done had it followed the Greater London growth rate, or 15,800 more jobs than it would have done had it followed the Inner East London<sup>78</sup> (IEL) growth rate. Of the 32,400 additional jobs, 16,400 were estimated to be in financial and business services. An additional 30,000 jobs were created at Canary Wharf between 2000 and 2004.<sup>65</sup>

However, most of these new jobs appear to have been taken by migrants into the area. The incumbent local population, particularly in the Docklands and Lower Lea Valley areas made relatively little use of the JLE and their travel patterns were largely unaffected by the investment. The proportion of the *incumbent* population in employment remained unchanged following the opening of the JLE (50 percent before vs. 49 percent after), while employment among *in-movers* and *new-build occupants* increased by 19 and 34 percentage points, respectively.<sup>65</sup> There was no change in the location of employment among the *incumbent* population, where a relatively high proportion of residents (30 percent) continued to be employed locally.<sup>68</sup> There is little data available on the change in employment for each JLE station individually.<sup>65</sup>

Subsequent interviews in 2011 found that the JLE has created new business districts, but these are staffed from outside the local area, not by local people who have been upskilled to take advantage of these new jobs.<sup>79</sup> However, between 1998/1999 and 2000/2001, the proportion of incumbent residents in managerial, professional or technical occupations increased by 7 percentage points, from 28.3 percent to 35.5 percent, suggesting that the opening of the JLE may have enabled incumbent populations to move to more highly paid jobs.<sup>65</sup>

While the JLE appears to have assisted job creation in the area, there is less evidence that it helped to reduce unemployment in the immediate years after its opening. Between 1996 and 2001, recorded unemployment in the

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<sup>78</sup> The IEL area comprises the London Boroughs of Haringey, Islington, Hackney, Tower Hamlets, Newham, Greenwich, Lewisham, Southwark and Lambeth.

<sup>79</sup> Jones et al (2009) “Jubilee Line Extension 10 Years On: Scoping Study to Assess the Case for Carrying Out a Longer Term Impact Study”, Centre for Transport Studies, University College London.

JLE Corridor fell by 49 percent, compared to 54 percent for the IEL reference area and 58 percent for the whole of Greater London.<sup>65</sup>

Ward-level analysis of the number of jobs around each JLE station provides some insight into how the JLE may have had a varied impact on employment along the length of the line. Table 4-2 below illustrates the percentage change in the number of jobs in the wards surrounding each station between 1998 and 2001 along with the corresponding figure for the London borough in which the station is located, for comparison.<sup>80</sup> The data shows the wards surrounding Waterloo, Bermondsey, Canada Water, Canary Wharf and Stratford in particular experienced higher jobs growth relative to their borough’s growth rate, suggesting that these stations of the JLE in particular may be associated with beneficial employment impacts. However, the increase in jobs at Waterloo is likely to be related to other factors, given the area’s existing accessibility. Similarly, the increase in jobs at Stratford may be partly attributable to HS1. The decrease in jobs observed at North Greenwich is likely to be related to the timing of the construction of the Millennium Dome commencing in 1998 and the closure of the Millennium Exhibition at the Dome at the end of 2000.

Table 4-2: Change in jobs between 1998 and 2001 in the wards surrounding JLE stations and the JLE boroughs

Area	Station	Borough	Percent change in jobs (1998 to 2001)	
			Wards surrounding station	Borough
1	Westminster	Westminster	11%	6%
	Waterloo	Lambeth	48%	9%
	Southwark	Southwark	10%	12%
	London Bridge	Southwark	9%	12%
2	Bermondsey	Southwark	27%	12%
	Canada Water	Southwark	20%	12%
3	Canary Wharf	Tower Hamlets	133%	25%
4	North Greenwich	Greenwich	-14%	0%
5	Canning Town	Newham	17%	15%
	West Ham	Newham	6%	15%
6	Stratford	Newham	20%	15%

Source: CEPA analysis of Annual Business Inquiry data. Green cells indicate where the station-specific growth rate is higher than the borough-wide figure, red cells indicate where the station-specific growth rate is lower than the borough-wide figure.

## Firm entry

Analysis by Pogonyi et al. (2019) found that the JLE caused a significant increase in the number of local business units in areas within 750m of JLE stations, while areas 750m to 2000m away from JLE stations experienced a decrease in the number of local business units. This finding suggests that the JLE attracted firms to locate within walking distance (i.e. within 750m) of stations, and demonstrates the ‘agglomeration shadow’ phenomenon, where economic resources close to an economic ‘core’ are absorbed by the core.<sup>81</sup>

## Land value

There have been various studies examining the uplift in land values associated with the JLE, all of which have found that the JLE caused a significant increase in land values.

<sup>80</sup> The wards examined are the same as those in the Jubilee Line Extension Impact Study.

<sup>81</sup> Pogonyi et al. (2019) “Metros, agglomeration and firm productivity. Evidence from London” Imperial College London, available [online](#).



- Mitchell and Vickers (2003) estimate that the JLE resulted in residential land value uplift of £9bn, based on calculations for six stations (uplift at Canada Water was taken as an approximation for Canary Wharf and North Greenwich, while West Ham was used as an approximation for Canning Town and Stratford).<sup>82</sup> Their calculations are based on assuming that all land was in private residential use and does not account for the possibility that commercial land may have risen in value to a greater extent than residential land. According to their analysis, Southwark and Waterloo experienced the largest uplift, at £2.70bn and £2.18bn, respectively. The uplift estimated at Canada Water (and correspondingly Canary Wharf and North Greenwich) was only £43m in each area and taken to be insignificant.
- A separate study by Atisreal and Geofutures estimated that £2.1bn and £80m of property value uplift around Canary Wharf and Southwark stations, respectively, could be attributed directly to the JLE.<sup>83</sup>
- A study by KPMG and Savills found that the JLE produced land value uplifts of 52 percent relative to controls, for the period of December 1995 to December 2005. The effect of the JLE on land values was measured by comparing changes within a 0.5 km radius of each station with a control of 1km to 2km around each station.<sup>84</sup>

## Property prices

Gibbons and Machin (2003) found that residential house prices in the vicinity of stations on the Jubilee Line extension increased by 9.3 percent compared to places unaffected by the project.<sup>85</sup> Subsequent stakeholder interviews confirmed that house prices started to rise in parts of the London Borough Newham after the JLE opened. Stakeholders also reported that the JLE had a major positive impact on the Bermondsey property market by improving buyers' perception of the area and thus leading to higher prices.<sup>79</sup>

The increase in property prices would have benefited existing property owners within the JLE corridor. However, according to surveys conducted by the JLE Impact Study in 1998/1999 and 2000/2001, a relatively low proportion of residents owned the property they lived in, as shown by Table 4-3 below. This suggests that the increase in land values would not have benefited the majority of residents in the JLE corridor.<sup>65</sup>

Table 4-3: Proportion of residents in the JLE corridor owning property or buying with a mortgage.

Resident type	Year	Property owned or buying with mortgage
Incumbent (staying)	1998/1999	25.0%
Incumbent (out-moving)	1998/1999	25.2%
Incumbent (staying)	2000/2001	30.6%
In-moving	2000/2001	20.2%
New build	2000/2001	36.5%

Source: Jones et al. (2004) "The Jubilee Line Extension Impact Study: Main Findings and Lessons Learnt"

## Wages

There is limited information available on the impact of the JLE on wages in the area. However, between 1998/1999 and 2000/2001, the proportion of incumbent residents in managerial, professional or technical occupations

<sup>82</sup> Mitchell and Vickers (2003) "The Impact of the Jubilee Line Extension of the London Underground Rail Network on Land Values", Lincoln Institute of Land Policy Working Paper, available [online](#).

<sup>83</sup> Atisreal and Geofutures (2005) "Property value study – Assessing the change in values attributable to the Jubilee Line Extension".

<sup>84</sup> KPMG and Savills for Transport for London (February 2017) "Land value capture" available [online](#).

<sup>85</sup> Gibbons, S. and S. Machin, (2003) "Rail Access and House Prices, An Evaluation of the Wider Benefits of Transport Improvements, and Employment and Rail Access", reports for the Department of Transport.

increased by 7 percentage points, from 28.3 percent to 35.5 percent, suggesting that the opening of the JLE may have enabled incumbent populations to move to more highly paid jobs.<sup>65</sup>

## Productivity

Analysis by Pogonyi et al. (2019) suggests that the JLE caused a significant increase in value added (15 percent), mean firm productivity and the number of local business units in areas within 750m of JLE stations. Areas 750m to 1250m away from JLE stations experienced an increase in mean firm productivity but a decrease in the number of local business units, while areas 1250m to 2000m away experienced a decrease in the number of local business units but no change in mean firm productivity. These findings suggest that the JLE attracted firms to locate within walking distance (i.e. within 750m) of stations and caused an increase in productivity in the areas closest to the stations.<sup>81</sup>

## Housing

Analysis by the Jubilee Line Extension Impact Study found that the rate of housing construction in the JLE corridor more than doubled between the period 1991-1994 and 1994-2000, from 1,000 units per annum to 2,200 units per annum. However, it is difficult to attribute all of this growth to the JLE as fluctuations in the development market due to the recession of 1990-1991 meant that an upturn in development applications would have been expected after 1993 in any case. Nevertheless, it is likely that the JLE hastened the trend and without the JLE, development may have been of a different character and lower density.<sup>65</sup> Between 1997-1999, a disproportionately high volume of all residential development recorded in the IEL area, and the key JLE boroughs (Southwark, Tower Hamlets and Newham), was concentrated in the central sections of the JLE Corridor between Bermondsey and Canning Town.<sup>65,68</sup>

## Regeneration and development

As of 2004, the only major commercial development in the JLE Corridor was Canary Wharf, which itself was already an established development prior to the opening of the JLE. However, the capacity of the transport system had been a limiting factor in the development of Canary Wharf. The JLE increased transport capacity, “enabling an additional 12 million sq. ft. and a type, scale and density of development not possible without it.” By 2003, 50,000 jobs had been created or relocated to Canary Wharf. Without Canary Wharf, London might have found it harder to sustain its predominant financial position in Europe in the face of competition from other European capitals. By enabling Canary Wharf to be developed, the JLE has made a major contribution to the whole London and national economy.<sup>65</sup> Subsequent interviews with stakeholders suggested that development at Canary Wharf on the scale observed would not have been possible without the JLE, as there would not have been sufficient confidence to invest on that scale nor sufficient transport provision.<sup>79</sup>

It is worth highlighting that Canary Wharf in particular was a one-of-a-kind development that was heavily dependent on the contemporary contextual factors: growth in the global and UK economy, a lack of office space in London appropriate for the digital age, the presence of the LDDC to promote massive development and the advent of Olympia & York, who was willing to take on such a massive project. Furthermore, the original enterprise zone at Canary Wharf and subsequent development by the LDDC was widely criticised, in particular for its failure to address the concerns of existing communities in the Docklands area.<sup>86</sup>

Elsewhere along the route, the JLE has appeared to have the following impacts on development intensity:

- **Westminster:** The only development in response to the JLE was Portcullis House, constructed over the new station, as the area was already mostly ‘built out’ and had little opportunity for redevelopment.<sup>87</sup>

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<sup>86</sup> London Assembly (February 2015) “Regeneration Committee – 5 February 2015 – Transcript of Item 5 – The Royal Docks” available [online](#)

<sup>87</sup> Pharoah, T., (2003) “Jubilee Line Extension Development Impact Study” for Jubilee Line Extension Impact Study Unit, University of Westminster.

- **Waterloo:** Around the time of the JLE opening there were proposals for major property development at and around the station but given the existing accessibility of the area it is unlikely that the JLE was the prime cause.<sup>87</sup>
- **Southwark:** Following the JLE authorisation there was an increase in interest in residential development, but it is unlikely that the JLE was responsible, given that the area was an ‘up-and-coming location’ at the time due to other attractions, such as the Tate Modern.<sup>87</sup> But the JLE may have facilitated subsequent office development in the Blackfriars corridor near Southwark station.<sup>79</sup>
- **London Bridge:** The JLE was unlikely to have been a significant factor influencing development activity around London Bridge, as a shift in development activity as already apparent prior to JLE authorisation.<sup>87</sup> However, the existence of the JLE was attributed as a key factor in the later Shard development at London Bridge.<sup>79</sup>
- **Bermondsey:** The JLE brought significant improvements in accessibility to the Bermondsey area and thus can be credited with having had a notable and positive impact on residential development in the area.<sup>87</sup>
- **Canada Water:** Canada Water experienced residential development exploiting proximity to the JLE, with the timing of development closely linked to the opening of the JLE.<sup>87</sup>
- **North Greenwich:** Stakeholders agreed that the development of the Millennium Dome and the scale of planned development on the North Greenwich peninsula would not have been possible without the JLE.<sup>79</sup> The Jubilee Line Extension Impact Study concludes that “it is clear that the Dome would not have gone ahead without the JLE”, and that without the combination of available land and the access provided by the JLE, the Millennium Exhibition would likely have been held in Birmingham.<sup>65</sup>
- **Canning Town:** Analysis of the London Development Monitoring System revealed an increase in residential development activity following JLE authorisation, however most of this was at a considerable distance from the JLE station and is more likely to be related to the DLR. Examining the area immediately around the station, as of 2003 the JLE had had little development impact.<sup>87</sup>
- **West Ham:** At West Ham, there was little evidence of development activity taking advantage of the JLE as of 2003, potentially because much of the potential development land was poorly connected to the road network and existing services.<sup>87</sup>
- **Stratford:** Most of the development at Stratford can be attributed to the Channel Tunnel Rail Link (CTRL), but it can be argued that the JLE was influential in securing the CTRL station at Stratford and is, therefore, a contributory factor for the development.<sup>65</sup>

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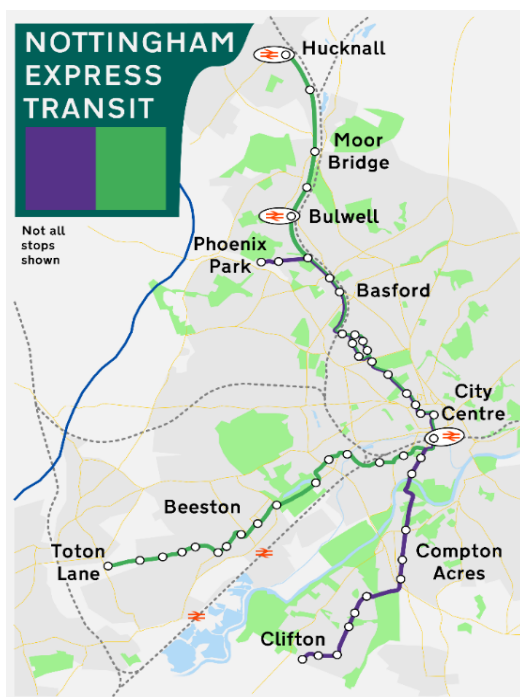
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## 5. NOTTINGHAM EXPRESS TRANSIT

### Summary of key messages

- The Nottingham Express Transit (NET) is considered a success due to its contribution to increasing accessibility and public transport usage. There is evidence that more than 30 percent of NET passengers switched from car to tram as their main mode of travel following Phase 2.
- The NET Line 1 and 2 corridors run through the city connecting residential and commercial sites in the North and Southwest to the city centre, giving residents increased access to job opportunities in the city centre.
- The NET benefited from implementation during a period of economic expansion and supporting policies promoting sustainable transport.
- There is a general consensus that the tram has contributed to an increase in property values along the Line 1 and 2 corridors. The tram connection has also been frequently used as a marketing tool for property and real estate developers.
- The scheme supported economic growth, although attribution solely to the scheme is challenging to assert. In general, the scheme has played an important role in lifting Nottingham's profile, which was one of its main aims at the outset.
- There is some evidence that the NET led to land use change of certain areas, through a sectoral change in the mix of businesses present, as well as ongoing developments.
- The NET Phase 2 had a positive impact on employment numbers across its 1 km catchment area. There are **signs** of a change in land use as the sectoral mix of the catchment area has changed significantly, in favour of 'other' sectors (non-retail, manufacturing, or business services), suggesting that the scheme may be transformational.
- **The key contextual factors relevant to this scheme are:**
  - Business cycle: both phases opened during a period of economic expansion.
  - Regeneration programme: the lines connected strategic development sites.
  - Quality of existing transport access: Nottingham has a well-connected bus network and several park and ride sites, which have supported the uptake of tram users.

Figure 5-1: Map of the NET network<sup>88</sup>



<sup>88</sup> By Rcsprinter123, available [online](#).

## 5.1. SCHEME SUMMARY

Scheme details	
<b>Scheme type:</b>	New light rail transport network and subsequent new route extensions
<b>Transformational impact:</b>	<p>There is evidence that the tram impacted connectivity and led to a significant change in land use which could be considered transformational, specifically:</p> <p><b>Residential impacts.</b> There is qualitative evidence that residential development has benefitted from the tram network through raised profile due to tram stop locations being in close proximity to residential developments. There is also evidence that house prices have increased along the route indicating that areas have become more attractive to buyers.</p> <p><b>Labour demand impacts.</b> The tram lines focus on connecting employment sites and there is some evidence that this has been effective. Employment numbers within 1km of Phase 2 tram stations have increased above that of comparable areas, suggesting that the NET Phase 2 has had a transformational impact.</p> <p><b>Sectoral impacts.</b> The tram lines connect commercial sites. There is evidence that this has encouraged investment and changes to business activity. Phase 2 has likely changed sectoral distribution within 1km of Phase 2 tram stations, favouring ‘other’ sectors (non-retail, manufacturing, or business services).</p>
<b>Mode:</b>	Light rail
<b>Region:</b>	East Midlands, England
<b>Responsible authority:</b>	Nottingham City Council
<b>Start of construction:</b>	Phase 1 – 2000 Phase 2 – 2012
<b>Opening date:</b>	Phase 1 – 2004 Phase 2 – 2015
<b>Approx. cost:</b>	Phase 1 – £220 million <sup>89 90</sup> Phase 2 – £570 million <sup>91</sup>

**Routes and areas served:** NET is a tram network in Nottingham that consists of two lines, Line 1 and 2, that run across the city, as well as serving the wider conurbation.

- Line 1 (green line on map above) is 14km long and goes between Hucknall in the north and Nottingham Railway Station, crossing the city.<sup>92</sup>
- Line 2 (purple line on map above), extends the tram network by 17.5km to the south and southwest of the city linking Nottingham Station to Chilwell via Queens Medicals Centre and Beeston and Clifton via Wilford.<sup>93</sup>

**Scheme objective:** The two phases have different primary focuses although they both have overlapping objectives. Phase 1 was predominantly about regeneration with an aim of connecting the north of Nottingham to the city centre to reduce congestion and stimulate regeneration.<sup>94</sup> Phase 2 shared the same objectives but had a focus on

<sup>89</sup> Railway Technology (2015) Nottingham Express Transit Light Rail Scheme, United Kingdom, available [online](#).

<sup>90</sup> These costs are current prices in the base price year.

<sup>91</sup> Infrastructure Intelligence (2015) Nottingham’s £570M tram extension opens. Available [online](#).

<sup>92</sup> Nottingham City Council (2011) Nottingham Express Transit (NET) Phase 2: FBC Annex A.

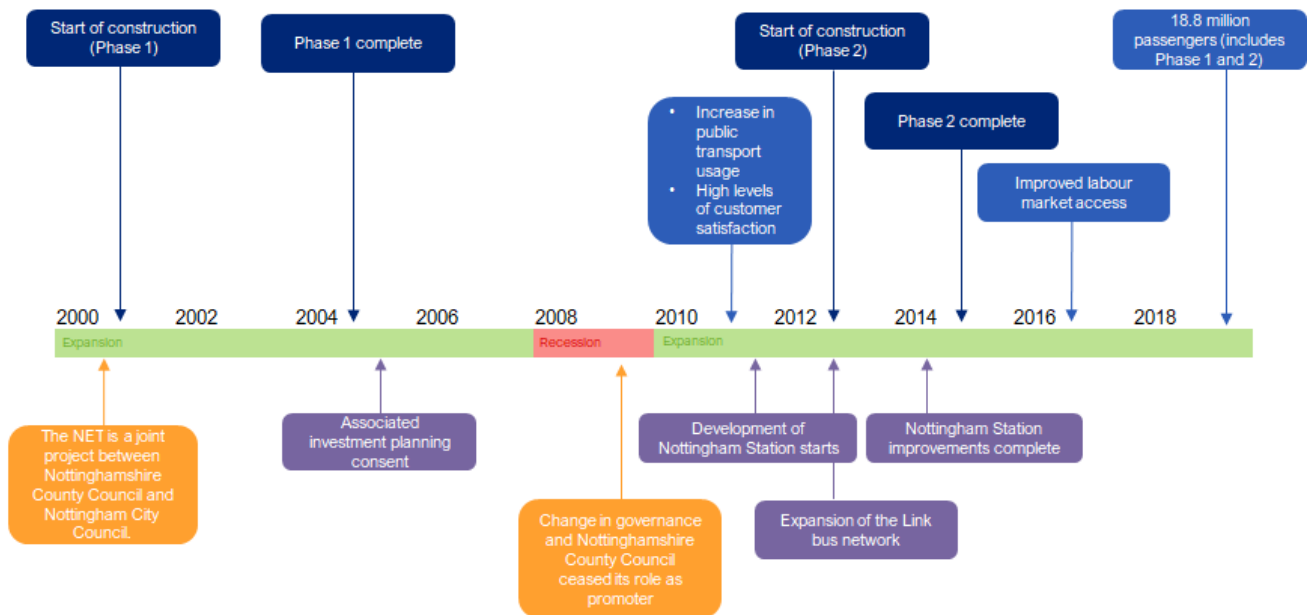
<sup>93</sup> NET (2017) NET Phase Two Monitoring and Evaluation – Year One Report.

<sup>94</sup> The Economic Strategy Research Bureau (ESRB) and Nottingham Business School (2016) NET Phase Two Local Economic Evaluation.



improving network integration, increasing public transport usage, and stimulating economic growth. See Figure 5-2 for a detailed timeline of key dates associated with the Nottingham Express Transit Scheme.

Figure 5-2: Timeline for Nottingham Express Transit



Legend	
<span style="display:inline-block; width:10px; height:10px; background-color:darkblue;"></span>	Scheme key dates
<span style="display:inline-block; width:10px; height:10px; background-color:blue;"></span>	Scheme outputs / outcomes
<span style="display:inline-block; width:10px; height:10px; background-color:purple;"></span>	Associated investments
<span style="display:inline-block; width:10px; height:10px; background-color:orange;"></span>	Changes in governance
<span style="display:inline-block; width:10px; height:10px; background-color:teal;"></span>	Major events

## 5.2. THEORY OF CHANGE

Figure 5-3 and Figure 5-4 below presents two logic maps articulating parts of the ToC for the NET scheme. The first logic map specifically considers transformational impacts that relate to changes in labour and consumer demand, while the second considers the transformation of residential locations.

**Inputs / Activities / Outputs.** NET consisted of the creation of new light rail links between Nottingham City Centre and areas to the north and southwest, and the creation of new tram stops along the routes. We would expect these new links to improve access between Nottingham city centre, the areas to the north and the areas to the southwest, benefitting the residents of these areas. We would also expect that the district town centres (such as Beeston) on the routes also benefit from the route, as do areas within the city centre that have been identified as regeneration sites.

**Outcomes / Impacts.** We have identified three channels through which the NET could have a transformational impact:

- **Labour demand, where the NET leads to changes in land use that make existing employment centres more productive.** We anticipate that NET will have led to the extension of the labour market catchment for employment centres located on either of the two routes, namely Nottingham city centre and the university and hospital district just to the southwest of the city centre. Existing residents of north Nottingham and southwest Nottingham may be able to move to jobs in these employment centres where they can be more productive, increasing the average wage and reducing unemployment. In addition, or alternatively, these areas may attract new residents who would otherwise have chosen jobs outside the region. Both these effects also increase the employment density of the employment centres, further improving productivity through agglomeration externalities. However, existing firms outside these employment centres may find it more challenging to retain staff and be crowded out by firms elsewhere that are able to offer higher salaries.
- **Residential demand, where NET leads to changes in land use that allows for more intensive use of residential areas.** We anticipate that NET would increase the attractiveness of neighbourhoods on the two routes with relatively cheap housing stock or cheap land to develop new housing. This may lead to residents moving from outside the Nottingham region into these neighbourhoods, or from elsewhere in the region into these neighbourhoods. We consider this second effect is especially likely to be the case if the wider region has housing shortages (i.e. there exists a latent demand for housing).

This could induce developers to invest in new housing stock, increasing residential density and creating demand for businesses that provide services for the new residents. However, if new housing stock is not developed, existing residents of an area may be displaced by incoming residents.

- **Consumer demand, where NET leads to land use change that regenerates areas for commercial, retail or leisure purposes.** For areas that have regeneration potential (e.g. under developed or under-utilised land), the NET may extend the labour market catchment or the customer catchment. The improved transport access to these locations may induce further investments to encourage firms to locate there, such as investments in new or more suitable premises. This may in turn provide improved employment options for nearby residents and, on the case of town centres, lead to an improved sense of pride in the local area.

**Contexts.** As with many other schemes, a key contextual factor is the quality of existing transport access. We note that prior to the introduction of NET, Nottingham had a well-regarded bus network and a culture of public transport use.

We also consider the contextual factors introduced in the Manchester Metrolink ToC to also be relevant in the NET context, namely complementary policies to support upskilling or job matching of residents of north Nottingham, investments in housing, and latent demand for housing and commercial real estate.

Figure 5-3: NET - Consumer and labour demand impacts

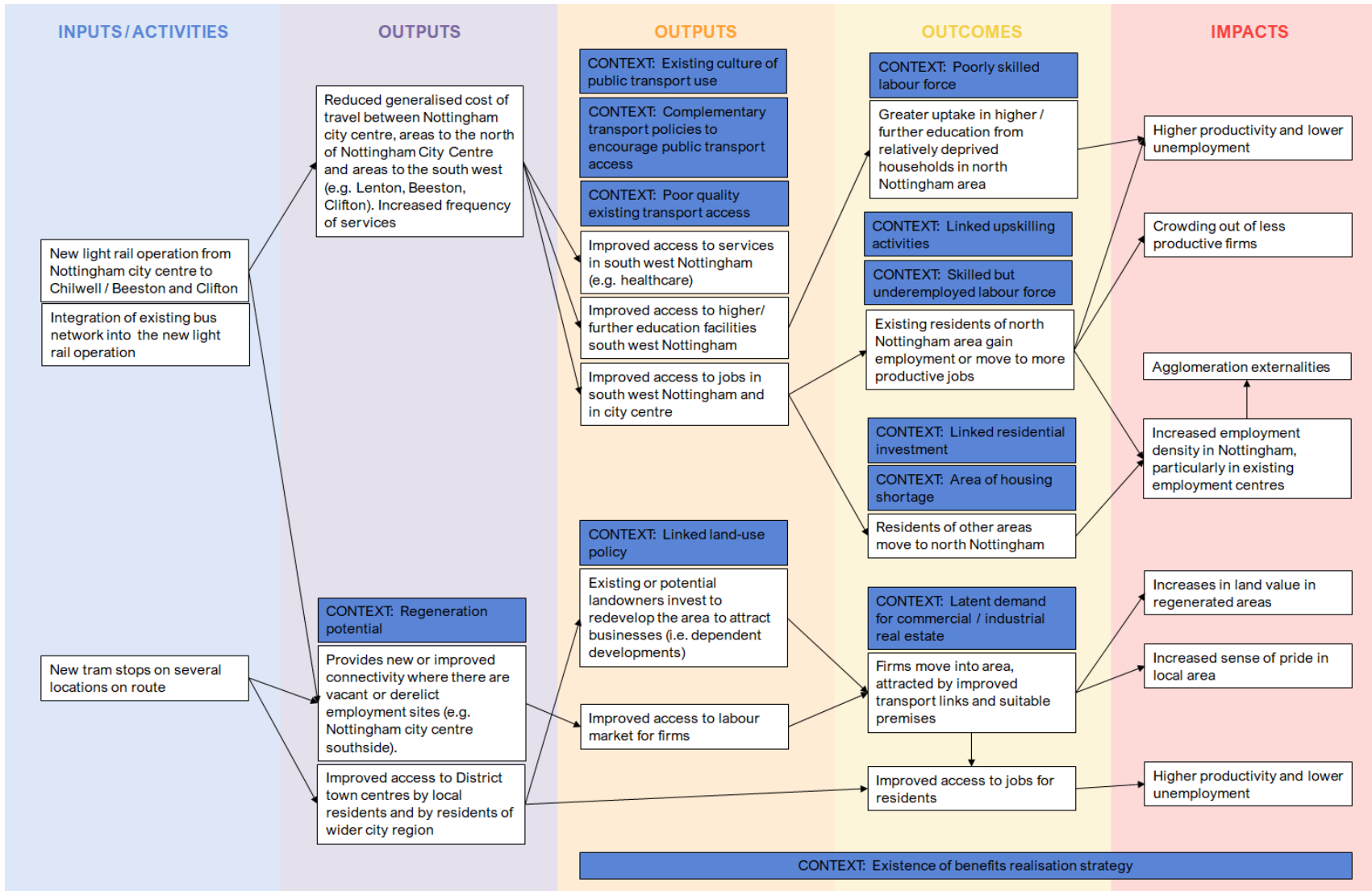
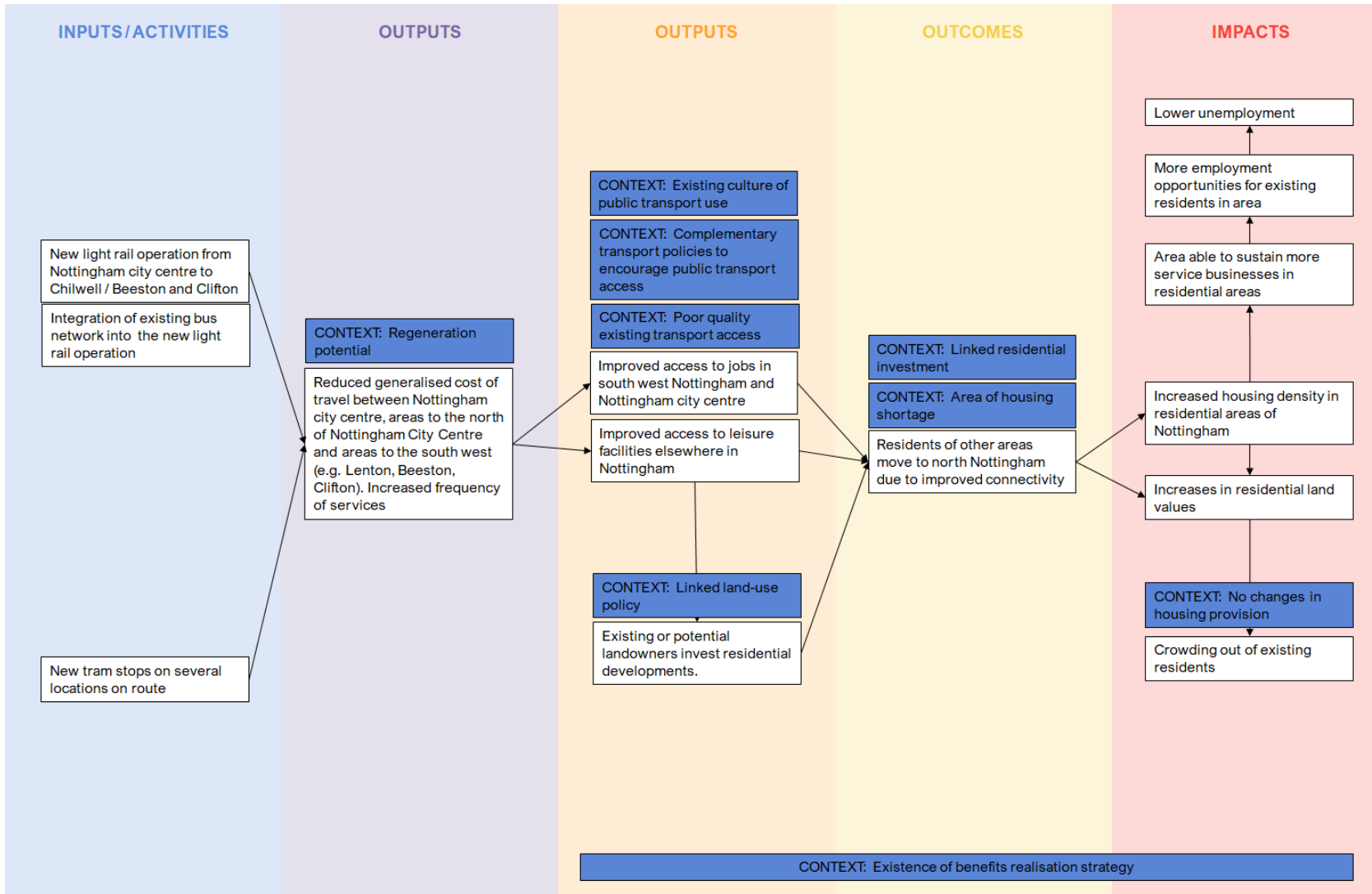


Figure 5-4: NET – Residential impacts



### 5.3. SURROUNDING CONTEXT

Based on the latest available data, Nottingham has approximately 9,300 businesses<sup>95</sup> and about 198,000 jobs<sup>96</sup>. These numbers have grown steadily, with an increase in knowledge intensive sectors. The city centre has a high number of commuters, with many highly skilled workers living in residential areas outside of the city centre, while residents living in the city centre are generally lower paid.

The NET Phase 1 opened in 2004, a time when Nottingham was experiencing a high level of population growth, as well as increasing congestion pressure. Nottingham, being a growing commercial and employment centre, was in need of a high capacity transport scheme that could increase connectivity to the city centre.

Phase 2 aimed to follow up on the success of Phase 1 and build on its strategic transport and economic benefits. Phase 2 was planned during poor economic conditions due to the 2008/9 recession, and Nottingham was especially hard hit with a significant decrease in employment. However, Line 2 opened in 2015 when economic recovery was underway.

Both Phase 1 and 2 were built alongside other significant investments across Nottingham and were implemented to support regeneration. Line 1 linked the redevelopment of Southside, the Broadmarsh Centre, the Canalside, the Lace Market area, and the Ice Arena and the Island Street Site.<sup>97</sup> These include commercial and residential developments. Between 2001 and 2005, the number of planning applications for residential developments that consisted of 10 dwellings or more was 2.6 times higher across the NET Line 1 corridor than in the study's control area (63 against 24 planning applications). For industrial, retail, and other major non-residential developments, there was no material difference between developments across the NET Line 1 corridor and the control area.<sup>98</sup>

Line 2 is close to three main regeneration zones that surround the city centre and links the city centre with Beeston and Clifton, supporting their neighbourhood transformation strategies. The aim was to provide a focus for development and regeneration across the Line 2 tram stops. The Line 2 corridor was designed to link residential areas with large employment centres. Research by the County Council found that more than 600 employers were located within 800 metres of tram stops across Beeston and Chilwell.<sup>99</sup> Overall, both Line 1 and 2 connected strategic locations that would integrate with the wider transport network and add economic benefits.

#### 5.3.1. Characteristics of the area at time of investment

##### Business cycle

Transport demand is usually connected to how the economy is performing, with a growing economy being linked to an increasing transport demand. Both the NET Phase 1 and 2 opened during a period of economic growth. Notably, Phase 2 occurred in a period when Nottingham's economy was recovering, having experienced a significant decrease in employment following the 2008 financial crisis.

##### Quality of existing transport access

Although the NET did improve accessibility, there was already a well-connected bus network in Nottingham that benefitted from increased transport connections provided by the NET. The bus network complements the tram corridor, as it provides routes from the city centre to areas outside of the centre of Nottingham, while the tram goes across the city.

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<sup>95</sup> ONS (2020) UK Business: Activity, Size and Location – 2020, available [online](#)

<sup>96</sup> ONS (2019) Business Register and Employment Survey, available [online](#)

<sup>97</sup> Nottingham City Council and Nottinghamshire County Council (2000) NET: Full Business Case.

<sup>98</sup> Stuart Northall and Mott MacDonald (2014) Improving the political case for transport investment: an ex-post evaluation of the external economic benefits of the Nottingham Express Transit LRT Scheme, available [online](#)

<sup>99</sup> Nottingham City Council (2011) NET Phase 2: Full Business Case.

Moreover, there are several Park and Ride sites that accommodate those who drive to use the tram, which has made it more attractive for car users to use the tram. These networks complement one another by increasing connectivity across the city centre and surrounding areas.

## **Housing**

House prices are considered to be relatively affordable in Nottingham as supply has been able to keep pace with increasing demand in the city. The city has an ambitious target of building 50,000 new homes in the next decade which is being planned alongside future extensions of the NET. The tram network is seen as a solution to the intergenerational housing problem: mostly young and old people live in the city centre as families have been moving out to the suburbs and surrounding satellite towns. The development of the network opens up new areas for development increasing the housing supply suitable for families.

## **Commercial development**

We have found no evidence that latent demand exists or existed in Nottingham for commercial development. Most retail areas had low vacancy rates prior to the opening of the NET and Nottingham has also been proud of its vibrant night life. A particular focus of the NET was to help the pedestrianisation of the city centre, allowing car drivers to leave their vehicles at the edge of the city in Park and Ride facilities and then taking the tram to reach the centre.

## **Regeneration potential**

The South Side regeneration area in the city centre had much regeneration potential with the Broad Marsh Shopping Centre struggling for years prior to the opening of the tram network. The council has been developing and executing plans to regenerate this area using various state funds and building new university facilities.

## **Underutilised skills**

We have not found evidence to suggest that Nottingham has “underutilised skills”, i.e. that there is skilled local labour sub-optimally allocated to low productivity industries.

### **5.3.2. Associated activities and actions alongside transport investment**

#### **Benefits realisation**

There was no overarching benefit realisation plan developed for the NET, its main objective was to alleviate congestion in the city centre which was hampering economic performance. The development of the NET was accompanied by a workplace parking levy which charged companies with more than nine parking places. The levy helped increase public transport passenger numbers and its revenues helped to fund the scheme. In addition, Nottingham’s mainline railway station was also redeveloped and new electric buses were purchased to provide a higher quality experience for public transport users.

#### **Unlocking development**

While there was no formal benefits realisation plan in place, the local government took the opportunity presented by the NET to unlock new land for development. The Western extension of the NET connected the city centre with the NG2 business park, the Queens Medical Centre (the largest hospital in Nottingham) and Nottingham University, which created more opportunities for development. The NET potentially helped to bring in new businesses to the business park, the expansion of the university and the opening of HMRC’s Unity Square redevelopment which houses government agencies.

#### **Regeneration programme**

Transport projects that are implemented in conjunction with regeneration programmes, such as residential or commercial developments, often benefit as these also facilitate investment and increase demand for transport rather than solely relying on transport improvements.



The aim of the tram network was to link areas across Nottingham with the city centre. Both phases identified growing residential and employment centres, ensuring that Line 1 and 2 corridors connected strategic areas that would benefit from increased connectivity. In a qualitative study it was found that development sites along the Line 2 corridor had strong interest before the line opened, but we found no evidence of changing land policy.<sup>100</sup>

## Skills investment

One of the main objectives of NET Phase 2 was to support economic vitality in the city centre, as well as throughout the NET corridors, which also entailed upskilling the local workforce. The Nottingham City Council’s Employer Hub, Job Centre Plus, local Further Education providers and Tramlink consortium members collaborated to deliver training, local recruitment programmes, apprenticeships, and work experience programmes.<sup>101</sup> The year one evaluation following Phase 2 states that up to 1,600 people were directly employed through the construction works and that there was a focus on upskilling and employing the local workforce.<sup>102</sup> Approximately 80 candidates attained a NVQ level 1, and about 50 candidates gained accreditations that were transferable for other future employment. Overall, there was a focus on recruiting and training local people through various programmes to ensure that the NET contributed in addressing social inclusion in Nottingham.<sup>101</sup>

## 5.4. SCHEME OUTPUTS, OUTCOMES, AND IMPACTS

### Primary analysis

Analysis of employment impacts following the NET Phase 2 opening in 2015 suggest that the NET Phase 2 has had a positive impact on employment numbers across a 1 km catchment area around each station suggesting that the project was an overall economic success. There are also signs of significant change in land use as the sectoral mix of the catchment area has changed significantly, favouring ‘other’ sectors most of all (‘other’ sectors include public administration and defence, education, health, transport, mining, and agriculture). The opening of the line coincided with a redrawing of geographical areas in the centre of Nottingham which makes it challenging to identify the specific impact of the NET. However, based on this analysis, we consider that NET Phase 2 was likely a transformational project.

Table 5-1: Change in employment (BRES)<sup>103</sup>

NET within 1km of Phase 2 stations	Average before 2009-2014	Average after 2016-2019	% difference
Total employment (count)	72,973	122,390	68%
Share of retail (%)	18%	20%	2%
Share of manufacturing (%)	10%	8%	-2%
Share of business services (%)	43%	33%	-10%
Share of other (%)	28%	40%	12%

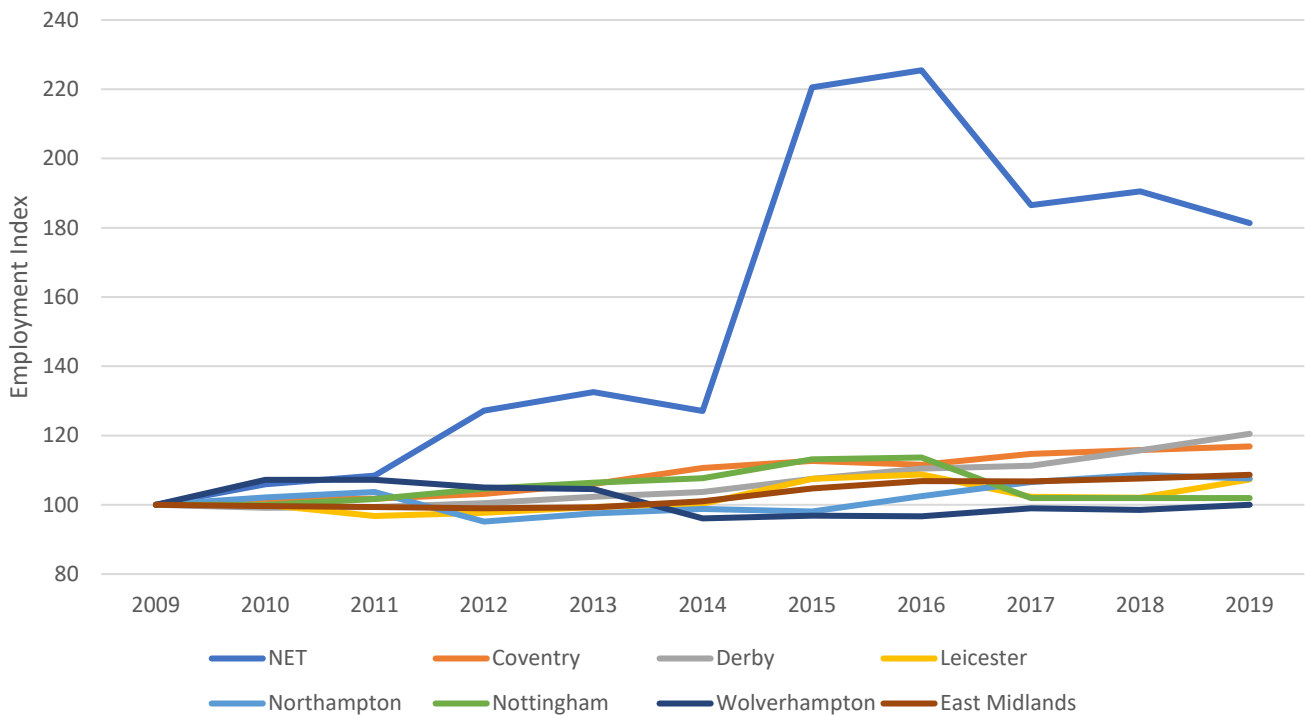
<sup>100</sup> NDE (2007) Economic Regeneration Impact of Line 1 of NET: A qualitative survey of development activity.

<sup>101</sup> The Economic Strategy Research Bureau, Nottingham Business School (2016) NET Phase Two Local Economic Evaluation.

<sup>102</sup> NET (2017) NET Phase Two Monitoring and Evaluation – Year One Report.

<sup>103</sup> ONS (2020) Business Register and Employment Survey.

Figure 5-5: Total Employment across comparable areas (100 = 2009)



Note: This analysis examined employment numbers<sup>104</sup> within 1km of NET Phase 2 tram stations across retail, manufacturing, business services, and ‘other’ (which consists of public administration and defence, education, health, transport, wholesale, mining, and agriculture).

### Accessibility / Connectivity

One of the primary objectives for both Phase 1 and 2 of the NET has been to increase public transport provision to enhance accessibility across Nottingham. There has been a focus on connecting key employment and residential sites, which has contributed to an increase in passenger growth across the transport network. Line 2 doubled Line 1’s passenger demand and revenues, and increased public transport capacity by approximately 20 percent, on opening. There is also evidence that more than 30 percent of passengers switched from car to tram as their main mode of travel following Phase 2.<sup>105</sup>

Factors that are considered to have contributed to the NET’s success include:

- **Frequent services.** The NET offers frequent services between 6:00am to 11:00pm every day, every 5 -7 minutes during peak hours, and 10-15 minutes off-peak.<sup>106</sup>
- **Route and connection to strategic commercial and residential sites.** The tram route and stops have been located according to strategic sites. Line 1 links the north-west of Nottingham to the city centre, with the business case stating that there were over 70 recently completed, active, or planned development sites within the NET corridor. The route runs from the north of Nottingham Station through the city centre to Phoenix Park and Hucknall, with specific sites including the retail space, Broadmarsh Centre, and the employment sites, Irwin Business Centre and Amber Business Park.<sup>107</sup> Line 2 serves the south western area towards Chilwell and Clifton. These include residential areas and employment sites such as the

<sup>104</sup> Using the Business Register and Employment Survey by the Office for National Statistics (ONS), which uses workplace employment numbers.

<sup>105</sup> NET (2017) NET Phase Two Monitoring and Evaluation – Year One Report.

<sup>106</sup> NET (2021) Timetable and Frequency, available [online](#).

<sup>107</sup> NDE (2007) Economic Regeneration Impact of Line 1 of NET: A qualitative survey of development activity.

Queens Medical Centre, NG2 Business Park, University of Nottingham, Highfields Science Park, the Southside and the Nottingham and South Wilford Industrial Estate.

- **Integration with existing public transport modes.** Both line 1 and 2 connect with other rail and bus links to enhance accessibility across Nottingham. Several bus connections are in close proximity to the tram stops and Hucknall, Bulwell, and Nottingham Station connect to a railway station. These connections increase connectivity, which are accompanied by the Robin Hood ticket, which allows for unlimited travel on buses, trams, and trains within Nottingham.<sup>108</sup>
- **Easing traffic congestion.** Light rail is often recognised as a good measure of easing traffic congestion, which often increases due to urbanisation. An online survey of property developers across Nottingham found that light rail's ability to reduce congestion and bypass traffic is one of the greatest contributors in increasing housing prices across tram stops.
- **Complementary policies:** Importantly, Nottingham has a Local Transport Plan, which sets out the plans for pedestrianisation of the city centre and policies that favour pedestrians, cyclists, and public transport users in general.<sup>109</sup> Overall, Nottingham has promoted sustainable travel, and this played an important role in encouraging public transport usage. The Workplace Parking Levy (WPL) has also been an important contributing factor to the scheme's success as this enabled Nottingham City Council to fund its part of the scheme.<sup>110</sup>

#### **5.4.1. Passenger growth compared to original forecasts**

The NET has contributed to modal shift and a higher number of passenger journeys since being implemented. However, as outlined above, it has not achieved its forecasted annual patronage as outlined in the Full Business Case for Phase 2.

This may be a reflection of underlying issues with the transport modelling and inappropriate assumptions on travel behaviour.

#### **5.4.2. Impact of transport investment on economic outcomes**

##### **Population**

There is little evidence on whether the NET has contributed to a movement in population. However, considering both lines have coincided with a rise in residential developments across the NET corridors it is likely that there has been some effect. Overall, there has been an increase in transport demand.

##### **Employment**

Between 2010 and 2020, Nottingham experienced an employment growth of 13 percent marginally above the UK average of 11 percent.<sup>111</sup> Although it is challenging attributing a part of this employment growth to the NET, previous research has found evidence linking the tram system to an increase in employment. An ex-post evaluation of NET Phase 1 by Mott MacDonald, found that employment increased by 11.6 percent within 400m of stations, significantly higher than the 1.9 percent employment increase in the control area.<sup>112</sup> This study also found a decrease in Jobseekers Claimants of 2.5 percent, higher than the 0.7 percent decrease found in the control area.<sup>113</sup>

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<sup>108</sup> NET (2021) Connecting bus services, available [online](#).

<sup>109</sup> Nottingham City Council (2011) Nottingham Local Transport Plan: Strategy 2011 – 2026, available [online](#).

<sup>110</sup> Nottingham City Council (2011) NET Phase 2: Full Business Case.

<sup>111</sup> ONS (2020) Annual Population Survey: Workplace Analysis, available [online](#).

<sup>112</sup> This analysis is done on workplace employment, i.e. the number of employees working within 400m of a NET Phase 1 station.

<sup>113</sup> Stuart Northall and Mott MacDonald (2014) Improving the political case for transport investment: an ex-post evaluation of the external economic benefits of the Nottingham Express Transit LRT Scheme, available [online](#).

Although it is likely that the NET has contributed to labour market growth, it is unlikely to be the only contributing factor.

The NET Phase 2's Year One Evaluation Report concluded that the NET improved Nottingham's labour market supply through improved accessibility. This is especially true in the case of those mobility impaired, of which 50 percent suggested that changing their workplace would have been impractical without the presence of the tram stations from NET Phase 2.<sup>114</sup>

Our primary analysis, suggests that NET Phase 2 has had a positive impact on employment numbers within 1km of Phase 2 tram stations.<sup>115</sup> As seen in Table 5-1, average employment increased by 68 percent between the pre-opening and post-opening period. This large increase in employment is at least in part likely to be the result of the NET; however, it is important to caveat that the 2015 redrawing of geographical boundaries across the country led to many areas changing shape and population size in the centre of Nottingham. Figure 5-5 shows that the NET catchment area was also performing better prior to the opening, and the opening (and redrawing of geographical areas) increased employment growth. A more in-depth and granular analysis is needed to create spatially consistent catchment areas around the NET stations to provide firm evidence of the impact of the opening.

## **Firm entry**

In terms of business movement and change, there is some anecdotal evidence that there has been an increase in businesses around certain tram stops and a change in the sectoral mix of businesses (see below under 'regeneration and development'). This appears to be especially prominent in areas across the city centre and the South Side Regeneration Area. Other district centres that have done well are Clifton, Beeston, and Hyson Green.<sup>116</sup>

The primary analysis suggests that Phase 2 has had an impact on the sectoral distribution of businesses within 1km of Phase 2 tram stations. We see the greatest positive change to 'other' (non-retail, manufacturing, or business services), while business services appear to have had the greatest decline to its share of total employment.

## **Land value and property prices**

One study found that the average property price increased by 5.1 percent within 1000m of Line 1 tram stops.<sup>117</sup> Another study confirmed that the average price paid per property along the NET Line 1 corridor increased at a higher rate than found across Nottingham.<sup>118</sup> Although, it is difficult to attribute the property price rise to the NET, there is a variety of sources that acknowledge that the NET has contributed to a raise in profile of residential properties. One qualitative study of Phase 1 stated that it was likely that the tram added a "few percentage points" to the property values along the NET Line 1 corridor.<sup>119</sup>

The NET is considered a success across the economic outcomes relating to employment, productivity, housing, and property value. Nevertheless, it is important to acknowledge that Nottingham has experienced population and infrastructure development growth, which is likely to have had an impact on the level of change in economic outcomes.

## **Wages and Productivity**

We found no evidence in studies on the impact of NET on wages or productivity.

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<sup>114</sup> NET (2017) NET Phase Two Monitoring and Evaluation – Year One Report.

<sup>115</sup> This analysis uses data from the BRES, which uses workplace employment numbers.

<sup>116</sup> This is information based on interviews with representatives from Nottingham City Council.

<sup>117</sup> Stuart Northall and Mott MacDonald (2014) Improving the political case for transport investment: an ex-post evaluation of the external economic benefits of the Nottingham Express Transit LRT Scheme. Available [online](#).

<sup>118</sup> Arup (undated) Evaluating the impact of light rail on urban gentrification: quantitative evidence from Nottingham's NET.

<sup>119</sup> NDE (2007) Economic Regeneration Impact of Line 1 of NET: A qualitative survey of development activity.

## Housing

The NET tram stops have been located to align with the location of residential and commercial development to ensure that both lines enhance connectivity across Nottingham. Land use policies, in terms of how sites come forward in local plans, appear to be important. Line 2 especially was designed to support neighbourhood transformational strategies and therefore links key residential areas across the Southwest of Nottingham.<sup>110</sup> For example, Beeston have plans for increasing housing,<sup>120</sup> and Clifton also has ongoing housing development plans.<sup>121</sup>

Moreover, both Line 1 and 2 have been used to promote residential properties as a marketing tool. Although, robust evidence is difficult to identify, it is acknowledged across the literature that the tram system has influenced property developers' views on potential sites and encouraged further housing development across the city.<sup>107</sup>

## Regeneration and development

Nottingham is one of the fastest growing cities in the UK, with significant employment and transport demand growth. This has led to development of residential and commercial spaces across the city. For example, Beeston, one of the largest satellite towns, has experienced major development since 2015. Since the NET Line 1 opened in 2015, the square in the Beeston Town Centre was refurbished to create a stronger retail and shopping centre and promote the night-time economy.<sup>122</sup> This formed part of a Masterplan, of which one of the objectives was to 'promote the development of a high-quality tram interchange to provide a high-quality gateway for people accessing the town centre by public transport'.<sup>123</sup> Broxtowe Borough Council is continuing this development, and new flats, and new food and drinks outlets are currently in construction.<sup>122</sup>

Another development site that has grown significantly is NG2 Business Park. This used to be a brownfield site on the edge of the City Centre and accommodates for 800,000 sq. ft. of office, retail, and leisure uses.<sup>124</sup> It opened in 2006, and has since used its tram connections to increase occupier interest.<sup>125</sup>

Until recently there were ambitious plans to develop the area around Toton, located south west of Nottingham's city centre, as part of the East Midlands HS2 Growth Strategy. Toton was the location of a proposed HS2 Hub Station, which will not be required for the revised HS2 East route.<sup>126</sup> The tram extension, NET Phase 3, which is currently being planned,<sup>127</sup> was also a key element of the connectivity strategy for the HS2 Hub Station. Despite revised plans for HS2, the local area is committed to progressing major development. The creation of the East Midlands Development Company<sup>128</sup> to oversee the development across the local area demonstrates the local government's commitment to transform the wider region. The tram extension plays a key role in maximising the economic benefits to the wider area.<sup>129</sup>

## 5.5. SOURCES

Arup (undated) Evaluating the impact of light rail on urban gentrification: quantitative evidence from Nottingham's NET.

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<sup>120</sup> Broxtowe Borough Council (2015) Housing Strategy 2020 – 2024, available [online](#).

<sup>121</sup> Nottingham Post (2021) Plans to build 3,000 homes near Clifton move closer as developers agree 250-acre land deal, available [online](#).

<sup>122</sup> Broxtowe Borough Council (2021) Beeston. *Town Centres*, available [online](#).

<sup>123</sup> Broxtowe Borough Council (2008) Beeston Town Centre Plan, available: [online](#).

<sup>124</sup> Maber (undated) ng2 Business Park, available [online](#).

<sup>125</sup> NDE Consultants (2007) Economic Regeneration Impact of Line 1 of NET.

<sup>126</sup> DfT (November 2021) Integrated Rail Plan for the North and Midlands, available [online](#).

<sup>127</sup> The Nottingham Post (2020) Plans for two tram extensions and a whole new line take major step forward, available [online](#).

<sup>128</sup> Midlands Engine (2021) East Midlands Development Corporation submits business case to Government, available [online](#).

<sup>129</sup> East Midlands Council (2017) East Midlands HS2 Growth Strategy, available [online](#)

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## 6. HIGH SPEED 1

### Summary of key messages

- High Speed 1 (HS1) delivered significant reductions in direct journey times for domestic routes, which has made places like Ebbsfleet, Ashford and Canterbury more attractive commuter locations.
- HS1 was the original catalyst for the ongoing regeneration of Kings Cross, St Pancras and the surrounding areas. However, rather than the transport outputs of HS1 that solely achieving this transformation, it is more likely to be a combination of factors around London's economy, the scale of the development opportunity, and the coherent public-private vision for regeneration.
- Outside London, the economic impacts of the project appear to have been more limited. Post-opening studies which considered the time period after the full route opening are affected by the 2008-09 financial crisis and, as a result, find that the full extent of benefits that HS1 could have delivered may not have been realised.
- The Ebbsfleet experience shows that new large-scale developments (including new towns) may require a coordinating public body with powers and levers to generate momentum amongst private actors (~2,500 homes competed so far out of an ambition for 15,000), and to ensure that development is of the right quality and nature to make it an attractive proposition for in-migrants.
- **The key contextual factors relevant to this scheme are:**
  - Business cycle: Domestic services started in the aftermath of the 2008-09 recession and against the backdrop of a slow recovery. This is likely to have masked some of the impacts of the scheme, particularly on employment growth, and on housing and business investment activity in areas outside of London.
  - Housing affordability: Strong demand and associated affordability pressures in London created the right incentives for property developers to build new housing around Kings Cross and Stratford stations, although this was not sufficient to meet the ambition for housebuilding around Ebbsfleet.
  - Regeneration potential: Large areas of land around Kings Cross and Stratford were ripe for redevelopment and regeneration, and this this was made possible by London's continuing economic growth and the successful bid for the 2012 Olympic Games.
  - Unlocking development: The new station at Ebbsfleet was meant to help support 15,000 new homes at Ebbsfleet, but the associated land use policies and enabling institutions (i.e. a funded Ebbsfleet Development Corporation) were not put in place until several years after HS1 was completed.

### 6.1. SCHEME SUMMARY

Background information	
<b>Scheme type:</b>	High speed rail line
<b>Type of transformational impact planned:</b>	Residential impacts; Labour demand impacts; Consumer demand impacts; Industrial and freight impacts.
<b>Location:</b>	London and Kent, South East
<b>Geography:</b>	Inter-city
<b>Promoter:</b>	Department for Transport
<b>Start of construction:</b>	1998
<b>Opening date:</b>	2009

<b>Cost:</b>	£5.7bn for HS1 and £1.6bn to operate additional commuter services (2008 prices) <sup>130</sup>
<b>Sources of funding:</b>	Direct government grant, commercial debt and LCR bond issuance.

HS1 is a 109km high-speed rail line that connects London with the Channel Tunnel, and then onwards to the continental Europe rail network – to Paris, Brussels and Amsterdam. The line runs from St Pancras International in London to the Channel Tunnel via Stratford, Ebbsfleet and Ashford stations. Domestic stations on the Southeastern Network also served by high-speed services include Canterbury, Dover, Margate, Ramsgate, Whitstable, Faversham, Gillingham, Gravesend and Folkestone.

HS1 is a purpose-built line which had the objective of increasing the speed at which international Eurostar services to/from London could operate, as well as provide faster domestic services, in turn reducing journey times. The scheme was delivered in two sections:

- **Section 1** opened in 2003 and ran 70km from the channel tunnel to North Kent, with the remainder of the journey into London using existing lines into Waterloo station.
- **Section 2** (39km) added an additional section of high-speed track from Ebbsfleet, a new station in Kent, to St Pancras International in London.<sup>131</sup> These lines were used for international services only until 2009, when domestic high speed rail services also began operating on the line.<sup>132</sup>

HS1 was originally to be financed, built and operated under a PFI agreement awarded to the London and Continental Railways (LCR) consortium. But in 1998 LCR announced that it was unable to raise the funds required for the project and the Government had to negotiate a PPP agreement, and split construction into two sections. The project was eventually funded partly via direct government grants to LCR, and Railtrack were brought in to manage construction and purchase Section 1 when completed. The remainder of the required funds were financed through a combination of commercial debt and bonds. Government credit stood behind LCR's privately issued bonds, with the debt repaid out of the proceeds of a future sale of an infrastructure concession.

Today, HS1 Ltd holds a concession from the UK Government to operate, manage and maintain the route and its four stations. HS1 Ltd contracts out the maintenance and operation of the railway infrastructure to Network Rail (High Speed). International passenger services on HS1 are currently provided by Eurostar, and domestic passenger services between London and Kent are operated on the line by the Southeastern rail franchise (until October 2021).<sup>133</sup> See Figure 6-1 for a detailed timeline of key dates associated with the HS1 Scheme.

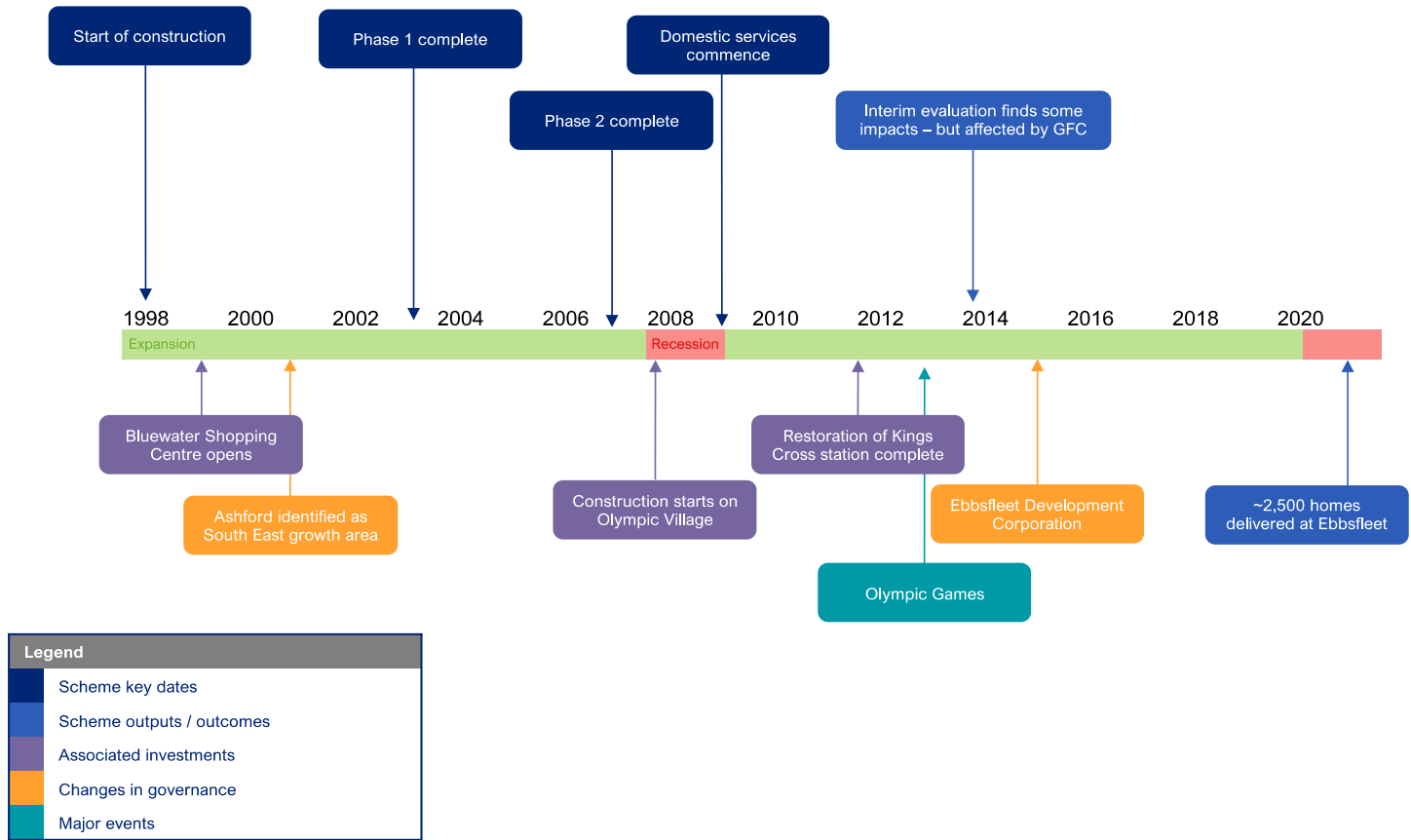
<sup>130</sup> Colin Buchanan and Volterra (January 2009) "Economic Impact of High Speed 1: Final Report" available [online](#).

<sup>131</sup> Colin Buchanan and Volterra (January 2009) "Economic Impact of High Speed 1: Final Report" available [online](#).

<sup>132</sup> Atkins (December 2014) "First Interim Evaluation of the Impacts of High Speed 1: Final Report Volume 1 – Main Report" available [online](#).

<sup>133</sup> Steer (2020) "Delivering for Britain and Beyond: The Economic Impact of HS1" available [online](#).

Figure 6-1: Timeline for High Speed 1



## 6.2. THEORY OF CHANGE

Figure 6-2 and Figure 6-3 present the logic maps showing the anticipated impact of HS1. In the logic map, and for this case study more broadly, we have focused on the impact of improving transport connectivity between Kent and London through HS1. We have not explored in detail the impact of improving transport connectivity between Stratford International and St Pancras, as improvements in intra-urban connectivity are covered in more depth within some of the other case studies.

**Inputs / Activities / Outputs.** HS1 led to the creation of a new high-speed rail line connecting parts of Kent to London via Stratford International and St Pancras stations. This was intended to substantially reduce journey times between many commuter towns in Kent and employment sites in London.

**Outcomes / Impacts.** In our ToC, the outcomes and impacts we have identified are very similar to the intra-urban schemes we have looked at – Manchester Metrolink, Nottingham Express Transit, and Jubilee Line Extension – but on a larger scale. There are two broad channels of impact we anticipate:

- **Changes in labour demand, where the HS1 leads to changes in land use that make London more of a centre for employment and leads to a change in the type of economic activity based in Kent.** We anticipate that HS1 will further expand the London labour market catchment by making more of Kent an easily commutable distance. Existing residents in these areas may be able to gain new jobs in London where they can be more productive, increasing the average wage and reducing unemployment. We also anticipate these areas will attract new residents who would otherwise have chosen jobs outside London, or chosen to live elsewhere in London or the South-East. These effects would allow London to accommodate more employees than previously, increasing employment density, and further improving productivity through agglomeration externalities. However, this may come at the expense of existing firms in Kent, which may find it more challenging to retain staff and, therefore, be crowded out by London-based firms.
- **Changes in residential demand, where HS1 leads to changes in land use that makes the affected parts of Kent more distinctive commuter towns, i.e., greater residential density.** As well as making London a more attractive location for firms by expanding the labour catchment, we also expect that HS1 will have led to the affected areas of Kent becoming more attractive for commuters choosing where to live. This would lead to the affected areas attracting new residents which, depending on whether the existing housing stock is densified, or new housing is developed, may lead to increases in house prices. The creation of a new station at Ebbsfleet may also enable the regeneration of the area around the station, by unlocking the development of new housing.

**Contexts.** We consider many of contextual factors introduced in previous theories of change to also be relevant to HS1; the key ones being:

- **Housing shortages in London and the south-East.** We consider housing shortages in London and the South-East to be a potentially relevant context to the residential transformation of Kent, by creating a latent demand for housing that is unlocked by HS1.
- **Linked land-use policy.** Similarly, we consider there may need to be explicit policy to support the development of new housing in Kent, alongside the improved transport links through HS1.
- **Limited existing labour catchment.** We consider that some of the economic benefit to London from HS1 may depend on the size of the existing catchment acting as a barrier to growth.

Figure 6-2: Logic Map for HS1 - Residential impacts (Kent)

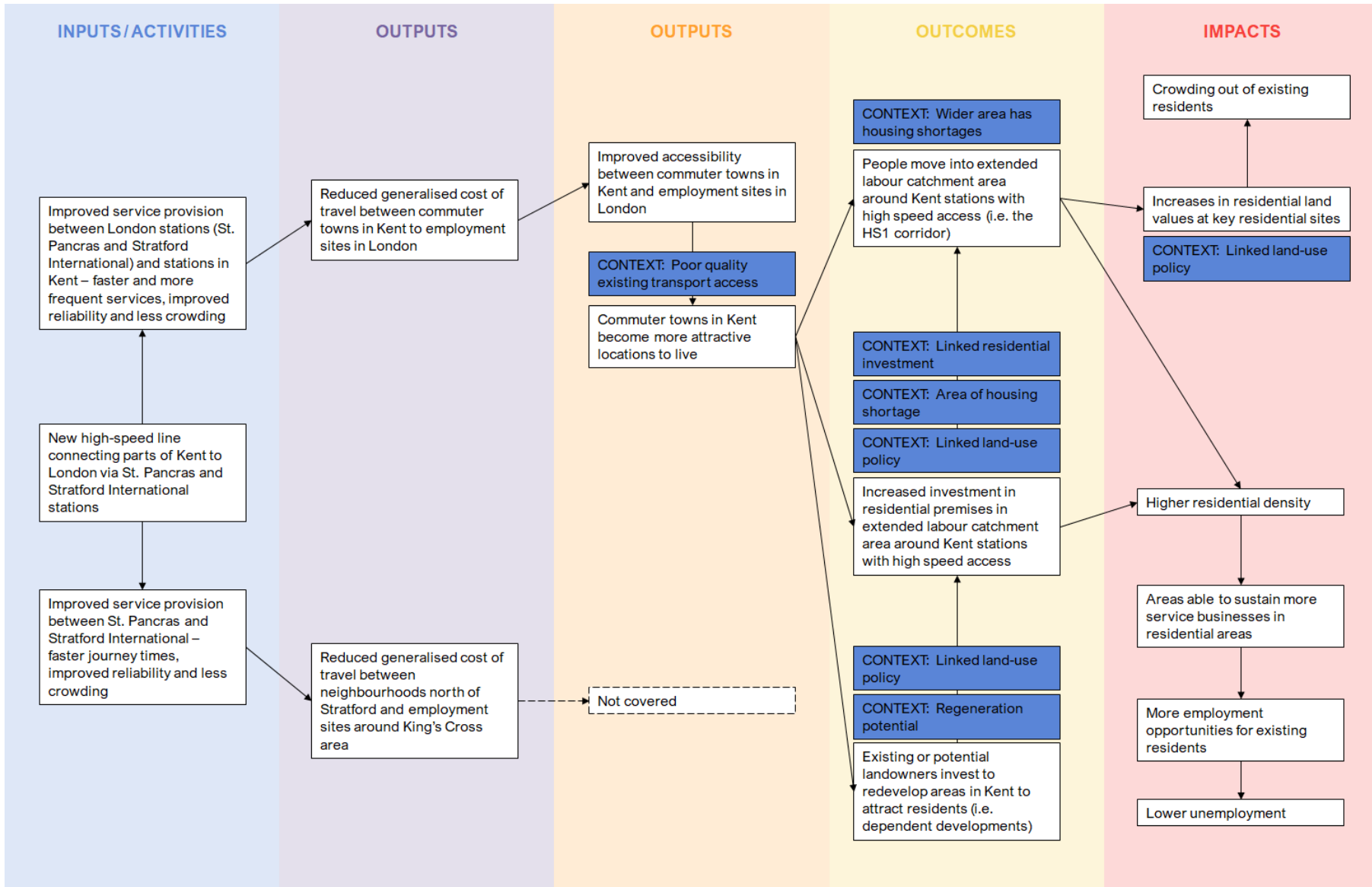
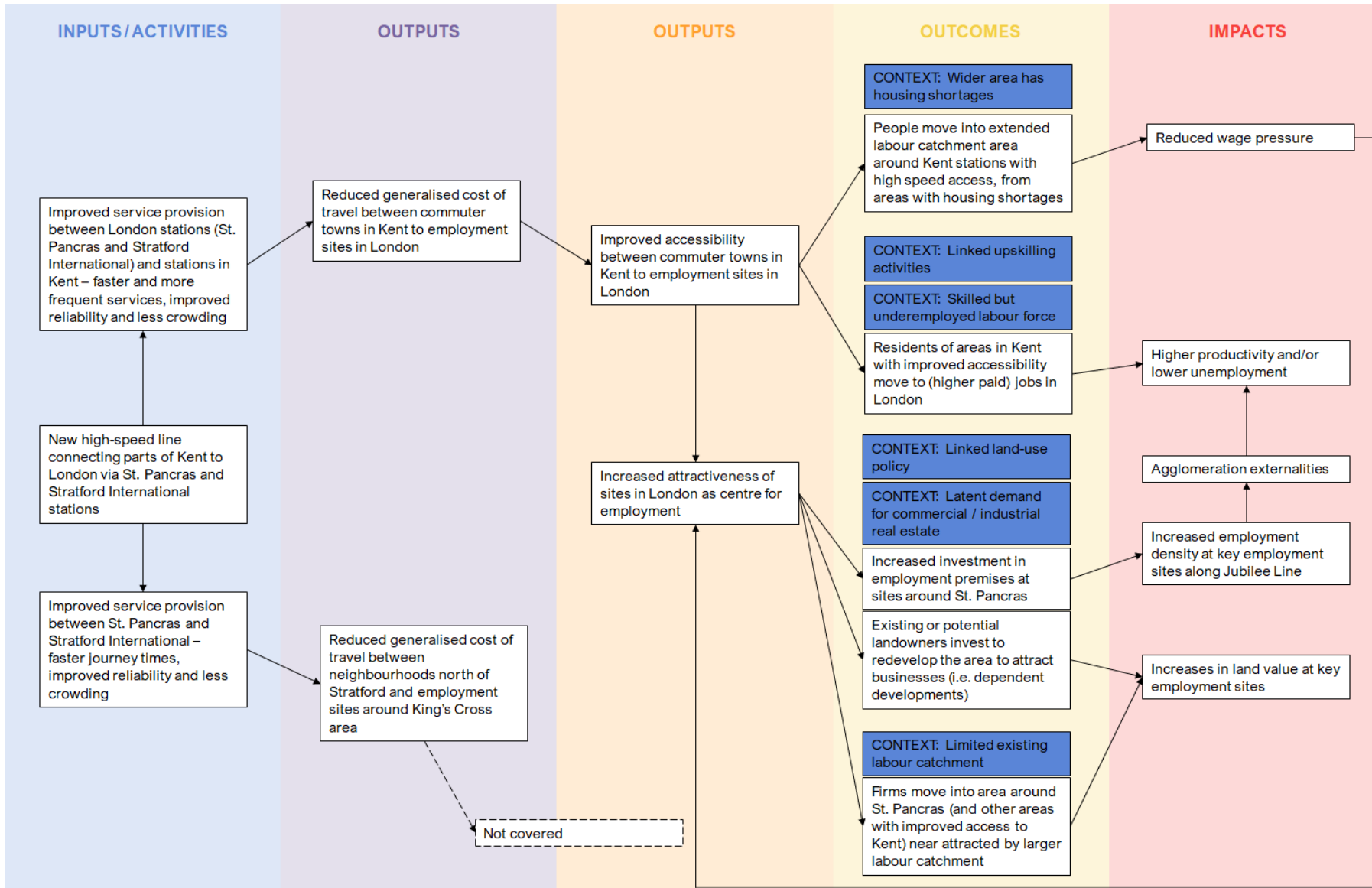


Figure 6-3: Logic Map for HS1 – Labour demand impacts (Kent)





## 6.3. SURROUNDING CONTEXT

### 6.3.1. Characteristics of the area at time of investment

The following factors, which were pre-existing conditions at the time domestic HS1 services commenced, may have influenced the realisation of the economic outcomes and impacts predicted by our Theory of Change.

#### Business cycle

The impacts predicted by our Theory of Change are likely to be influenced by wider macroeconomic conditions through one of two general channels: (i) the rate of growth in passenger demand, and (ii) wider business and consumer confidence.

First, the economic cycle is one of several factors which contributed to the over-optimistic passenger forecasts that formed part of the HS1 business case. Whilst Section 1 opened in 2003 during a period of expansion for the UK economy, Section 2 opened in November 2007 just as the global financial crisis was beginning. Domestic HS1 services followed later in 2009 shortly after the economic recession that followed the financial crisis, and domestic passenger flows were suppressed as a result.

Second, the recession of 2008-09 was then followed by a relatively sluggish recovery and low productivity growth, partly due to a slow recovery in business investment. The recovery from the 2008-09 recession was also geographically uneven: several indicators (including (un)employment and house prices) recovered faster in London than less affluent regions of the UK, including much of Kent.

The impact of the recession may have inhibited investors and developers from undertaking riskier investments, such as the large-scale residential and commercial developments planned around Ashford and Ebbsfleet. More generally, the depressed economic environment after the opening of HS1 may have reduced economic output and employment levels, potentially masking any improvements that could be attributable to HS1.<sup>134</sup>

#### Quality of existing transport access

The quality of existing transport access is also important because, all else equal, our Theory of Change suggests that the impacts should be larger in places where the change (improvement) in transport connectivity is greatest.

In this case, domestic rail access between Kent and London was not perceived as poor prior to the introduction of HS1. But the improvements in journey times were a significant step-change that increased the population within regular commuting distance (~60 minutes) of key London employment centres (see Table 6-1 below). In making the case for HS1, Kent-based stakeholders believed that the line would significantly improve access into the City and the West End, and thereby improve employment opportunities for the residents of Kent.

Table 6-1: Direct journey times (minutes) to London, 2013

Origin	Mainline	via HS1	Saving	Origin	Mainline	via HS1	Saving
Stratford	32	7	<b>25</b>	Whitstable	88	71	<b>17</b>
Ebbsfleet	51	18	<b>33</b>	Herne Bay	96	77	<b>19</b>
Ashford	84	37	<b>47</b>	Birchington	105	86	<b>19</b>
Gravesend	57	22	<b>35</b>	Margate	111	91	<b>20</b>
Strood	66	33	<b>33</b>	Broadstairs	118	91	<b>27</b>
Rochester	63	38	<b>25</b>	Ramsgate	129	80	<b>49</b>
Chatham	53	39	<b>15</b>	Canterbury	110	61	<b>49</b>

<sup>134</sup> Atkins (December 2014) "First Interim Evaluation of the Impacts of High Speed 1: Final Report Volume 1 – Main Report" available [online](#).

Origin	Mainline	via HS1	Saving	Origin	Mainline	via HS1	Saving
Gillingham	58	43	<b>15</b>	Folkestone W	99	55	<b>44</b>
Rainham	60	49	<b>11</b>	Folkestone C	101	57	<b>44</b>
Sittingbourne	69	56	<b>13</b>	Dover Priory	116	69	<b>47</b>
Faversham	72	65	<b>7</b>	<i>Eurostar</i>	168	135	<b>33</b>

Source: Atkins et al (2014) analysis of Southeastern website<sup>135</sup>

However, in our analysis of the economic impacts of HS1 below (see Section 6.4.2 below) we find that the most significant (potentially “transformational”) impacts occurred not in Kent, but around Kings Cross (Camden and Islington) and Stratford (Newham). There is a debate about the extent to which these impacts are attributable to changes in transport connectivity. Whilst there was a significant reduction in journey times from Stratford to London via HS1, it seems likely that other factors would have been more important, including the investment in and around Stratford for the London 2012 Olympic Games;<sup>136</sup> and public realm improvements that improved the environment, security and access through the Kings Cross/St Pancras site.

Overall, the lesson we might draw from the HS1 experience is that the change in transport connectivity may not always be the primary factor in driving transformational economic change. Other factors, such as proximity to the main regional centre of economic activity may be more important or stimulate impacts to materialise sooner. This is likely due to both the existing density of economic activity and demand for labour, but also because of the density of existing transport networks, which allow for onward connections to other locations, and therefore allows centrally located firms to reach a larger market of potential consumers.

## Housing

New housing development is more likely to be stimulated in areas where the demand for housing is already high, and the supply constrained. This is particularly true of the London housing market, but because of London’s dominance as a centre of employment and economic activity, the wider South East forms the housing market that serves London-bound commuters. Most indicators show that the supply of new housing in London around the wider South East has been insufficient to meet demand since at least the mid-1990s, resulting in growing affordability pressures.

In 2009, when domestic HS1 services began, the median house price to earnings ratio (‘housing affordability ratio’) was around 9 for London and 6.5 for the areas of Kent served by the new line (slightly below the average for England and Wales). By 2019, the affordability ratio had increased to around 15 for London and 9 for Kent (slightly above the average for England and Wales).<sup>137</sup> Therefore, HS1 may have allowed London-based residents to move out to more affordable areas of Kent, and the excess demand for housing might be a factor in the success (or otherwise) in the development of new housing in the areas around HS1 stations: particularly around Kings Cross, Stratford and (latterly) Ashford.

But housing affordability is not the only contextual factor that influences new housing development. The Ebbsfleet experience shows that the promised large-scale housing developments there have not yet materialised, despite London’s affordability pressures (see Section 6.4.2). There are likely to be macroeconomic, market and other site-specific factors which determine whether the associated residential developments materialise or not.

<sup>135</sup> Table 6-1 is directly reproduced from Atkins et al (2014) which CEPA/Arup cannot independently verify. In certain cases, present day mainline origin/destination journey times may be significantly different than the times presented above.

<sup>136</sup> Some reports note that the HS1 station at Stratford was a factor in London’s successful bid to host the 2012 Olympic Games.

<sup>137</sup> ONS (March 2021) “Housing affordability in England and Wales: 2020” available [online](#).

## Commercial development

We also expect that it is more likely that new commercial development is stimulated in areas where demand was already greater than supply (e.g. in London).

We didn't find any publicly available quantitative indicators which demonstrated that there was pent-up demand for new commercial development along the HS1 route. However, the case for the regeneration of Kings Cross was built on the value of that area for potential commercial development, and the need to plan for London's future economic growth by allocating more central land to employment uses. London's consistent economic growth in the years before HS1 opened would suggest to planners and investors that demand growth would continue, and supply was a known constraint.

Stratford was a higher risk location where demand for office and commercial uses was less well proven prior to the opening of HS1 and the wider regeneration in preparation for the 2012 Olympic Games. In effect, the public sector was able to de-risk Stratford for private developers through a substantial investment in land assembly, remediation and investment in infrastructure and the public realm.

## Regeneration potential

One of the reasons that HS1 was routed through east London was to stimulate regeneration and these regeneration benefits were monetised within the business case. The NAO reports that the valuation was unconventional for a transport project at the time, and that it was based on the 50,000 jobs that DfT originally estimated the line would create at sites around the three international stations at Kings Cross, Stratford and Ebbsfleet.<sup>138</sup>

Kings Cross was generally recognised for its potential for regeneration. Until the 1970s it was a busy industrial and distribution services district centred around the former railyards. The area fell into decline during the era of deindustrialisation, there were many vacant sites, and the area became notorious for illegal activities and polluted waterways. There had been several unsuccessful attempts to draw up plans for regeneration projects.

Stratford was one of the most deprived local authorities in the country. Unemployment was high and measures of public health and life expectancy were generally poor when compared with other areas of London. Like Kings Cross, the physical environment of Stratford (and what is now the Queen Elizabeth "Olympic" Park) was particularly poor in some places: there were polluted waterways, large areas of marshland, derelict industrial units and a refuse site for household goods. There was a lack of infrastructure which inhibited redevelopment. The 2012 London Olympics bid was partly successful on the understanding that Stratford would be regenerated and leave a 'lasting legacy' for the local communities.

Ebbsfleet is a collection of former quarry sites just outside the M25 owned by a former cement manufacturing company. The nearest existing settlements were Swanscombe, Northfleet and Gravesend. As the quarry sites came to the end of their useful lives, the owners believed that they had development potential and formed a joint venture with a multinational property and construction group to develop one of the sites into what is now the Bluewater Shopping Centre. There are plans to develop other sites into new "garden towns" to relieve housing supply constraints in the South East, but there are several regulatory and site-specific constraints which have slowed development, including difficult ground conditions and topography; complex remediations (e.g. removing polluted or contaminated soil due to former land uses); nearby Special Sites of Scientific Interest<sup>139</sup>; and interaction with greenbelt policies.

Although not a particularly deprived region, several towns along the HS1 route through Kent are below average in terms of household income and employment, and above average for unemployment, when compared to the wider South East.<sup>140</sup> The Bexley–Dartford–Gravesham "riverside strip" has notably underperformed the rest of the

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<sup>138</sup> NAO (March 2012) "The completion and sale of High Speed 1" available [online](#).

<sup>139</sup> We understand from a representative of Gravesham Borough Council that although there is a long-standing geological SSSI, it only became a major issue when it was extended in March 2021. Natural England is considering the issue.

<sup>140</sup> The Economist (26 October 2013) "High Speed Rail: a slow start" available [online](#).

Thames Estuary region. Whilst there probably existed some potential for small-scale regeneration projects in these towns, it would have required a significant increase in consumer demand to generate this change over time.

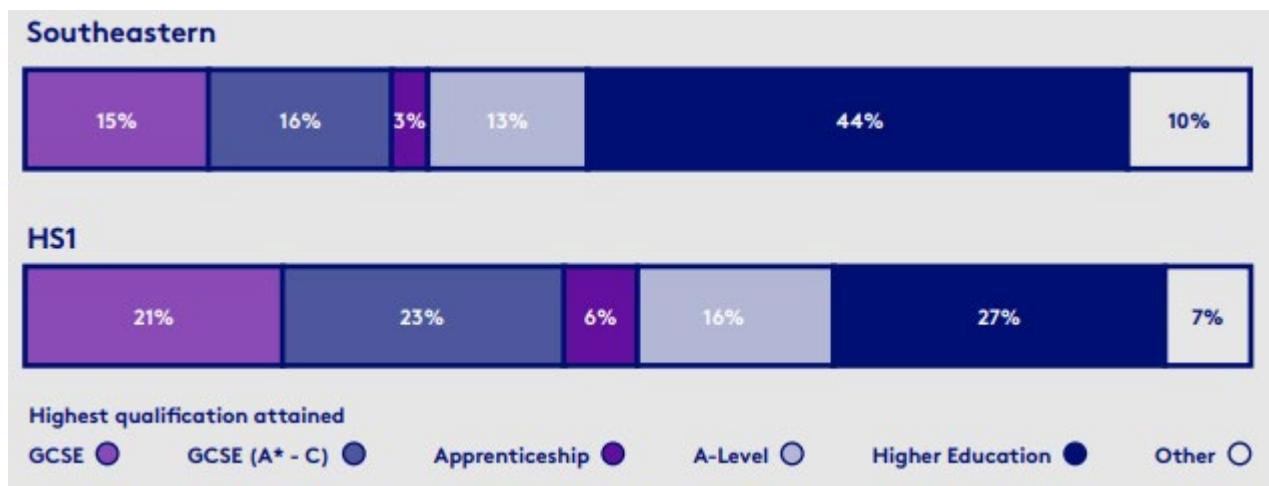
### Underutilised skills

Our Theory of Change suggests that the change in transport connectivity should facilitate a reduction in unemployment and/or an improvement in productivity, in places where there where “underutilised skills” in the labour force – i.e. local workers have the potential to produce more output and/or move to a more productive sector, or if local unemployment is higher than the “natural rate”.

We have not found any quantitative indicators to suggest that the areas served by HS1 had underutilised skills. Demonstrating that the labour force is underutilised is difficult, particularly in relation to skills. It often depends on survey data, asking employees whether they believe they have more skills than are necessary for their current job. But further research on this issue would be useful because the benefits of HS1 were partly the improved access to higher paid jobs in London from the Kent towns along the route.

Previous analysis prepared for HS1 Ltd showed that the line has brought 63,000 more highly educated potential employees within an hour commute of London, compared to the Southeastern network.<sup>141</sup> This might indicate that the line has improved the quality of the pool of labour available to London-based employers, and facilitated job moves between places on the HS1 route. But it is not possible to conclude that Kent had an underutilised labour force with the available evidence.

Figure 6-4: Skills profile of population within one hour of London using HS1 or other Southeastern services



Source: Steer analysis of UK Skills Data, Department for Education

### 6.3.2. Associated activities and actions alongside transport investment

The following factors, which occurred alongside the introduction of HS1 services, may have influenced the realisation of the economic outcomes and impacts predicted by our Theory of Change.

#### Benefits realisation

Our Theory of Change posits that transformational impacts are facilitated by a coherent plan to realise the benefits of the investment in HS1.

But we were not able to locate a benefits realisation strategy for HS1, noting that the scheme was originally conceived over 30 years ago, and approved at a time when benefits realisation plans were not routinely required as part of the business case development. We would assume that there existed in some form a benefits realisation

<sup>141</sup> Steer (2020) “Delivering for Britain and Beyond: The Economic Impact of HS1” available [online](#)

plan for the regeneration of Kings Cross and St Pancras, and have been able to locate various ‘vision statements’ produced by Argent, the Borough of Camden and others.<sup>142</sup>

It is not the existence of a benefits realisation plan that matters, as that will not in and of itself determine the success of the scheme. What matters is the overall coherence of the local economic development strategy to realise the benefits that HS1 brings through better public transport connectivity. With the benefit of hindsight, the redevelopment of Kings Cross appears to have realised significant economic benefits off the back of this significant investment, and there has also been significant change around Stratford, noting that this is likely to be more attributable to investment in the 2012 Olympic Games infrastructure.

As we find in Section 6.4.2, it is less clear from the existing body of quantitative evidence that areas outside of London have benefitted significantly from the improved connectivity that HS1 offers. One contributory factor might be that these areas had less well established and/or coherent plans for realising local economic benefits.

## Unlocking development

Our Theory of Change recognises that a change in transport connectivity may not ‘unlock’ associated changes in land use (via residential and/or commercial real estate investment) unless there is an associated change in land use policy<sup>143</sup> to enable that development to take place.

The new station at Ebbsfleet and improvements to Ashford International station were meant to stimulate new housing development and relieve affordability pressures in the London housing market. Previous governments had designated these towns as areas for strategic population growth in the South East.

As we find in Section 6.4.2, progress against housing development ambitions in these areas was initially slow – particularly in Ebbsfleet. Large areas around the station remained undeveloped for several years after HS1 opened, and the number of new housing completions remained below pre-2007 levels.<sup>144</sup> It is likely that the slow rate of housing completions is partly due to the impact of the 2008-09 recession which had a negative impact on house prices and reduced the profitability of building out such large sites for private housebuilders.

We also understand from an interview with a representative of Gravesham Borough Council that the Ebbsfleet sites had several constraints which needed to be overcome before development could take place, including “lift and shift” car parking provisions in the development agreement with the former landowner, complex ground conditions, topography, necessary remediations, Special Sites of Scientific Interest (SSSIs) and utilities infrastructure. It was perceived that these challenges and the associated costs affected the confidence shown by the major landowner at the time (a large UK Real Estate Investment Trust) in building out the development at pace.

To address these issues and help unlock further development at Ebbsfleet, the UK government designated the town as a Garden City in 2014.<sup>145</sup> Planning powers have been transferred to the Ebbsfleet Development Corporation which has a mandate to speed up delivery of up to 15,000 homes and work with local authorities and communities to develop a shared vision for the area. We understand that the main levers at the disposal of the Development Corporation are:

- To act as a catalyst, e.g. by undertaking studies of the infrastructure needs of the garden city as a whole and then present infrastructure providers with a viable business case for undertaking investment.
- Invest directly in infrastructure that unlocks development. Subject to government approval, the Corporation would be supported by up to £200m of government funding.

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<sup>142</sup> For example, see London Boroughs of Camden and Islington (January 2004) “Kings Cross Opportunity Area Planning & Development Brief” available [online](#).

<sup>143</sup> We use a broad definition of ‘land use policy’ to include, for example, the creation of an urban development company with powers over land use planning and development control.

<sup>144</sup> The Economist (26 October 2013) “High Speed Rail: a slow start” available [online](#).

<sup>145</sup> HM Treasury (19 March 2014) “Budget 2014: documents” available [online](#).

- To determine planning applications; and
- Use compulsory purchase powers, as required, to ensure effective regeneration where negotiations fail.<sup>146</sup>

It is perceived that the impact of the Development Corporation was positive: it has facilitated agreements between government and private developers; and it has funding to invest in necessary infrastructure that other partners are unwilling or unable to take risk on. Progress has improved – particularly at the Eastern Quarry (Whitecliff) site – but remains gradual. Ebbsfleet Central has been recently held up by the impact of The London Resort DCO application and SSSI designation.<sup>147</sup> As at the time of this study, the Development Corporation had so far delivered just over 2,500 new homes.<sup>148</sup>

## Regeneration programme

Regeneration benefits were an important element in the case for investing in HS1 – see Section 6.3.1 above. It was the original catalyst for the ongoing regeneration of Kings Cross, St Pancras and the surrounding areas. Because of the scale of physical regeneration, creation of a safer and more attractive environment, and the new commercial and employment space, Kings Cross is now regularly cited as a success story for transport-led regeneration.

But whilst HS1 was the catalyst for the regeneration effort at Kings Cross, it is not obvious that it was the transport *outputs* (i.e., the change in transport capacity, connectivity or journey times) which stimulated this transformation. Rather, the closer causal factors are likely to be London as a global centre of economic activity, the scale of development opportunity, and a coherent public-private vision and strategy for transformation combining a diversity of commercial uses.<sup>149</sup>

The new international HS1 stations were expected to help attract private investment into, and help regenerate, other areas close to central London – particularly Stratford and Ebbsfleet. In Stratford, the aim was to stimulate the regeneration of large, former industrial brownfield sites – in particular to support the development of the 2012 Olympic Stadium – and investment in new commercial and leisure uses, to provide more employment opportunities in some of London’s most deprived boroughs. New development at Stratford since HS1 opened has been substantial, but it is not possible to definitively attribute changes in economic outcomes to the new Stratford International station alone. It is generally perceived by economic experts that other intra-urban transport networks, such as the Jubilee Line Extension, Docklands Light Railway and Crossrail, are likely to be more material factors in stimulating investment in Stratford.<sup>150</sup>

## Skills investment

With economic transformation we would expect a change in the sectoral distribution of employment. The UK’s competitive strengths lie in higher valued added industries, and (in theory) we would expect to see a transition from manufacturing and lower value-added service activities towards higher value-added service activities. But to facilitate this transformation, local actors may need to invest in the human capital of the labour force.

However, in this case we were not able to identify any notable skills policies which were specifically implemented alongside HS1 to improve and/or better match the skills of the labour force in the areas along the line of route, and therefore raise productivity.

## 6.4. SCHEME OUTPUTS, OUTCOMES AND IMPACTS

The original business case was not available for this review, so we are not able to compare the original forecasts for scheme outcomes against what was delivered. The business case was updated multiple times during the

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<sup>146</sup> DCLG (August 2014) “Ebbsfleet Development Corporation: Consultation” available [online](#).

<sup>147</sup> Email exchange between CEPA and representative of Gravesham Borough Council.

<sup>148</sup> <https://ebbsfleetc.org.uk/> (accessed July 2021).

<sup>149</sup> Regeneris (November 2017) “The economic and social story of King’s Cross” available [online](#).

<sup>150</sup> Preston, J. (2016) “Direct and Indirect Effects of High Speed Rail” available [online](#).



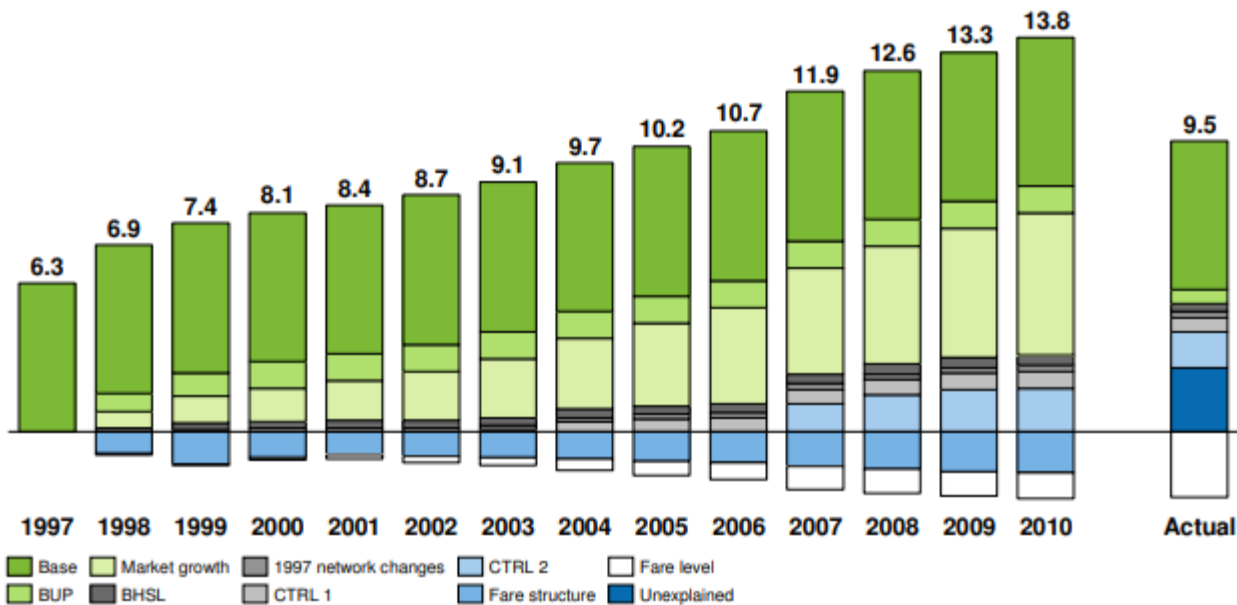
development of HS1, as is common for projects which take several years to design and construct, so the exact baselining of expected outcomes would involve a degree of judgement.

Overall, we conclude that the existing evidence suggests that HS1 was not successful in achieving its ‘transformational’ objectives. But HS1 serves a wide area, and the impacts vary by place. The intended transformational effects have materialised sooner in some areas which were already well connected to employment areas in central London (e.g. Kings Cross) but not yet in others where the change in transport connectivity was greater (e.g. Ebbsfleet).

### 6.4.1. Passenger growth compared to original forecasts

We do know that actual passenger numbers in the early years after the line opened were less than a third of the level originally forecast in LCR’s PFI bid, or approx. 30 percent below the forecasts made when the government rescued HS1 in 1998.<sup>151</sup> The over-optimism in the original forecasts has mostly been attributed to lower than expected international passenger demand due to competition from low-cost airlines, rather than domestic effects.

Figure 6-5: 1997 modelled passenger forecasts by growth component and comparison with 2010 actuals (millions)



Source: Booz & Co (2012)

### 6.4.2. Impact of transport investment on economic outcomes

Although HS1 did not achieve expected passenger usage, the economic impacts were still expected to be significant. In this subsection, we consider whether there is evidence to demonstrate that HS1 contributed to “transformational” changes in the main economic outcomes of interest - employment, productivity and housing – as well as some other close proxies for economic change along the line of route.

#### Population

We were not able to find any evidence that links population growth in the towns and cities along the line of route directly to the improvements in transport accessibility due to the new domestic HS1 services. We have seen results from one study, which remains in draft, which suggest that reductions in commuting times associated with HS1 were associated with increases in the local working age population. But this result cannot be relied upon for our report, given the current status of that study.

<sup>151</sup> Subsequent forecasts were rather more accurate, as shown in NAO (March 2012) “The completion and sale of High Speed 1” available [online](#).

Further research on the population impacts of HS1 would be useful because our Theory of Change emphasises the expectation that journey time improvements between the Kent towns and London would make these locations more attractive places to live.

## Employment

HS1 expanded London’s commuter catchment area. Research commissioned by HS1 Ltd estimated that there are now 164,000 households (or 400,000 workers) less than one hour travel time from central London – a “rule of thumb” threshold when considering how far people are prepared to commute.<sup>152</sup> According to our Theory of Change (see Section 6.2) this would increase the attractiveness as London as a centre of employment, stimulate investment in employment premises around Kings Cross/St Pancras and Stratford, and lead to an increase in measured (workplace-based) employment in London. It should also lead to a reduction in measured unemployment (or an increase in residence-based employment) in the Kent towns along the HS1 route.

In 2012, the NAO reported that out the outset of scheme the approved master plans for developments at King’s Cross, Stratford City and Ebbfleet Valley would deliver new office, retail and other spaces capable of supporting at least at least 70,000 jobs, and that early progress was both substantial and in line with expectations at both Kings Cross and Stratford.<sup>153</sup> This suggests that HS1 improve the attractiveness of Kings Cross and Stratford as employment sites, as demonstrated by increased investment in new office developments.

But the existing evidence on the actual employment effects is mixed. The interim evaluation of HS1 published in 2014 found that overall employment growth along the line between 2009–2011 was just 8,000 (+0.7 percent). This was compared with other strategic transport corridors between London and other towns of similar population size and employment base, to disentangle HS1 from other background effects. The results show that employment did not grow notably faster than the “control corridors”.<sup>154</sup> The interim evaluation notes that one possible explanation for these results is that the period after HS1 opened was negatively affected by the 2008-09 recession and a sluggish macroeconomic recovery.

Table 6-2: Employment growth along the line

	2007	2008	2009	2010	2011	% Change	
						2007-11	2009-11
HS1 Corridor	1,121,000	1,132,000	1,087,000	1,093,000	1,095,000	-2.3%	0.7%
Control Corridor 1: M11 towards Cambridge	1,037,000	1,048,000	1,015,000	1,020,000	1,051,000	1.4%	3.6%
Control Corridor 2: M1 towards Milton Keynes	1,002,000	1,026,000	974,000	979,000	980,000	-2.2%	0.6%
Control Corridor 3: A12 Chelmsford/ Colchester	585,000	598,000	582,000	577,000	577,000	-1.4%	-0.8%

Source: Atkins (2014)

There is some evidence on where *workplace-based* employment impacts have materialised, and where they have not, but it is limited and inconclusive.

The interim evaluation published in 2014 found that some areas in the HS1 corridor had experienced positive changes, whilst others saw a decline in employment levels. Between 2009 and 2011, total employment increased

<sup>152</sup> Steer (2020) “Delivering for Britain and Beyond: The Economic Impact of HS1” available [online](#)

<sup>153</sup> NAO (March 2012) “The completion and sale of High Speed 1” available [online](#).

<sup>154</sup> We consider that these results to be useful in the context of this study. But compared to other studies which consider the link between new transport links and employment (e.g. Metrolink, Section 3.4.2), the approach adopted in the interim evaluation is a less convincing means of isolating the impact of improved transport connectivity versus other (background or simultaneous) effects.

around Stratford station, but declined in the (2km) zones around Ebbsfleet, St Pancras and Ashford stations. It also concluded that employment around Ramsgate station was unchanged.<sup>155</sup>

A separate research study published in 2017 estimated that, at that point in time, there were around 8,500 jobs directly supported on site at Kings Cross–St Pancras<sup>156</sup> compared to previous estimates of over 22,000, although the study recognised that there are still several significant commercial developments yet to complete and the final number of jobs is likely to be much higher.

The 2014 interim evaluation also considered *residence-based* changes in employment, which provides some insight into where employed people reside within the corridor (but not where their jobs are located).

Within the HS1 Corridor, the strongest residence-based employment growth between 2009 and 2013 occurred in Swale, where the number of residents in employment increased by 13%, followed by Shepway with 7%. Within London, Resident employment increased by 6% in Newham and Camden. Lower levels of growth of resident employment (of less than 5%) occurred in Islington, Thurrock, Medway, Maidstone, and Ashford.<sup>157</sup> This is close to what we would expect given the reduction in journey times between Folkestone (Shepway) and London, although the impact on Swale appears large given the smaller journey time improvements between London and Faversham.

The interim evaluation also found that residence-based employment decreased in other parts of the HS1 corridor, including Dartford (-1%), Dover (-1%), Canterbury (-7%), and Gravesham (-8%). The most significant decline in resident employment occurred in Thanet (-15%).<sup>158</sup> These results appear weak relative to the changes in journey times to London (noting that there may be other local economic factors at play), so further research which explores the impact between changes in journey times to London and changes in residence-based employment would create a richer and more robust evidence base.

Overall, the interim evaluation concluded that the introduction of the HS1 passenger services was not associated with an observable increase in residence-based employment across much of the corridor.

## **Firm entry**

We were not able to find any completed studies which have considered the impact of domestic HS1 services on the entry and exit for firms from local economies along the line of route.

We have seen results from one study, which remains in draft, which suggest that lower commuting times (to central London) were associated with *lower* plant entry. This appeared to be particularly true of the wholesale and retail and business services sectors, which experienced lower entry and higher exit. For some sectors this was also observed within multi-plant firms. The draft results of that study suggest that reductions in commuting time might be leading to increased competition and a reduction in local demand in some industries. It is possible that reduced travel time to London, and subsequent increases in commercial rents and/or competition, resulted in the exit of less productive firms and plants, but we cannot support that conclusion definitively given the current status of that study.

## **Land value and property prices**

According to our Theory of Change (see Section 6.2), the reduction in journey times from Kent commuter towns to London would increase the attractiveness of the Kent commuter towns. Assuming that the supply of housing is less elastic than the change in demand, one possible indicator of this effect is a change in residential property values.

But the existing literature on the impact of HS1 on residential property prices suggests only a weak impact.

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<sup>155</sup> The observed increase of 300 jobs within 2km of the station was unlikely to be statistically significant given the sample size.

<sup>156</sup> Regeneris (November 2017) “The economic and social story of King’s Cross” available [online](#).

<sup>157</sup> Atkins (December 2014) “First Interim Evaluation of the Impacts of High Speed 1: Final Report Volume 1 – Main Report” available [online](#).

<sup>158</sup> Atkins (December 2014) “First Interim Evaluation of the Impacts of High Speed 1: Final Report Volume 1 – Main Report” available [online](#).

The interim evaluation found that there was no significant uplift in house prices relative to the UK average across the corridor as a whole, or at the station level.<sup>159</sup> Over the period 2010 to 2013, average house prices increased by 17% across England and Wales, which was broadly in line with the average level of house price across the HS1 Corridor (16%).

*Table 6-3: Percentage Change in Average House Prices*

	% change 2005 Q3 – 2012 Q3	% change 2010 Q1 – 2012 Q3
HS1 Corridor	36.5%	4.2%
Control Corridor 1: M11 towards Cambridge	33.0%	11.7%
Control Corridor 2: M1 towards Milton Keynes	49.2%	12.1%
Control Corridor 3: A12 Chelmsford/ Colchester	15.3%	2.2%

*Source: Atkins (2014)*

At the station level the highest house price growth occurred around the two London stations (St Pancras and Stratford International). The three Kent stations zones all underperformed the HS1 Corridor average over the period 2010-13. In Ashford, average house prices grew at less than half the HS1 Corridor rate, and in Ebbsfleet house prices remained unchanged over the period 2010-13.<sup>160</sup> There may be non-transport related factors influencing the changes in house prices around the London stations, particularly related to the economic cycle (London house prices recovered much faster after the 2008-09 recession) and other regeneration initiatives (e.g. the Olympics). The interim evaluation also notes that below corridor average levels of house price growth around individual stations could also indicate that any impact on house prices may occur across a larger spatial area, particularly for stations that attract commuters from a wide area and/or operate as a Parkway Station (e.g. Ebbsfleet).

*Table 6-4: Average house prices, by 2km zone around station*

	2009	2010	2011	2012	2013	% Change
St Pancras	£555,000	£641,000	£726,000	£732,000	£832,000	50%
Stratford International	£204,000	£223,000	£221,000	£247,000	£246,000	21%
Ramsgate	£155,000	£163,000	£156,000	£162,000	£169,000	9%
Ashford International	£144,000	£157,000	£159,000	£161,000	£154,000	7%
Ebbsfleet	£162,000	£164,000	£162,000	£161,000	£162,000	0%

*Source: Atkins (2014)*

We have seen results from another study, which remains in draft, which did find an impact on house prices due to changes in commuting times into central London, and that the size of the effect was comparable to previous studies looking at the association between house prices and distance from London Underground station.<sup>161</sup> We do not cite the results of that study because we understand that it is not yet complete.

<sup>159</sup> Atkins (December 2014) "First Interim Evaluation of the Impacts of High Speed 1: Final Report Volume 1 – Main Report" available [online](#).

<sup>160</sup> Atkins (December 2014) "First Interim Evaluation of the Impacts of High Speed 1: Final Report Volume 1 – Main Report" available [online](#). The station level data is taken from a different source from the corridor level data. Therefore, the results are not directly comparable.

<sup>161</sup> Journal of the Transport Economists Group (Volume 46, Number 2, Summer 2019) "The economic impacts of HS1 in Kent" available [online](#). Previous study referred to is Gibbons, S. and Machin, S. (January 2004) "Valuing rail access using transport innovations" available [online](#).

Overall, we suggest that there is likely to be good evidence that HS1 has made parts of Kent more attractive places to live and commute from, but we do not find a robust impact on house prices which may take time to materialise. Further research on this topic would be useful because our Theory of Change emphasises the expectation that journey time improvements between the Kent towns and London would make them more attractive places to live.

According to our theory of change, the reduction in journey times between London and Kent, and reduced wage pressures as a result, should improve the attractiveness of Kings Cross/St Pancras, Stratford and other station areas as places to locate a business. Assuming that the supply of commercial property is less elastic than demand, one possible indicator of this effect is a change in commercial property values.

Unfortunately, most databases on commercial property transactions are not available in the public domain. The existing literature focuses on the rateable value of business properties as set by the Valuation Office Agency for the purposes of calculating business rates. The rateable value is based on the VOA's estimate of the open market rental value of the property and is therefore only indirectly related to transaction-based open market values. Additionally, revaluations took place every five years (the last revaluation was April 2015).<sup>162</sup> This means that the rateable value will lag changes in the open market valuation of commercial property.

The interim evaluation found that the average rateable value of a business property located in the HS1 Corridor increased by 24% between 2005 and 2010, from £31,000 to £38,300. This increase was greater than the average increase across England and for each of the Control Corridors where over the same period the average rateable value increased by between 14% (Control Corridor 2, Milton Keynes) and 20% (Control Corridor 1, Cambridge).

The performance of average business rates at the station level was more variable (see Table 6-5 below). In Ramsgate and Ebbsfleet the average rateable value within 2km of the station increased by more than the surrounding district average. But in the St Pancras, Stratford, and Ashford station zones, the increase in rateable values between was lower than the district-wide level, although in the case of St Pancras / Kings Cross the variation was marginal.

*Table 6-5: Percentage increase in average rateable values, 2005-10*

	500m buffer zone	2km buffer zone	District average
Ashford International	8.7%	16.0%	17.2%
St Pancras	53.1%	46.0%	47.3%
Ebbsfleet	*	28.7%	11.3%
Ramsgate	25.9%	21.1%	20.7%
Stratford International	*	25.7%	28.2%

*Source: Atkins (2014) based on Valuation Office Agency (2013); \*Insufficient businesses based in this location in 2005.*

The interim evaluation also found evidence of a faster increase in the number of business premises in the areas around the HS1 stations (see Table 6-6). The most significant growth occurred around Ashford station, where the number of businesses increased by 4.8% within 500m of the station and by 6.1% within 2km, compared to an increase of 0.77% across Ashford district. Weaker growth occurred within the Stratford International 2km buffer zone, but there was zero background growth in Newham Borough over this period.<sup>163</sup>

<sup>162</sup> The UK Government announced that the revaluation cycle will become more frequent (every three years from the next revaluation date) but subsequently postponed the next revaluation date to April 2021 to provide businesses relief from the impacts of Covid-19.

<sup>163</sup> Atkins (December 2014) "First Interim Evaluation of the Impacts of High Speed 1: Final Report Volume 1 – Main Report" available [online](#).

Table 6-6: Percentage increase in number of commercial premises, 2005-10

	500m buffer zone	2km buffer zone	District average
Ashford International	4.8%	6.1%	0.8%
St Pancras	5.1%	2.9%	0.1%
Ebbsfleet	*	4.7%	0.7%
Ramsgate	2.0%	3.5%	0.6%
Stratford International	*	0.6%	0.0%

Source: Atkins (2014) based on Valuation Office Agency (2013); \*Insufficient businesses based in this location in 2005.

The interim evaluation concluded that the overall results for commercial real estate values in the HS1 Corridor and station zones were positive. But it also noted that:

- Around St Pancras, it will be difficult to identify the extent to which HS1 or some other London-wide effect is responsible for the observed uplift; and
- Only the immediate impacts of HS1 will have taken effect by 2010 and the next round of VOA valuations may capture further business impacts associated with HS1 (which took place after the interim evaluation).

## Productivity and wages

Our Theory of Change suggests that HS1 should improve productivity through higher density of employment (primarily in London) and should result in higher wages for workers based in Kent who benefit from improved connections and better access higher paid jobs in more productive industries.

However, the existing literature is relatively thin on evidence around the impact on productivity and wages.

The interim evaluation analysed the impact on Gross Value Added (GVA, a measure of output) rather than productivity. It found only a modest increase in GVA across the HS1 corridor between 2009–2011. Although this was higher than two of the three other ‘control’ corridors examined, it was considerably lower than the third (the M11 towards Cambridge). It also found that GVA growth appeared to be focused in the central London area, which suggests that economic performance across the rest of the HS1 corridor was considerably weaker.<sup>164</sup>

Table 6-7: Estimated GVA Change Associated with Changing Employment Profile

	Estimated change in GVA (2009-11), 2010 prices (£m)
HS1 Corridor	187
Control Corridor 1: M11 towards Cambridge	3,108
Control Corridor 2: M1 towards Milton Keynes	-259
Control Corridor 3: A12 Chelmsford/ Colchester	-630

Source: Atkins (2014)

Where employment growth did occur in the HS1 corridor, the interim evaluation found that it was strongest in lower value-added sectors, such as Accommodation & Food Services and Business Administration. These are typically sectors where GVA per employee (one measure of productivity) is less than the UK average. Our Theory of Change does not consider which industries are most likely to benefit from improvements in rail connectivity (which is likely to depend on other local factors), but further research would be useful to consider why employment growth appeared to be strongest in lower productivity sectors.<sup>165</sup>

<sup>164</sup> Atkins (December 2014) “First Interim Evaluation of the Impacts of High Speed 1: Final Report Volume 1 – Main Report” available [online](#).

<sup>165</sup> Wider macroeconomic factors during the recovery from the 2008-09 results may have affected the results.



More recent work commissioned by HS1 Ltd includes an estimate of UK productivity improvements associated with the agglomeration impacts (~£33m p.a.).<sup>166</sup> Although the methodology behind this estimate is not provided, it looks like it is based on DfT’s own WebTAG guidance. If so, it is a model-based estimate rather than an observed measure of productivity improvements. Therefore, we do not place any weight on the robustness of this evidence.

On wages, the interim evaluation found that the rate of wage growth in the HS1 corridor declined between 2009 and 2012. This reflected a broader trend of stagnant wages across the UK during the recovery from the 2008-09 recession. It is also consistent with the growth of employment in less productive sectors identified in this section.<sup>167</sup>

*Table 6-8: Average weekly earnings of Full-Time Employees, 2009-12*

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	09-12
HS1 corridor	£522	£535	£548	£562	£581	£610	£630	£641	£653	£667	£657	+3%

*Source: Atkins (2014)*

## Housing

According to our Theory of Change (see Section 6.2), the reduction in journey times from Kent commuter towns to London should increase the attractiveness of the Kent commuter towns. In turn, this stimulates an actual or anticipated increase in land values, therefore stimulating a response from developers to build new housing.

Our research did not find a definitive number of homes that have been built in the areas served by HS1 to compare against the original plans. As at 2017, there were 900 housing units delivered at Kings Cross (around half of the original plans) and there are reports that over 2,000 homes (~40 percent) have been built at Stratford in response to the wider regeneration effort there, with several thousand more in planning.

Our Theory of Change emphasises the theoretical link between improvements in rail connectivity (in the form of reduced journey times) and an increase in the demand for housing. Given that the change in journey times between central London and Kings Cross and Stratford were marginal (both stations being connected to the Underground network), we might therefore conclude that the development of new homes in these areas was a result of other regeneration factors, and not the transport improvements specifically. However, both Kings Cross and Stratford demonstrate that economic transformation is facilitated when the targeted area is made a more attractive place to live (e.g. via public realm and safety improvements) and it is notable that part of the increase in value created by the regeneration of these sites could then be captured to improve the affordability of the transport improvements (i.e. LCR was a partner in both developments).

Our Theory of Change would suggest stronger theoretical support for new housing development at Ebbsfleet and Ashford, given the significant improvements in journey times. However, new developments around these stations took longer than anticipated and less progress has been achieved.

It was previously reported that only a few hundred houses had been built around Ebbsfleet station<sup>168</sup>, although the Ebbsfleet Development Corporation now reports that over 2,500 homes have been built since the town was granted Garden City status, and that there are around 1,500 more in planning.<sup>169</sup> In any case, the volume of development at Ebbsfleet has significantly disappointed compared to the original plans, leading to further government initiatives to speed up delivery, including establishing the Development Corporation in 2015.

<sup>166</sup> Steer (2020) “Delivering for Britain and Beyond: The Economic Impact of HS1” available [online](#).

<sup>167</sup> Atkins (December 2014) “First Interim Evaluation of the Impacts of High Speed 1: Final Report Volume 1 – Main Report” available [online](#).

<sup>168</sup> New Civil Engineer (21 April 2017) “Midlands HS2 development to ‘avoid HS1 mistakes’” available [online](#).

<sup>169</sup> Ebbsfleet Development Corporation (2021) “Business Plan 2021/22” available [online](#).

## Regeneration and development

The case for HS1 included significant regeneration benefits at Kings Cross, Stratford and the areas around Ebbsfleet. These benefits have not yet been realised at Ebbsfleet, although there are clear physical signs that significant regeneration around Kings Cross and Stratford. At the Stratford International Quarter site, LCR and Lendlease report that they have delivered over 1 million sq.ft. of Grade A office space, with more planned.<sup>170</sup>

It is worth noting that residential developers of the type that have invested in Kings Cross and Stratford are long-term investors and tend to build out large development sites in stages, recycling the capital released from sales to fund the next phase of development. It is not unusual to find that new housing and commercial development is still being delivered even a decade later on a scheme of this scale.

## Other socioeconomic and environmental benefits

In addition to the main indicators of economic development considered in all our case studies, we also captured other socio-economic and environment benefits which are claimed by stakeholders, and which may be relevant to transformational change.

A report commissioned by HS1 Ltd estimates that £7m of environmental and social benefits are delivered each year because of travellers switching from car travel to the train. These benefits are mainly reduced congestion on local roads (£5.5m) and lower road accident rates (£0.9m) but are also attributable to better air quality (£0.1m), reduced noise pollution (£0.1m) and reduced greenhouse gas emissions (£0.4m). The environmental benefits from international travellers switching from plane to HS1 are estimated to be worth £66m per year, saving 60,000 short-haul flights and 750,000 tonnes of CO<sub>2</sub>e each year.<sup>171</sup>

Another study commissioned by HS1 Ltd claims that the line has facilitated significant tourism impacts: annual expenditure by visitors to the UK arriving via HS1 is estimated to be worth £2bn per year, supporting around 3,600 full-time employees.<sup>172</sup> The study also estimates that direct expenditure by visitors arriving in Kent via HS1 is estimated to be about £56.5m per year.<sup>173</sup> The study also states that leisure journeys to Kent via HS1 have increased almost nine-fold, from 100,000 in 2010 to 890,000 in 2016.<sup>174</sup> The study cites survey evidence which suggests around 40 percent of journeys made on HS1 in 2016 were for leisure purposes, and of those who travelled by rail to Kent, over 10 percent said that they would not have visited Kent without the HS1 service.<sup>175</sup>

With regards to both of these studies, the methodologies used to derive these estimated impacts is not explained. Whilst in some cases the analysis appears to replicate the type of analysis that DfT would itself employ, we are not able to verify that this is indeed the case. Additionally, since the reports were commissioned by HS1 Ltd, there is a risk that the reports focus only on those results that portray a positive image of the company's services and it was not possible to assess the methodology adopted within the scope of this report.

## 6.5. SOURCES

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Atkins (December 2014) "First Interim Evaluation of the Impacts of High Speed 1: Final Report Volume 1 – Main Report" available [online](#)

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<sup>170</sup> LCR Property (accessed July 2021) "International Quarter London" available [online](#).

<sup>171</sup> Steer (2020) "Delivering for Britain and Beyond: The Economic Impact of HS1" available [online](#).

<sup>172</sup> Steer (2020) "Delivering for Britain and Beyond: The Economic Impact of HS1" available [online](#).

<sup>173</sup> Steer (2020) "Delivering for Britain and Beyond: The Economic Impact of HS1" available [online](#).

<sup>174</sup> HS1 Ltd (September 2017) "High Speed One at 10: measuring HS1's impact on Kent's visitor economy" available [online](#).

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## 7. HIGH SPEED RAIL NETWORK – SPAIN

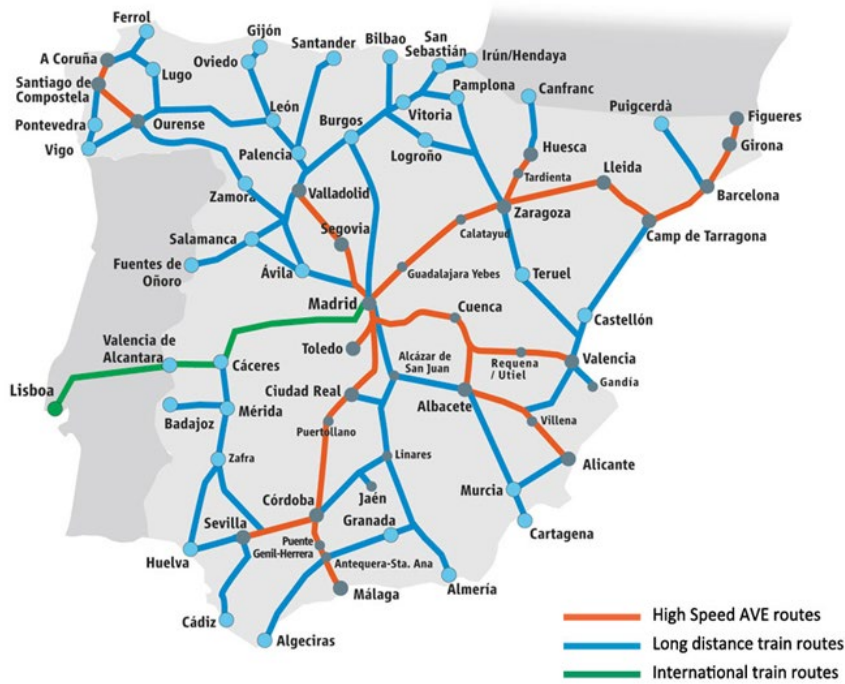
### Summary of key messages

- The focus of this case study is on two lines of the Spanish High-Speed Rail (HSR): the Madrid-Seville (1992) and the Madrid-Barcelona (2008) lines. The main objective of the HSR was to improve accessibility and territorial cohesion.
- The Spanish HSR has delivered limited transformational impact to the majority of the areas it serves. Key determinants include low passenger ridership, limited complimentary investment and development to capitalise on the scheme, as well as lack of economic and land-use change observed for the majority of the areas.
- At the business case stage and the evaluation stage, passenger numbers (and subsequently revenue) were found to be too low to cover the cost of the infrastructure. However, there was significant modal shift from air, road and standard rail.
- There is some evidence that the introduction of HSR coincided with and possibly contributed to population growth in intermediate areas between the cities linked by the new lines. HSR had positive economic effects in cities on the Madrid-Barcelona line; evidence shows increases in economic activity (GVA contribution) and labour productivity, but not employment growth.
- There is some evidence that HSR and planned co-investments have contributed to urban renewal and land use change in Madrid and Seville, but very little in Barcelona.
- There was no coordinated effort from central government - in terms of strategy and land-use policy - to deliver an integrated, urban development plan for the cities/towns served by HSR. This has led to significant variation in the scale of complimentary investment and planning across cities/towns.
- Independent evaluation of the scheme found that it demonstrated poor value for money, despite being constructed at a relatively efficient cost compared to other European high speed rail networks; and that it did not achieve the fundamental objective of improving territorial cohesion.<sup>176</sup>
- **The key contextual factors relevant to this scheme are:**
  - Business cycle: the Madrid-Barcelona line was completed as the 2008 financial crisis hit, which may have limited the wider economic outcomes the HSR had the potential to deliver, including more housing.
  - Regeneration programme: although some cities did introduce complimentary regeneration investment to capitalise on HSR, for e.g. Ciudad Real (Madrid-Seville), not all cities and towns followed suit, limiting the wider economic outcomes HSR had the potential to deliver.
  - Underutilised skills: HSR enabled wider access to the labour market (particularly a highly skilled labour force in the intermediate towns/cities), and additionally offered wider access to employment opportunities in the major cities - Barcelona, Madrid and Seville.

<sup>176</sup> Independent Authority for Fiscal Responsibility (July 2020) Public expenditure evaluation 2019: Transport infrastructures, available [online](#).

Figure 7-1: High speed and long-distance routes for the Spanish HSR

## High Speed and Long Distance routes



### 7.1. SCHEME SUMMARY

Background information	
<b>Scheme type:</b>	New high speed rail network
<b>Type of transformational impact planned:</b>	None stated, though the intent of the scheme was to support territorial cohesion <sup>177</sup> and economic development in Spain's poorer regions
<b>Location:</b>	Madrid-Seville: Ciudad Real, Puertollano, Córdoba Madrid-Barcelona: Guadalajara, Catalayud, Zaragoza, Lleida, Tarragona
<b>Geography:</b>	Intra-city rail
<b>Promoter:</b>	Renfe Operadora (State-owned rail transport enterprise)
<b>Start of construction:</b>	Madrid-Seville December 1988
<b>Opening date:</b>	Madrid – Seville: April 1992 Madrid – Barcelona: February 2008
<b>Cost:</b>	Madrid-Seville: 2.8 billion euros <sup>178</sup> (in 1992) Madrid-Barcelona line: 8.97 billion euros <sup>179</sup> (in 2008)

<sup>177</sup> Independent Authority for Fiscal Responsibility (July 2020) Public expenditure evaluation 2019: Transport infrastructures, available [online](#).

<sup>178</sup> Smith (2014) New Starts: Spain's Dirt-Cheap High-Speed Rail, Upgrading Toronto Commuter Rail, NYC Elevator Woes. Accessed 12 August 2021. Available [online](#).

<sup>179</sup> Carbo et al, (2018) Evaluating the Causal Economic Impacts of Transport Investments: Evidence from the Madrid-Barcelona High Speed Rail Corridor.

**Sources of funding:**

The scheme was funded by the government, with a third of all investment (amounting to 82.96 billion euros) in the country's strategic plan (PEIT) is to be devoted to HSR until 2020.<sup>180</sup>

The Alta Velocidad Española (AVE) is a high-speed rail (HSR) network of more than 3,000km within Spain, connecting to HSR in France. This case study focuses on the development of the first two lines:

- The Madrid-Seville line (the Nuevo Acceso Ferroviario an Andalucía (NAFA)) opened in 1992 and includes stops at Ciudad Real, Puertollano and Cordoba.
- The Madrid-Barcelona line (Línea de Alta Velocidad (LAV)) was implemented in phases, with the Madrid to Lleida opening in 2003 and including stops at Guadalajara, Catalayud and Zaragoza. The line was extended to Cap de Tarragona in 2006 and finally to Barcelona in 2008.

The decision to build the Madrid to Seville line was taken in 1986 during a period of rapid economic expansion and construction of the line started in 1989. This route was first line to be built partly because of the 1992 Expo World Fair, which was to be held in Seville. The rationale provided for the scheme was to promote economic development in Spain's poorer regions and to spread territorial equity<sup>181</sup>, but there was also a sense that a new high speed rail line would help to promote Spain as a forward thinking and modern country. It was not primarily driven by existing congestion/capacity issues, although these issues nonetheless exist.<sup>182</sup> For example, according to J. Coronado, the author of the paper "Long term implications of HSR on small cities: Ciudad Real and Puertollano revisited 25 years after the arrival of the HSR" (2018)<sup>183</sup>, congestion in the Despeñaperros Pass, the access to Andalusia from central Spain, for the conventional rail (single track) existed. HSR line reduced traffic long this rail route, relieving congestion pressures.

Similar to the Madrid-Seville line, the objectives of the Madrid-Barcelona line were focused on enhancing economic prosperity across the North-East region of the country, as well as significantly reducing travel times, increasing capacity, and improving comfort and safety for rail users. The scheme promoters targeted increasing the rail market share along the Madrid-Barcelona corridor, increasing competitiveness with road and air travel, as well as attracting new rail passengers and increasing passenger demand for long-distance and regional rail.<sup>184</sup> See Figure 7-2 and Figure 7-3 for a detailed timeline of key dates associated with the two key lines for the High Speed Rail Network in Spain.

<sup>180</sup> Albalate Et Al (2010) High Speed Rail: Lessons for Policy Makers from Experiences Abroad.

<sup>181</sup> Daniel Albate and Germa Bel, (2010) High-Speed Rail: Lessons for Policy Makers from Experiences Abroad.

<sup>182</sup> J.M. Coronado and J.M. Urena, University of Castilla La Mancha, (2018) Long term implications of HSR on small cities: Ciudad real and Puertollano revisited 25 years after the arrival of the HSR.

<sup>183</sup> Coronado, J.M, Urena, J.M (2018), Long term implications of HSR on small cities: Ciudad Real and Puertollano revisited 25 years after the arrival of the HSR.

<sup>184</sup> Frontier Economics, Atkins, ITS. (March 2011) Appendix 1 – High speed railway Madrid – Barcelona in Spain.



Figure 7-2: Timeline for the Spanish HSR - Madrid-Seville line

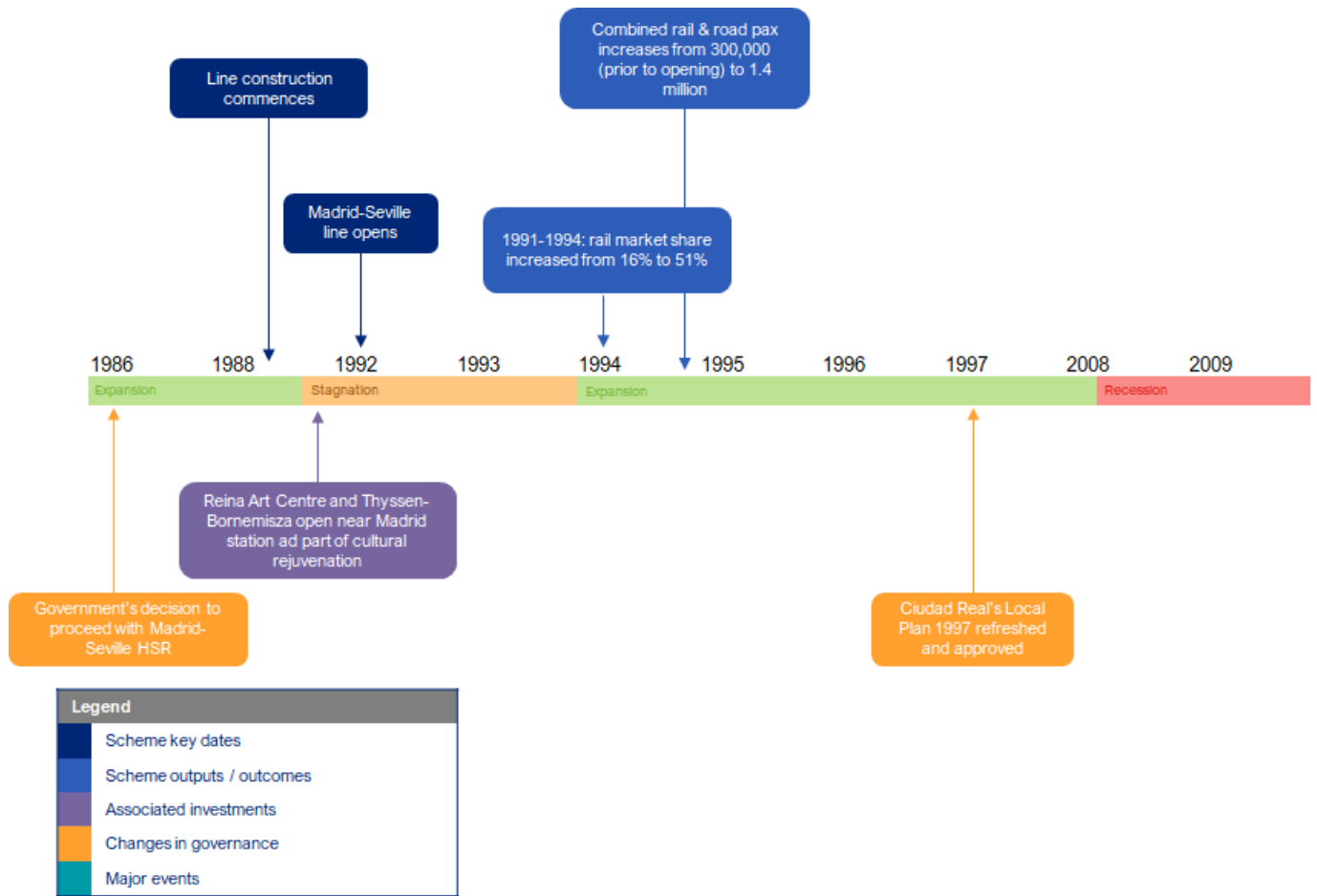
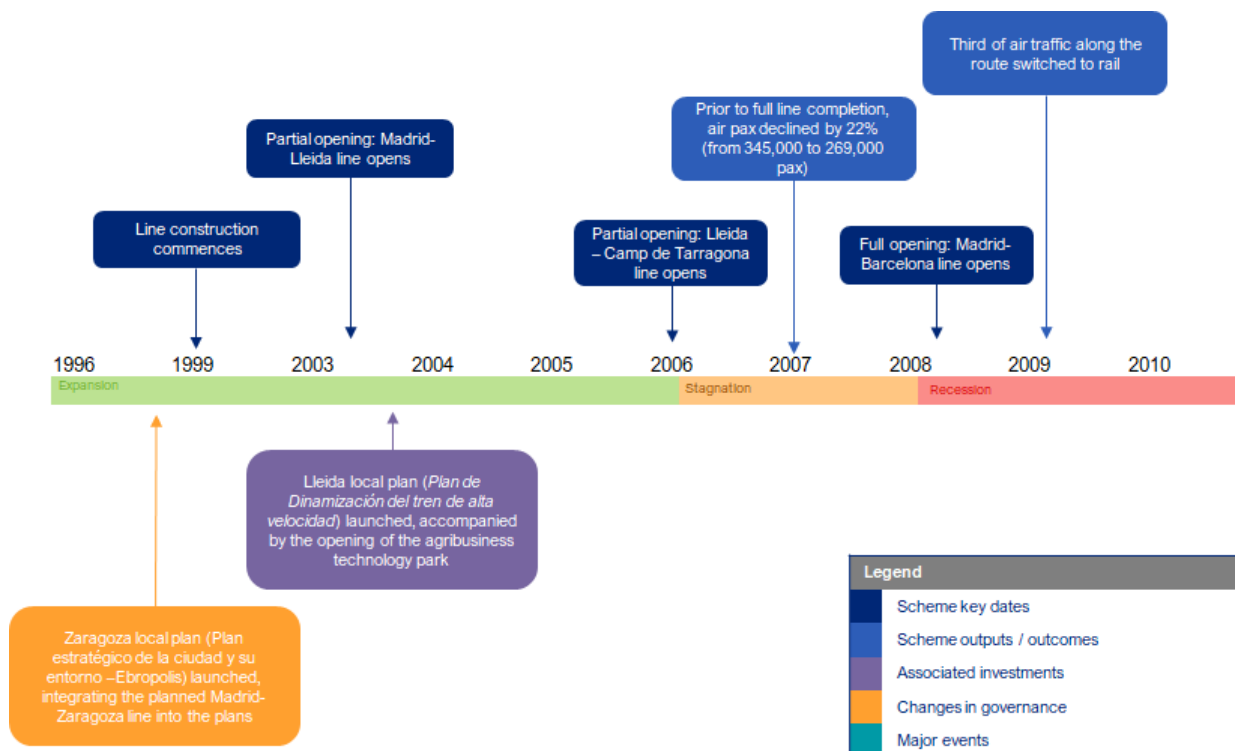


Figure 7-3: Timelines for Spanish HSR - Madrid-Barcelona line



## 7.2. THEORY OF CHANGE

Figure 7-4 and Figure 7-5 present logic maps showing the ToC of the Spanish high-speed rail network, with a focus on the Madrid to Seville line. The ToC presented within the logic map would equally be applicable to the Madrid-Barcelona line.

**Inputs / Activities / Outputs.** The Spanish high-speed rail network consisted of the creation of new high speed rail lines connecting major cities within Spain, and some smaller towns and cities en-route. This reduced the travel time between the major cities themselves (e.g. between Seville and Madrid, or between Madrid and Barcelona) and the travel time between the major cities and nearby towns and cities that were on the route (e.g. Seville and Cordoba).

**Outcomes / Impacts.** There are two key channels of transformational impact that we have explored within this ToC:

- **Changes in labour demand, where the high-speed rail line leads to changes in land use that make Seville, Barcelona, and Madrid more effective centres for employment, and leads to a change in the type of economic activity based in the nearby towns and cities.** Similar to the HS1 ToC, we hypothesise that the high-speed rail lines will further expand labour market catchments of the existing major cities by making more nearby areas an easily commutable distance. Existing residents in these nearby areas may be able to gain new jobs in these major cities where they can be more productive, increasing the average wage and reducing unemployment. We also anticipate these areas will attract new residents who would otherwise have chosen jobs elsewhere. Furthermore, there was an opportunity to build new commuter towns such as Valdeluz near Guadalajara (which was ultimately unsuccessful).<sup>185</sup> These effects would allow the major cities to accommodate more employees than previously, increasing employment density, and further improving productivity through agglomeration externalities. However, this may come at the expense of existing firms in the nearby towns and cities, which may find it more challenging to retain staff and, therefore, be crowded out.
- **Changes in economic activity and land-use, where the high-speed rail line allows for more effective business travel between the major cities.** Under this channel, we theorise that the high-speed rail lines between the major cities improve accessibility for business travel by reducing journey times and increasing the frequency of services. This makes the cities more attractive locations for firms as they can more easily access customers and suppliers based in the other cities. In the case of the Madrid-Seville line, we expect this would increase the attractiveness of Seville as a location for corporate offices due to the improved connectivity to Madrid, leading to more firms locating there. This would in turn improve labour market opportunities for residents in Seville and increase employment density in the city.

**Contexts.** In addition to the contexts discussed in previous ToCs, we consider a key contextual factor for Seville experiencing the economic benefits outlined above, is likely to be the existence of a strategy to attract firms to the area. This may be through marketing campaigns, complementary investments in supporting infrastructure, fiscal / regulatory incentives, etc.

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<sup>185</sup> Villarino, A, September 2015, El Confidencial article “ Valdeluz, de ciudad fantasma a paraíso de mileuristas y divorciados” Accessible [online](#).

Figure 7-4: Logic Map for High-Speed Rail Network Spain – Labour Demand Impacts, Seville Line

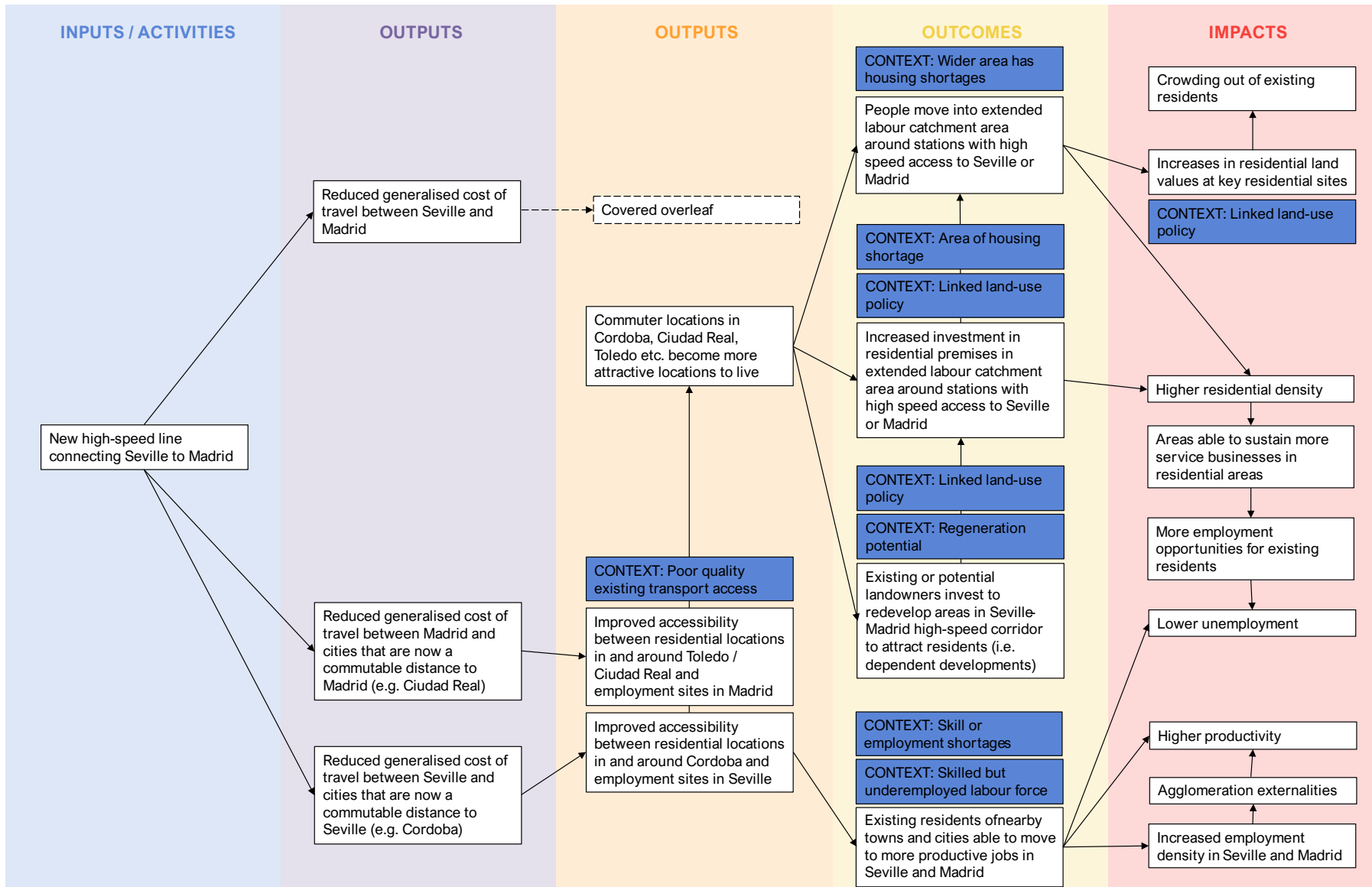
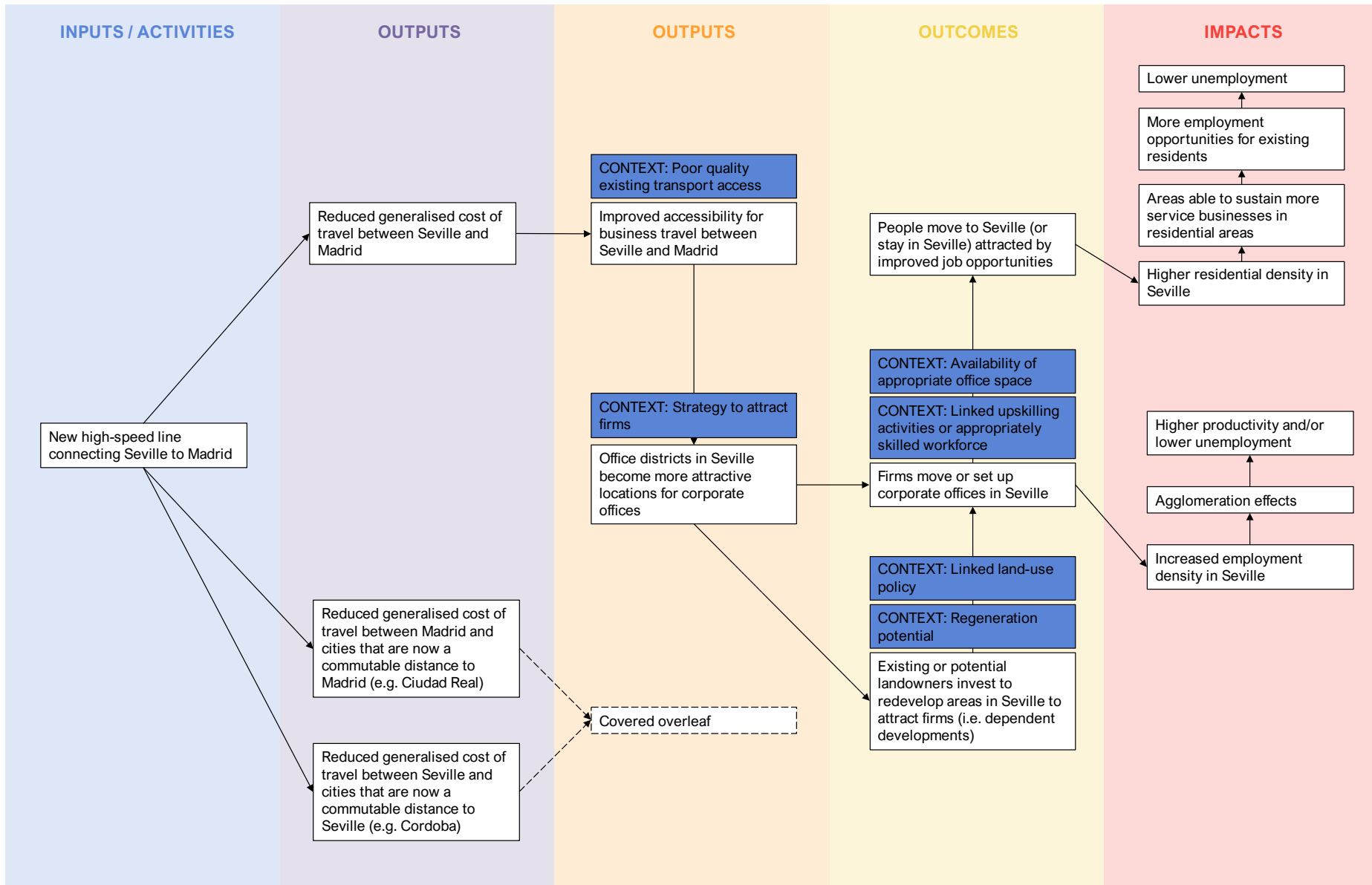


Figure 7-5: Logic Map for High-Speed Rail Network Spain – Industrial Impacts, Seville Line



## 7.3. SURROUNDING CONTEXT

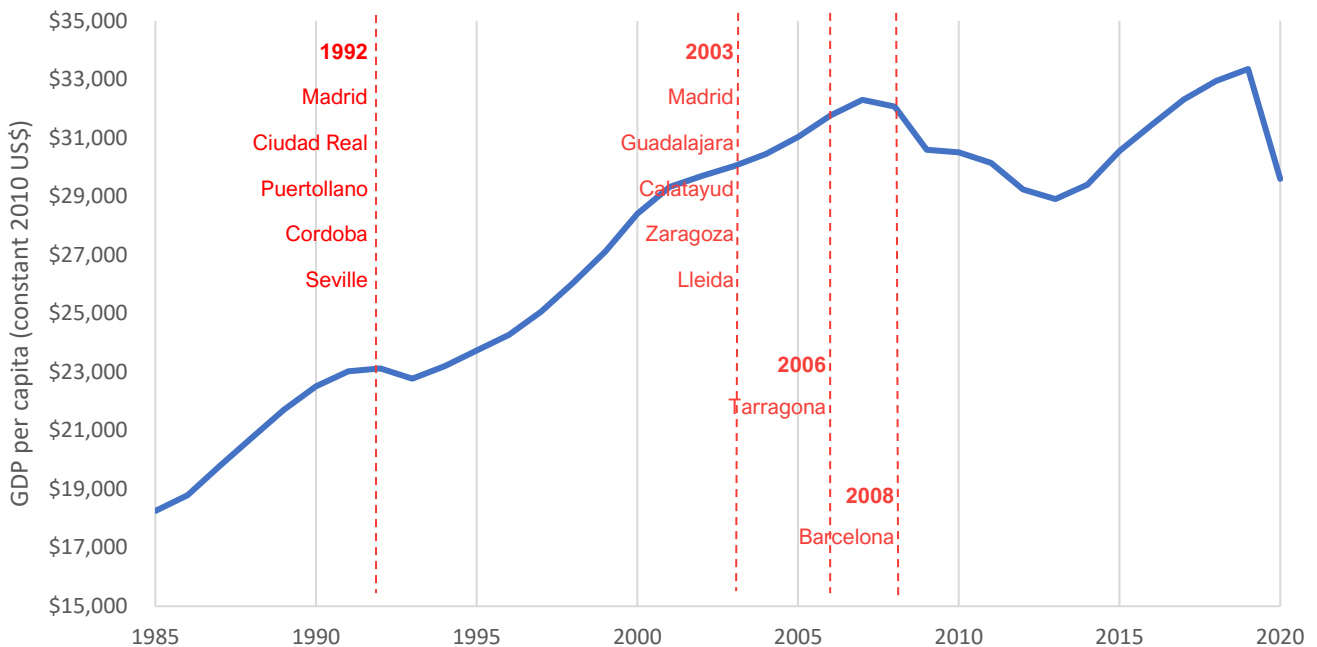
### 7.3.1. Characteristics of the area at time of investment

#### Business cycle

##### *The Madrid – Seville Line*

The Spanish economy had experienced significant economic and wage growth during the 1980s when the decision to build the Madrid-Seville HSR was taken (see Figure 7-6). Property prices were increasing even more quickly with an average increase of almost 200 percent in the second half of the decade.<sup>186</sup> The decision to build the line in 1986 took place during a period of significant property price and productivity growth and so decision makers may have anticipated imminent property and labour market pressures. However, by the time the line opened, the economy was stagnating, property prices were falling, and unemployment spiked to highs of 25 percent. During this time property prices and productivity stalled suggesting there was no general labour market or housing pressures.

Figure 7-6: GDP per capita in Spain



Source: Arup analysis. World Bank, 2020. Spanish GDP. Available [online](#).

Madrid is the largest city in Spain and centre of the Spanish HSR network, with a population of just over 3 million people. Prior to the 1970s, Madrid had experienced rapid population growth. Simultaneously, the surrounding area of Madrid Atocha station (which received the HSR network) had become increasingly derelict in the 1970s and 1980s due to population pressures and poor road planning in the area. This had a negative effect on quality of accommodation in the area and the hospitality sector. By the 1980s there were increasing calls for regeneration for which the HSR was seen as a natural solution.<sup>187</sup>

The two Southern end stations of the HSR were Cordoba and Seville in the region of Andalucía. This region was one of the poorer areas of Spain; the arrival of the HSR was seen as a key opportunity for economic growth.

The HSR stops at two intermediate stations: Ciudad Real and Puertollano. Both of them were small and relatively isolated cities before the HSR arrived in 1992. Ciudad Real was a tertiary Spanish city and was already growing in

<sup>186</sup> In Spain Today, 2021. Spanish Property Prices. Available [online](#).

<sup>187</sup> South Madrid and High Speed. An example of symbiosis, Juan Perez, 2018.

population pre-HSR more than other provincial capitals. Puertollano had more of an industrial profile and was experiencing a declining economy. It had lower population growth than other industrial cities, both during the HSR construction time, just after the opening, and during the longer period since opening. Puertollano’s economy was based on the oil and gas sector, which had been decreasing in employment, while other industrial comparison cities were more diversified.<sup>188</sup>

### **The Madrid – Barcelona Line**

The second half of the 1990s saw a twelve-year period of rapid national economic expansion (4 percent GDP growth from 1998 onwards),<sup>189</sup> productivity growth, low unemployment compared to historical highs (under 10 percent) and a booming property market which saw double digit property price growth in the early 2000s. It was at the peak of the economic expansion that the Madrid-Lleida section of the Madrid-Barcelona line opened in 2003. The extension to Tarragona opened just as the economic expansion period was coming to an end and the opening of the full Madrid-Barcelona line in 2008 coincided with the 2008 financial crisis. The financial crisis marked the start of a severe economic downturn in Spain, in which the economy shrank, property prices experienced significant decline, and unemployment jumped to record levels.

### **Quality of existing transport access**

The introduction of HSR to Ciudad Real and Puertollano (Madrid-Seville line) reduced travel times by two thirds and introduced the possibility of daily commutes.<sup>190</sup> Prior to this, the route to Madrid from the two smaller cities was either served by a relatively slow network of A-roads or an equally slow conventional railway line.<sup>191</sup> On average, the introduction of the HSR line has led to a reduction in travel time of 151 minutes, or 27% reduction in linking each province with all of the others.<sup>192</sup>

The introduction of the Madrid-Barcelona line reduced door-to-door journey times from 7 hours 50 minutes (conventional rail) to 2 hour 38 minutes (non-stop HSR), with most intermediate routes experiencing a similarly dramatic reduction in rail travel times.<sup>193</sup> Prior to the line implementation, there were regular flights between Madrid and Barcelona and journey times similar to the HSR journey times.

Whilst there have been positive effects observed in the quality of existing transport access, the implementation of Spanish HSR has contributed to a moderate growth in provincial disparities related to travel cost and travel time. According to an evaluation by the Independent Authority for Fiscal Responsibility, the investment provided greater benefits to those provinces which were already in an advantageous position, therefore the investment failed to improve territorial cohesion<sup>194</sup>.

*Table 7-1: HSR Madrid-Barcelona line - door-to-door journey times comparison by transport mode<sup>195</sup>*

Route	Car	Bus	Air	Conventional Rail	HSR
<b>Madrid-Barcelona</b>	5 hr 54 mins	8 hr 34 mins	3 hr 30 mins	7 hr 50 mins	3 hr 50 mins (non-stop: 2 hr 28 mins non)

<sup>188</sup> Long Term Implications of HSR on Small cities: Ciudad Real and Puertollano revisited 25 years after the arrival of HSR, Jose Coronado, Jose Urena, 2018.

<sup>189</sup> World Bank, 2020. Spanish GDP. Available [online](#).

<sup>190</sup> Long Term Implications of HSR on Small Cities: Ciudad Real and Puertollano revisited 25 years after the arrival of the HSR, Jose Coronado, Jose Urena, 2018.

<sup>191</sup> Interview with Jose Coronado.

<sup>192</sup> Independent Authority for Fiscal Responsibility (July 2020) Public expenditure evaluation 2019: Transport infrastructures, available online

<sup>193</sup> Frontier Economics, Atkins, ITS. (March 2011) Appendix 1 – High speed railway Madrid – Barcelona in Spain.

<sup>194</sup> Independent Authority for Fiscal Responsibility (July 2020) Public expenditure evaluation 2019: Transport infrastructures, available online.

<sup>195</sup> Frontier Economics, Atkins, ITS. (March 2011) Appendix 1 – High speed railway Madrid – Barcelona in Spain.



Route	Car	Bus	Air	Conventional Rail	HSR
Lleida-Barcelona	1 hr 40 mins	3 hr 05 mins	-	3 hr 50 mins	1 hr 40 mins
Madrid-Zaragoza	3 hrs 01 mins	4 hr 39 mins	3 hr 10 mins	3 hr 20 mins	2 hr 20 mins
Zaragoza-Lleida	1 hr 27 mins	2 hr 32 mins	-	2 hr 30 mins	1 hr 23 mins

## Housing

The Spanish economy had experienced significant economic and wage growth during the 1980s when the decision to build the Madrid-Seville HSR was taken.<sup>196</sup> Property prices were expanding even more quickly with an average increase of almost 200% in the second half of the decade<sup>197</sup>. The decision to build the line in 1986 took place during a period of significant property price and productivity growth and so decision makers may have anticipated imminent property and labour market pressures. However, by the time the line opened, the economy was stagnating, property prices were falling, and unemployment was spiking at highs of 25%. During this time property prices and productivity stalled suggesting there was no general labour market or housing pressures.

## Commercial development

In Madrid, the HSR station itself was redeveloped and expanded. The area around Madrid Atocha station had experienced decades of dereliction up until the 1970s which had coincided with the deteriorating standard of the Spanish conventional rail network. In the 1980s, the standard conventional lines were improved, and tunnels were built to link Madrid Atocha to other stations in the city.<sup>198</sup>

## Regeneration potential

We have not found evidence in English language documents on the regeneration potential of any of the areas served by the two HSR lines.

Based on our interview with Jose Carbo, researcher and author of the paper *“Evaluating the causal economic impacts of transport investments evidence from the Madrid-Barcelona high speed rail corridor”*, the area around Madrid Atocha station had experienced decades of decline and dereliction before the implementation of the new HSR station in 1992. Further to this, the land around the station was owned by the redevelopment corporation and as such could be made available for redevelopment. This was not the case for the area around the Barcelona station which was not under the control of the redevelopment corporation and where there was very little land available for redevelopment.

Furthermore, according to Jose Coronado, the strongest urban regeneration occurred in Córdoba as rail brownfields were urbanised, unlocked by the Spanish HSR. This led to strong urban transformation and real estate development in the area, although further details on the level of housing and commercial development was delivered in Córdoba were not found through the online research (in English). Realisation of urban regeneration in Córdoba was possible before the 2008 financial crisis, which halted a similar impact in other cities such as Zaragoza and Valladolid.

<sup>196</sup> World Bank, 2020. Spanish GDP. Available [online](#).

<sup>197</sup> Spanish House Prices, Trading Economics, 2021, available [online](#).

<sup>198</sup> Juan Perez, 2018, South Madrid and High Speed. An example of symbiosis.

## Underutilised skills

We have not found evidence to suggest that the areas served by the two HSR lines had “underutilised skills”, i.e. that there is skilled local labour sub-optimally allocated to low productivity industries. However, we only searched English sources.

### 7.3.2. Associated activities and actions alongside transport investment

#### Benefits realisation

We have not found evidence of a benefits realisation strategy in place for the two HSR lines. There was an attempt at Guadalajara to plan and set out to construct a new commuter town – Valdeluz – with capacity for a population of ~30,000, adjacent to Guadalajara AVE station. At the time of writing it had only 3,500 residents, with investment in new infrastructure for residential settlements that have not since been built. Therefore, Valdeluz is not considered a success.

#### Unlocking development

According to Jose Coronado, researcher and author of the paper “*Long term implications of HSR on small cities: Ciudad Real and Puertollano revisited 25 years after the arrival of HSR*”, during construction of HSR, brownfield sites were repurposed into residential developments in Ciudad Real by the City Council and the HSR company, RENFE, as land viability was enabled by HSR. The City Master plan was adapted to the new situation allowing real site development in the former station area. By comparison we found limited evidence to suggest that material urban development projects were unlocked in Puertollano. Although the HSR led to some development projects related to transportation and leisure in Puertollano (as well as Ciudad Real), including an industrial incubator and several solar panel factories, these were considered small-scaled activities.<sup>199</sup>

#### Regeneration programme

The scale of planning and complimentary investments developed varied significantly across the areas served by HSR.<sup>200</sup>

The implementation of the HSR services was part of a wider, complex process of local urban renovation and cultural rejuvenation in the areas surrounding the Madrid Atocha station. For example, two new museums were constructed, Reina Sofia Art Centre (1990) and the Thyssen-Bornemisza (1992). Coupled with induced private investments which enhanced local retail and accommodation sectors, the local area experienced a “revolution.”<sup>201</sup> This was confirmed by Jose Carbo, noting the railway operator was the primary owner of the land surrounding Madrid Atocha station, hence planning and delivering new development around the station was facilitated more easily, bypassing the need to transfer land ownership and other planning and legal obstacles.

The Madrid-Seville extension was part of the 7.8-billion-euro plan by then-President of Spain Felipe Gonzalez to modernise the region of Andalucía.<sup>202</sup> There were several major projects within Seville that may have been linked to this investment – a new airport, a tourist destination zone outside of the city centre, and a 24-hectare industrial zone near a university campus. The programme was also designed to coincide with the 1992 Universal Expo of Seville (Expo '92). However, many of the buildings produced to showcase the Expo were intended to be demolished following the celebration, meaning the projects were more likely to have been a by-product of the Expo, rather than HSR.

Ciudad Real experienced major urban renewal and inward investment following the opening of the station in 1992. New developments included a new library, a music school, a new park, new streets and over 2,000 units of housing.

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<sup>199</sup> Coronado, J.M, Urena, J.M (2018), Long term implications of HSR on small cities: Ciudad Real and Puertollano revisited 25 years after the arrival of the HSR.

<sup>200</sup> Views of interviewees.

<sup>201</sup> Juan Perez, 2018, South Madrid and High Speed. An example of symbiosis,

<sup>202</sup> Seville City - Expo 92 Article, Andalucia.com, available [online](#)

The city renewed its municipal development urban plans in 1987/88, four years before the arrival of the HSR, and then approved a new one in 1997. The 1997 plan defined a city three times bigger than the 1987/88 one, with major development initiatives including an airport, a tourist destination project, and a 24 hectares industrial zone near university campus in more peripheral locations.<sup>203</sup> However, we find that the 1997 plan was not achieved, in that the population of Ciudad Real has not grown to the level envisaged in the plan, and the airport was a notable commercial failure – closing to passenger operations in 2012 just three years after it was opened.

In contrast, a number of cities and towns did not capitalise on HSR in the same manner as Ciudad Real did. For example, there was comparatively little planning for the arrival of HSR to Puertollano (Madrid-Seville line).

When compared to the cities of Madrid and Seville, the arrival of HSR in Barcelona was accompanied by very little urban regeneration planning, expansion or redevelopment of the station or other complimentary investments. According to Jose Carbo, this may have been due to limited available land capacity surrounding Barcelona station. The ability to attract more private investment to the area was likely to have been further exacerbated by the impact of the 2008 financial crisis.

However, not all cities/towns served by the Madrid-Barcelona line failed to deliver complimentary investment and projects. The arrival of HSR to Zaragoza was used to catalyse urban and socio-economic transformation of the city and was integrated into local plans (Plan estratégico de la ciudad y su entorno –Ebropolis, 1998).<sup>204</sup> Ninety one percent of employers surveyed soon after the line opened indicated the perception of Zaragoza had improved following the HSR opening. The arrival of HSR in Lleida (an hour away from Barcelona on HSR) was accompanied by the opening of a technology park, specialising in agribusiness. The opening was also accompanied by a plan to promote the city as a tourist gateway (Plan de Dinamización del tren de alta velocidad) and a marketing campaign.

Evidence of significant redevelopment and land-use was not found for either Guadalajara or Tarragona stations. This was confirmed by Jose Carbo, suggesting the location of the HSR station and lack of integration with the existing transport network (both stations were built on the outskirts of the town) limited the effectiveness of HSR.

## **Skills investment**

We have not found substantial evidence of major skills investment delivered to compliment the development of either line.

In Ciudad Real, the opening of the HSR station in 1992 coincided with new developments including a new library and new school, and a 24 hectares industrial zone earmarked for development near the university campus. According to J. Coronado, although it was difficult to observe the impact on land value HSR has had, there was noticeable development in universities, in which “HSR was good at moving brains, not moving freight.” This may be due to the accessibility to a wider pool of highly skilled people and students in Madrid and other cities enabled by HSR.

## **7.4. SCHEME OUTPUTS, OUTCOMES AND IMPACT**

### **7.4.1. Passenger growth compared to original forecasts**

Passenger numbers on both the Madrid-Seville line and the Madrid-Barcelona line were significantly lower than would be needed for the investment to be cost effective, both from a purely financial point of view and if a wider economic cost benefit analysis is considered, although the revenue from both lines do cover variable costs<sup>205</sup>. According to O. Betancor and G. Llobet (2015), the overestimation of passenger volumes is likely to be due to systematic bias that has been observed; the passenger volume projections were based on the assumption that

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<sup>203</sup> Coronado, J.M, Urena, J.M (2018), Long term implications of HSR on small cities: Ciudad Real and Puertollano revisited 25 years after the arrival of the HSR.

<sup>204</sup> Frontier Economics, Atkins, ITS (March 2011) High speed railway Madrid – Barcelona in Spain. Appendix 1.

<sup>205</sup> Ophelia Betancor, Gerard Llobet (2015) Financial and Social Accounting of High Speed Rail in Spain.

overcapacity on other modes of transport would lead to higher-than-expected demand being diverted from other modes, which in reality did not align with traveller's behaviour.<sup>206</sup>

Prior to the opening of the **Madrid-Seville** line in 1992, the combined number of rail and air passengers traveling between the two cities stood at around 800,000 each year. By 1995, this had grown to 1.4 million passenger journeys.<sup>207</sup> No effects have been reported for the interurban bus service, which continued to carry around 200,000 annual passengers during that period. The opening of HSR had a profound impact on conventional rail services, which lost a large part of their traffic along the corridor to HSR.

According to European Commission data, between 1991 and 1994 the modal share of air traffic in the corridor fell from 40 to 13 percent, and that of car and bus from 44 to 36 percent, while rail increased from 16 to 51 percent. This suggests that the scheme has been effective in achieving modal shift. However, total rail traffic is still very small in comparison to the volumes carried on TGV in France, suggesting a poor rate of return.<sup>208</sup> Infrastructure utilisation of this line is under capacity given its length and relative isolation, as well as the small proportion of the population it serves.<sup>209</sup>

For the **Madrid-Barcelona** line to be cost effective it would need 10 million passengers a year. In 2009 - one year post-implementation - with the exception of the Madrid-Barcelona segment, the ex-ante analysis assumed a higher number of passengers compared with actual numbers (See Figure 7-7).<sup>210</sup> By 2019, passenger ridership reached 4.4 million.<sup>211</sup> The ex-ante cost benefit analysis over-estimated the amount of new journeys leading to a positive net present value<sup>212</sup>. Over 85 percent of passengers are travelling to and from stations on the HSR line, rather than using the line to access other towns or provinces<sup>213</sup>.

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<sup>206</sup> O.Betancor, G.Llobet, 2015, Financial and Social Accounting of High Speed Rail in Spain.

<sup>207</sup> Menéndez, José M., Ana Rivas, and Inmaculada Gallego, (2016) Mobility characteristics of medium distance high-speed rail services. Territorial implications of High-Speed Rail. A Spanish perspective.

<sup>208</sup> Vickerman (1997) High-speed rail in Europe: experience and issues for future development. Available [online](#).

<sup>209</sup> Marti Hennenberg, (2000) An evaluation of the high-speed train in France: lessons for the Spanish case.

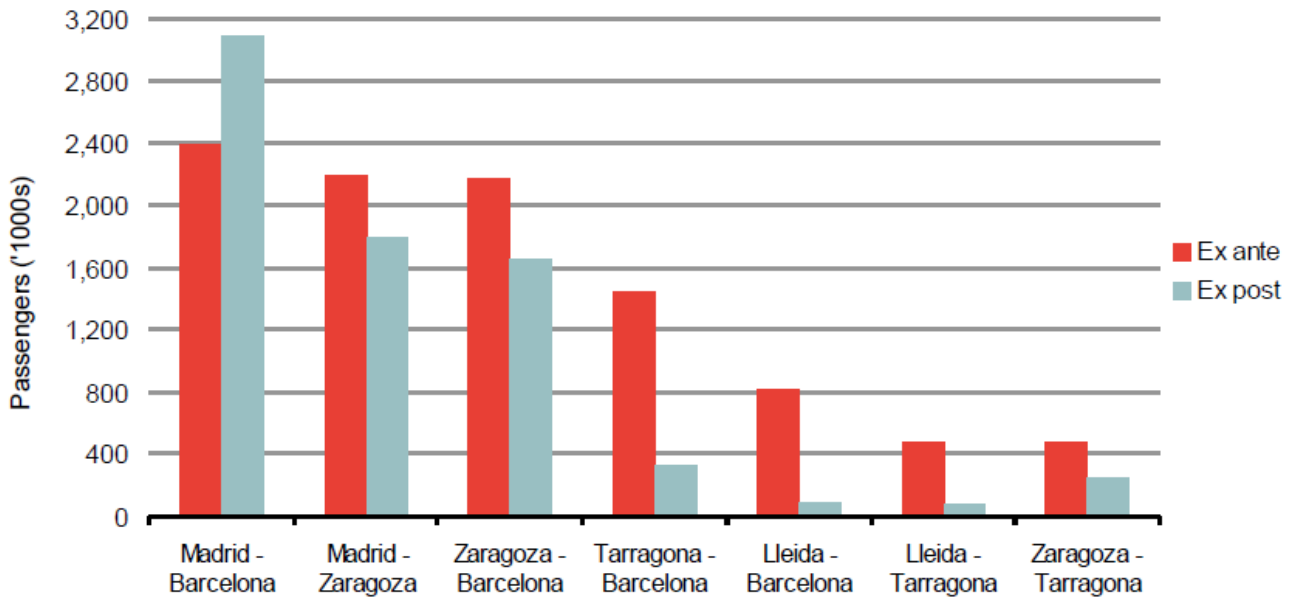
<sup>210</sup> Frontier Economics, Atkins, ITS, March 2011, Appendix 1 – High speed railway Madrid-Barcelona in Spain.

<sup>211</sup> La Vanguardia, 20 February 2020, "AVE Barcelona-Madrid cumple 12 años acumulando mas de 40 millones de viajeros". Available [online](#).

<sup>212</sup> Frontier Economics, Atkins, ITS (March 2011) High speed railway Madrid – Barcelona in Spain. Appendix 1.

<sup>213</sup> Statista (undated) Number of passengers using the high-speed train or AVE between Madrid and Barcelona from 2010 to 2019. Available [online](#).

Figure 7-7: Traffic volume comparison, 2009 by segment



The aim of taking a significant share of travel between the two major cities has been achieved, with significant mode shift from air travel to HSR. The number of air passengers decreased from 345,000 to 269,000 from 2007 to 2008 (year of Madrid-Barcelona line opening), a decline of 22 percent<sup>214</sup>. In 2009, a year after the opening of the Madrid-Barcelona line, a third of air traffic along the route had switched to rail<sup>215</sup>. A survey carried out by RENFE in October 2009 suggested that leisure & tourism was the reason for travelling in 29.2% of responses, and potentially the key driver behind the modal shift.<sup>216</sup>

The HSR line also captured travellers opting to switch from road and bus/train as the number of passengers per year between Barcelona and Madrid declined from 1.77 million to 1.69 million.

#### 7.4.2. Impact of transport investment on economic outcomes

##### Population

Following the full opening of the Madrid-Barcelona line, annual population growth<sup>217</sup> slowed down in Madrid and Barcelona between 2007 and 2015, compared to 1996 to 2007.

Table 7-2 shows the population growth for cities on the two lines. This also shows the large impact that the 2008 financial crisis had on levels of growth. The annual growth in Spain between 1996 and 2007 has been 1.19 percent a year, however the annual population growth slowed down between 2007 and 2015 to a mere 0.85 percent per annum. As such, it is difficult to judge of the effects of HSR without comparing cities. By comparing these figures, we can assess the likely effect of HSR. Due to a lack of population data prior to 1996 however, the assessment is less effective for the Madrid to Seville route. As such, we mainly focus on the Madrid to Barcelona route.

Table 7-2: Population growth of cities that received HSR stations

Region	Arrival of HSR	CAGR 1996-2007	CAGR 2007-2015	CAGR 1996-2015
Spain		1.19%	0.39%	<b>0.85%</b>

<sup>214</sup> Jimenez and Betancor, (2012) When trains go faster than planes: The strategic reaction of airlines in Spain.

<sup>215</sup> Daniel Albate and Germa Bel, (2010) High-Speed Rail: Lessons for Policy Makers from Experiences Abroad.

<sup>216</sup> Frontier Economics, Atkins, ITS, March 2011, Appendix 1 – High speed railway Madrid-Barcelona in Spain.

<sup>217</sup> Compound annual growth rate.

Region	Arrival of HSR	CAGR 1996-2007	CAGR 2007-2015	CAGR 1996-2015
Madrid	Apr-92	0.81%	0.04%	<b>0.48%</b>
Seville	Apr-92	0.02%	-0.09%	<b>-0.03%</b>
Guadalajara	Oct-03	1.37%	0.85%	<b>1.15%</b>
Lleida	Oct-03	1.17%	1.06%	<b>1.12%</b>
Barcelona	Feb-08	0.51%	0.07%	<b>0.32%</b>

Source: Jose Luis Miralles, (2017) *Integration of high-speed train stations in cities: The case of Spain and Valencia city*

The annual population growth of Guadalajara was 1.37 percent from 1996 to 2007, a little above the national average and almost double that of Madrid's growth. From 2007 to 2015 population growth declined to 0.85 percent, whilst Madrid's population growth almost entirely stagnated. The opening of the HSR station in 2003 could have facilitated Guadalajara's growth into a commuter city to Madrid, but low traffic levels at the station suggests that this did not happen.

On the Madrid-Barcelona line, a similar pattern is observed between Lleida and Barcelona. Lleida had population growth similar to the national average from 1996 to 2007, but almost three times higher from 2007 to 2016. Barcelona on the other hand had population growth significantly below the national average between 2007 and 2015. The station opened at the start of 2008 and so HSR may have facilitated the migration of residents to Lleida. It should be noted, however, that this does not necessarily imply high numbers of daily commuters between the major city and the satellite city.

Based on the population data found at this stage, there's limited evidence to suggest the introduction of HSR led to significant population growth and migration across the cities and towns served by the Madrid-Barcelona line. This may partly be due to the effects of the 2008 financial crisis.

## Employment

The opening of the **Madrid-Seville** line led to a migration of highly skilled commuters to Ciudad Real. Health and university services moved into the intermediate cities and employees commuted in from Madrid. Ciudad Real benefited from the migration of high productivity workers, particularly from neighbouring the city of Puertollano, making use of the improved commuting times, as well as burgeoning economic health sector of Ciudad Real. An additional impact of HSR on Ciudad Real was a new demand for a conference industry and, resulting from this, greater demand in the hospitality sector.<sup>218</sup>

In terms of its economic impact, the investment in the Madrid-Seville line was not guided by attempts to increase economic dynamism around the HSR stations.<sup>219</sup> Neither has it led to new firms establishing themselves within their vicinity. According to Jose Coronado, there's fewer advantages of being closer to the HSR station in small cities, as the whole city itself is close to the HSR station and does not suffer the congestion pressures larger cities face.

From 2001 to 2008, the province of Aragon experienced an increase in GDP per capita relative to the rest of the country, whereas the Madrid and Catalonia regions experienced a decline. This could be due to the partial opening of the **Madrid-Barcelona** (Madrid-Zaragoza-Lleida) route line in 2003 which runs through the Aragon region. Unemployment in Aragon was lower than the national average throughout that period, and lower than Catalonia and Madrid. However, research has shown that the opening of the Madrid-Barcelona line had little impact on unemployment<sup>220</sup>.

<sup>218</sup> Joe Coronado and Jose Urena, (2018) Long term implications of HSR on small cities: Ciudad real and Puertollano revisited 25 years after the arrival of HSR.

<sup>219</sup> Marti Hennenberg, (2000) An evaluation of the high-speed train in France: lessons for the Spanish case.

<sup>220</sup> Jose Carbo and Daniel Graham, Evaluating the Causal Economic Impacts of Transport Investments: Evidence from the Madrid-Barcelona High Speed Rail Corridor.



According to Jose Coronado, in the case of Madrid and Ciudad Real, the arrival of HSR didn't lead to one city gaining more employees than the other, but rather both cities gained from each other. On one hand, the HSR connectivity to and from Madrid meant employment opportunities in Madrid was, and still is, available to Ciudad Real. Residents of Ciudad Real, particularly young people had less incentive to migrate to Madrid, and opted to commute instead, reversing decades-long trend (since the 1960s) of young professionals migrating to Madrid. Conversely, Ciudad Real gained more highly skilled professionals, including doctors and dentists. With the HSR connection between the two cities, professionals can opt to live in Madrid and work in Ciudad Real.

## Land value and property prices

There is limited evidence of the impact of HSR (both lines) on the land value and property prices. Property prices in Ciudad Real have increased significantly since the opening of the station, perhaps due to the viability of now commuting to Madrid.

## Wages

We found no studies in English that examined the impact of the two HSR lines on wages in Madrid, Barcelona, or any of the intermediate cities/towns served by the two routes.

## Productivity

On the Madrid-Seville line, Ciudad Real benefited from the migration of high productivity workers, particularly from the neighbouring city Puertollano, to make use of the improved commuting times, as well as burgeoning economic health sector in Ciudad Real. An additional impact of HSR on Ciudad Real was a new demand for a conference industry and, resulting from this, greater demand in the hospitality sector.<sup>221</sup>

Evidence suggests there has been a positive economic impact in provinces on the Madrid-Barcelona line.<sup>222</sup> Findings show positive impacts on GVA contribution, likely due to labour productivity, as well as the number of businesses locating to the areas served by HSR, yet no significant impact on employment was found. Interviewees suggested that productivity gains observed in the intermediate cities were the result of better connectivity for major firms that had regional offices in these cities, and possibly some entry of high productivity firms.

Furthermore, CBA analysis by the Independent Authority for Fiscal Responsibility (AIRef) found that Spanish HSR returns between zero and minimum levels of socioeconomic returns in all high-speed corridors. These returns were significantly below the requirement for the implementation of significant infrastructure projects such as Spanish HSR.<sup>223</sup>

## Housing

We found limited evidence of noteworthy housing development delivered. According to interviewees, this may be due to the impact of the 2008 financial crisis may have played a role in restricting housing developments.

Significant population growth was expected in Ciudad Real on the Seville line (there were campaigns in Madrid "Come to live in Ciudad Real"), although this did not materialise<sup>224</sup>. In response to the anticipated population growth, according to Jose Coronado, brownfield sites surrounding the incoming HSR station in Ciudad Real were converted for residential use<sup>225</sup>. Ciudad Real is generally said to have integrated within the Madrid metropolitan area, as it is now within a one-hour commute time from the capital. However this integration process may have

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<sup>221</sup> Joe Coronado and Jose Urena, (2018) Long term implications of HSR on small cities: Ciudad real and Puertollano revisited 25 years after the arrival of HSR.

<sup>222</sup> Carbo, Jose M., et al. (2019) Evaluating the causal economic impacts of transport investments: evidence from the Madrid-Barcelona high speed rail corridor.

<sup>223</sup> Independent Authority for Fiscal Responsibility (July 2020) Public expenditure evaluation 2019: Transport infrastructures.

<sup>224</sup> Albalade Et Al, (2010) High Speed Rail: Lessons for Policy Makers from Experiences Abroad.

<sup>225</sup> Coronado, Jose M, Urena, Jose M. (2018) Long term implications fo HSR on small cities: Ciudad Real and Puertollano revisited 25 years after the arrival of the HSR.

begun before HSR services started. Neither Ciudad Real nor Puertollano experienced higher rates of population growth between 1991 and 2001 compared to other cities in the region. Puertollano is the only city in the region which experienced a decline in population in the period after HSR opened (1992). However, property prices in Ciudad Real have increased significantly since the opening of the station. This may be related to the viability of now commuting to Madrid, but we note that the region has also received significant EU regional development support for other projects.

Similarly, the HSR services did not stimulate economic growth of metropolitan areas of Seville or Zaragoza.<sup>226</sup> Zaragoza has experienced lower population growth than the national average since the station opened. According to Jose Carbo, there were originally plans to build new housing in Zaragoza, however this came to a halt, likely due to the 2008 financial crisis.

## Regeneration and development

We have not found substantial evidence linking the arrival of HSR services to significant regeneration and development across the cities served by the two HSR lines.

On the Madrid-Barcelona route, according to Jose Carbo, Guadalajara had the potential to be the ideal location for commuters to gravitate to, including Valdeluz (8km from Guadalajara), where up to 9,500 dwellings were planned to be built to accommodate 30,000 inhabitants<sup>227</sup>. But the urbanisation project has only attracted around 3,500 inhabitants to Valdeluz as of 2020.<sup>228</sup> Furthermore, due to the HSR station being situated outside of the city centre, any new developments and regeneration projects observed within the city are unlikely to be attributable to HSR. Failure to maximise the benefits of HSR highlight the importance of integrating HSR into the existing transport network and coordinated planning.

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<sup>226</sup> High-Speed Rail and Urban Development in Spain from 1992 to 2016, Miralles I Garci, Jose Luis, 2018.

<sup>227</sup> Villarino, A, September 2015, El Confidencial article “ Valdeluz, de ciudad fantasma a paraíso de mileuristas y divorciados” Accessible [online](#).

<sup>228</sup> Instituto Nacional de Estadística, 2020.

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## 8. WEST COAST MAIN LINE UPGRADES

### Summary of key messages

- The West Coast Main Line (WCML) upgrade can be considered a success as the upgrade achieved its main objectives, including a significant modal shift from air and road travel to rail.
- WCML upgrades increased rail capacity three-fold, and reduced travel times between London and Manchester by 40 minutes to 2 hours 6 minutes.
- There is little evidence of significant land use change and induced private sector investment directly linked to the WCML upgrades. The primary objective of the scheme was to address a backlog of maintenance and renewal works and was not a core part of the project, hence delivering significant land use change was not a priority.
- The WCML *may* have led to some land use changes, but attribution is challenging in the absence of a robust evaluation. It also may have catalysed urban regeneration effects in metropolitan areas through changes in office rent and residential values.
- There is limited evidence of the scheme directly attracting employment and thus significantly impacting the local labour market.
- The scheme has had a significant positive environmental impact through modal shift.
- **The key contextual factors relevant to this scheme are:**
  - Underutilised skills: WCML upgrade linked skills' hubs with the rest of the country, attracting major employers.
  - Business cycle: the first two phases were completed during periods of economic expansion.
  - Quality of existing transport access: prior to the scheme, the existing rail service along the route was performing poorly, less frequent services, older rolling stock, poor punctuality and reliability.

Figure 8-1: WCML route map



Source: National Audit Office analysis of Network Rail information

## 8.1. SCHEME SUMMARY

Background information	
<b>Scheme type:</b>	Conventional rail route upgrade
<b>Type of transformational impact planned:</b>	<p>The scheme was anticipated to deliver the following transformational impacts:</p> <ul style="list-style-type: none"> <li>• <b>Labour impacts</b> – by vastly improving journey times and reliability between major metropolitan areas such as Manchester and Liverpool and the peripheral non-metropolitan areas such as Halton (i.e. Runcorn and Widnes), Warrington and Lancaster, WCML upgrade would widen employment opportunities within the metropolitan areas, and conversely, access to a wider labour pool in the non-metropolitan areas.</li> <li>• <b>Sectoral impacts</b> - the improvements to rail connectivity as a result of the WCML upgrades were expected to increase the attractiveness of cities such as Manchester and Birmingham for firms, particularly that would have opted for London prior to the WCML upgrade, to capitalise on the improved access to customers and suppliers.</li> </ul>
<b>Location:</b>	London-Glasgow, with branches to Birmingham, Liverpool, Manchester, and Edinburgh
<b>Geography:</b>	Inter-city
<b>Promoter:</b>	Department for Transport (and previously Railtrack, the Strategic Rail Authority)
<b>Start of construction:</b>	1996, then re-specified in 2003
<b>Opening date:</b>	Phase 1: September 2004 Phase 2: December 2005 Phase 3: December 2008
<b>Cost:</b>	£8.6 billion <sup>229</sup>
<b>Sources of funding:</b>	<p>Originally financed through borrowing by Railtrack, funded through government grants (baseline upgrade PUG1) and future revenues (PUG2).</p> <p>Oct 2001-Mar 2002, funded through administrators and from 2002, funded through a combination of Railtrack-in-Administration and Network rail loans<sup>230</sup>, ultimately through government borrowing.</p>

The WCML upgrade is a core national long-distance freight and commuter route, linking London with the Home Counties, the North West, North Wales and Scotland<sup>231</sup>, including Northampton, Birmingham, Manchester, Liverpool, Glasgow, and Edinburgh. The network is a mixed-traffic railway, with intercity, regional, commuter and freight rail services. The WCML upgrade led to faster, more frequent and more services. Journey time savings observed as a result of the upgrade are summarised in Table 8-1.

Table 8-1: WCML upgrade – journey time changes by destination (to/from London Euston)<sup>232</sup>

Route	Pre-project implementation	Post-project implementation
Birmingham	1 hr 43 mins	1 hr 30 mins
Coventry	1 hr 11 mins	1 hr 04 mins
Manchester	2 hr 36 mins	2 hr 06 mins

<sup>229</sup> National Audit Office (2006) The Modernisation of the West Coast Main Line. Available [online](#).

<sup>230</sup> National Audit Office (2006) The Modernisation of the West Coast Main Line. Available [online](#).

<sup>231</sup> Strategic Rail Authority (June 2003) West Coast Main Line Strategy. Available [online](#).

<sup>232</sup> Department for Transport (2006) West Coast Main Line Progress Report May 2006.

Route	Pre-project implementation	Post-project implementation
Liverpool	2 hr 53 mins	2 hr 30 mins
Crewe	2 hr 08 mins	1 hr 45 mins
Carlisle	4 hr 04 mins	3 hr 44 mins
Glasgow	5 hr 35 mins	5 hr 00 mins

Since the route's electrification in the 1960s, financial constraints meant that maintenance and renewal work was limited, causing the infrastructure to deteriorate in the years that followed. This was until the 1993 budget announcement, when the Chancellor of the Exchequer, Ken Clarke, announced the upgrade of the WCML would be taken forward as part of the Private Finance Initiative.<sup>233</sup>

The government was to pay for the basic level of upgrade (to 125mph running, called PUG1), with a further enhancement (to 140mph running, PUG2) being agreed separately by Railtrack (the infrastructure provider, and forerunner to Network Rail) and Virgin Trains (the operator). The work began in 1996 at a slow pace, and against the background of technical difficulties, the PUG2 programme was ended after Railtrack's administration in 2001. The Strategic Rail Authority (SRA) intervened in 2002, re-specifying the programme the year after.<sup>234</sup> The 2003 WCML Strategy,<sup>235</sup> developed by the SRA, set out the programme's five key objectives:

1. Address the backlog of maintenance and renewals on the route, providing improved performance, safety, and reliability.
2. Regain lost market share and increase role of the railway in national and regional economies.
3. Provide additional capacity to accommodate for anticipated passenger and freight business growth.
4. Establish sustainable and cost-effective maintenance regimes.
5. Continuation of freight and passenger traffic during construction.

The new programme had the following outputs:

- Phase 1 September 2004: Track upgrades to 125mph between London, Manchester, Birmingham, and Crewe to produce a more frequent timetable.
- Phase 2 December 2005: Track upgrades to 125mph between Preston and Glasgow.
- Phase 3 December 2008: Renewals and enhancements to increase capacity for 80 percent more long-distance passenger trains and 70 percent more freight paths than pre-2004.

See Figure 8-3 for a detailed timeline of key dates associated with the West Coast Mainline upgrades.

According to the project sponsor, the WCML was considered first and foremost to be a transport project, intended to address a poorly performing rail line, a backlog of maintenance and renewal works, whilst improving journey times and reliability, and increasing the overall volume of travel between the major population centres of the United Kingdom. Hence, delivering conventional transport outcomes was potentially prioritised over opening up/unlocking new areas for development. Nonetheless, high speed trains and improved intra-regional rail schemes has the potential to strengthen local economies and employment in the knowledge economy over time.<sup>236</sup>

Due to the scale of the project, for the purpose of this case study, the study area will cover four regions: Scotland, North-West (NW), Midlands and South.

<sup>233</sup> Strategic Rail Authority (June 2003) West Coast Main Line Strategy. Available [online](#).

<sup>234</sup> National Audit Office (2006) The Modernisation of the West Coast Main Line. Available [online](#).

<sup>235</sup> Strategic Rail Authority (June 2003) West Coast Main Line Strategy. Available [online](#).

<sup>236</sup> Chia-Lin Chen, Peter Hall (2011) The Wider Economic Impacts of High-Speed Trains: A Comparative case study of Manchester and Lille sub-regions.



Figure 8-2: Regional study area

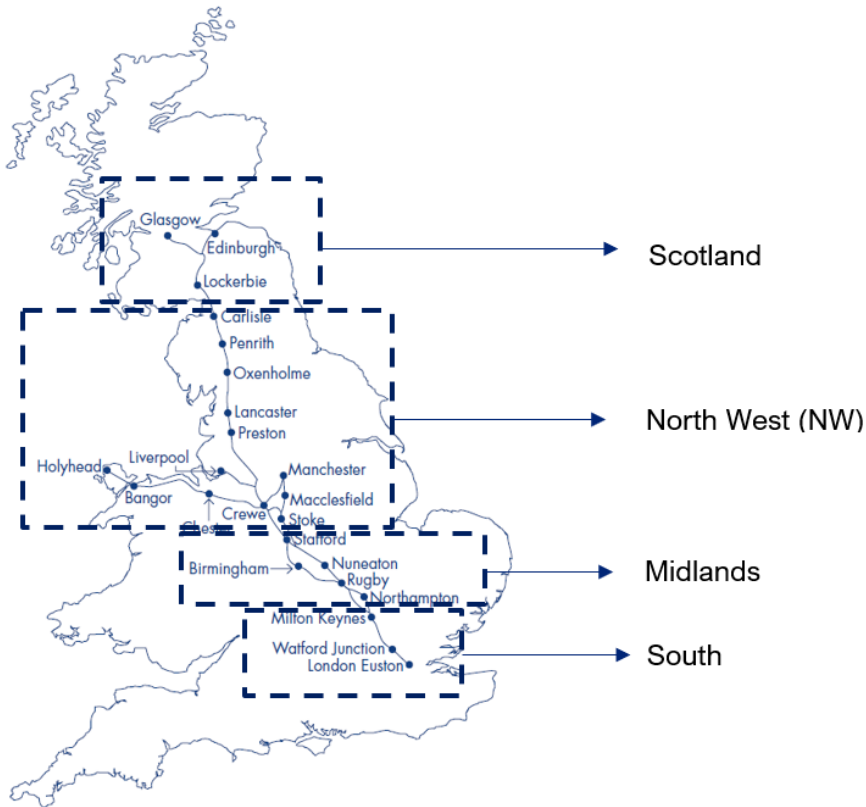
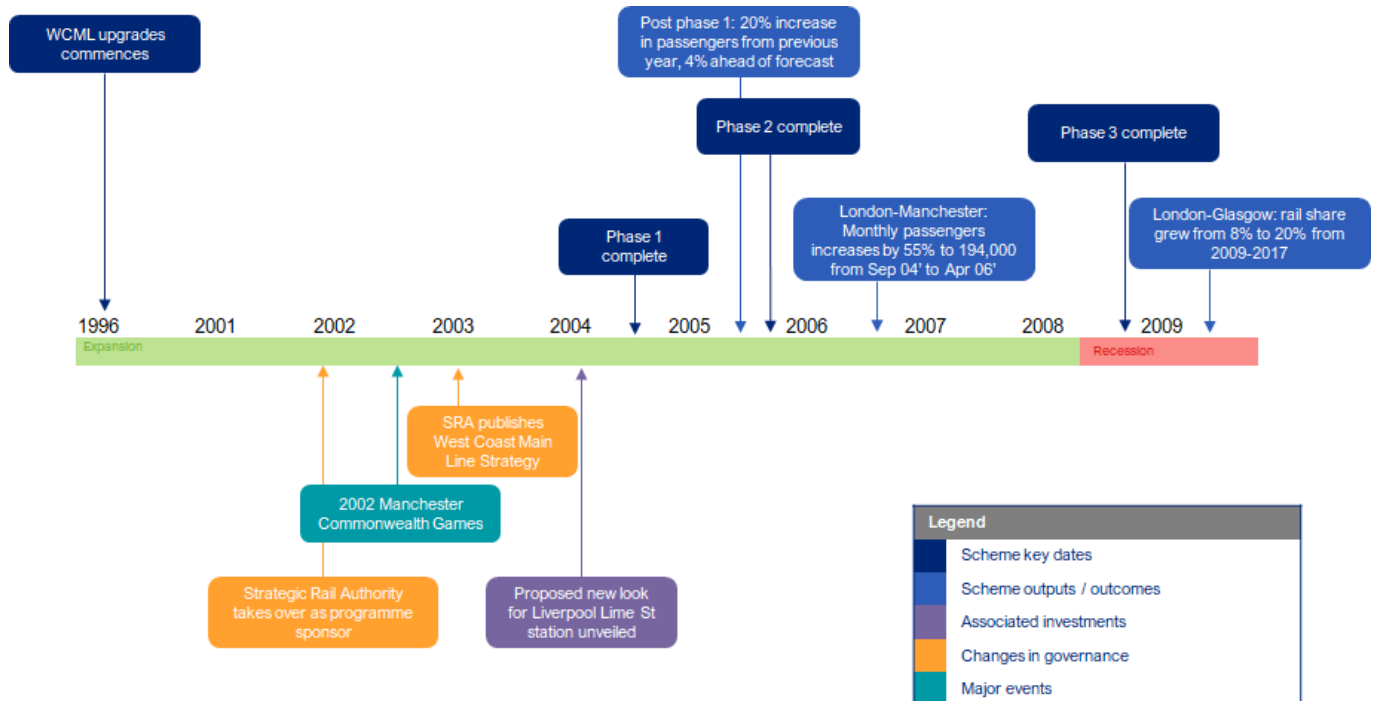


Figure 8-3: Timeline for the West Coast Mainline



## 8.2. THEORY OF CHANGE

Figure 8-4 and Figure 8-5 present logic maps showing the ToC of the WCML upgrades, focusing on impacts in the northwest of England, notably Manchester which had the greatest proportional reduction in journey times. However, Figure 8-4 can potentially be generalisable to other cities impacted by the WCML, such as Liverpool, Birmingham and Glasgow.

**Inputs / Activities / Outputs.** The scheme consisted of a series of improvements to the WCML that led to reduced journey times, higher frequencies and higher capacity trains on the rail route that connected London to the West Midlands, North West, and Scotland.

**Outcomes / Impacts.** There were two key channels of transformational impact that we have explored within this ToC:

- **Changes in economic activity and land-use, where the upgrades to the rail line allowed for more effective business travel between London and the cities on the WCML.** As with the Spanish high-speed rail ToC, we expect that the improvements to rail connectivity as a result of the WCML upgrades increased the attractiveness of cities such as Manchester and Birmingham for firms. Firms would choose these cities as locations for offices where they would have otherwise chosen London due to its proximity to suppliers and customers, leading to changes in land use that support these commercial activities. This in turn may lead to further investment to provide the necessary infrastructure to attract firms. The combined effect of this would be to provide residents with more (and better) employment opportunities, increasing productivity and lowering unemployment.
- **Changes in consumer demand, where the upgrades to the rail line leads to higher demand for leisure and retail activities, supporting more economic activity and more employment.** The improvements to the WCML could have increased the attractiveness of existing leisure, retail, and tourism destinations such as the Lake District, both for visitors using the WCML and those that value the option of the rail connection. This may lead to more visitors to these areas, increasing demand for firms providing leisure, retail, or tourism services supporting employment, but also potentially inducing further investment. This in turn increases economic activity and further improves the attractiveness of the areas to potential visitors.

**Contexts.** A key potential context for both channels of transformation is that the WCML upgrade represents a step-change in transport connectivity (i.e. existing transport connectivity was poor). For the first channel, this would represent a step-change in accessibility between firms choosing to locate in cities such as Manchester, and suppliers based in other cities on the WCML. For the second channel, this would represent a step-change in visitor perceptions around the accessibility of destinations such as the Lake District.

Figure 8-4: Logic Map for WCML - Industrial impacts (Manchester)

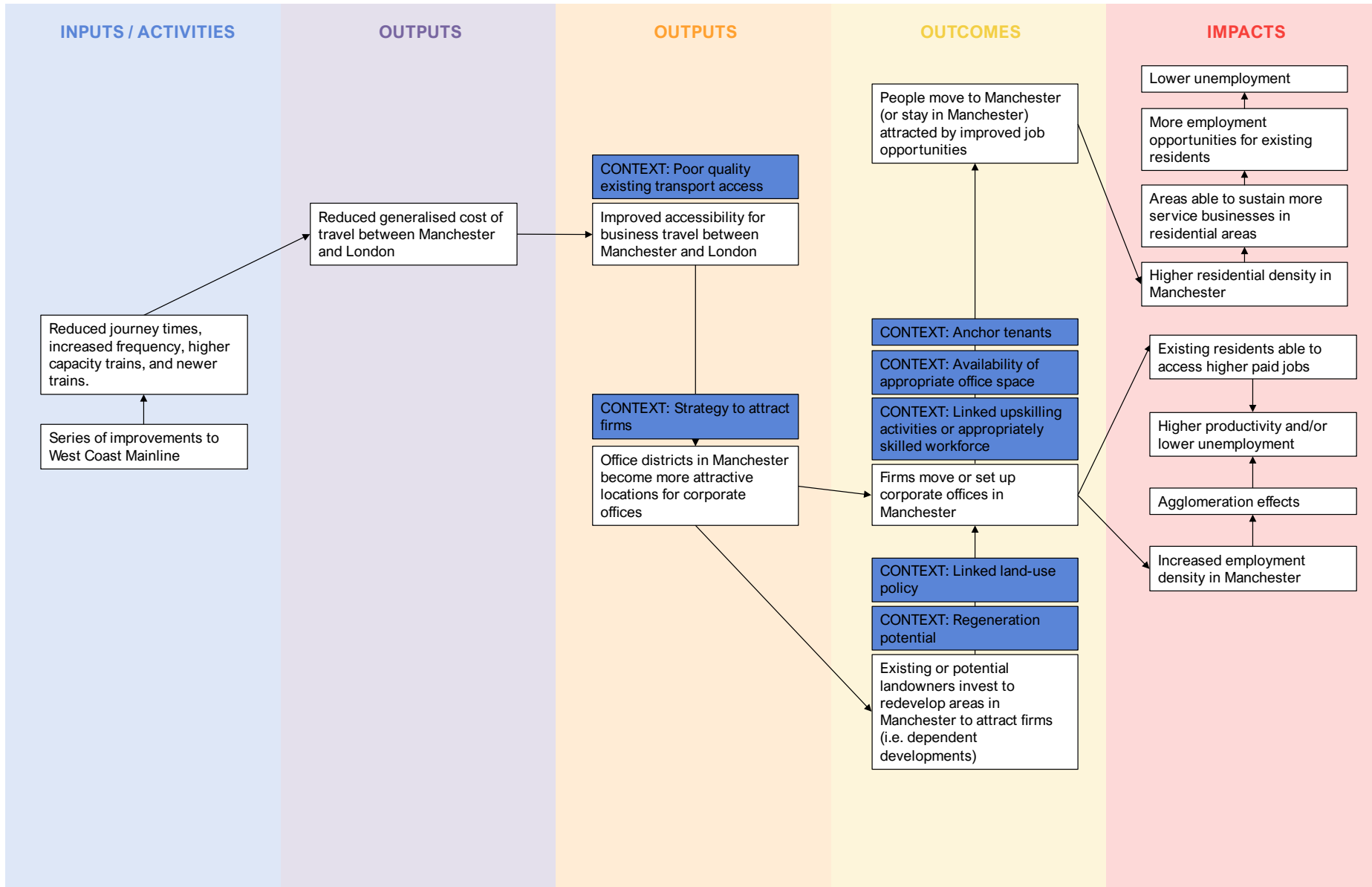
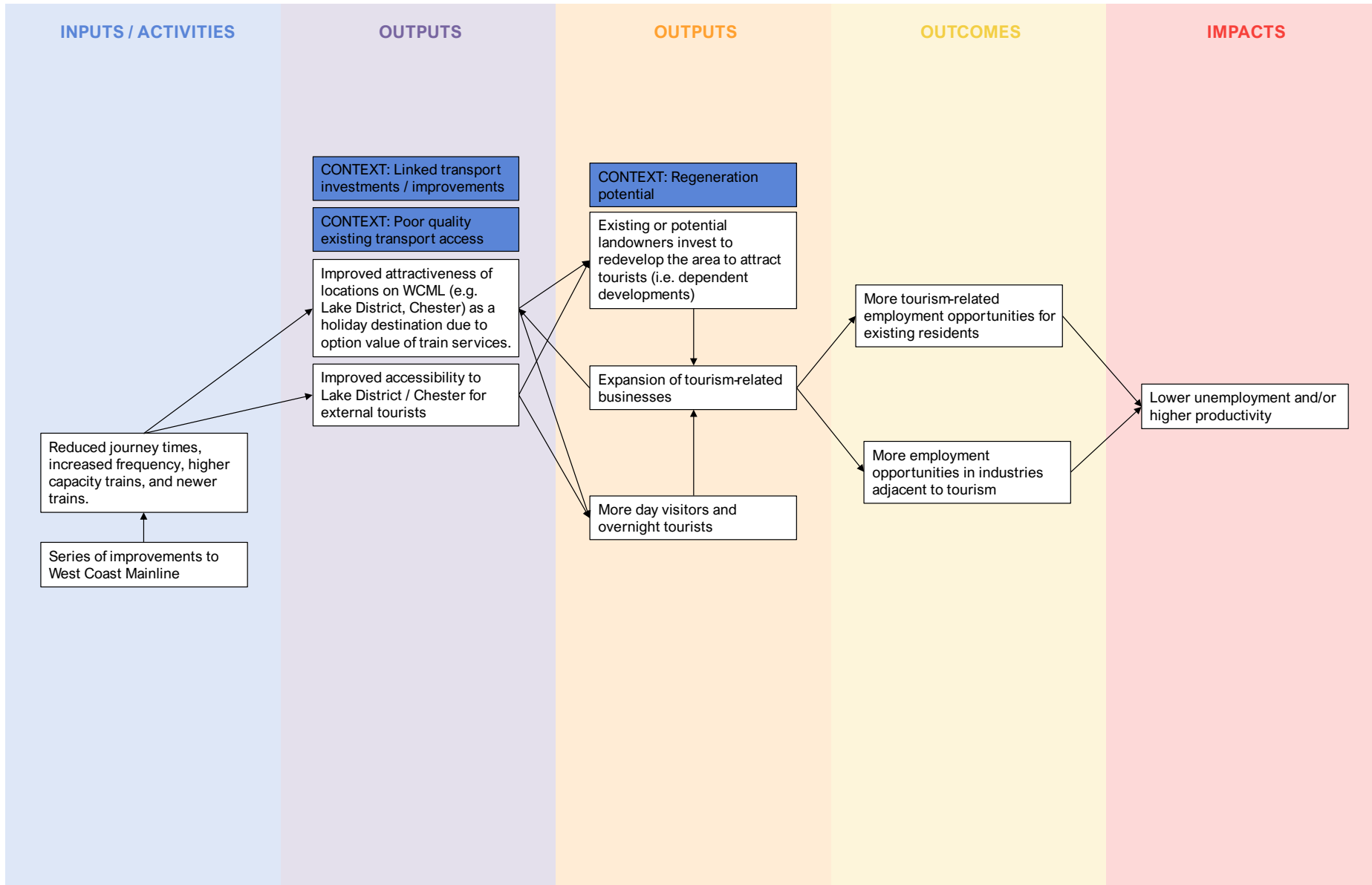


Figure 8-5: Logic Map for WCML - Consumer impacts (Lake District, London, Chester)



## 8.3. SURROUNDING CONTEXT

### 8.3.1. Characteristics of the area at time of investment

#### Business cycle

Phase 1 of the WCML upgrade was completed in 2004 as the UK economy was experiencing high economic growth (by 3.1 percent from the previous year). Phase 2<sup>237</sup> was completed the following year as the UK economy continued to expand (by 2.8 percent). However, just before completion of Phase 3 of the scheme in December 2008, the UK was entering a period of economic contraction caused by the 2008 financial crisis.<sup>238</sup> Hence, the realisation of outcomes in the short-term is likely to have been affected by the economic downturn.

#### Quality of existing transport access

Despite being one of the most critical trunk routes on Britain's route network, the WCML had been one of the many strategic trunk routes neglected in terms of maintenance and renewal works, leading to poor reliability and low frequency of services, which according to the 2003 WCML strategy, was due to financial constraints.<sup>239</sup> According to the then DfT project sponsor of the WCML upgrade, the journey times and poor reliability of the long distance passenger trains on the WCML, particularly between Manchester and London, made rail travel commercially unattractive compared to road and air travel. Rail had a lower mode share, compared with both air and road, than on the East Coast Main Line corridor, so there was an opportunity to shift some of the passenger traffic from air to rail – particularly on the WCML corridor. Traffic growth on the WCML had been subdued due to the poor performance and condition of the route and trains, and, in the years leading up to the first outputs, the intrusive nature of the engineering works themselves, which often led to prolonged closures of the rail line, especially at weekends. As demonstrated by the five main objectives set by the SRA, the primary focus of the investment was to address the poor condition of the route, enabling rail travel between major cities such as London, Manchester and Liverpool to become an attractive and viable option for travellers.

#### Housing

Based on the Index of Multiple Deprivation (IMD) Data<sup>240</sup>, a measure of relative deprivation which combines a range of sub-measures including Education, Income and Crime, suggests that there were housing constraints and barriers to services in the neighbourhoods surrounding WCML stations in 2004. Areas around Manchester Piccadilly station were amongst the 10 percent most deprived neighbourhoods in the country in terms of barriers to housing and services. Areas around Birmingham New Street were also relatively deprived, ranking amongst the 10 to 20 percent most deprived areas for housing and services. In comparison, areas around Milton Keynes and Liverpool Lime Street stations were less deprived at the time, respectively ranking between the 30 to 40 percent most deprived and 50 to 60 percent most deprived respectively.

Although some of the major cities along the line were experiencing housing shortages/barriers, there is little evidence found to suggest that there were housing developments proposed to directly complement the WCML upgrade.

#### Commercial development

Based on our research, we were not able to identify indicators or existing literature to suggest that any of the areas served by WCML had significant constraints on the supply of commercial and office space that would suggest a latent demand would have been addressed by WCML upgrades.

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<sup>237</sup> BBC News, 2005. UK Economy ends 2004 with a spurt. Available [online](#).

<sup>238</sup> ONS, 2015. Trends in the UK Economy. Available [online](#).

<sup>239</sup> Strategic Rail Authority, (2003), The West Coast Main Line Strategy.

<sup>240</sup> GOV.UK 2004, English Indices of Deprivation. Available [online](#).

## Regeneration potential

Data from the IMD 2004 shows that neighbourhoods surrounding stations in Manchester and Liverpool were ranked amongst the 10 to 20 percent most deprived in terms of living environment. Similarly, neighbourhoods surrounding Birmingham New Street station were slightly less deprived in this category, ranking between 20 to 30 percent most deprived. By contrast, neighbourhoods surrounding WCML stations in the Southern region such as Milton Keynes Central ranked between 20 to 30 percent least deprived in the country, suggesting a relatively good living environment prior to the upgrade.

## Underutilised skills

Although the North West region saw considerable economic restructuring and strong job creation, the 2004 IMD data suggests that there were significant barriers to education, skills and training in some neighbourhoods surrounding WCML stations prior to the upgrade.

Based on the 2004 Indices of Deprivation data, areas surrounding the WCML-served stations in the North West and Midlands region sat higher in the deprivation ranking table than the Southern regions. Neighbourhoods surrounding key stations in the North West and Midlands region such as those in Birmingham ranked between the 10 to 20 percent most deprived in England for skills, education, and training. Neighbourhoods surrounding Manchester and Liverpool stations ranked slightly higher, between 20 to 30 percent most deprived for skills, education, and training. This was higher again in the South, with Milton Keynes ranked between 50 and 60 percent most deprived. Upgrading the WCML therefore presented an opportunity to improve connectivity between the major cities along the route, reducing journey times and opening up access to wider, educational opportunities.

Prior to the WCML upgrade, the North West region had already undergone considerable economic restructuring with higher than national average economic strength and job creation. This was concentrated in Greater Manchester South, as well as Halton, Warrington, Cheshire East, Cheshire West and Chester. From 1998 to 2004, Greater Manchester improved its productivity from 109.7 to 111.5 (base year index 100 = 1998), and employment grew by 14 percent, double the 7 percent national average at the time.<sup>241</sup>

Manufacturing made up a significant portion of economic output in the North West, Yorkshire & Humberside and East Midlands regions prior to the upgrade. The North West saw 31.4 percent of GVA produced in manufacturing in 1992, followed by 25.6 percent in 2004, similarly to Yorkshire & Humberside which had 32.1 percent of GVA produced in manufacturing in 1998, followed by 26.7 percent in 2004. The East Midlands saw an even higher share at 35.35 percent in 1998, falling to 29.2 percent in 2004. In comparison, in the South East, only 23.9 percent of GVA was related to manufacturing in 1998, where knowledge intensive services played a more prominent role in the economy.

### 8.3.2. Associated activities and actions alongside transport investment

#### Benefits realisation

We have not found a plan, nor detailed planning/strategies to deliver and realise wider economic outcomes from the WCML upgrades. According to the project sponsor of the WCML upgrades, the primary objective of the scheme was to address the inadequate, deteriorating state of the existing route and improve reliability, meaning delivering wider economic outcomes may not have been a priority at the time of development. Whilst the project team maintained good relationships with local authorities, and some of those local authorities had redevelopment plans that were co-timed with the WCML upgrade (for example, the development of the areas around Liverpool Lime Street and the Liverpool One shopping centre), the ambition of these programmes, the integration of transport and land use, and the amount of management time awarded to them, was smaller than contemporary examples such as Crossrail and HS2.

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<sup>241</sup> Chia-Lin Chen, Peter Hall, (2011). The Wider Economic Impacts of High-Speed Trains: A Comparative case study of Manchester and Lille sub-regions.



## Unlocking development

According to the project sponsor, the WCML upgrade may have directly unlocked development around Stoke-on-Trent, Stockport and Macclesfield, although further evidentiary material to support was not found at the time of research. According to the project sponsor, the WCML upgrade may have unlocked development around Manchester Piccadilly, Liverpool Lime Street, and Birmingham New Street stations even if it was not directly coordinated with the transport programme. Indeed, each of these areas has seen an increase in commercial development in the years that followed the WCML programme, although, as noted earlier, this corresponded with a period of economic growth, particularly in cities, and increased public funding for improved public realm. Other development may have taken place alongside Stoke-on-Trent, Stockport and Macclesfield stations. Further evidentiary material to support was not found.

There is limited evidence found to link the redevelopments in Manchester directly with the WCML upgrades, as a number of major infrastructure projects were being delivered simultaneously. In the NW region, prior to the opening of Phase 1, the implementation of the WCML upgrade coincided with the 2002 Commonwealth Games in Manchester. Interviewees suggested that any significant developments completed prior to 2002 in Manchester was more likely to be motivated by the Commonwealth Games, as opposed to the WCML upgrades. Furthermore, Phase 2 of Manchester Metrolink opened in 2000, hence developments implemented prior to 2004 would have been difficult to directly attribute to the WCML upgrades. No evidence was found of complimentary investments in the Scottish, Midlands nor Southern regions.

## Regeneration programme

We have not found any studies which examined or noted regeneration programmes or policies specifically implemented alongside the WCML upgrades.

## Skills investment

We have not found any studies which examined or noted skills policies specifically implemented alongside the WCML upgrades to improve and/or better match the skills of the local labour force, and therefore raise productivity.

## 8.4. SCHEME OUTPUTS, OUTCOMES AND IMPACTS

### 8.4.1. Passenger growth compared to original forecasts

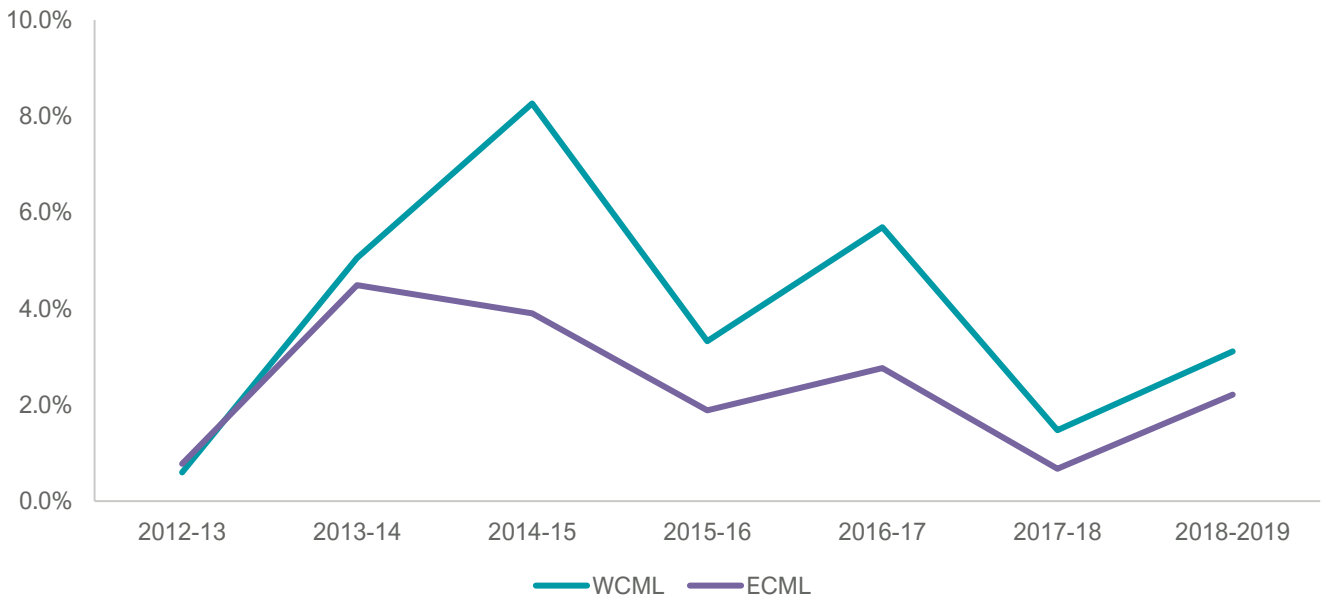
The short-term outcomes show Phase 1 and 2 exceeded demand forecasts. In 2005-06, following Phase 1 of the WCML upgrade programme, annual passenger journeys on Virgin West Coast grew by more than 20 percent on the previous year, and 4 percent ahead of the business case forecast for that year.<sup>242</sup> Virgin West Coast also grew at a greater rate than that experienced by its nearest comparator, the intercity operator on the East Coast Mainline (ECML).

In the long term, passenger growth along the WCML route (current operator – Avanti West Coast) continued to outpace its ECML competitor (current operator – London North Eastern Railway), as shown in Figure 8-6 below.

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<sup>242</sup> National Audit Office (NAO), (November 2006) The Modernisation of the West Coast Mainline.

Figure 8-6: Annual passenger growth, 2012-13 to 2018-19<sup>243</sup>



Revenue increased significantly, with a larger proportion of business travellers using the route, and a greater share of these passengers opting to travel First Class.<sup>244</sup> One of the key drivers of the scheme was to increase mode share on the London-Manchester market which prior to the WCML upgrade was mainly served by road and air. The scheme targeted 15 to 25 percent more passenger trips between London and the major urban centres of Birmingham, Manchester, Liverpool and Glasgow, and 60 percent modal shift from road to rail.<sup>245</sup>

The impact of increasing capacity by three-fold<sup>246</sup> and reducing journey times by 30 minutes to 2 hours 6 minutes has meant the WCML made a mark in the London-Manchester market, as illustrated in Figure 8-7. The substantial increase in rail ridership, coinciding with the relatively small fall in air travel along the route, demonstrates success in achieving modal shift from air to rail so soon after opening. There were also early indications that there has been a modal shift from road on several of the route’s corridors: although the number of passengers who switched from road to rail had not been evaluated at that stage, the significant increase in absolute number of passengers travelling between London and Manchester indicates the likelihood that the increase captured road users as well.<sup>247</sup>

<sup>243</sup> Office of Rail and Road, 2021, Table 1223 – Passenger journeys by operator.

<sup>244</sup> Department for Transport, 2006, West Coast Main Line Progress Report.

<sup>245</sup> Strategic Rail Authority, June 2003, West Coast Main Line Strategy. Available [online](#).

<sup>246</sup> Campaign for Better Transport (2019) Transformation of the West Coast Main Line.

<sup>247</sup> Campaign for Better Transport (2019) Transformation of the West Coast Main Line.

Figure 8-7: The changing mode choice of London – Manchester (Sep 2004 vs Oct 2005)<sup>248</sup>



Source: Department for Transport (May 2006), *West Coast Main Line: Progress Report*

## 8.4.2. Impact of transport investment on economic outcomes

### Population

Population changes seen between 1998 to 2004, show a shift of people from metropolitan sub-regions to non-metropolitan sub-regions with good transport connections and less industrial legacy.<sup>249</sup> Well-established metropolitan sub-regions (Greater Manchester South, Greater Manchester North and Merseyside) experienced population losses, while substantial population increases occurred in sub-regions such as Halton, Warrington, Cheshire CC, Lancaster and Central Lancashire. These sub-regions are characterised by a weaker industrial legacy, designated new town development, critical railway stations on the direct WCML line, and motorway connections (M6, M56 for example). This demonstrates that quality of existing transport access is considered a key contextual factor; prior to the WCML upgrades, transport access to the metropolitan regions were poor compared to post-project implementation. The improved access enabled by the WCML upgrades has made out-of-town commuting a more viable option along selected routes, including Milton Keynes-London, therefore encouraging more people to move outside of the metropolitan regions and opt to commute in instead.

Table 8-2 : Changes in population, 1998-2007 (population change%)<sup>250</sup>

Sub-regions	NUTS3 region	1998-2004	2004-2007
GB/England		6.1%	1.9%

**Areas served by WCML**

<sup>248</sup> Department for Transport (May 2006), "West Coast Main Line: Progress Report".

<sup>249</sup> Chia-Lin Chen, Peter Hall (2011) *The Wider Economic Impacts of High-Speed Trains: A Comparative case study of Manchester and Lille sub-regions.*

<sup>250</sup> Chia-Lin Chen, Peter Hall (2011) *The Wider Economic Impacts of High-Speed Trains: A Comparative case study of Manchester and Lille sub-regions.*

Sub-regions	NUTS3 region	1998-2004	2004-2007
Greater Manchester South	<sup>a</sup>	-5.4%	2.2%
Greater Manchester North	<sup>a</sup>	-0.5%	0%
Liverpool		-14.6%	0.2%
Halton, and Warrington	<sup>a</sup>	5.7%	1.0%
Cheshire East <sup>b</sup>	Cheshire CC	8.5%	1.3%
Cheshire West, and Chester <sup>b</sup>	Cheshire CC	4.4%	0.6%
Lancaster <sup>b</sup>		10.15	1.5%
<b>Areas not served by WCML</b>			
West Coast Lancashire <sup>b</sup>	Blackpool <sup>b</sup>	0%	0.4%
Pennine Lancashire <sup>b</sup>	Blackpool with Darwen <sup>b</sup>	2.8%	0.3%

<sup>a</sup> The name of NUTS3 unit is identical to the classification of subregions.

<sup>b</sup> There is no equivalent figures for spatial units at the NUTS3 level for GVA. Figures used here are therefore only used for reference rather than actual performance.

We found no evidence to link the WCML-served areas' population changes in the Scottish, Midlands or Southern regions directly to the improvements in journey times and reliability enabled by WCML. It is likely that WCML made some contribution to boosting the attractiveness of the major cities and commuter towns as a place to live.

## Employment

We have not found pre-2011 employment data at this stage at the Lower Super Output Area (LSOA) level; it is therefore difficult to determine the short- and long-term regional employment impact following completion of the WCML upgrades in 2008.

Following completion of Phase 1 and Phase 2, between 2004 and 2007 there was little change and/or slight decline in employment for some NW regional areas served by WCML, including Manchester South (-1.5 percent) and Merseyside (-0.1 percent).<sup>251</sup> Only the WCML-served Liverpool (2.1 percent), Halton and Warrington (2.5 percent) and Cheshire East (4.6 percent) experienced employment growth in the same period.<sup>252</sup>

High value added innovative and creative industries tend to cluster in cities to benefit from agglomeration, whereas routine industries decentralise from city centres, assisted by transport infrastructure and digital connectivity. As such, areas in the NW region served by the WCML showed notable growth in employment for knowledge-intensive services following the upgrade of the line. For example, from 2004 to 2007, Greater Manchester South experienced a 5.5 percent growth, which is greater than the 4.3 percent growth in North-West England, and the 3.7 percent growth in Great Britain as a whole. However, the employment share of knowledge-intensive services in Greater Manchester South was already expanding since 1998, in alignment with the expansion of this sector as a whole in NW region and nationally (Great Britain)<sup>Error! Bookmark not defined.</sup>. Therefore, it is likely the shift in sectoral employment share would have occurred regardless of the WCML upgrades. Hence, the shift towards the knowledge intensive sector is considered a contextual factor, as opposed to a direct consequence of the WCML upgrades.

<sup>251</sup> Chia-Lin Chen, Peter Hall (2011) The Wider Economic Impacts of High-Speed Trains: A Comparative case study of Manchester and Lille sub-regions.

<sup>252</sup> Chia-Lin Chen, Peter Hall (2011) The Wider Economic Impacts of High-Speed Trains: A Comparative case study of Manchester and Lille sub-regions.

## Firm Entry

We have not found any studies which examined the impact of the WCML upgrades on firm entry across the cities and towns served by the WCML, although it is likely more firms would have been attracted to (re)locate to the areas surrounding the WCML-served stations.

According to the Campaign for Better Transport report<sup>253</sup>, the BBC played a central role in seeding the creative sector's growth and the corporation's decision to take up residence in Manchester in 2011 was partly dependent on the WCML upgrade, which enabled improved links to the BBC's headquarters in London.

## Land value and property prices

Urban regeneration effects of the WCML upgrades in well-established metropolitan areas can be examined by looking at changes in office rental prices. Most notably, from 2004 onwards, in the NW region, office rents in Manchester rose to levels higher than outer London. For instance, in 2008, office rents in Manchester were £108 higher per m<sup>2</sup> than in outer London, and £153 higher per m<sup>2</sup> than the England and Wales average. Liverpool and Merseyside also demonstrated improvements in office values both within and outside the town centres.<sup>254</sup> These effects were felt prior to the full completion of the scheme in 2008 because the stations were announced in the late 1990s. This suggests the WCML did influence land values in late 2004.

When considering the contextual factors that would have played a role in the increase in land value, the poor quality of the existing transport links between the commuter cities and towns prior to the WCML upgrade completion was critical, notably to and from areas served in the NW region. By improving the connectivity between the major cities (Manchester, Liverpool, London) with the surrounding commuter towns (e.g. Chester, Crewe, Macclesfield), access to a wider pool of labour was enabled, and people living in the commuter towns were more incentivised to work in the major cities to capitalise on wider employment opportunities. The combined effect would likely have made the city centres a more attractive place to be based in. Although the increase in land value within the city centres of the WCML-served areas was expected as a result of the WCML upgrades, there may be a weaker link between the WCML upgrades and land value increase outside of the city/town centres. In Manchester for example, Phase 3 of the Manchester Metrolink extension was simultaneously underway, in which the intra-city connectivity improvement would have had more impact on land values outside of the city centre.

The North-Western regions served by WCML stations saw high residential values between 2004 and 2009, suggesting that despite the 2008 financial crisis, the areas were becoming more attractive for urban living.<sup>255</sup> In terms of residential land values, in the NW region, Manchester, Stockport, and Chester were the only three places served by the WCML with residential values that were higher than the average across England and Wales throughout 2004, 2008, and 2009. In 2009, the average residential land value of Manchester, Stockport and Chester was £2,983 per hectare, versus £1,960 per hectare in England and Wales.

## Wages

We have not found any studies which examined the impact of the WCML upgrades on wages across the cities and towns served.

## Productivity

In 1998 (prior to the completion of Phase 1 of the WCML upgrades), sub-regions within the NW region had to some extent already undergone considerable economic restructuring, with higher-than-national average productivity evident and concentrated in the southern parts of the NW region, namely Greater Manchester South, Halton and Warrington, Cheshire East and West, and Chester, as shown in . From 1998 to 2004 (completion of Phase 1), GVA

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<sup>253</sup> Campaign for Better Transport, 2019, Transformation of the West Coast Mainline.

<sup>254</sup> Chia-Lin Chen, Peter Hall (2011) The Wider Economic Impacts of High-Speed Trains: A Comparative case study of Manchester and Lille sub-regions.

<sup>255</sup> Chia-Lin Chen, Peter Hall (2011) The Wider Economic Impacts of High-Speed Trains: A Comparative case study of Manchester and Lille sub-regions.

per head increased (relative to national average) in Greater Manchester South, a trend followed suit by Liverpool, whilst Halton and Warrington and Cheshire CC maintained their strong position. Meanwhile, the remaining sub-regions experienced a decline in productivity within the 1998-2004 period. Despite a fall in population between 1998 to 2004, the productivity increase experienced in the major metropolitan regions Greater Manchester South and Liverpool may be explained by the contextual factor:

- **Underutilised skills:** by improving transport provision, existing firms are given wider access to the labour market and people are given wider access to employment. This may have led to increased investment in the requisite skills that would not have taken place because the relevant jobs did not exist in Manchester and Liverpool. The WCML upgrades may have attracted more highly skilled workers to the major city centres, hence leading to increased productivity.

Table 8-3: Changes in headline GVA per head, 1998-2007 (Index = GB/England average)<sup>256</sup>

Sub-regions	NUTS3 region	1998	2004	2007
GB/England		100.0	100.0	100.0
<b>Areas served by the WCML</b>				
Greater Manchester South	<sup>a</sup>	109.7	111.5	111.0
Greater Manchester North	<sup>a</sup>	73.1	69.5	65.9
Liverpool		87.4	90.5	92.7
Halton and Warrington	<sup>a</sup>	114.8	114.8	111.9
Cheshire East <sup>b</sup>	Cheshire CC	110.5	104.2	104.0
Cheshire West and Chester <sup>b</sup>	Cheshire CC	110.5	104.2	104.0
Lancaster <sup>b</sup>		84.3	82.5	79.9
<b>Areas not served by the WCML</b>				
West Coast Lancashire <sup>b</sup>	Blackpool <sup>b</sup>	72.6	65.0	62.1
Pennine Lancashire <sup>b</sup>	Blackpool with Darwen <sup>b</sup>	83.9	77.2	74.2

<sup>a</sup> The name of NUTS3 unit is identical to the classification of the subregions.

<sup>b</sup> There is no equivalent figure for spatial units at the NUTS3 level for GVA, figures presented here are only used for reference rather than actual performance.

## Housing

We found very limited evidence during the course of our online research regarding the impact of the WCML upgrades on housing across the cities and towns served. Although robust evidence of increased housing enabled by WCML was not found, we can hypothesise that demand for housing around the WCML stations increased as a result of the WCML upgrades. Based on the population changes observed in the NW region between 1998-2004 (population increases in non-metropolitan regions such as Halton, Warrington and Cheshire CC, population decreases in metropolitan regions such as Greater Manchester South and Liverpool), there is an argument to be made that demand for residential development was unlocked around the non-metropolitan areas served by WCML, as more people are motivated to move to the area and opt to commute into the major city centres such as Manchester and Liverpool. However, this is only a hypothesis and according to the project sponsor, the upgrade had a significantly higher impact on long-distance commute as opposed to short-distance commute.

<sup>256</sup> Chia-Lin Chen, Peter Hall (2011) The Wider Economic Impacts of High-Speed Trains: A Comparative case study of Manchester and Lille sub-regions.



## Regeneration and development

The 2006 DfT WCML Progress Report indicates the scheme and the station redevelopment induced major investment around the Manchester Piccadilly railway station, catalysing the redevelopment of the station and creating high-quality mixed-use office and commercial development. This development can be considered transformational as the combined impact of the WCML upgrades, and the station redevelopment unlocked significant private sector investment leading to a change in the use of land around the station.

In late 2004, Liverpool Vision was unveiled, with a proposed new look for Liverpool Lime Street station including new public space, hospitality space and new offices. Plans for the redevelopment of Birmingham New Street station were also underway in 2006.<sup>257</sup>

Runcorn's 20-year transformation plan was created to accommodate the increasing volume of passengers travelling through Runcorn station following the WCML upgrade completion, as well as prepare for the forthcoming HS2.<sup>258</sup> ORR estimates that between 2004 and 2018, station users doubled to over 730,000.<sup>259</sup> The plan includes new public realm, transport interchanges, leisure facilities, housing, and commercial properties.

According to the North West Development Agency, *"The WCML provides an economic lifeline to the North West of England...much of the region including Cumbria and the three NW regions are now benefitting from faster, more reliable and better-quality rail services. The scheme has brought opportunities for growing inbound tourism, improved business competitiveness and regional economic growth and regeneration"*<sup>260</sup>

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<sup>257</sup> Department for Transport (May 2006) West Coast Main Line Progress Report.

<sup>258</sup> We Made That (2018) Runcorn Station Quarter Masterplan. Available [online](#).

<sup>259</sup> Campaign for Better Transport (2019) Transformation of the West Coast Main Line.

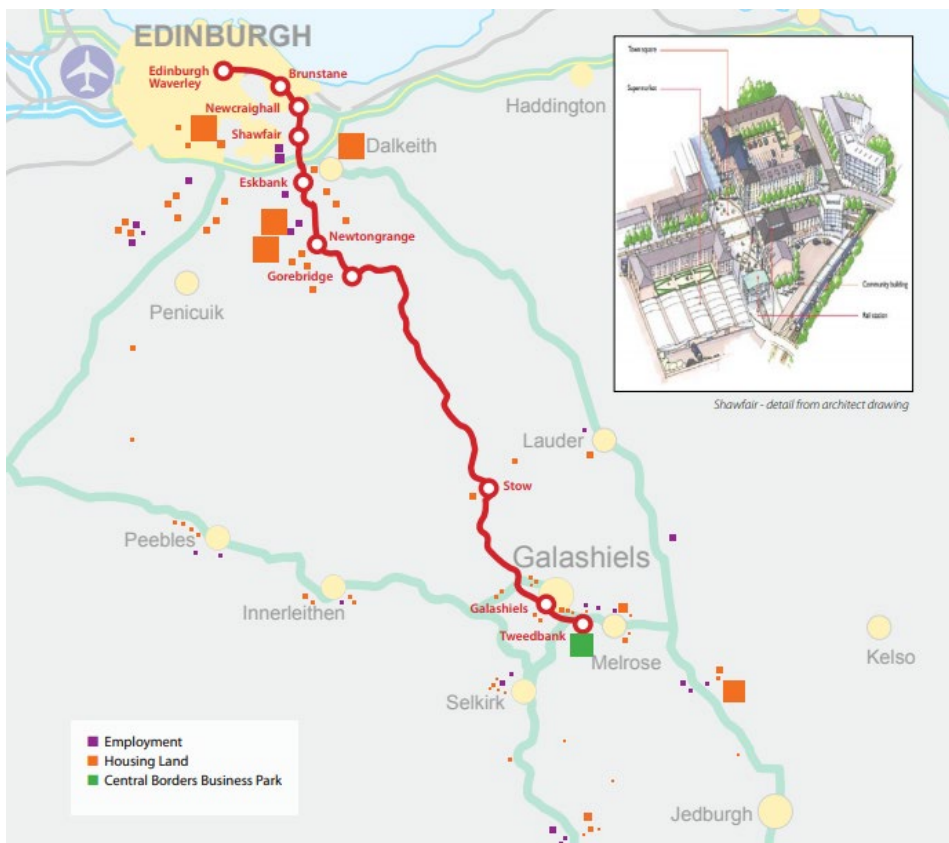
<sup>260</sup> Department for Transport (May 2006) West Coast Main Line Progress Report.

## 9. BORDERS RAILWAY

### Summary of key messages

- The main aim of the Borders Railway was to promote accessibility to and from the Scottish Borders and Midlothian to Edinburgh and the central belt of Scotland, with a particular focus on enabling residents of the Borders and Midlothian to access the Edinburgh labour market.
- The Borders Railway has succeeded in improving accessibility between the Scottish Borders, Midlothian and Edinburgh. Commuting has been the most common journey purpose of users of the railway, and Edinburgh the most frequent journey destination, suggesting that the line has supported access to employment opportunities in the capital for residents of the Scottish Borders.
- Discussions with stakeholders suggested that the Borders Railway has exceeded expectations in terms of attracting tourism to the Borders region. This may be due to notable publicity efforts when the route opened.
- However, the evidence suggests that the railway has had limited broader economic impacts. There may have been a positive effect on employment around stations closer to Edinburgh, but there is little evidence that the scheme has had notable effects in terms of productivity, housing or property values. In particular, there has been little construction progress at Shawfair, a new township served by the railway.
- Given that the railway only opened in 2015, it may be too early to see any concrete effects, as the primary mechanism through which one would expect a transformation is by encouraging more highly-skilled, working-age households to live in the Borders region – a process which may take more than 5 to 10 years to achieve.
- **The key contextual factors relevant to this scheme are:**
  - Quality of existing transport access: prior to the opening of the Borders Railway, the Scottish Borders and Midlothian had no direct access to a railway.
  - Benefits realisation: the Borders Railway “Blueprint for the Future” (2014) sets out how the Scottish government and its partners seek to fully realise the economic benefits of the scheme.

Figure 9-1: Map of the Borders Railway and associated employment, housing and commercial sites.



Source: Borders Railway (2014) “Maximising the Impact: A Blueprint for the Future”

## 9.1. SCHEME SUMMARY

Background information	
<b>Scheme type:</b>	Restoration and reopening of a line closed in 1969
<b>Type of transformational impact planned:</b>	Residential impacts; labour demand impacts
<b>Location:</b>	Scotland, UK
<b>Geography:</b>	Urban periphery
<b>Promoter:</b>	Transport Scotland
<b>Start of construction:</b>	April 2013
<b>Opening date:</b>	September 2015
<b>Cost:</b>	£294m (2012 prices)
<b>Sources of funding:</b>	Transport Scotland

The Borders Railway connects the city of Edinburgh with the regions of Midlothian and the Scottish Borders, following the northern part of the alignment of the Waverley Route, which ran between Edinburgh and Carlisle before it was closed in 1969 as part of the Beeching Cuts. The Borders Railway runs from Edinburgh Waverley station via Brunstane, Newcraighall, Shawfair, Eskbank, Newtongrange, Gorebridge, Stow, Galashiels and Tweedbank, with a total journey time of around 66 minutes. The project involved constructing 30 miles of new track and 7 new stations.<sup>261</sup>

Transport Scotland took responsibility for funding and delivery the project from 2008, with Network Rail announced in 2012 as the 'Authorised Undertaker'. Advanced works by Network Rail and their main contractor BAM Nuttall, supported by Scottish Borders Council, Midlothian Council and the City of Edinburgh Council, began in 2013. The railway opened in September 2015, at a final cost of £294m (2012 prices).<sup>261</sup>

According to the Final Business Case, the aim of the Borders Railway was to “support the Scottish Government’s Purpose by delivering improvements in access to Edinburgh and important regional markets for those living in the Scottish Borders and Midlothian, securing access to Edinburgh’s labour market”. The Borders Railway also contributes to fulfilling the transport objectives set out in the Government Economic Strategy, by improving the opportunities for leisure and tourism in the region, and the National Transport Strategy’s objectives by improving integration, promoting regional cohesion / social inclusion and helping to promote economic growth.”<sup>262</sup>

The Borders Railway has four specific investment objectives:

- The promoting of accessibility to and from the Scottish Borders and Midlothian to Edinburgh (including the airport) and the central belt.
- Foster social inclusion by improving access to key services for those without access to a car.
- To prevent decline in the Borders population by securing ready access to Edinburgh’s labour market.
- To create a modal shift from the car to public transport.<sup>262</sup>

The Borders Railway summarises its vision as follows:

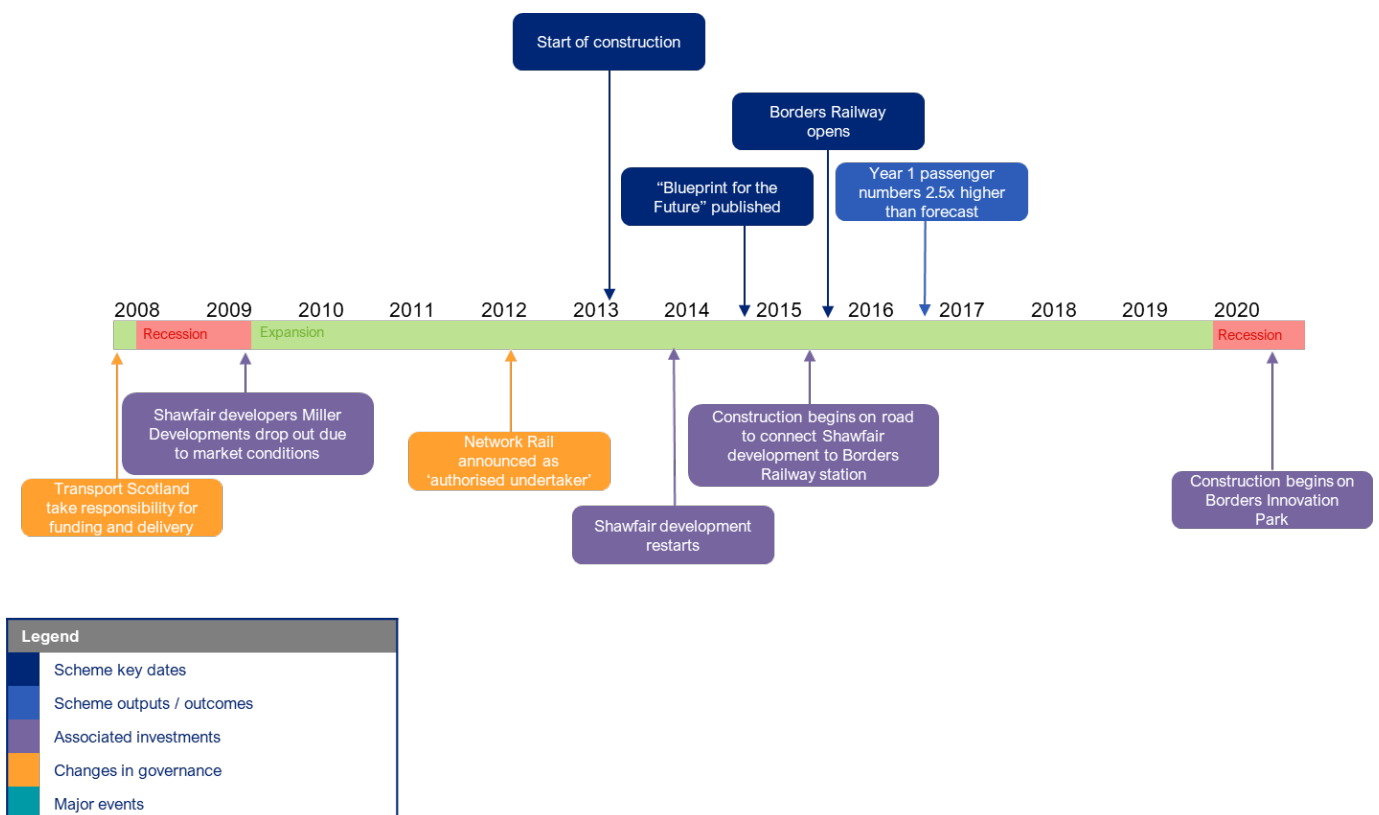
<sup>261</sup> Borders Railway “The Route and its Construction” available [online](#).

<sup>262</sup> Ernst & Young for Transport Scotland (2012) “Borders Railway Final Business Case final version” available [online](#).

- “To accommodate future growth, making it easier for people in Edinburgh to commute to Midlothian and the Scottish Borders, maximising the two-way flow the Borders Railway will create, widening the labour catchment and making it easier for businesses to recruit.”
- “We will continue to work on creating a vibrant economy providing access to development land, skilled people and capital, supporting business growth and the number of higher value and better paid jobs they provide.”
- “The investment in railway infrastructure makes Midlothian and the Scottish Borders better locations for businesses to invest. We aim to respond with a level of support that incentivises growth in more productive business activity and capitalises on the advantage we have in tourism and food and drink production. Our overall aim is to increase the proportion of growth sector activity, bringing it closer to Edinburgh levels.”<sup>263</sup>

See Figure 9-2 for a detailed timeline of key dates associated with the Borders Railway.

Figure 9-2: Timeline for Borders Railway



<sup>263</sup> Borders Railway “Our Vision” available [online](#).

## 9.2. THEORY OF CHANGE

Figure 9-3 and Figure 9-4 present logic maps articulating the theory of change for the Borders Railway. The scheme bears some resemblance to HS1 but at a smaller scale, and as a result, has a similar ToC.

**Inputs / Activities / Outputs.** The Borders Railway consisted of a new railway line connecting Edinburgh with the Midlothian and Scottish Border regions, and several new stations at locations along the line.

**Outcomes / Impacts.** There are two channels of transformational impact that we consider to be relevant within this ToC:

- **Changes in labour demand, where the new railway line leads to changes in land use that make Edinburgh more of a centre for employment and leads to a change in the type of economic activity based in Midlothian and the Scottish Borders.** We anticipate that one of the key outcomes of the Borders Railway will be to expand Edinburgh's labour catchment to incorporate the locations on the new line. As with HS1, we expect existing residents in these areas may be able to gain new jobs in Edinburgh where they can be more productive, and these areas may attract new residents. This would increase Edinburgh's employment density, further improving productivity through agglomeration externalities.
- **Changes in residential demand, where the new railway line leads to changes in land use that increases (or stabilises) the population of Midlothian and the Scottish Borders.** By becoming part of the Edinburgh labour market catchment, we expect the locations on the new railway line to attract new residents, which may in turn support the development of housing. This would increase the population of the area or prevent what would otherwise have been a reduction in the population.

Alongside changes in access to centres of employment and expanding the Edinburgh labour market, the Borders Railway also improves access to higher education opportunities because of the station close to Eskbank College and access to the various colleges and universities in Edinburgh. But the impacts of this improvement in access may take longer to feed through into our chosen indicators.

**Contexts.** Many of the contexts relevant to HS1 are also likely to be relevant for the Borders Railway:

- **Housing shortages in Edinburgh's existing labour catchment.**
- **Linked land-use policy to support the development of new housing in the Midlothian and the Scottish Borders regions.**
- **Limited existing labour catchment in Edinburgh, preventing further economic growth.**

Figure 9-3: Logic map for Borders Railway – Residential impacts

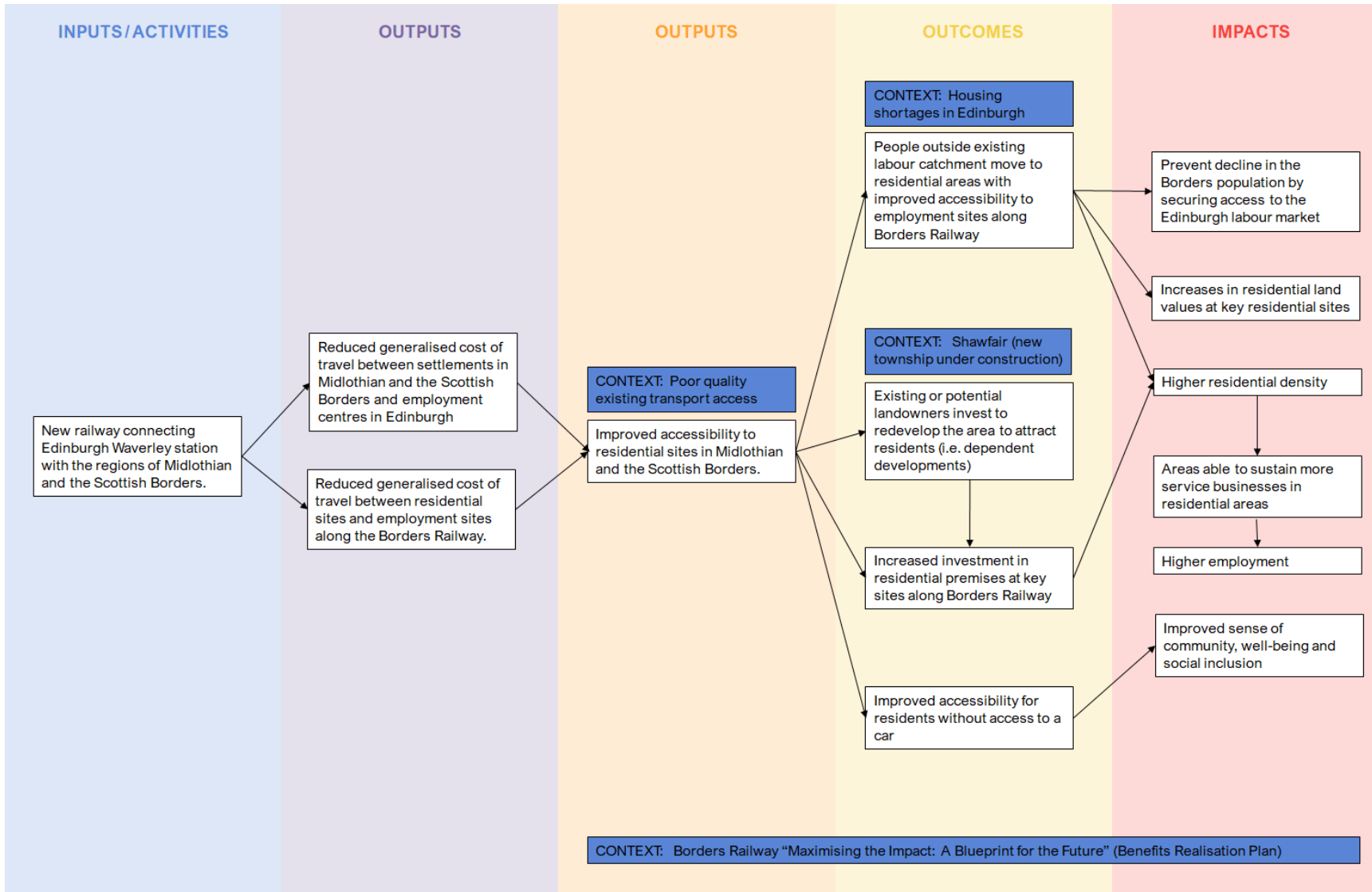
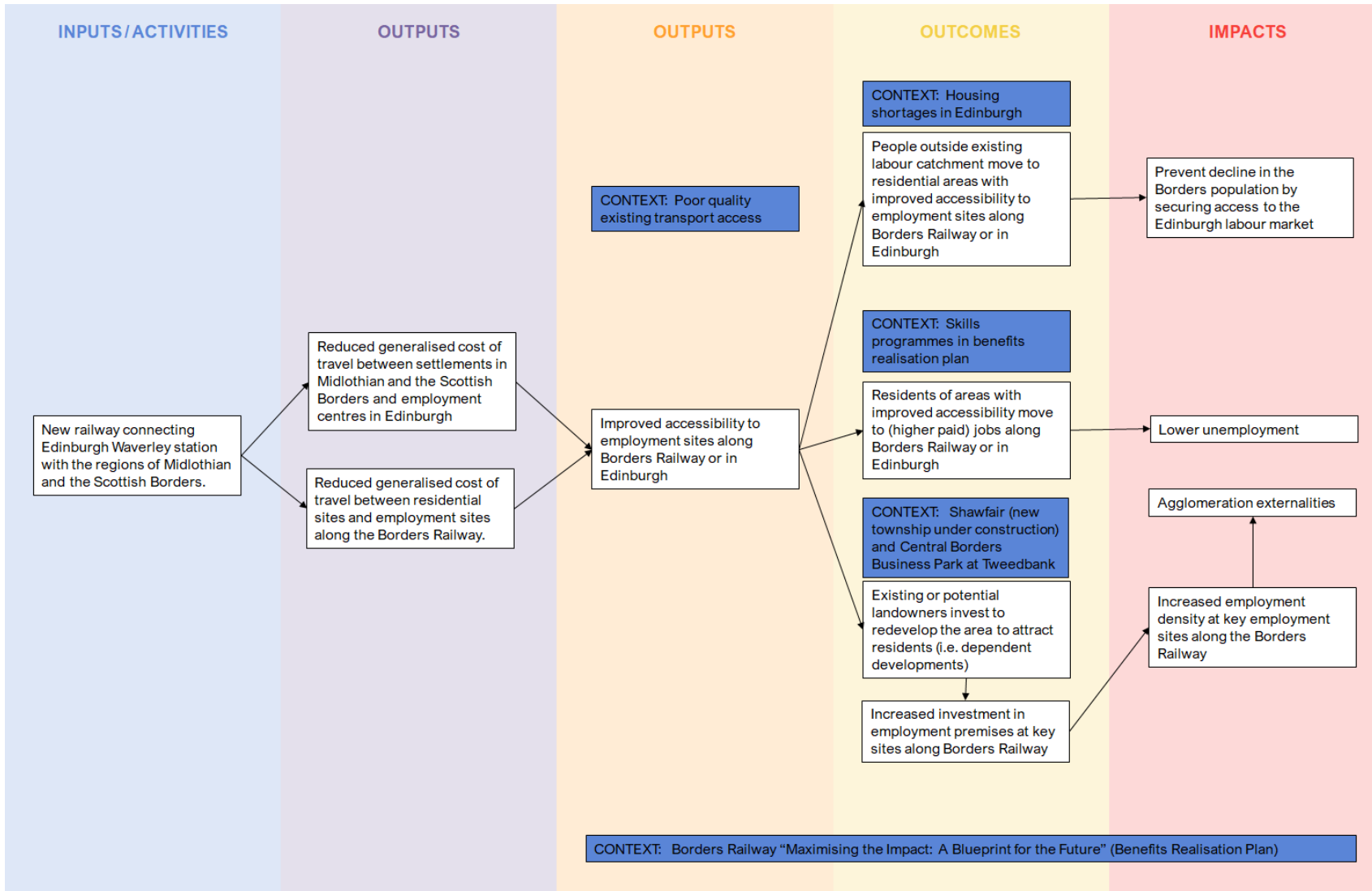




Figure 9-4: Logic map for Borders Railway – Labour demand impacts



### **9.3. SURROUNDING CONTEXT**

#### **9.3.1. Characteristics of the area at time of investment**

##### **Business cycle**

The Borders Railway opened in 2015, during a period of economic expansion in the UK.

##### **Quality of existing transport access**

Prior to the opening of the Borders Railway, the regions of the Scottish Borders and Midlothian had no direct access to a railway and 21 percent of the population did not have access to a car. From Galashiels, it would take over 90 minutes to reach the outskirts of Edinburgh on public transport – the Borders Railway was forecast to cut this time to approximately 60 minutes.

##### **Housing**

Midlothian and the Borders do not have an acute housing shortage, in contrast to Edinburgh, where there is a shortage of affordable family homes. The Scottish Indices of Multiple Deprivation 2012 does not show significant deprivation in the housing domain in the areas along the railway. Only six zones (out of the 100 examined for this analysis) are in the 20 percent most deprived in Scotland in the housing domain – three in the ‘urban’ zone and three in the ‘semi-urban’ zone defined above – so the potential for real estate-based regeneration linked to the scheme was low. The Borders Railway was expected to “mitigate against the effects of planning constraints around Edinburgh, by making available more affordable housing within commuting distances” and facilitate residential development on the outskirts of Edinburgh and in Midlothian.<sup>262</sup>

##### **Commercial development**

We have not found any evidence to suggest that Midlothian and the Borders faced particular constraints to commercial development at the time of the construction of the Borders Railway, other than poor accessibility to Edinburgh.

##### **Regeneration potential**

Midlothian and the Borders are not areas with significant regeneration potential. The Borders region, in particular, is a rural region with good visual amenity.

##### **Underutilised skills**

Given the Borders region had poor access to Edinburgh prior to the opening of the railway, it is possible that some of the population’s skills were underutilised. Prior to the opening of the railway, the median weekly earnings for full time workers in the Scottish Borders council area was ranked among the lowest in Scotland, at around 90 percent of the national average.<sup>262</sup> When compared to Edinburgh (which has a relatively highly skilled labour pool), a lower proportion of residents of Midlothian and the Scottish Borders work in the higher earning professions. This provides important context for the railway’s investment objective of providing a fast, reliable rail service to give people in the Borders and Midlothian area access to higher wage jobs and improve social mobility.<sup>262</sup>

The Scottish Indices of Multiple Deprivation 2012 show that most data zones around the Borders Railway fall in the middle deciles for the income, employment and education domains of deprivation. However, there are concentrated pockets of deprivation at points along the route, in particular in Dalkeith, Mayfield and Gorebridge in Midlothian (adjacent to the Eskbank, Newtongrange and Gorebridge stations), and in Langlee in the Borders (near Galashiels and Tweedbank stations). In Dalkeith there are two zones which are within the 10 percent most deprived in Scotland (in terms of the overall index of deprivation), but almost immediately adjacent to these there are four

zones which are in within the 10 percent least deprived in Scotland, located in Eskbank. Thus, the overall picture is mixed, with pockets of deprivation and affluence located along the railway.<sup>264</sup>

### **9.3.2. Associated activities and actions alongside transport investment**

#### **Benefits realisation**

The Borders Railway “Blueprint for the Future” sets out how the Scottish Government and its partners in the development of the railway seek to achieve their ambition to fully realise the economic benefits of the Borders Railway. Development opportunities are advertised and encouraged through the Borders Railway Prospectus – a PR and marketing campaign which “promotes site-specific development opportunities in the Railway Corridor and Station Hub areas to housing, commercial and leisure developers”.<sup>265</sup>

#### **Unlocking development**

We have not found any evidence to suggest that the Borders Railway scheme was associated with the release of land or the relaxation of planning rules. However, the scheme is associated with the development of land along the route.

The main associated investment with the Borders Railway is the Borders Innovation Park, located at the former Tweedbank Industrial Estate, developed to “respond to, and capitalise on, this opportunity with the provision of new high quality office accommodation, suites and facilities”.<sup>265</sup> The business park will ultimately accommodate 3,300sqm of office space, 2 hectares of serviced development land, and 3,000sqm of mixed use business space, and is expected to generate over 380 jobs. The Borders Innovation Park is a key component of the wider Tweedbank Masterplan, which has the potential to create over 1,400 jobs and attract inward investment. Work began on the Borders Innovation Park in July 2020 and is expected to cost £29m, funded Scottish Enterprise, the Borders Railway Blueprint programme and a £15m investment from the Edinburgh and South East Region City Deal.<sup>266</sup>

Discussions with a stakeholder at Transport Scotland revealed that the route of the Borders Railway was changed versus the original plans so that it could have a station at Shawfair, a 202-hectare mixed use development area which “will ultimately provide a new township of up to 4,000 new homes, 12 hectares of commercial development, a supermarket, new schools, and hotel and leisure facilities”.<sup>267</sup> According to the stakeholder, little progress has been made in the construction of Shawfair, potentially because the plans for Shawfair and the Borders Railway originate from pre-2008, when business confidence was higher.

#### **Regeneration programme**

The Borders Railway catchment area includes the towns of Dalkeith, Newtongrange, Galashiels and Tweedbank, each of which are the subject of council-led masterplan exercises to transform the town centres and provide economic, social and environmental benefits.

#### **Skills investment**

The “Blueprint for the Future” also includes funding and delivery of a “Modern Apprenticeship Programme reflecting the STEM subjects, Tourism/ Hospitality and Construction curriculums”.<sup>265</sup> The Borders College Business Development Unit provides practical help and advice for employers to enable them to develop the skills of their employees.<sup>268</sup>

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<sup>264</sup> Transport Scotland “Borders Railway Evaluation Secondary Data Baseline Report” available [online](#).

<sup>265</sup> Borders Railway (2014) “Maximising the Impact: A Blueprint for the Future” available [online](#).

<sup>266</sup> Scottish Borders Council (July 2020 “Boost for Borders as Innovation Park works begin” available [online](#).

<sup>267</sup> Borders Railway “Shawfair”. Available [online](#) accessed 23 June 2021

<sup>268</sup> Borders Railway “Talent”. Available [online](#) accessed 11 August 2021.

## 9.4. SCHEME OUTPUTS, OUTCOMES AND IMPACTS

To understand the context and impacts of the Borders Railway, it is useful to categorise the stations on the line into three groups:

- **Urban:** Brunstane, Newcraighall<sup>269</sup> and Shawfair, the stations located closest to Edinburgh City Centre.
- **Semi-urban:** Eskbank, Newtongrange and Gorebridge, located in Midlothian, located about 20-30 minutes' drive from Edinburgh City Centre.
- **Rural:** Stow, Galashiels, and Tweedbank, the stations located in the Borders.

### 9.4.1. Passenger growth compared to original forecasts

The Borders Railway significantly exceeded expectations in terms of passenger numbers within the first two years of opening, serving 1,419,000 passengers in Year 1 relative to the forecast of 647,136. Passenger numbers for years 1 to 4 are shown in Table 9-1 below.

Table 9-1: Borders Railway passenger numbers, years 1 to 4

Year	Year 1	Year 2	Year 3	Year 4
Passenger numbers	1,419,000	1,656,000	1,784,000	1,737,000

Source: Scottish Government <sup>270</sup>

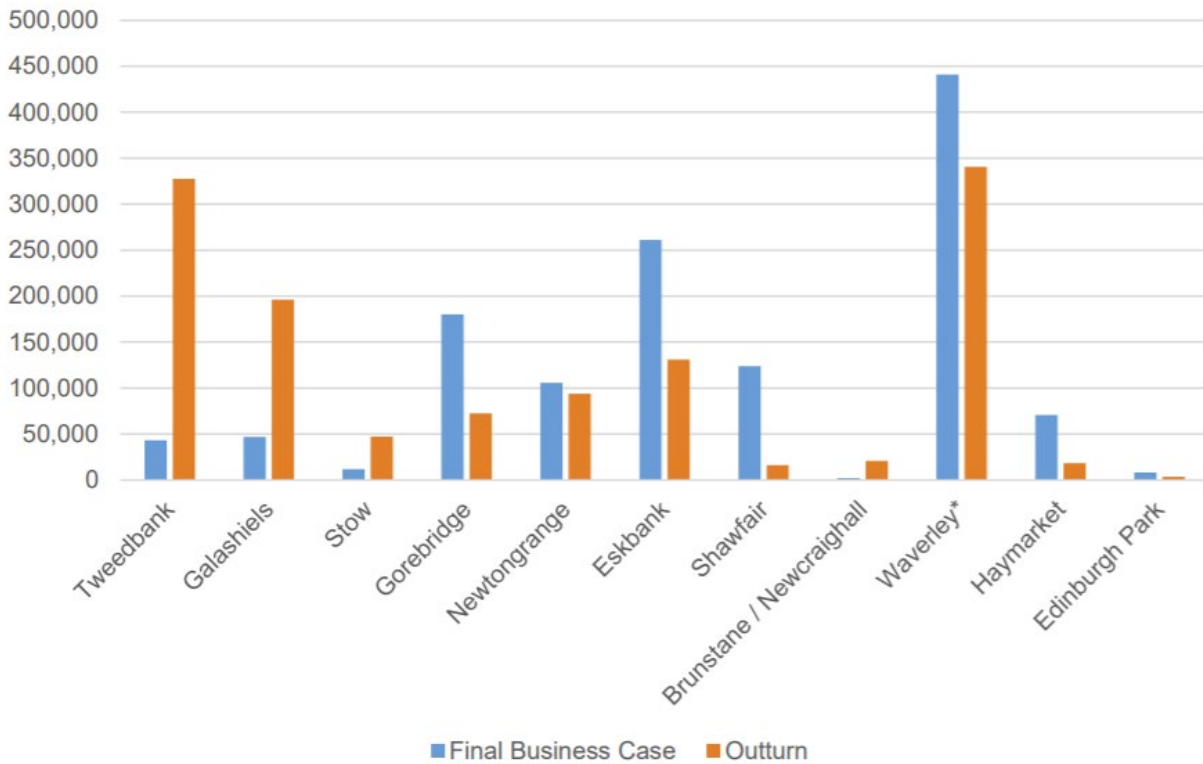
However, the overall numbers mask variation in performance relative to expectations across stations. As shown in Figure 9-5 below, passenger numbers in Year 1 were lower than forecast at the stations in the 'semi-urban' category (Eskbank, Newtongrange and Gorebridge) and at Shawfair and higher than forecast at stations in the 'rural' category (Stow, Galashiels and Tweedbank). The low patronage at Shawfair can be attributed to an absence of development at the Shawfair site. The Year 1 Evaluation does not offer any explanation for the discrepancy between forecast and outturn passenger numbers for the other stations.<sup>271</sup> Discussions with a stakeholder at Transport Scotland suggested that passenger numbers are frequently underestimated and that this issue is not isolated to the Borders Railway.

<sup>269</sup> Brunstane and Newcraighall stations opened in 2002, before the Borders Railway.

<sup>270</sup> Scottish Government (Jan 2020) "The Scottish Borders Railway Line evaluation reports and projections: EIR release" available [online](#).

<sup>271</sup> Transport Scotland (June 2017) "Borders Railway Year 1 Evaluation" available [online](#).

Figure 9-5: Forecast versus outturn passenger numbers for Year 1



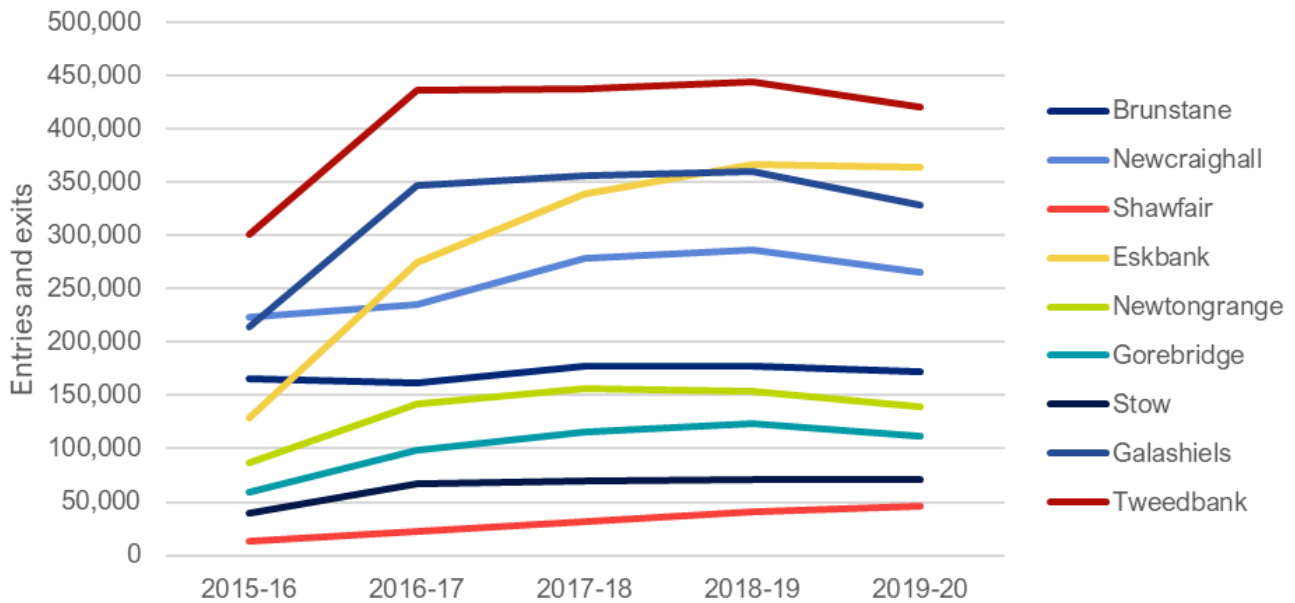
Source: Borders Railway Year 1 Evaluation <sup>271</sup>

In Year 2, overall travel on the line increased by 9.5 percent to 1,387,819 trips. Compared to Year 1, there was an increase in inbound and outbound travel at all the Midlothian stations (in the ‘semi-urban’ category) while the number of people travelling to Galashiels and Tweedbank fell, with the latter potentially reflecting the novelty effect of the new line tapering off.<sup>272</sup>

Figure 9-6 below provides a time series of entries and exits at each of the Borders Railway stations between 2015 and 2020. The data shows a notable increase in the first two years after the line opened, followed by a stabilisation of passenger numbers, and a slight drop in 2019-2020, likely due to the Covid-19 pandemic.

<sup>272</sup> Transport Scotland (February 2018) “Borders Railway Year 2 Evaluation Survey of users and non-users” available [online](#).

Figure 9-6: Entries and exits over time at Borders Railway stations



Source: Office of Rail and Road, Timeseries of passenger entries and exits by station

### 9.4.2. Impact of transport investment on economic outcomes

While the Borders Railway exceeded expectations in terms of passenger numbers following its opening and was found to have achieved its original investment objectives, the scheme does not appear to have had a transformational impact on the regions of Midlothian and the Scottish Borders.

#### Population

Analysis of population data for the wards through which the Borders Railway runs suggests that the railway had varying population impacts along its length, as shown in Table 9-2 below.

- ‘Urban’ stations:** The City of Edinburgh saw a slight slowdown in population growth for the period 2015-2019 relative to 2010-2015. However, the wards of Portobello / Craigmillar (containing Brunstane and Newcraighall stations) and Dalkeith (containing Shawfair station) saw a significant increase in growth between the two periods of 4.5 and 4.8 percentage points, respectively.
- ‘Semi-urban’ stations:** The Midlothian Council Area saw little change in population growth between the two periods, while the ward of Midlothian South (containing Newtongrange and Gorebridge stations) saw significant uplifts in population growth, of 4.8 and 4.0 percentage points respectively. However, the ward of Midlothian East (containing Eskbank station) saw a notable fall in population growth of 3.9 percentage points.
- ‘Rural’ stations:** A similar varied picture emerges in the Scottish Borders, which, as a council area, saw a small uplift in population growth between 2010-2015 and 2015-2019. The ward of Galashiels and District (containing Stow and Galashiels stations) saw a large uplift in population growth between the two periods of 4.7 percentage points, whereas population growth fell marginally in the ward of Leaderdale and Melrose (which contains Tweedbank station).

Table 9-2: Population growth before and after the opening of the Borders Railway

Ward / Council Area	Stations	Population growth (2010-2015)	Population growth (2015-2019)	Change in growth (percentage points)
City of Edinburgh		6.1%	5.2%	-0.9



Ward / Council Area	Stations	Population growth (2010-2015)	Population growth (2015-2019)	Change in growth (percentage points)
Portobello / Craigmillar	Brunstane, Newcraighall	6.5%	11.0%	4.5
<b>Midlothian</b>		6.1%	5.8%	-0.3
Dalkeith	Shawfair	9.6%	14.4%	4.8
Midlothian East	Eskbank	6.4%	2.5%	-3.9
Midlothian South	Newtongrange, Gorebridge	3.8%	7.8%	4.0
<b>Scottish Borders</b>		0.3%	1.3%	1.0
Galashiels and District	Stow, Galashiels	0.1%	4.8%	4.7
Leaderdale and Melrose	Tweedbank	1.7%	0.6%	-0.9

Source: [statistics.gov.scot](https://statistics.gov.scot)

## Employment

In the Year 1 Evaluation, it was found that the majority of patronage on the line is towards Edinburgh and commuting was the most common journey purpose. Of those who moved employment since the line re-opened, 80 percent stated that the railway was a factor in their decision.<sup>273</sup> In the Year 2 Evaluation, commuting was again the most common journey purpose, but there was a higher proportion of commuting and leisure trips and a smaller proportion of educational trips. 52 percent of those who had moved employment stating that the re-opening of the line had been a factor in their decision.<sup>274</sup> In terms of location decisions by firms, the Baseline Study found that none of the businesses who had recently moved to the Scottish Borders and Midlothian stated that the rail line had been a factor in their decision to relocate.<sup>275</sup>

Primary research suggests that the Borders Railway had a modest positive impact on employment.<sup>276</sup> The areas surrounding the ‘urban’ stations (Brunstane, Newcraighill and Shawfair) and ‘semi-urban’ (Eskbank, Newtongrange and Gorebridge) experienced a significant increase in employment following the opening of the Borders Railway relative to comparator areas, whereas the areas surrounding ‘rural’ stations (Galashiels, Tweedbank and Stow) did not.<sup>277</sup> However, it should be noted that both the impacted and comparator areas for the ‘urban’ and ‘semi-urban’ stations were experiencing an upward trend in employment prior to the opening of the Borders Railway, so it is possible that the gains are due to some other confounding factor that could not be controlled for in the analysis. These findings of the analysis are summarised in Table 9-3 below:

Table 9-3: Average employment before and after the opening of the Borders Railway in impacted and comparator areas

Area		Average employment (2009-2014)	Average employment (2016-2019)	% change
Rural	Impacted	5,378	5,873	9%

<sup>273</sup> Transport Scotland (June 2017) “Borders Railway Year 1 Evaluation” available [online](#).

<sup>274</sup> Transport Scotland (February 2018) “Borders Railway Year 2 Evaluation Survey of users and non-users” available [online](#).

<sup>275</sup> Transport Scotland (2016) “Borders Railway Baseline Study Final Report” available [online](#).

<sup>276</sup> Arup (July 2020) “Evaluating the impact of the Borders Railway on local employment”.

<sup>277</sup> The comparator areas used were Edinburgh as a whole for the ‘urban’ stations; Loanhead, Bilston and Penicuik for the ‘semi-urban’ stations; and Innerleithen, Peebles and West Linton for the ‘rural’ stations.

Area		Average employment (2009-2014)	Average employment (2016-2019)	% change
	Comparator	2,086	2,316	11%
Semi-urban	Impacted	2,124	2,735	29%
	Comparator	7,966	8,790	10%
Urban	Impacted	4,844	5,810	20%
	Comparator	307,133	338,695	10%

Source: Arup

## Firm entry

We have not found any studies which examined the impact of the Borders Railway on firm entry. Stakeholder discussions suggested that the primary impacts of the Borders Railway have been increased tourism and improved accessibility to Edinburgh for commuters.

## Land value

We have not found any studies which examined the impact of the Borders Railway on land values.

## Property prices

As of September 2015, the Borders Railway had not had a notable impact on the housing market along its route. Since 2006, when the Borders Railway was approved, house prices within five miles of the new stops had increased by 6.1 percent and 4.5 percent in Midlothian and the Borders, respectively. However, the corresponding council-wide area figures were 13.4 percent and 9.5 percent in Midlothian and the Borders, respectively.<sup>278</sup> As of September 2016, Eskbank, Newtongrange, and Stow saw an increase in house prices of 9 percent, 17 percent and 11 percent, respectively.<sup>279</sup>

As of June 2017, the average selling price in the Borders region had decreased by 3.5 percent year on year, compared to an increase in Edinburgh of 6.5 percent. However, the volume of properties being sold in the Borders region increased by 17.7 percent year on year.<sup>280</sup>

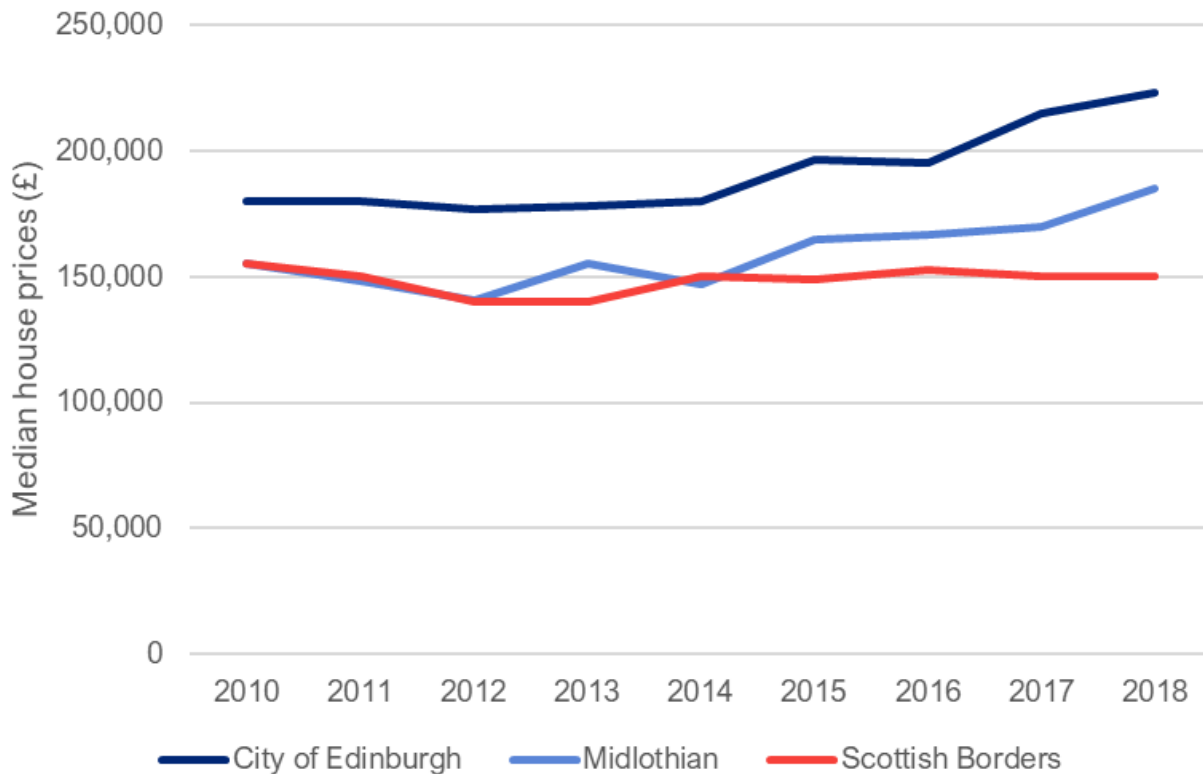
Figure 9-7 below illustrates the trend over time in median house prices for the regions of the City of Edinburgh, Midlothian and the Scottish Borders. Average house prices in Midlothian have been growing steadily since 2014, most likely an indirect effect of high demand for residential property in Edinburgh, while median house prices in the Scottish Borders have remained static, reflecting the region's more rural location. Overall, the Borders Railway does not appear to have had a notable impact on land values in the regions of Edinburgh and Midlothian.

<sup>278</sup> BBC News (September 2015) "Borders Railway housing market impact still awaited" available [online](#).

<sup>279</sup> Savills (September 2016) "Scottish Borders market steams ahead as new railway celebrates its first year" available [online](#).

<sup>280</sup> Borders Railway (June 2017) "Borders railway driving increase in house sales" available [online](#).

Figure 9-7: Growth in median house prices over time in Edinburgh, Midlothian and the Scottish Borders



Source: *statistics.gov.scot, median value of residential property transactions*

## Wages

We have not found any evidence regarding the impact of the Borders Railway on wages in Midlothian and the Scottish Borders.

## Productivity

We have not found any evidence regarding the impact of the Borders Railway on productivity in Midlothian and the Scottish Borders.

## Housing

In the Baseline Study (July-Sept 2015), of those who had moved to the Scottish Borders and Midlothian within the last 5 years, 15 percent stated that the re-opening of the line had been a main factor in their decision to move to the area.<sup>281</sup> In the Year 1 Evaluation, over 50 percent of users who had moved house since the line re-opened stated that the railway was a factor in their decision.<sup>273</sup> In the Year 2 Evaluation, 17 percent of respondents stated that they had moved house since the re-opening of the line, of which 58 percent stated that the reopening of the Borders Railway was a factor in their decision and 29 percent stated that they would not have moved to their current address in the absence of the railway.<sup>274</sup>

The Borders Railway “Blueprint for the Future” states that the local authorities identified land to deliver around 24,000 homes in Midlothian and the Scottish Borders by 2024. There is limited evidence to show how many of these have been built – one source suggests that 10,000 new homes had been built as of September 2020.<sup>282</sup>

<sup>281</sup> Transport Scotland (2016) “Borders Railway Baseline Study Final Report” available [online](#).

<sup>282</sup> Network Rail (September 2020) “Borders Railway celebrates fifth anniversary” available [online](#).

## Regeneration and development

There is some evidence of some broader land use change in response to the Borders Railway, including the construction of 10,000 new homes and the development of 150 hectares of land for commercial use near the railway corridor as of September 2020.<sup>282</sup>

For example, the £5.2m Galashiels Transport Interchange, a commercial development built in direct response to the opening of the Borders Railway, provides modern office space and conference facilities above a new local transport hub.<sup>283</sup> However, there is limited progress with other associated investments, such as the Shawfair township, which has been slow to develop, according to a stakeholder.

## Leisure and tourism

In the Year 1 Evaluation, 39 percent of respondents to the user survey indicated the purpose of their trip was either a tourist day trip or overnight stay. Of these, 34 percent were travelling to the Scottish Borders / Midlothian. More than 65 percent of tourist users stated that the re-opening of the line was a factor in their decision to make their trip and 23 percent stated that they wouldn't have made their trip were it not for the rail line. Scottish Tourism Economic Assessment Monitor (STEAM) statistics indicated that there was a significant improvement in key tourism performance figures in the first half of 2016 compared to the first half of 2015.<sup>273</sup> In the Year 2 Evaluation, 71 percent of tourists surveyed said that the re-opening of the line had been a factor in choosing to make their trip and 25 percent stated that they would not have made the trip had the line not been in place.<sup>274</sup>

Stakeholder discussions revealed that patronage by tourists (focused on the southern half of the line) was significantly higher than expected once the line opened. This was credited to extensive publicity, helped by the Queen and Prince Philip opening the line, as well as a monthly charter steam service which ran on the line during the first year.

## Performance against investment objectives

The Year 2 Evaluation found that the Borders Railway was achieving its investment objectives.<sup>274</sup>

- **Promote accessibility to and from the Scottish Borders and Midlothian to Edinburgh and the central belt – Achieving.**

Large volumes of users were using the service to travel between the Scottish Borders / Midlothian and Edinburgh. While commuting was the most common journey purpose, there were also a significant number of leisure and tourist users and evidence that the line has improved access and encourage people to make additional / new trips which they previously did not make.

- **Foster social inclusion by improving services for those without access to a car – Largely achieving.**

There was strong agreement amongst respondents to the user survey that the railway has enabled them to access opportunities without using the car / only using the car for a portion of the journey. However, while the re-opening of the railway has resulted in improvements in access between the stations, it has also resulted in changes in bus service provision within the study area, most notably the reduction of the X95 service to an hourly service in May 2016.

- **Prevent decline in the Borders population by securing ready access to Edinburgh's labour market – Achieving.**

Commuting was found to be the most common journey purpose and Edinburgh is the most frequent destination, suggesting that the line has secured access to employment opportunities in the capital for residents of the Scottish Borders and Midlothian. The results also suggest that the improved access

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<sup>283</sup> Borders Railway "Space for Growth" available [online](#).

opportunities associated with the rail line have influenced people's residential choices and encouraged immigration to both Midlothian and the Scottish Borders.

- **Create modal shift from the car to public transport – Achieving.**

The responses to the User Survey suggested that there has been a significant modal shift from car to rail, with the majority of respondents (64 percent) who previously made their trip by another mode stating that they drove all the way to their destination equating to an estimated 36,000 saved annual single car trips from the sample alone.

## **9.5. SOURCES**

Arup (July 2020) "Evaluating the impact of the Borders Railway on local employment"

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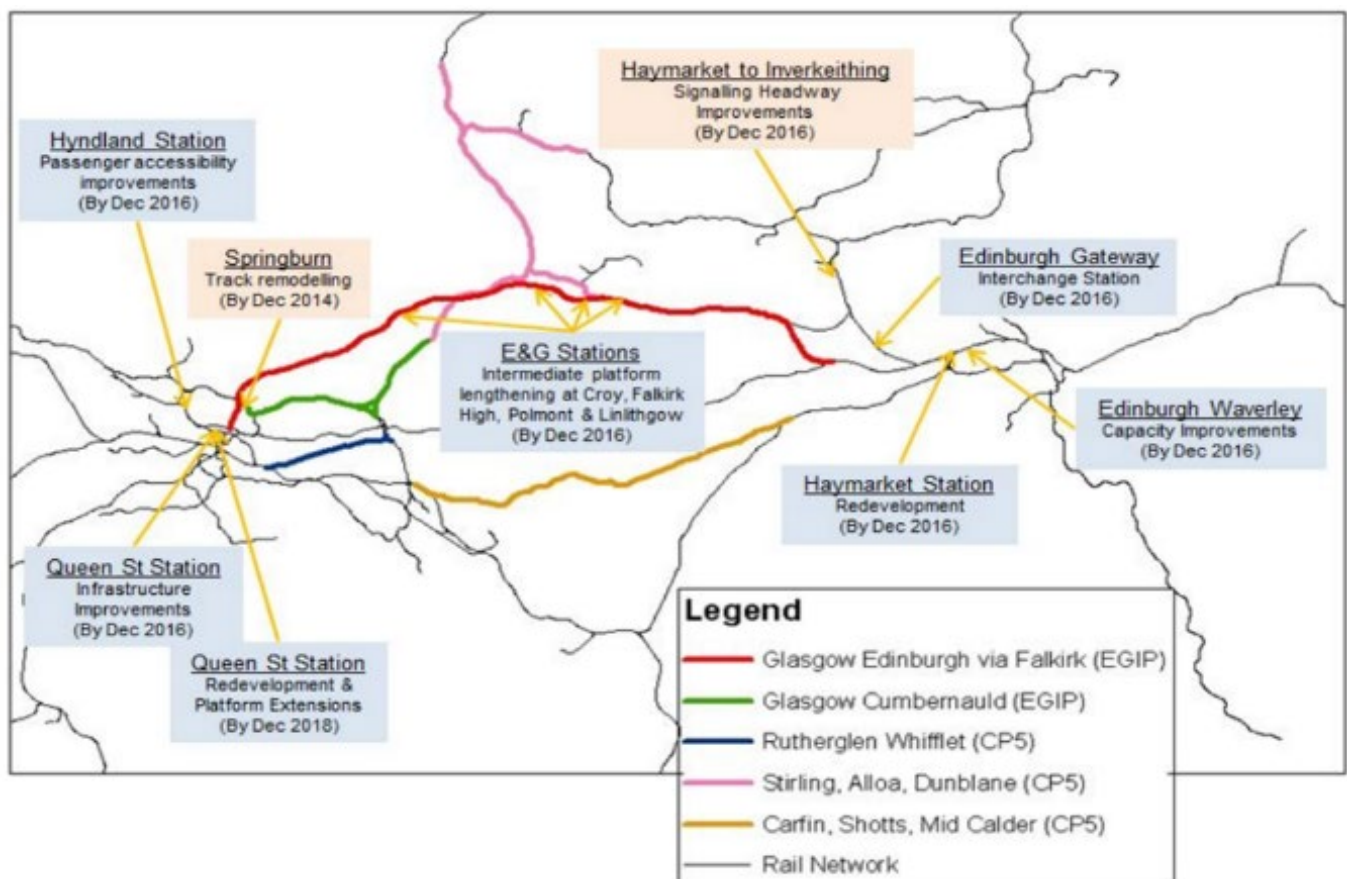
Transport Scotland (February 2018) "Borders Railway Year 2 Evaluation Survey of users and non-users" available [online](#)

## 10. EDINBURGH – GLASGOW IMPROVEMENT PROGRAMME

### Summary of key messages

- The Edinburgh Glasgow Improvement Programme (EGIP) was developed to boost synergies between the two largest cities in Scotland through a reduction of rail capacity constraints, enhancing catchment areas for businesses and improving connectivity to Edinburgh airport.
- Both cities had been experiencing a period of economic growth, with well-educated and highly skilled populations, but there was some concern over a potential mismatch between skill supply and demand.
- The EGIP scheme included a redevelopment and extension of Glasgow Queen Street Station, coinciding with an investment in station regeneration. It was also planned to coincide with an extension of the Buchanan Galleries shopping centre but this has not yet materialised.
- The programme is being developed in two distinct phases, the first of which was only officially completed in March 2021, though the improvements were mostly operational a year prior. The electrified route via Falkirk High completed in December 2017 and to Dunblane in December 2018.
- An increase in capacity and reduction in journey times have been successfully delivered. The opening coincided with the onset of the COVID-19 pandemic, so it has not been possible to assess the impacts of the scheme beyond this.
- **The key contextual factors relevant to this scheme are:**
  - Business cycle: The works on EGIP were completed in early 2020, coinciding with the Covid-19 pandemic and associated recession.
  - Housing: Edinburgh has high housing costs, while Glasgow has had some supply constraints.
  - Regeneration potential: Both cities have experienced strong and robust growth over recent years.
  - Underutilised skills: Both cities have a highly educated population, but there are some concerns over mismatch in supply and demand in Glasgow.

Figure 10-1: EGIP route map





## 10.1. SCHEME SUMMARY

Background information	
<b>Scheme type:</b>	Improvement to existing connections and development of new linkages.
<b>Type of transformational impact planned:</b>	Labour demand impacts
<b>Location:</b>	Edinburgh – Glasgow, Scotland, UK
<b>Geography:</b>	Intra-city
<b>Promoter:</b>	Transport Scotland
<b>Start of construction:</b>	Phase 1: January 2012. Phase 2: unknown
<b>Opening date:</b>	Phase 1: March 2020 Phase 2: 2025 expected
<b>Cost:</b>	Phase 1: £742 million <sup>284</sup> Phase 2: unknown
<b>Sources of funding:</b>	Transport Scotland

The Edinburgh Glasgow Improvement Programme (EGIP) is a comprehensive set of improvements to the railway infrastructure, station facilities, rolling stock and service provision in Scotland. Initially introduced in 2007, the programme is positioned to support sustainable economic growth in Scotland under the 2011 Economic Strategy.

Edinburgh and Glasgow represent the main economic centres in Scotland. This programme of improved connectivity between the two was developed to “make best use of their synergies” as well as enhance the catchment areas for businesses therein. It also responded to upcoming capacity constraints at Edinburgh Waverley, Glasgow Central and Glasgow Queen Street, which were all operating either at or near full capacity at peak times, and thus contributing to poor performance (e.g. delays). Finally, it represented an opportunity to improve public transport connections to Edinburgh airport.

Overall the programme’s final business case sets out the following three objectives:

1. Deliver a programme of cost-effective improvements to rail connections between Glasgow and Edinburgh, improving reliability, capacity and journey times.
2. Provide public transport linkage between the Edinburgh airport and the Scottish rail network.
3. Deliver a more sustainable, efficient railway which generates fewer carbon emissions and is less expensive to operate

The programme delivery is separated into two distinct phases:

- **Phase 1** (2014-2018), which includes enhancing the existing 4 trains per hour between Glasgow with longer trains and extended platforms at Queen St Station, the electrification of the core Edinburgh-Glasgow line via Falkirk, as well as the Cumbernauld lines, the development of Edinburgh Gateway Station, a rail/tram interchange for connection to Edinburgh airport, and the development / improvement of a number

<sup>284</sup> Outturn prices.



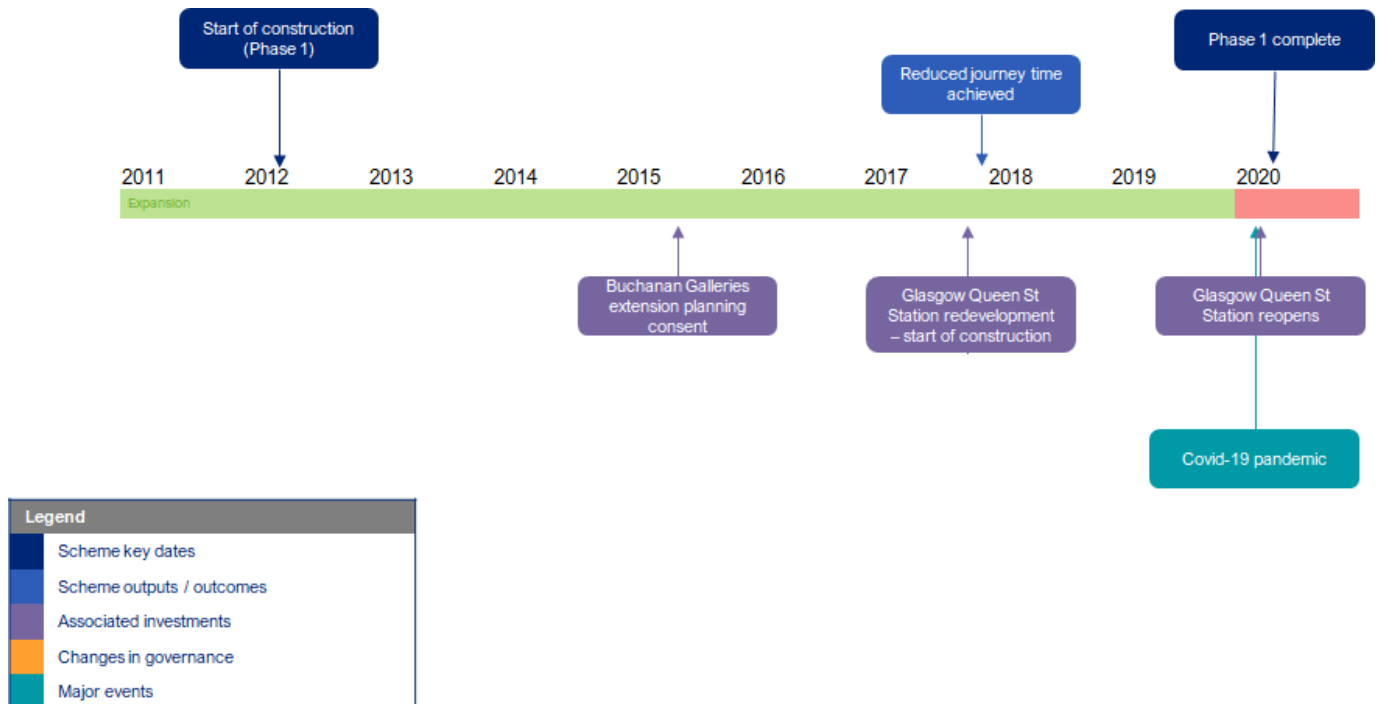
of other stations/platforms.<sup>285</sup> Part of this programme is aimed at future proofing against the aspiration to deliver a high speed rail connection between Edinburgh and Glasgow.

- **Phase 2** (2025 onwards), though elements of this programme remain subject to further debate by Ministers, depending on affordability and other considerations (including capacity). This phase may include infrastructure to support an increase to 6 trains per hour and new connection between the Glasgow line and Edinburgh Gateway Station.

The planned size and set of investments within the programme shifted between 2007 and 2012, when construction commenced, subject to available funds and other considerations. These changes came under some scrutiny; in particular, under Phase 1, the decision to lengthen trains rather than increase frequency (initial proposals included an increase to six trains per hour) and deferring electrification to the Stirling lines.<sup>286</sup> These changes also reduced the extent of journey time improvements: the fastest trains save a minimum of 42 minutes but the majority are slower services. Changes due to the Covid-19 pandemic have also changed service patterns.<sup>287</sup>

The first phase of the programme was officially completed in March of 2021, once works on Glasgow Queen Street station had been finalised. However, the works were halted in March 2020 due to the pandemic and considered sufficiently complete as to allow usage of the station from that point onwards.<sup>288</sup> Overall, costs were estimated at £742 million, paid for by Transport Scotland and delivered by Network Rail (given the complexity involved), alongside a civils / infrastructure contractor and an overhead line equipment contractor as it is best place to manage the complexity. See Figure 10-2 for a detailed timeline of key dates associated with Edinburgh – Glasgow Improvement Programme.

Figure 10-2: Timeline for the Edinburgh – Glasgow Improvement Programme



<sup>285</sup> These include Haymarket, Cumbernauld, Gogar, Linlithgow, Polmont, Falkirk High and Croy Stations.

<sup>286</sup> Hirst (2012) EGIP: 'A shadow of its former self?'. Railway Technology Magazine October/November 2012. Accessed 1 July 2021. Available [online](#).

<sup>287</sup> Email exchange between CEPA and a representative of Transport Scotland.

<sup>288</sup> Transport Scotland (undated) Edinburgh Glasgow Improvement Programme (EGIP). Accessed 25 June 2021 [online](#).

## 10.2. THEORY OF CHANGE

Figure 10-3 and Figure 10-4 present logic maps articulating the ToC for the Edinburgh-Glasgow Improvement Programme. We have focused our ToC on connectivity between the two cities rather than connectivity with intermediate locations, as the former is considered one of the key objectives to the programme.

**Inputs / Activities / Outputs.** The EGIP incorporates a series of improvements to the rail route between Edinburgh and Glasgow that increases capacity on the route and improves journey times and reliability. This in turn is expected to improve rail connectivity between the two cities, such that it is considered possible to commute between the two cities.

**Outcomes / Impacts.** There are two channels of transformational impact that we consider to be relevant within this ToC:

- **Changes in labour and residential demand, from people choosing to live in one city and commute to another city.** By improving connectivity between the two cities, we expect that both cities benefit from an extended labour catchment. This could allow existing residents to benefit from better job opportunities (increasing productivity and employment), while also attracting new residents. This could in turn lead to changes in land use to accommodate the increase in population in both cities and to accommodate more firms choosing to locate in either of the two cities.
- **Changes in the structure of economic activity between Glasgow and Edinburgh, by improving rail connectivity between firms in one city and potential customers and suppliers in the other city.** Improving rail connectivity between the two cities could increase the potential for business travel, benefitting firms that have suppliers or customers in both cities. This could lead to changes in where firms decide to locate, with some expanding into both cities while others rationalise into a single location. Both types of change are likely to lead to economic efficiencies that improve productivity.

Figure 10-3: Logic map for EGIP (Labour demand impacts)

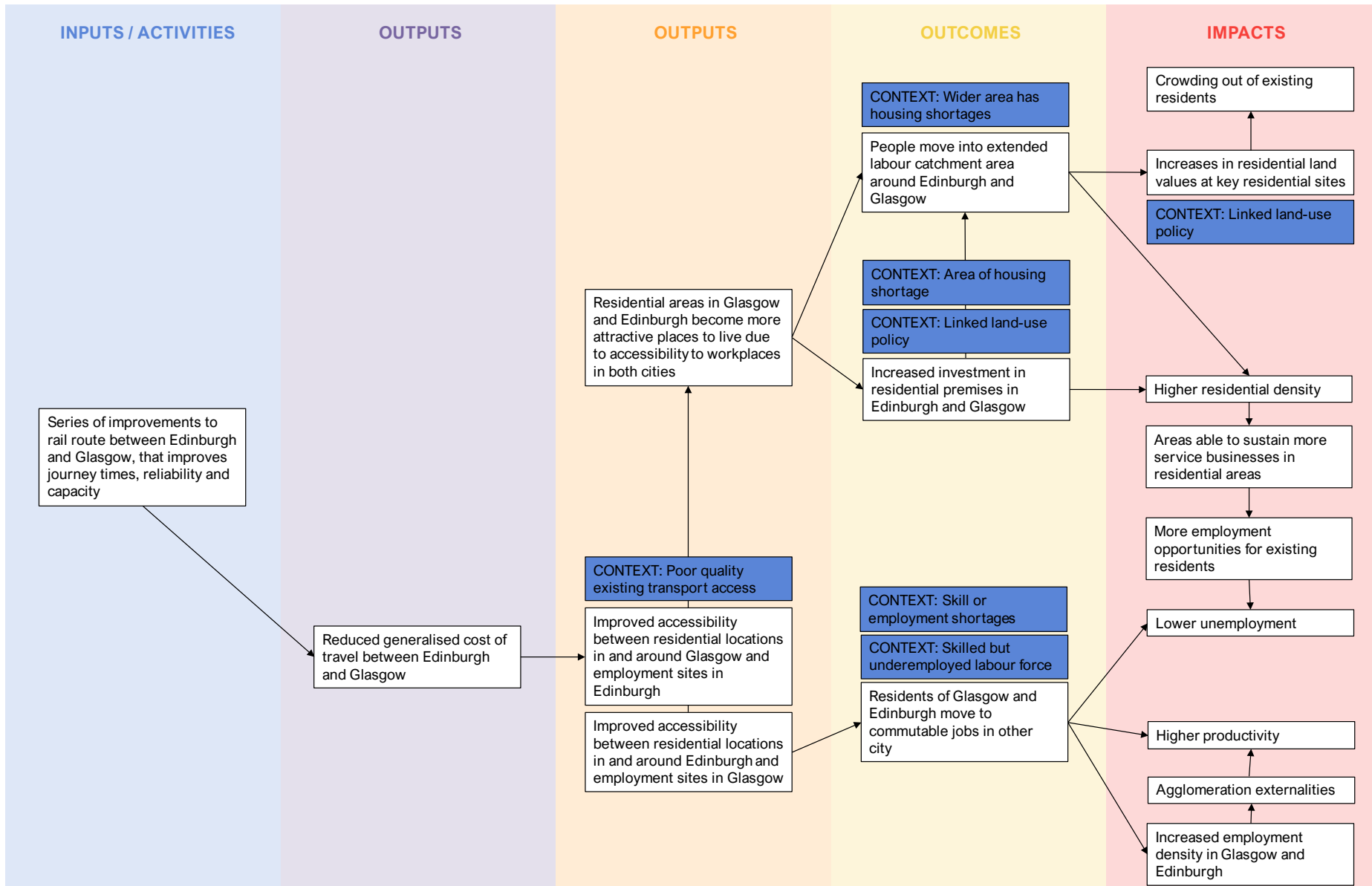
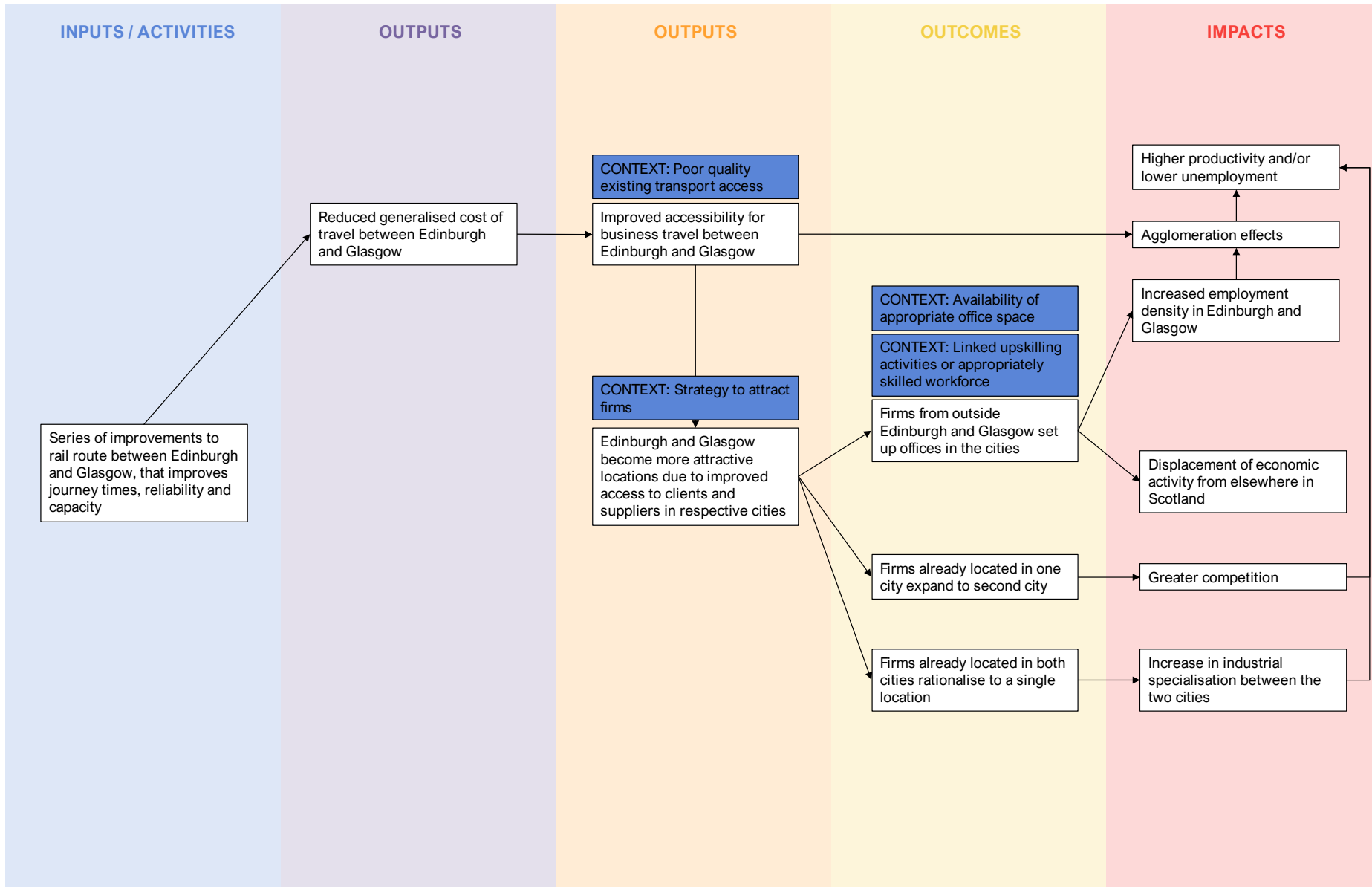


Figure 10-4: Logic map for EGIP (Industrial impacts)



## **10.3. SURROUNDING CONTEXT**

### **10.3.1. Characteristics of the area at time of investment**

#### **Business cycle**

The economy was in expansion when construction of Phase 1 of the scheme commenced. As noted above, the works were completed in early 2020, coinciding with the Covid-19 pandemic and associated recession.

#### **Quality of existing transport**

A rail line connecting the two cities, as well as intermediate cities, existed prior to the scheme with journey times of around 50 minutes. However, there were capacity constraints at the main rail stations, contributing to poor performance (e.g. delays). It is also possible to travel by car, bus or plane between the cities. Depending on traffic conditions, car journey times did not differ significantly from rail.

A desire for improved rail services between the two cities has been highlighted in the National Transport Strategy (Scotland's Railways and Freight Action Plan), the Scottish Ministers High Level Output Specification, the Scottish Rail Planning Assessment and the Route Utilisation Strategy, as well as the SEStran Regional Transport Strategy 2008-2023. In 2011 the Glasgow Edinburgh Collaboration Initiative (GECI) published a study considering the economic and transport linkages between the two cities.

The 42 miles between the two cities encompass major towns such as Motherwell, Cumbernauld, Falkirk and Livingston. Many residents have chosen these areas due to the proximity of the two cities for job and leisure purposes. The Strategic Transport Projects Review noted that, of the rail travel along the corridor connecting the two cities, only 37 percent were between Edinburgh and Glasgow; the remaining 63 percent represented journeys to or between intermediate stations.

#### **Housing**

Edinburgh faces the challenge of high housing costs, contributing to poverty and inequality. It remains the least affordable Scottish city in which to buy a home; thus, the most recent strategy for Edinburgh is focused on inclusion alongside innovation.

The development of private housing in Glasgow stalled following the 2008 financial crisis due to challenges in accessing mortgages and housing associations struggling to access loans on favourable terms.<sup>289</sup>

#### **Commercial development**

The Buchanan Galleries shopping centre, across from Glasgow Queen Street Station, had plans for expansion prior to the commencement of the scheme although this extension has yet to materialise. The EGIP business case noted that the station redevelopment would align with this extension, which was subsequently put on hold to enable timely rail works.

No further associated commercial developments were noted. Glasgow is a manufacturing and office centre and was recently named the European Entrepreneurial Region of the year. Edinburgh is the second largest financial centre in the UK, creating 70 percent more per capita wealth than Scotland as a whole.

#### **Regeneration potential**

Edinburgh and Glasgow are Scotland's two largest cities, both of which have experienced relatively robust growth over recent years. The 2011 GECI study found that the two cities contribute to each other's economic mass, with 17 percent of Edinburgh's attributable to Glasgow, and 5 percent conversely.

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<sup>289</sup> Glasgow City Council (2011) Glasgow's Housing Strategy 2011 to 2016. Accessed [online](#).

Edinburgh is regularly voted as one of the best cities in the world to live in. As of 2016, Glasgow held the title of the fastest growing major city economy in the UK, as well as being the largest city in Scotland with the highest GVA (£19.3 billion per annum). Thus, regeneration was not a main focus of this scheme; rather, it was intended to leverage the cities' synergies.

### **Underutilised skills**

The unemployment rate in Edinburgh lower than other major UK cities and 59 percent of citizens are educated at least to degree level (above the UK average). Despite this, there are concerns over mismatches in supply and demand; the Regional Skills Assessment has highlighted shortages and gaps in key growth areas.

Glasgow also has a highly educated population (50 percent educated to degree level) and improving employment figures but continues to struggle with long term unemployment. Job creation, as well as tackling issues around poverty, health and inequality, are top priority for the city's development.

The 2011 GECl study found that Glasgow contributed 4.3 percent of Edinburgh's labour market, and 1.8 percent conversely. Labour market links between the two cities were expected to increase as residents looked to bolster their skills, specialise and find the right type of employment. However, at the time of the study, commuting between the two was considered to be "at the far end of the spectrum of acceptable commuting distances". (p.3) Despite being structurally distinct, the cities are both shifting towards a service sector economy, which could serve to strengthen their linkages through trade, business contacts and labour markets.

More reliable, comfortable and timely travel delivered by the scheme was intended to maintain, at minimum, or enhance the labour market catchment areas. Transport Scotland noted that this would help to counteract the forecasted decrease in catchment caused by congestion and journey times. A similar impact between Inverclyde / Ayrshire and Edinburgh, via Glasgow, was intended due to improved connectivity and interchange opportunities.<sup>290</sup>

### **10.3.2. Associated activities and actions alongside transport investment**

#### **Benefits realisation**

We have not found evidence of a benefits realisation strategy in place for EGIP.

#### **Unlocking development**

The overall programme involved several distinct activities, but the Glasgow Queen Street Station development in particular was significant. In order to accommodate longer, electrified trains, Network Rail obtained planning permission to build into land and airspace previously occupied by station retail facilities, the Millennium Hotel 1970s extension and the Consort House office building.<sup>291</sup> This part of the scheme's development was boosted by further investment towards the regeneration of the station, including extensive retail, food and beverage opportunities and the development of a link across to Buchanan Galleries shopping centre, also undergoing expansion during the same period. Together, these investments represent a regeneration of the Queen Street area.

Overall, the benefit cost ratio for the scheme is estimated at 1.3, or 1.7 with wider economic benefits included. This does not, however, include less crowding, nor the ambience, accessibility or retail benefits of Queen Street Station. The rental income from station development was projected to increase from £370k to between £2.2 and £2.7 million per annum.<sup>292</sup> It is unclear what, if any, benefits associated with increased public transport connectivity to Edinburgh airport were included.

As noted by Transport Scotland, rail interventions are likely to be more successful at generating economic benefits where "station development is integrated within a visionary city master plan that provides for and encourages

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<sup>290</sup> Transport Scotland (2009) Strategic Transport Projects Review: Final Report. Accessed [online](#).

<sup>291</sup> The Scottish Government, Planning and Appeals Division (2016) Network Rail (Glasgow Queen Street Station) Order. Accessed [online](#).

<sup>292</sup> Scottish Construction Now (2018) Enhanced Queen Street Station development given £80m investment boost. Accessed 1 July 2021. Available [online](#).

complementary urban development, particularly if this is based on an economy which relies on personal contact such as the major knowledge-based industries which make up the broadly-defined service sector.”<sup>293</sup> The same report stressed the importance of connectivity between the two cities for tourism benefits.

One of the main objectives of the scheme is to improve the sustainability of the rail network. On one end, Transport Scotland hopes that the reduced congestion should encourage walking and cycling, with cyclist-friendly stations offering bike storage.<sup>294</sup> Looking more widely, electrification is, over time, expected to reduce carbon emissions and operating costs.

## Regeneration programme

As noted above, the improvements around Queen Street Station are referred to as a “regeneration” of the area. No further regeneration programmes are noted as part of this scheme.

## Skills investment

We have not found evidence of to suggest that any skills programmes were specifically linked to the scheme.

## 10.4. SCHEME OUTPUTS AND ASSOCIATED OUTCOMES

### 10.4.1. Passenger growth compared to original forecasts

The improved journey time of 42 minutes between Edinburgh and Glasgow was achieved in December 2018.<sup>295</sup> Coupled with increases in capacity, and other nearby improvements (e.g. stations, interchanges, etc.), the scheme was intended to improve patronage. The Final Business Case for EGIP included forecast increases in patronage for ScotRail as a whole. This does not separate out to what extent the increases were attributable to the scheme, nor does it consider patronage specifically on the upgraded lines. The business case forecasts are shown in Table 10-1 below.

Table 10-1: Passenger journey forecasts on all ScotRail services

Time period and scenario	Passenger journeys (million)
2012-13 values	83.3
2019 no EGIP	97.3
2019 EGIP Phase 1	99.4
2025 no Phase 2	110.3
2025 EGIP Phase 2	117.8

Source: Ernst & Young LLP (2013) *Edinburgh Glasgow Improvement Programme – Final Business Case*

Based on ORR data, ScotRail passenger numbers between Q4 2018-19 and Q3 2019-20 amounted to approximately 99.1 million.<sup>296</sup> Assuming the target in the table above does not include any adjustments, this puts passenger numbers slightly under the target set for 2019, though again, it is not clear to what extent the increase is attributable to the scheme relative to, for example, organic growth or concurrent rail improvements.

<sup>293</sup> Transport Scotland (2011) *Fast Track Scotland - Making the Case for High Speed Rail Connections with Scotland*. Accessed [online](#).

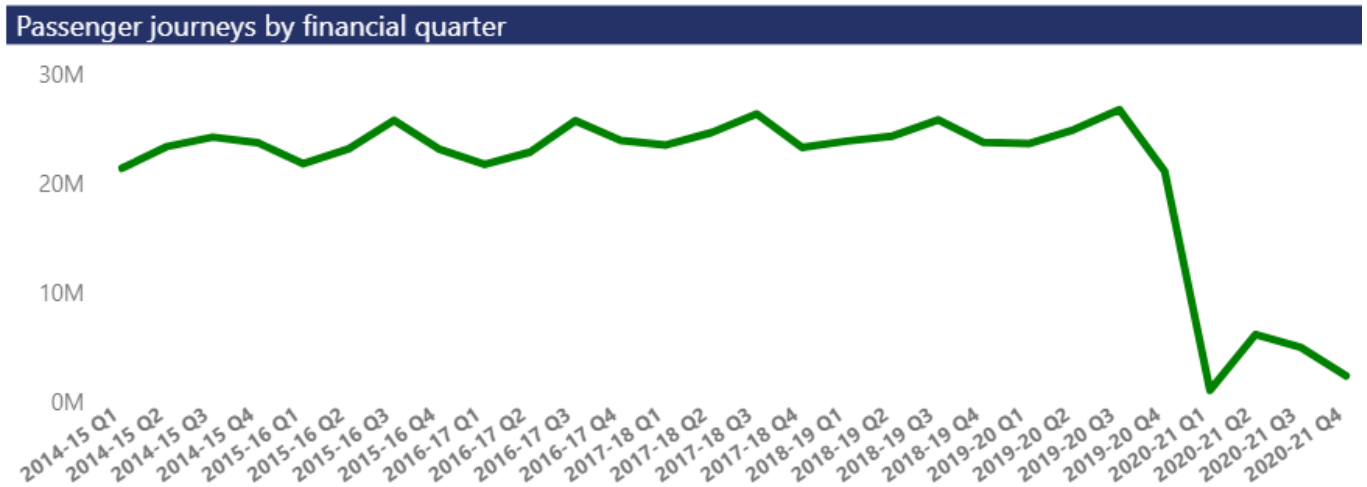
<sup>294</sup> Hirst (2012) EGIP: ‘A shadow of its former self?’. *Railway Technology Magazine* October/November 2012. Accessed 1 July 2021. Available [online](#).

<sup>295</sup> Budget and Spending Directorate (2020), *Infrastructure Investment – Major Capital Projects Progress Update*.

<sup>296</sup> ORR (accessed 9 August 2021) “Passenger rail usage”. Available [online](#).



Figure 10-5: ScotRail passenger journeys by financial quarter



Source: ORR (undated) *Passenger rail usage*, available [online](#).

An additional complication is the timing of the opening. As noted above, Queens St. station in Glasgow resumed operation in March 2020, with the EGIP works fully completed by March 2021. We understand that work on stations that were completed earlier has helped to balance patronage across the routes between Edinburgh and Glasgow and that there is some evidence of reduced overcrowding. But the commencement of Covid-19 restrictions in early 2020 will naturally limit the interpretability of any passenger data since the scheme’s full completion, both in terms of demand and other presumed benefits, such as reduced crowding, which the scheme was intended to deliver.

Similarly, the reduction in rail travel associated with Covid-19 makes it challenging to assess benefits such as reduced crowding. The scheme was intended to increase seating capacity by 44 percent by 2018 through the extended platforms and increased carriages.<sup>297</sup>

Though there has not been a concrete assessment of the impact of EGIP on housing prices, however, research by Nationwide notes that “the premium for transport links in Scotland’s largest city [Glasgow] has increased despite the reduction in public transport usage.”<sup>298</sup>

The Final Business Case defines the scheme outputs as timetable and service improvements. In this regard, it seems fair to assume that the scheme has generally achieved its intended outputs, with reduced journey time and increased capacity. In terms of reliability, reduced congestion and the transition to electric trains from diesel are expected to improve this metric, but this remains to be seen.

### 10.4.2. Impact of transport investment on economic outcomes

#### Population

Edinburgh has experienced population growth of over 12 percent between 2008 and 2018. In comparison, the population of Glasgow increased just over 5% over the same period.

The Final Business Case noted an expectation of relocation of population towards Edinburgh, Glasgow and Stirling, but provided limited evidence or discussion.

As the scheme opened in March 2020 and coincided with the Covid-19 pandemic, it remains too early to identify whether there are population impacts associated with the scheme.

<sup>297</sup> Scottish Parliament (2020) *Infrastructure Investment – Major Capital Projects Progress Update – Overview Report*. Accessed [online](#).

<sup>298</sup> Harrison (2021) *House prices Glasgow: Living near a rail link adds thousands to property values*. Accessed 9 August 2021. Available [online](#).

## **Employment**

The Final Business Case noted an expectation of relocation of employment towards Edinburgh, Glasgow and Stirling, but provided limited evidence or discussion.

As the scheme opened in March 2020 and coincided with the Covid-19 pandemic, it remains too early to identify whether there are employment impacts associated with the scheme.

## **Firm entry**

As the scheme opened in March 2020 and coincided with the Covid-19 pandemic, it remains too early to identify whether there are firm entry impacts associated with the scheme.

## **Land value and property prices**

As the scheme opened in March 2020 and coincided with the Covid-19 pandemic, it remains too early to identify whether there are land value and property price impacts associated with the scheme.

## **Productivity and wages**

As the scheme opened in March 2020 and coincided with the Covid-19 pandemic, it remains too early to identify whether there are productivity and wage impacts associated with the scheme.

## **Housing**

As the scheme opened in March 2020 and coincided with the Covid-19 pandemic, it remains too early to identify whether there are housing impacts associated with the scheme.

## **Regeneration and development**

Edinburgh Gateway station opened in December 2018 but we understand that patronage has been significantly lower than expected due to slower than anticipated development of the surrounding areas, which is still to get underway.<sup>299</sup>

As set out above, the scheme contributed to what is referred to as a “regeneration” of the Queen Street Station area. Additional impacts associated from this, or other parts of the scheme, remain to be seen as the scheme opened in March 2020 and coincided with the Covid-19 pandemic.

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<sup>299</sup> Email exchange between CEPA and a representative of Transport Scotland.

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## 11. READING STATION REDEVELOPMENT

### Summary of key messages

- Between 2011 and 2014, Reading Station underwent major redevelopment to address bottlenecks in its infrastructure. Reading had previously been identified by Network Rail as the greatest performance and capacity constraint on the GWML. The platform configuration at the station and track layout within the vicinity of the station was causing congestion both in operating the service and the passenger experience.
- The work undertaken at the station included a new Thames Valley signalling centre; five new platforms; platform extensions for Waterloo line services; and extensive track layout reconfiguration. In addition to the work undertaken by Network Rail, Reading Borough Council undertook further work on the station building, with the aim of improving the concourses and area surrounding the station.
- The work delivered four additional train paths per hour in each direction, a 125 percent improvement on through line platform capacity and a 38 percent improvement in service performance.
- There is very limited information in the public domain regarding the broader impact of the redevelopment on the local economy. However, the works may have catalysed some of the ongoing redevelopment in the area around the station
- **The key contextual factors relevant to this scheme are:**
  - Regeneration potential: in the early 2000s, there was an increase in the number of closed and vacant buildings in the area surrounding the station.
  - Regeneration programme: Reading Borough Council began its efforts to redevelop the area surrounding the station several years before the works commenced on the station.

### 11.1. SCHEME SUMMARY

Background information	
<b>Scheme type:</b>	Station redevelopment
<b>Type of transformational impact planned:</b>	Residential impacts; labour demand impacts
<b>Location:</b>	Reading, Berkshire, UK
<b>Geography:</b>	Inter-city; urban periphery
<b>Promoter:</b>	Department for Transport, Network Rail, Reading Borough Council
<b>Start of construction:</b>	2011
<b>Opening date:</b>	July 2014
<b>Cost:</b>	£897m
<b>Sources of funding:</b>	Unknown

Reading station is one of the busiest in the UK outside of London, acting as a station of interchange as well as origin and destination. It is a key station on the Great Western Main Line, which runs west from London Paddington to Reading, then onwards via two branches, to Bristol Temple Meads and Taunton. Other main lines connect Reading with Birmingham, northern England and Scotland, and Basingstoke, Winchester, Southampton and Bournemouth.<sup>300</sup>

<sup>300</sup> Department for Transport (July 2007) "Reading Station Area Re-Development Project Business Case Version 1".

The secondary North Downs Line connects Reading with Guildford, Reigate and Gatwick Airport. Reading will also serve as the western terminus of the new Elizabeth Line (Crossrail).<sup>301</sup>

Beginning in 2011 and completing in 2014, Reading station underwent a £897m<sup>302</sup> redevelopment to address bottlenecks in the infrastructure at and around the station. Prior to its redevelopment, Reading was identified by Network Rail as the greatest performance and capacity constraint on the Great Western Main Line (GWML), due to the platform configuration at the station and track layout within the vicinity of the station. The constraints were causing several inter-related issues, such as trains having to wait outside of the station until a platform became available, which in turn led to ‘padding’ of the scheduled timetable to accommodate this addition to the journey time. Limited platform capacity also constrained scope for recovery of journey time following delays. The layout of the station infrastructure for passengers was also associated with congestion, for both passengers interchanging between services and those entering and leaving the station. During the peak periods, there were delays at entrances, queuing at ticket barriers and overcrowding on and around escalators and stairs.<sup>304</sup>

The work undertaken at the station included a new Thames Valley signalling centre; five new platforms; platform extensions for Waterloo line services; extensive track layout reconfiguration and provision for a possible future extension of Crossrail services and introduction of AirTrack services to London’s Heathrow Airport.<sup>303</sup> In addition to the work undertaken by Network Rail, Reading Borough Council undertook further work on the station building, with the aim of improving the concourses and area surrounding the station. The focus of the work included interchanges on the north and south of the railway line; station concourses and footbridges; the existing subway access to the platforms; the wider connections to adjoining sites and the town centre; and the planning & transport policy context established by Reading Borough Council’s Local Development Framework documents (specifically the Reading Central Area Action Plan). The incremental cost of the station entrance work was £32.2m in the business case.<sup>304</sup>

The main objective of the redevelopment of the station itself was to ease capacity constraints. The objectives of the work undertaken by Network Rail included:

- reliability improvements as measured by the public performance measure (to achieve 92 percent on long distance and regional services and 93 percent on London and South East services by December 2014);
- capacity enhancements (including at least four additional train paths per hour in each direction);
- a reduction in the number of conflicting moves within the Reading Station area; and
- to deliver a station design which able to accommodate a doubling of passenger movements, flexibility in timetabling and future electrification of the Great Western route.<sup>304</sup>

The objectives for enhancing the station entrances, concourses and surrounding area included:

- To increase capacity of the station infrastructure (e.g. entrances, lift, stair and escalator links) to enable the station to handle forecast growth in demand.
- To minimise journey time to passengers entering, leaving and interchanging at the station, especially between the southern entrances and the proposed new over bridge.
- To minimise journey time to passengers interchanging between the station and existing and planned bus and taxi interchanges adjoining the rail station to the south east, south west and to the north.
- To create an entrance building or buildings of high architectural quality which can act as a fitting ‘gateway’ to Reading.<sup>304</sup>

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<sup>301</sup> Cross Rail Route Map available [online](#).

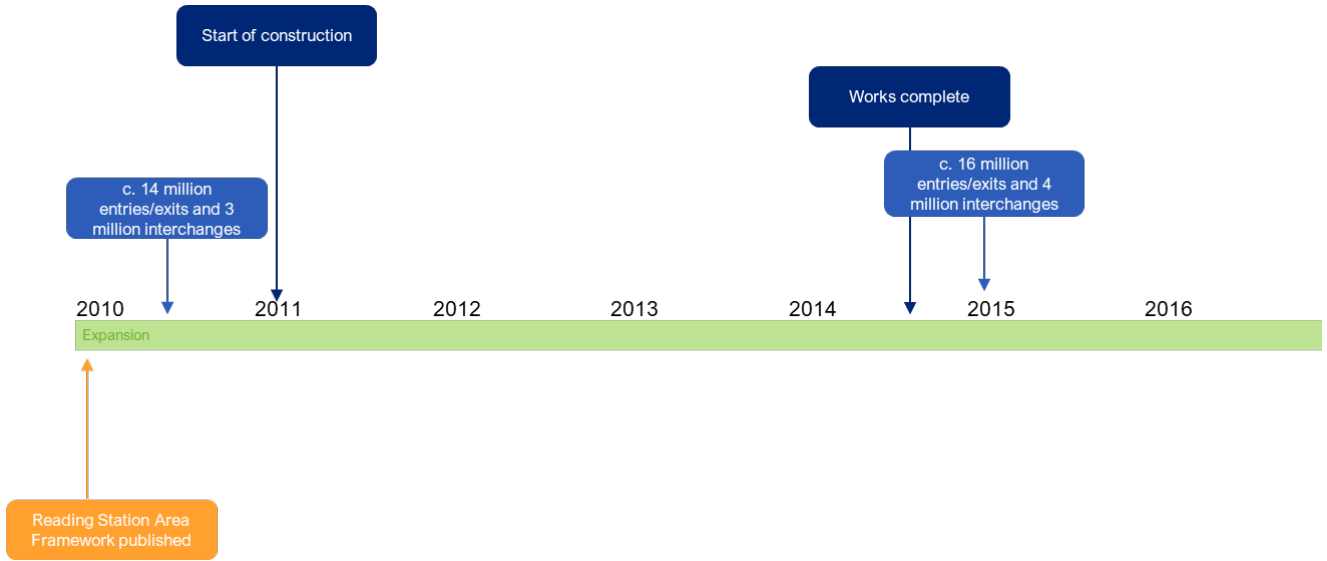
<sup>302</sup> BBC News (July 2014) “Queen opens revamped Reading railway station” available [online](#).

<sup>303</sup> Network Rail Consulting “Reading Station Area Redevelopment” available [online](#).

<sup>304</sup> Department for Transport (June 2009) “Reading Station Central Area Redevelopment Project Business Case of Key Outputs”.

See Figure 11-1 for a detailed timeline of key dates associated with the Reading Station redevelopment.

Figure 11-1: Timeline for the Reading Station Redevelopment



Legend	
	Scheme key dates
	Scheme outputs / outcomes
	Associated investments
	Changes in governance
	Major events

## 11.2. THEORY OF CHANGE

Figure 11-2 presents a logic map articulating the ToC for the Reading station redevelopment. Unlike the other case studies this scheme does not include any substantive improvements in rail connectivity, beyond some enhancements to the integration of the station with other transport modes.

**Inputs / Activities / Outputs.** The redevelopment of the station some improvements to the station configuration that would allow it to accommodate more traffic and more passengers with improved reliability and less congestion. The station redevelopment also aimed to enhance the local area by creating a high-quality public space and station building. The main outputs were expected to be reduced journey times to and from the station, particularly at peak periods and a more attractive local area

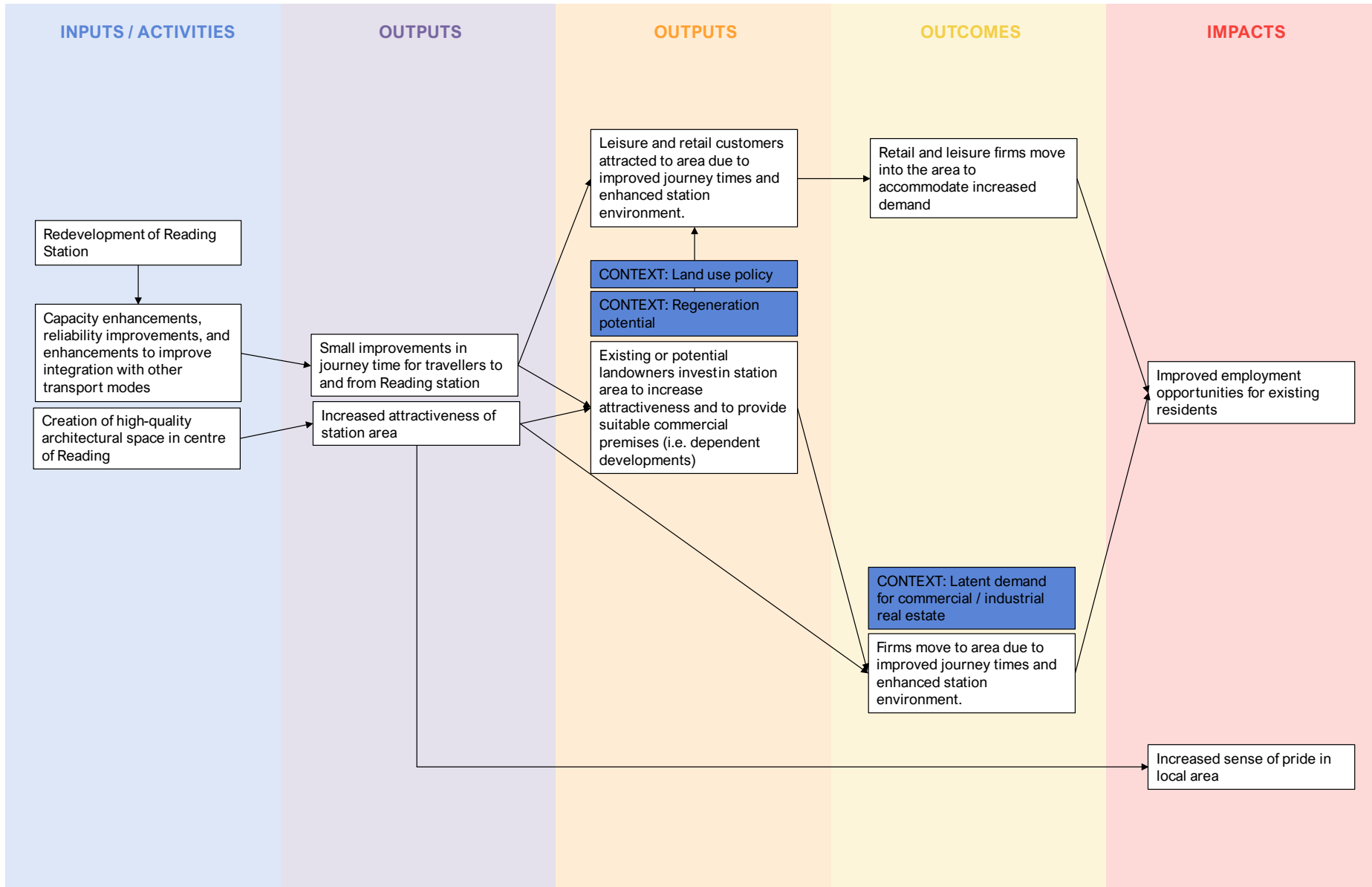
**Outcomes / Impacts.** We have identified one channel through which the station redevelopment could be expected to have a transformational impact:

- **Changes in economic activity and, therefore, labour demand, by enhancing the local areas attractiveness as a leisure and retail location/destination and location for offices.** We expect that enhancements to the public space in and around the station could attract customers and firms who value high-quality public spaces. This may induce other landowners in the area to invest in redevelopment to take advantage of the increased demand and provide suitable commercial, leisure and retail premises. These two effects may combine to increase economic activity in the area and provide employment opportunities for local residents.

**Context.** We expect that this transformational impact can only realistically be achieved if the area was previously in need of redevelopment and suffered from poor-quality public spaces (i.e. the area had regeneration potential). Additionally, it may be necessary for there to be a land-use policy to coordinate the investments of the various landowners to provide a cohesive regeneration strategy. In the absence of such a policy or a wider strategy, it may be that some of the outcomes we anticipate fail to materialise.



Figure 11-2: Logic map for Reading station redevelopment



### 11.3. SURROUNDING CONTEXT

Reading is an important commercial centre in the Thames Valley. The Reading economic area is home to many global businesses and organisations, including Microsoft, EY, PwC, Nokia, Huawei, John Lewis, Pepsico and Bayer.<sup>305</sup> Reading station “serves as a ‘gateway’ to Central Reading’s civic, retail, leisure and cultural facilities and to the wider urban area including peripheral employment centres such as Green Park and Thames Valley Business Park.”<sup>304</sup>

Reading is seen as a successful commercial centre in the region. In 2019, Reading was named the second-best place to live and work of the largest 36 economic areas in the UK, according to the PwC Good Growth for Cities 2019 index, based on factors such as jobs, income, skills, health, housing, and transport.<sup>306</sup>

#### 11.3.1. Characteristics of the area at time of investment

##### Business cycle

Central Reading experienced rapid development between 1990 and 2010, focused on the Oracle Shopping centre (located five minutes’ walk south of Reading Station), the banks of the Kennet (a tributary river of the Thames, 10 minutes’ walk south of Reading Station), and the Forbury (10 minutes’ walk east of Reading Station, where a new office area has been developed).<sup>307</sup>

The Reading station redevelopment itself was completed in 2014, in a period of economic expansion in the UK. In 2015, the Greater Reading Area was ranked as having the most productive workforce among the 64 largest cities in the UK, according to *the Cities Outlook 2015* by the think-tank Centre for Cities, with an average gross value added of £70,900 per person.<sup>308</sup>

##### Quality of existing transport access

Reading is a well-connected town in addition to its rail links. The town is located adjacent to the M4 motorway running west from London to southwest Wales and is also only 25 miles away from London Heathrow airport by road. While close enough to London to serve as a dormitory town for the capital itself, commuters also travel to Reading itself for work.

In addition to Reading’s existing transport links, several new connections are currently under construction. Reading will be a western terminus of the new Elizabeth Line (Crossrail), and there is also a new railway station under construction at the Green Park business area, on the southern outskirts of Reading, on the Reading to Basingstoke line. Proposals have also been submitted for a western rail link to London Heathrow Airport, involving a new 6.5km rail link between the Great Western Main Line and Heathrow. If approved, the scheme would reduce rail journey times between Reading and Heathrow by delivering a new, faster, frequent, more reliable direct train service to Heathrow with four trains per hour in each direction.<sup>309</sup>

##### Housing

Analysis of the English Indices of Multiple Deprivation for 2010 and 2015 reveals that the LSOAs containing Reading Station and those adjacent rank below average to average for the housing domain, suggesting the area was not experiencing a severe housing shortage.

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<sup>305</sup> Living Reading “Major businesses and employers” available [online](#).

<sup>306</sup> Reading Chronicle (November 2019) “Reading named one of best ‘cities’ to live and work” available [online](#).

<sup>307</sup> Reading Borough Council (December 2010) “Reading Station Area Framework” available [online](#).

<sup>308</sup> ITV News (January 2015) “Reading ranks highly in productivity report” available [online](#).

<sup>309</sup> Network Rail “Western Rail Link to Heathrow” available [online](#).

## Commercial development

Discussions with stakeholders at Reading Borough Council revealed that prior to the station redevelopment, recent commercial developments in Reading were mainly located in out-of-town locations such as Green Park and Thames Valley Business Park. This is probably a reflection of the two key development constraints faced by Reading, according to stakeholders: land and congestion. Reading Borough Council's jurisdiction does not encompass the whole of Reading's urban area, as the suburbs extend beyond the Borough Council boundaries. The highway network is also capacity-constrained and previous efforts to expand capacity for cars led to negative effects on access for other users (e.g. pedestrians and cyclists). The stakeholders noted a tension between attracting office developments to the town and providing sufficient access for office workers to travel to the developments.

## Regeneration potential

In the early 2000s, there was an increase in the number of closed and vacant buildings and sites in the 'Station Hill South' area – the area immediately to the south of the station, essentially regarded as a 'gateway' to Reading. Planning documents note limited pedestrian accessibility, 'uncharismatic, convoluted, hard-surfaced spaces', and the high number of vacant, disused building contributing to a perception of crime. The station forecourt was described as an 'unwelcoming, hard landscape with few distinctive uses or features.'<sup>310</sup> These features made the station area ripe for redevelopment.

In addition to the station itself, as of 2010 the station area was dominated by:

- Station Hill – a largely vacant high rise commercial development characteristic of the 1970s with office towers, retail, leisure and a multi-storey carpark.
- The main station car park accompanied with a retail park, and the Royal Mail sorting office to the west.
- A two-hectare site occupied by Southern Electric, comprising offices and electricity transmission equipment.
- Thames Tower – a semi-empty 1980s office block 100m from the station entrance.

## Underutilised skills

Analysis of the English Indices of Multiple Deprivation does not suggest that Reading's population has underutilised skills. The indices for 2010 and 2015 reveal that the LSOAs containing Reading Station and those adjacent rank average to above average for the education, skills & training domain, suggesting the area has a relatively highly skilled population. The indices for the employment and income domain do not suggest that the area faced particularly high unemployment.

### 11.3.2. Associated activities and actions alongside transport investment

#### Benefits realisation plan

There is no formal evidence available in the public domain of a benefits realisation plan to capitalise directly on the capacity and improvements unlocked by the Reading station redevelopment. However, discussions with stakeholders at Reading Borough Council revealed that the redevelopment of the station was closely linked to other works in the vicinity to maximise the benefits of the increased station capacity by improving access to the station area and the built environment around the station. These works included the rebuilding of Cow Lane Bridge (previously a major road bottleneck) and the relocation of the public transport interchange at Station Hill, so that the area immediately adjacent to the station was public open space. Relocating the interchange required significant reconfiguration of the road network, such as altering routes and widening pavements.

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<sup>310</sup> Reading Borough Council (March 2007) "Station Hill South Planning and Urban Design Brief" available [online](#).

## **Unlocking development**

We have not found any evidence to suggest that the Reading station redevelopment was linked to any relaxation of planning rules or release of land.

## **Regeneration programme**

Reading Borough Council began its efforts to redevelop Reading Station and the surrounding area several years before the works on the station itself commenced. A station partnership board was formed in 2004 to progress the redevelopment. Between 2004 and 2010, Reading Borough Council produced various policy documents and guides as Planning and Transport Authority and in partnership with other key players, including Network Rail. In 2010, Reading Borough Council published the Reading Station Area Framework to outline broad development principles and provide supplementary planning guidance for the area, individual sites, the public realm and new transport infrastructure.

## **Skills investment**

We have not found any evidence to suggest that the Reading station redevelopment was associated with any skills investment programmes.

## **11.4. SCHEME OUTPUTS AND ASSOCIATED OUTCOMES**

The redevelopment of Reading Station delivered on its intended outputs of a minimum of four additional train paths per hour in each direction and five additional platforms. The project achieved a 125 percent improvement on through line platform capacity and a 38 percent improvement in service performance.<sup>303</sup> The removal of the bottleneck also allowed for six extra freight trains daily, taking around two hundred lorries a day off the roads.<sup>311</sup>

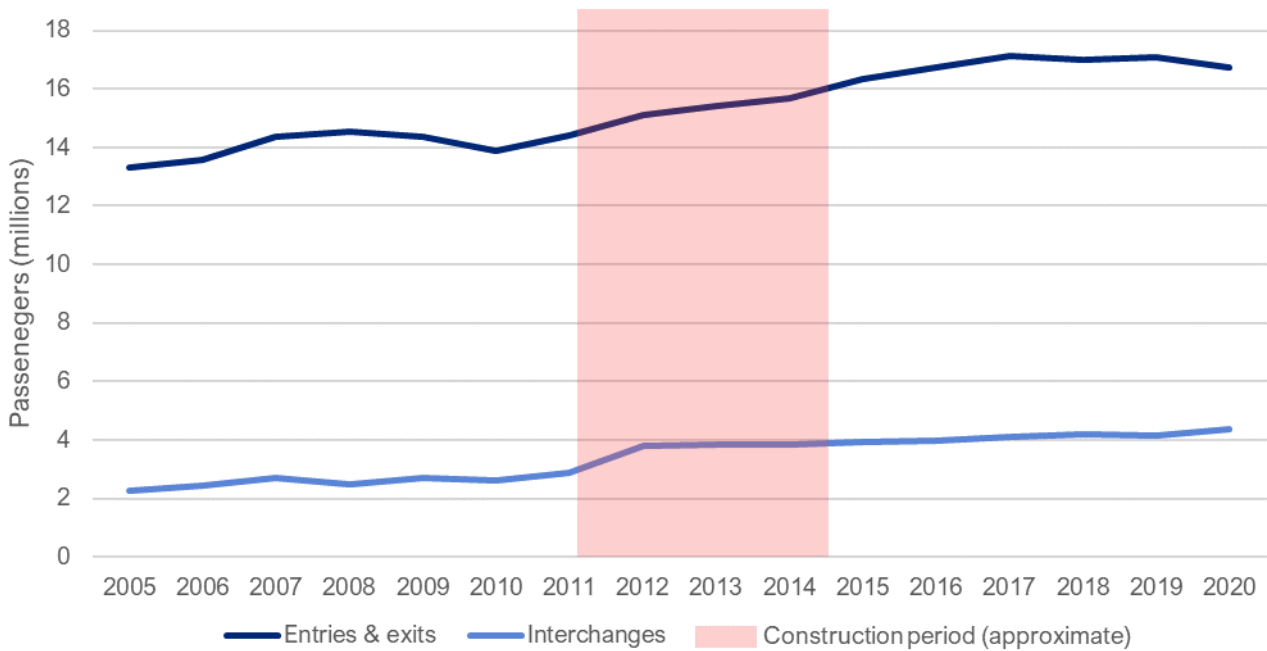
### **11.4.1. Passenger growth compared to original forecasts**

Figure 11-3 below illustrates the increase in passenger numbers at Reading Station over time, with the approximate construction period highlighted in pale red. The main purpose of the redevelopment was to accommodate forecast growth in passenger numbers without performance or quality of service suffering. The observed data shows that passenger growth maintained its historic trend following the completion of the redevelopment in 2014, suggesting that the scheme was successful in its objective of accommodating growth in passenger numbers.

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<sup>311</sup> Network Rail (April 2019) “Reading station celebrates three decades of improvements since a right Royal visit” available [online](#).

Figure 11-3: Passenger numbers at Reading station, 2005 to 2020



Source: Office of Rail and Road, Timeseries of passenger entries and exits and interchanges by station

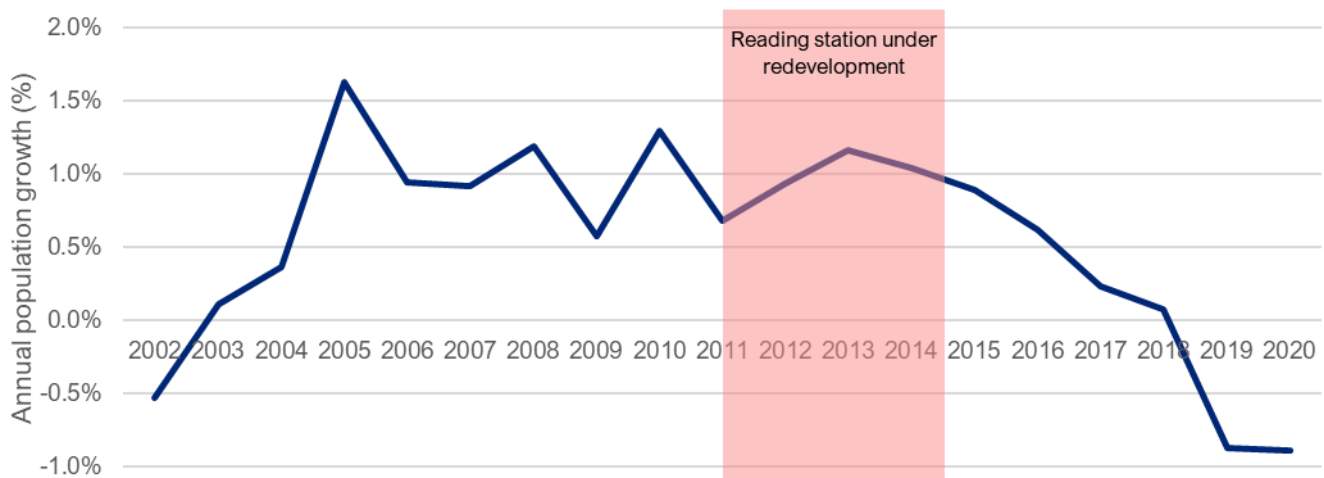
### 11.4.2. Impact of transport investment on economic outcomes

There is very limited information in the public domain regarding the wider impact of the redevelopment of Reading station on the local economy.

#### Population

Between 2006 and 2015, Reading experienced relatively consistent population growth of between 0.6% and 1.3% per annum. Following the completion of the station redevelopment in 2014, population growth steadily decelerated from 1.2% per annum in 2015 to -0.9% per annum in 2019 and 2020, as shown in Figure 11-4 below. This evidence suggests that the Reading station redevelopment did not have a positive effect on population growth in Reading.

Figure 11-4: Annual population growth in Reading (2002-2020)



Source: CEPA analysis of annual population estimates for the United Kingdom by local authority (ONS).

## **Employment**

We have not found any evidence which quantifies the impact of the Reading station redevelopment on employment in the area. However, discussions with stakeholders suggested that multiple office buildings have been built or redeveloped in the vicinity since the scheme completed, thus it is possible that the scheme has had some beneficial impact on employment.

## **Firm entry**

We have not found any evidence regarding firm entry that can be directly attributed to the station redevelopment. Some firms may have relocated to newly built or refurbished office buildings near to the station.

Reading's connectivity appears to have been an important factor influencing large firms to establish offices in the town in recent years. While Reading's position on the GWML may have some influence, the town also has other accessibility advantages given its proximity to the M4 motorway and London Heathrow airport – these factors may be of greater importance to businesses than Reading's rail connectivity.

For example, in 2016, Bayer Life Sciences relocated its UK and Ireland HQ to Green Park in Reading in 2016, home to around 500 employees. Bayer cited Reading's connectivity as a reason for choosing to relocate there, as the town is located close to Heathrow with excellent UK-wide connectivity through the M4, Great Western Main Line and Crossrail.<sup>312</sup> In 2018, Nokia opened its new South East office in Arlington Business Park, employing 250 staff. The town's excellent transport links and airport access were highlighted by Nokia as influencing their decision to relocate to Reading.<sup>313</sup>

## **Land value**

We have not found any evidence regarding the impact of the station redevelopment on land values in Reading.

## **Property prices**

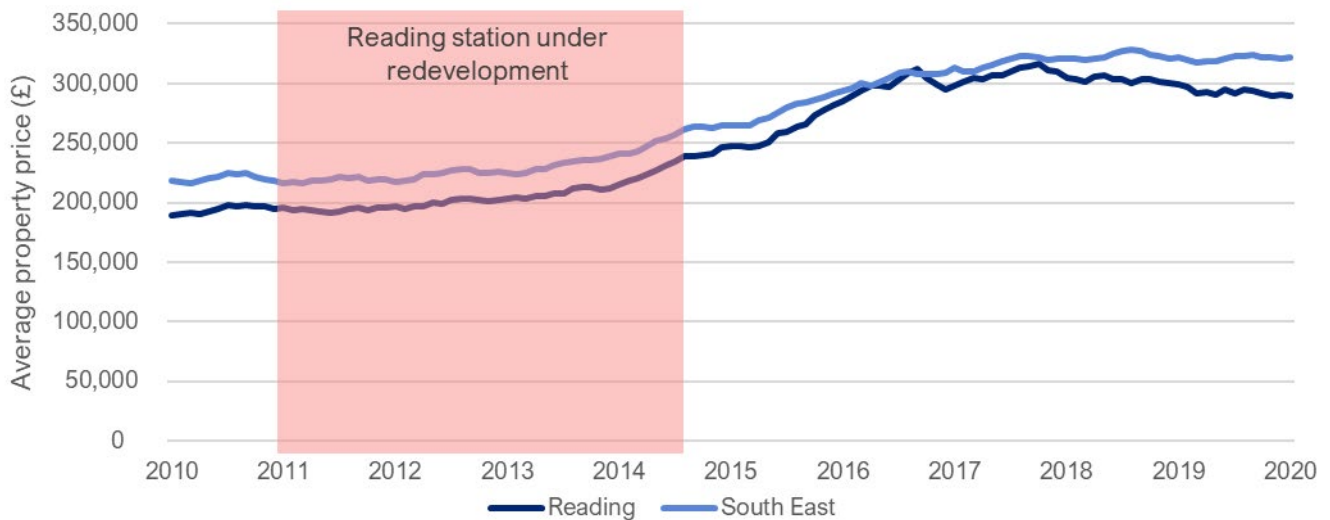
Figure 11-5 below shows average property prices in Reading and the South East between 2010 and 2020. Between 2010 and 2014 average property prices in Reading followed a similar trend to those in the South East. Between 2015 and 2017 average property prices grew faster in Reading than the South East. While the timing of this acceleration is close to the completion to the station redevelopment works in July 2014, it is not possible to attribute the acceleration to the station scheme based on this preliminary analysis. Between 2017 and 2020, average property prices grew slightly slower in Reading than the South East.

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<sup>312</sup> Living Reading “Business in Reading case studies – Bayer Life Sciences” available [online](#).

<sup>313</sup> Living Reading “Business in Reading case studies – Nokia choose Reading” available [online](#).

Figure 11-5: Average property prices in Reading and the South East, 2010-2020.



Source: CEPA analysis of Land Registry average property price data.

## Wages

We have not found any evidence regarding the impact of the station redevelopment on wages in Reading.

## Productivity

We have not found any evidence regarding the impact of the station redevelopment on productivity in Reading.

## Housing

Discussions with stakeholders suggested that the station redevelopment may have played a role in encouraging the development of apartment buildings in the town centre (such as at Chatham Place), although the increased frequency of train services to London via the Elizabeth Line (CrossRail) is likely to be the more important factor.

## Regeneration and development

The redevelopment of Reading Station was anecdotally attributed to have “increased confidence in the Reading office market, with developers and investors moving fast to create high quality office space within a short distance of the rail gateway to London and Europe”.<sup>314</sup> The project has also been labelled as “a catalyst for major redevelopment in Reading as a whole”.<sup>315</sup>

Similar views were expressed by the stakeholders interviewed, who consider the station redevelopment to have played an important role in the regeneration of the station area. According to the stakeholders, most of the area within five to ten minutes’ walk of the station has been redeveloped since the completion of the station scheme, or there are plans for redevelopment in the near future.

Of particular note is the Station Hill redevelopment, 1,500,000 sq.ft. mixed use redevelopment with ambitions to create a new gateway for Reading. Currently under construction, once complete the redevelopment will feature new homes, assisted living accommodation, a hotel, high-tech office space, retail and leisure facilities, designed to be accessible to all users. The Station Hill development will provide 600,000 sq.ft. of office space, 100,000 sq.ft. of retail and leisure space and 1,200 new homes.<sup>316</sup> Stakeholders noted that the Station Hill scheme was slow to get underway, as the previous landowner was unable to devise a viable scheme, demonstrating how local authorities are often reliant on landowners and developers to be willing and able to undertake redevelopment work.

<sup>314</sup> Living Reading (March 2014) “The Station Effect” available [online](#).

<sup>315</sup> Stantec “Reading Station Area Regeneration” available [online](#).

<sup>316</sup> Station Hill “Info” available [online](#).



## **11.5. SOURCES**

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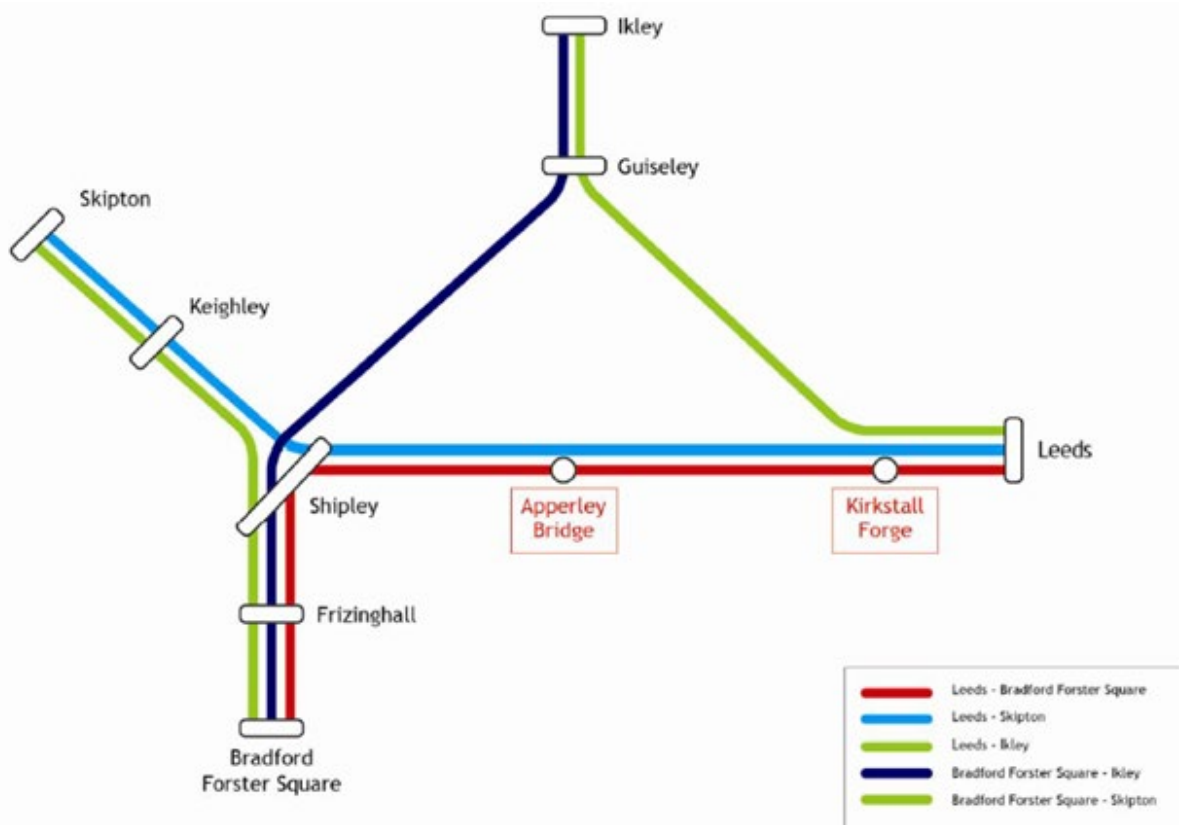
Station Hill “Info” available [online](#)

## 12. KIRKSTALL FORGE

### Summary of key messages

- Kirkstall Forge rail station opened in 2016, positioned on the lines running between Leeds and Shipley, allowing onward connection to Bradford. It was proposed jointly with another station (Apperley Bridge) to DfT in 2009, and crucially, as part of a regeneration plan of 23 acres of mixed-use development.
- The corridor connecting Bradford and Leeds is increasingly suffering from road congestion. These urban centres are on the rise, seeing general improvement in indicators such as employment and skills, with increasing targets for annual economic output.
- Economic plans for these areas raised concerns over both housing supply and congestion; the Kirkstall Forge station and development, in tandem, are well positioned to alleviate both potential constraints to economic growth, through residential developments and improved connections, supporting modal shift away from cars.
- One year after opening, passenger numbers were aligned with forecasts and have grown significantly since then. Survey results suggest the station is contributing to a reduction in car journeys.
- Employment growth was steady prior to and following the station opening, and as such it has not yet been possible to ascertain any attributable employment impacts.
- Further commercial and residential construction has begun but, despite the growth in passenger numbers, the wider economic impact of this station remains difficult to assess at this stage.
- **The key contextual factors relevant to this scheme are:**
  - Business cycle: Kirkstall Forge Station opened during a period of economic expansion in the UK.
  - Quality of existing transport access: Bradford-Leeds corridor was suffering from road congestion and poor journey time prior to the scheme.
  - Housing: Region was not considered to have acute housing shortage but was expected to experience significant growth in jobs and population.

Figure 12-1: Kirkstall Forge routes served



Source: Metro (2014) "Project Initiation Document – Rail Growth Package"

## 12.1. SCHEME SUMMARY

Background information	
<b>Scheme type:</b>	New station on existing rail line
<b>Type of transformational impact planned:</b>	Residential impacts, labour demand impacts, consumer demand impacts
<b>Location:</b>	Leeds, West Yorkshire
<b>Geography:</b>	Suburban
<b>Promoter:</b>	West Yorkshire Combined Authority
<b>Start of construction:</b>	October 2014
<b>Opening date:</b>	June 2016
<b>Cost:</b>	£16.6 million (for both Kirkstall Forge and Apperley Bridge stations) <sup>317</sup>
<b>Sources of funding:</b>	£10.3m from DfT, with the remainder provided by Commercial Estates Group (CEG) and the West Yorkshire Combined Authority

Kirkstall Forge is a former industrial site, purchased in 2005 by a private developer – Commercial Estates Group (CEG) – who plan to transform 23 acres of the 60 acre site, into a mixed use development, including approximately 1,050 new homes, 300,000 sq.ft. of office space and 100,000 sq.ft. of leisure and retail. To make this investment viable, the opening of the new Kirkstall Forge railway station (on the site of a previous station, closed in in the early 1900s), was proposed as part of the West Yorkshire Rail Growth Package (WYRGP). The business case was originally put forward to DfT in 2009 by Yorkshire and Humber Regional Transport Board.

The WYRGP includes two new stations – Kirkstall Forge, intended to serve the local community and the new development, and Apperley Bridge, designed to operate as a park and ride. They were combined into a single business case for several reasons:

- Economies of scale in construction;
- Limiting revenue support risk of the transport authority for West Yorkshire (Metro) by capturing customers across two stations with different market characteristics; and
- Pooling of funds across Metro and CEG, the latter of which is contributing to the station and rolling stock costs given the symbiotic relationship between the development and station.

Both stations are positioned on the Wharfedale and Airedale lines which run between Leeds and Shipley, towards Bradford. They will improve access between these two main regional urban hubs and the suburban areas in which the stations are located. Overall, the WYRGP has three core objectives, in addition to three sub-objectives:

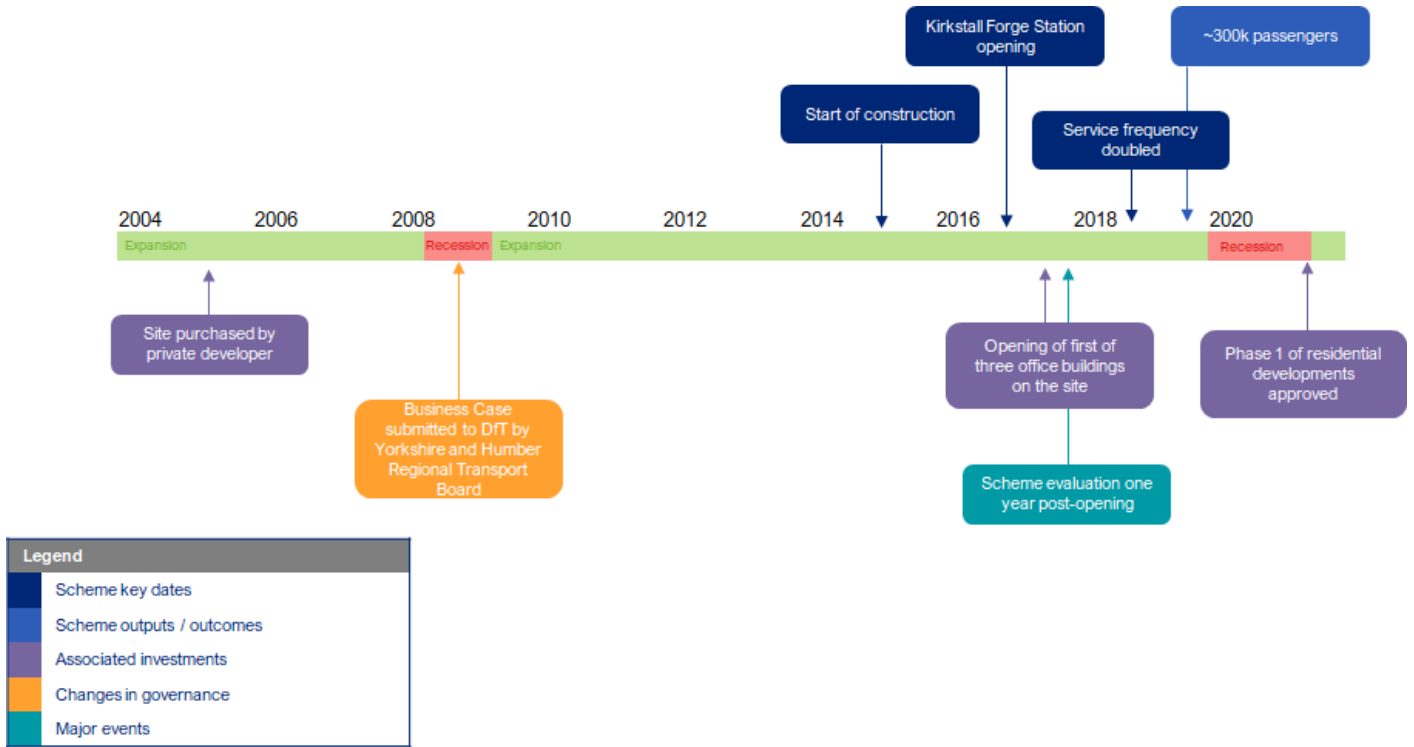
- Encourage mode shift away from car
  - Improve accessibility to the City Region’s rail network
  - Increase attractiveness of rail for all journeys, particularly for commuting or business
- Improve accessibility to economic centres of Leeds and Bradford

<sup>317</sup> DfT (2018) “Capturing housing impacts in transport appraisal - Case studies” available [online](#).

- Tackle congestion in the major centres and on main corridors by providing a real alternative to the car; and
- Facilitate local development.

See Figure 12-2 for a detailed timeline of key dates associated with the Kirkstall Forge Scheme.

Figure 12-2: Timeline for Kirkstall Forge



## 12.2. THEORY OF CHANGE

Figure 12-3 and Figure 12-4 present logic maps articulating the ToC for the Kirkstall Forge railway station development.

**Inputs / Activities / Outputs.** The scheme consisted of the construction of a new railway station at Kirkstall Forge, which was an area being redeveloped, allowing for two new trains per hour to Leeds and Bradford.

**Outcomes / Impacts.** There are two channels of transformational impact that we consider to be relevant within this ToC, which are explored separately in Figure 12-3 and Figure 12-4. These follow many of the same themes explored in some of the other case studies, albeit at a smaller scale:

- **Changes in residential demand, by Kirkstall Forge becoming a new residential location within the Leeds labour market catchment (and possibly the Bradford labour market catchment).** The creation of a new railway station and the introduction of services potentially extends the labour catchments of both Leeds and Bradford to incorporate the area around the station. This could unlock the areas development potential, enabling the creation of new housing and attracting new residents.
- **Changes in labour demand, by Kirkstall Forge, Leeds city centre, Bradford city centre, all becoming more attractive locations for firms due to improved access to the labour market.** Extending the Leeds and Bradford labour catchments to incorporate Kirkstall Forge may make the cities more attractive for firms. However, we consider this effect will be relatively small given the size of the Kirkstall Forge development and the size of both cities' existing labour catchments. We would expect there to be larger effect at Kirkstall Forge itself, where the existence of a new rail connection increases the area's attractiveness to firms that now have access to both the Leeds and Bradford labour markets. As such, we do anticipate the scheme to be transformational at a city-wide level, but it could be at a local level.

**Context.** The key contextual factor likely to be relevant to this scheme is the linked investment in the redevelopment of Kirkstall Forge.

Figure 12-3: Logic Map for Kirkstall Forge - Residential Impacts

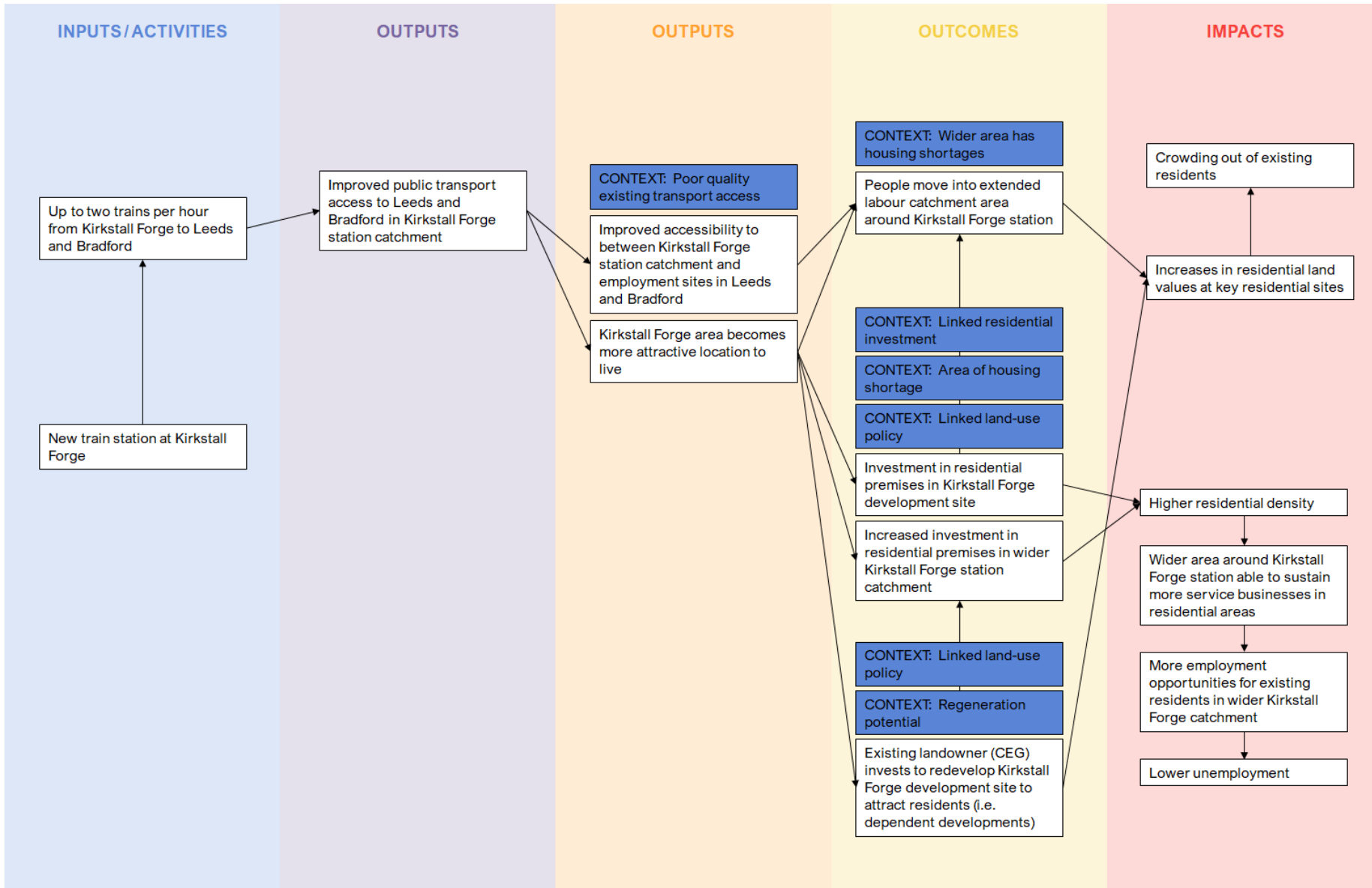
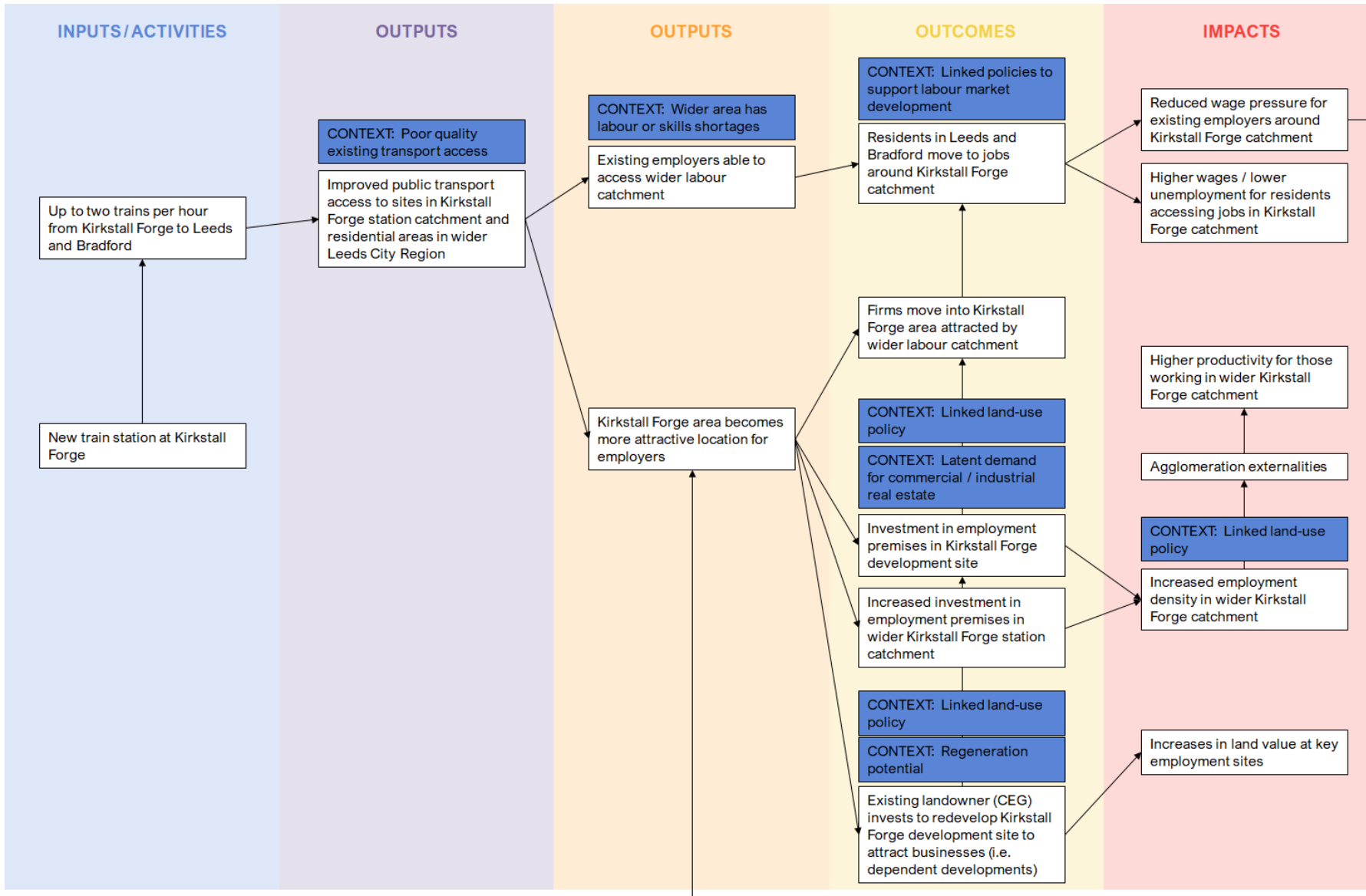


Figure 12-4: Logic Map for Kirkstall Forge – Labour Demand Impacts





## 12.3. SURROUNDING CONTEXT

### 12.3.1. Characteristics of the area at time of investment

#### Business cycle

Kirkstall Forge Station opened in 2016, during a period of economic expansion in the UK.

#### Quality of existing transport access

The development at Kirkstall Forge had been under consideration since 2003, as part of the Leeds City Council Urban Housing Capacity Study. Investments in public transportation were required for the development to proceed, as the Bradford-Leeds corridor was already suffering from road congestion.

Highway congestion and poor journey time were raised as potential constraints that could negatively impact economic performance in the region. Rail improvements could both alleviate congestion and enable a modal shift away from cars. In line with that, the development describes itself as “a place for people who want to be connected to a growing city and its culture, without having to rely on car travel to get around”<sup>318</sup>. It is worth noting, however, that the station is located along a commercial bus corridor, implemented in 2012, which had been funded by DfT, and so there was some risk of competition between the modes.

#### Housing

Though the surrounding areas were not considered to have acute housing shortages, as defined by the housing domain under the UK’s Index of Multiple Deprivation<sup>319</sup> (both were at or near the 6<sup>th</sup> decile in 2015), the region was expected to experience significant growth in jobs and population over the coming years. By 2016, the city region was second largest in the UK after London, generating 5 percent of England’s output with a workforce of just under 2 million people. The strategic plan of the Leeds City Region (2016-2036)<sup>320</sup> aims to generate an additional £3.7 billion of annual economic output over and above normal growth. This target is built on four key priorities – growing business, skilled people and better jobs, clean energy and environmental resilience, and infrastructure for growth. A number of these are relevant to the Kirkstall Forge station and development, which not only supports a modal shift away from cars but enables greater connectivity to a regenerated housing and employment growth area.

The Yorkshire and Humber Regional Spatial Strategy<sup>321</sup> reports that a significant increase in housing in and around Leeds and Bradford is required to realise the region’s economic potential. According to the UK’s Index of Multiple Deprivation, both cities were considered average in 2015 as regards employment, income and education, while the living environment was slightly below average. As of the end of 2017/18, the average income in the Kirkstall suburb of Leeds was £29,800, compared to 87 percent of households having an average income of £22,500-£39,200, suggesting the area has average income on a national level<sup>322</sup>.

#### Commercial development

We have not found any evidence on commercial development linked to the scheme.

#### Regeneration potential

We have not found any evidence on regeneration potential of the areas served by the scheme.

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<sup>318</sup> CEG (undated) “Kirkstall Forge Brochure”.

<sup>319</sup> Ministry of Housing, Communities & Local Government (September 2015) “English Indices of Deprivation 2015” available [online](#).

<sup>320</sup> West Yorkshire Combined Authority (May 2016) “Leeds City Region Strategic Economic Plan 2016-2036” available [online](#).

<sup>321</sup> Government Office for Yorkshire and the Humber (May 2008) “The Yorkshire and Humber Plan: Regional Spatial Strategy to 2026” available [online](#).

<sup>322</sup> ONS (March 2020) “Income estimates for small areas, England and Wales: financial year ending 2018” available [online](#).

## Underutilised skills

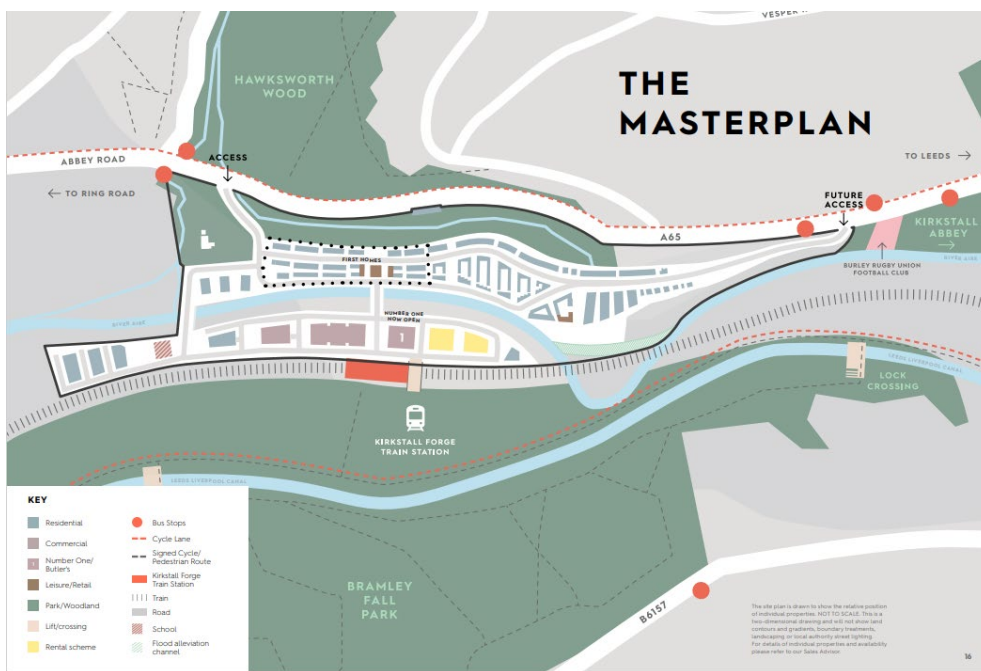
The productivity gap has continued to widen between Leeds and the rest of the UK. In terms of GVA, in 2015 Leeds and Bradford were sitting at 73.5 percent and 48 percent of the UK average, respectively. However, labour demand in 2018 was at its highest since records began in 2004 and there has been an improvement in skills supply; in 2017 the proportion of people qualified to at least level 4 increased by 3 percent. Though this is below the national average, the gap is narrowing. Employment figures have suffered under the pandemic, but the city region nonetheless continues to grow at rates above the national average. Generally speaking, the region is seeing growth and improvement across a number of measures.

### 12.3.2. Associated activities and actions alongside transport investment

#### Benefits realisation

The supply and demand of both labour and consumers may flow both ways through the Kirkstall Forge development. With its upcoming residences, the area can act as a commuter town, being only 6 minutes from Leeds city centre and 15 minutes from Bradford, but it will also house commercial units, with the potential to draw labour out of the city centres. Overall, it is intended to “facilitate local development at Kirkstall Forge and wider job creation in the primary 7 economic centres of West Yorkshire”<sup>323</sup>. The area also benefits from surrounding woodland, riverside walks and canal towpaths, with pedestrian and cycle links for non-motorised users, to the benefit of residents, employees and visitors.

Figure 12-5: Kirkstall Forge master plan



Source: CEG (undated) Kirkstall Forge brochure

## Unlocking development

The Kirkstall Forge station was expected to reduce traffic levels overall along the corridor, as well as vehicle-based emissions. It would also improve journey times towards Leeds and Bradford for those that switched to rail, which, it was hoped, would generate more trips. Thus, this transport investment paired with the development was able to align with a variety of regional objectives, though only if implemented in tandem as neither is viable without the other.

<sup>323</sup> CEG “Kirkstall Forge Brochure”.

Planning permission for the residential and office development was granted on a conditional basis that the station was built with developer contribution. The station opened in 2016, though the mixed-use development remained at relatively early stages and construction is still underway (planning approval for the first phase of residential development was only recently obtained in June 2021).

## **Regeneration programme**

We have not found any evidence on a public sector led regeneration programme linked to the scheme.

## **Skills investment**

We have not found any evidence on skills investment linked to the scheme.

## **12.4. SCHEME OUTPUTS, OUTCOMES, AND IMPACTS**

This scheme has been in operation for just under five years. While it is possible to consider short term changes in relation to station opening (passenger numbers, early-stage modal shift), longer term outcomes and impacts such as housing, employment and productivity are more challenging to determine at this stage.

### **12.4.1. Passenger growth compared to original forecasts**

There were multiple passenger forecasts undertaken for both Kirkstall Forge and Apperley Bridge stations. Assessing performance against these has proven somewhat complex, as set out in DfT's scheme evaluation one year after opening.<sup>324</sup> First, because these forecasts were reliant on differing assumptions, many of which did not come to fruition, and secondly, because not all assumptions have been transparently stated, making them challenging to reconcile.

Despite these difficulties, DfT's evaluation indicates that the station was performing on par with expectations nine months after the start of operations. This was concluded after adjustments to accommodate unrealised assumptions, including service frequency being only half of what was expected, with only one train per hour, and progress on site development was expected to be further along. Overall, for both stations it was estimated that the generated demand was 294,400 one-way trips, net of abstraction from other stations (22 percent at Kirkstall Forge).

Passenger numbers have grown significantly since. According to the most recent ORR data on station usage,<sup>325</sup> entries and exits to Kirkstall Forge have grown by over 200 percent between 2016/17 and 2019/20, now sitting at nearly 300k. Since May 2018 the service frequency was doubled to 2 trains per hour to both Leeds and Bradford. Changes in journey time reliability remained challenging to conclude on at the time of the evaluation.

As part of the one-year evaluation, a survey of users found that 28 percent of passengers did not make their current journey (i.e. from origin to destination) prior to the opening of the Kirkstall Forge station. While this cannot be directly attributable, it does suggest that the station enabled an increase passenger trips. 46 percent of survey respondents indicated that, prior to the station opening, they made the same journey (i.e. from origin to destination) using an alternate transit mode. From this evidence, it is estimated that the station has resulted in 13,000 less car trips annually, although the traffic data has not yet been sufficient to confirm this.

Relatedly, there is a potential concern around parking availability. Despite not being classified as a park and ride station, users have been using the Kirkstall Forge station as such, with parking facilities already nearing capacity. Though it is expected that the future residents of the development will not travel to the station by car, it remains possible that parking availability could limit potential mode shift benefits over the longer term.

The vast majority (74 percent) of trips in the first year of station operations were to Leeds city centre, mainly for commuting purposes (70 percent), with most passengers being frequent service users. At the time of the survey there was little travel to Bradford. This may have been due to few meaningful connections to Shipley at the time,

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<sup>324</sup> DfT (2018) "Capturing housing impacts in transport appraisal - Case studies" available [online](#).

<sup>325</sup> ORR (December 2020) "Estimates of station usage" available [online](#).

which has since changed with the 2018 timetable adjustment. One of the 74 survey respondents noted that the station enabled them to move to the Kirkstall Forge area.

## 12.4.2. Impact of transport investment on economic outcomes

### Population

We found no studies that considered the impact of the new station on changes in local population.

### Employment

This subsection presents our analysis regarding how the opening of Kirkstall Forge Railway Station in June 2016 may have impacted total employment, as well as employment across three sectoral shares: retail, manufacturing and business services. Overall, our analysis suggests that the Kirkstall Forge railway station has positively impacted the local economy through increased employment levels, though sectoral shares did not change significantly.

Table 12-1 illustrates the impact of the opening of Kirkstall Forge Railway Station (in June 2016) on total employment and three sectoral shares: retail, manufacturing and business services. It shows that total employment within 1km of the station (for those Lower Super Output Areas where their centroid is within 1km of the station) increased by 10 percent between the three years before and after the opening. This suggests that the level of economic activity increased after the opening. The table also shows that the overall sectoral mix – and therefore broadly defined land use – around Kirkstall Forge did not change significantly.

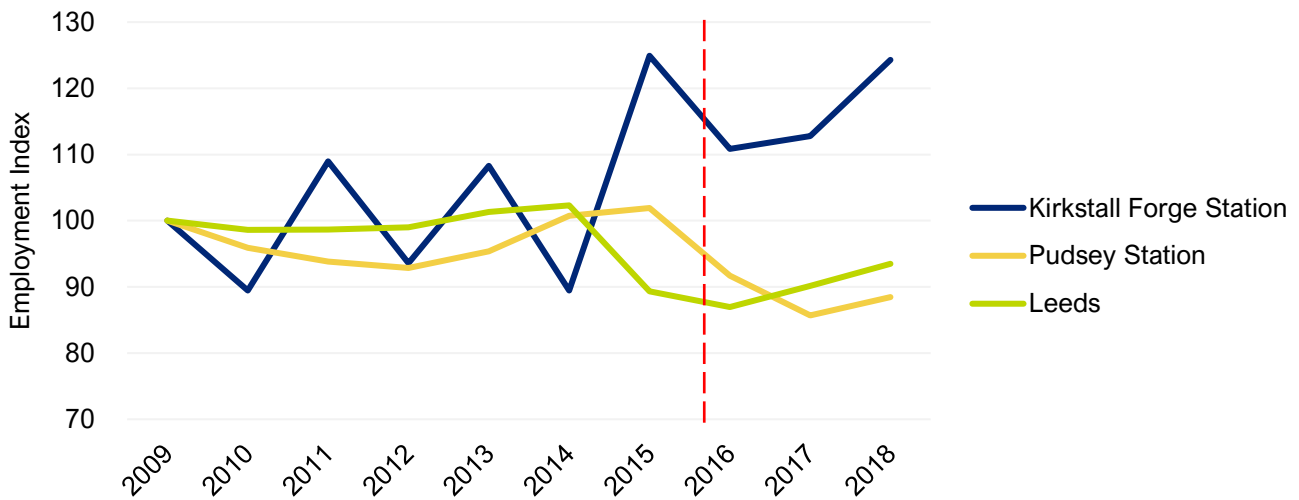
Table 12-1: Kirkstall Forge station - employment impacts

Kirkstall Forge (within 1km)	Unit	2013-2015 average	2017-2018 average	% change
<b>Total employment</b>	<i>Count</i>	1,683	1,855	10%
<b>Retail</b>	<i>% of employment</i>	15%	16%	1%
<b>Manufacturing</b>	<i>% of employment</i>	11%	13%	2%
<b>Business services</b>	<i>% of employment</i>	21%	23%	2%
<b>Other</b>	<i>% of employment</i>	53%	48%	-5%

Source: Arup analysis

This is supported by Figure 12-6 which compares total employment growth around Kirkstall Forge station to New Pudsey station and to the Leeds city average. New Pudsey was selected as a geographical comparator for Kirkstall Forge station, being a similar size commuter station with a similar distance to Leeds City Centre and serving a town with a comparable population size. Figure 12-6 shows that prior to 2015, total employment in the three areas moved broadly together until the time of the Kirkstall Forge station opening, suggesting that the patterns of employment in Kirkstall Forge may be at least partially due to the opening of the station.

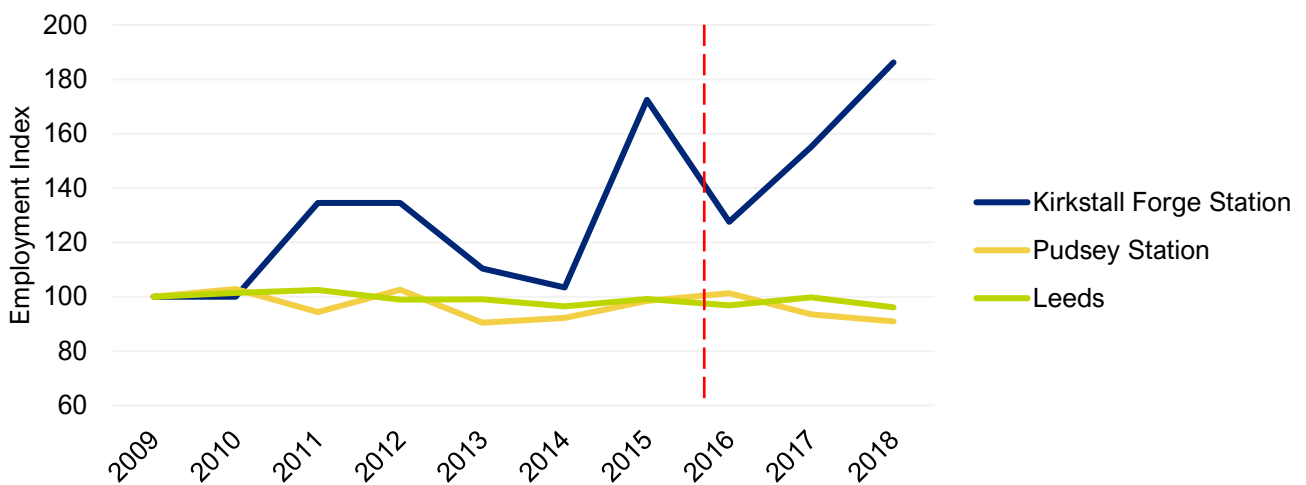
Figure 12-6: Total employment (100=2009)



Source: Arup analysis

While manufacturing employment increased more around Kirkstall Forge relative to the two comparators, as shown in Figure 12-7 this growth started prior to the opening of the station in 2016. The spike in 2015 may be due to the temporary hiring of personnel to construct the station and/or the surrounding development, noting that construction sector is categorised as manufacturing in our analysis.

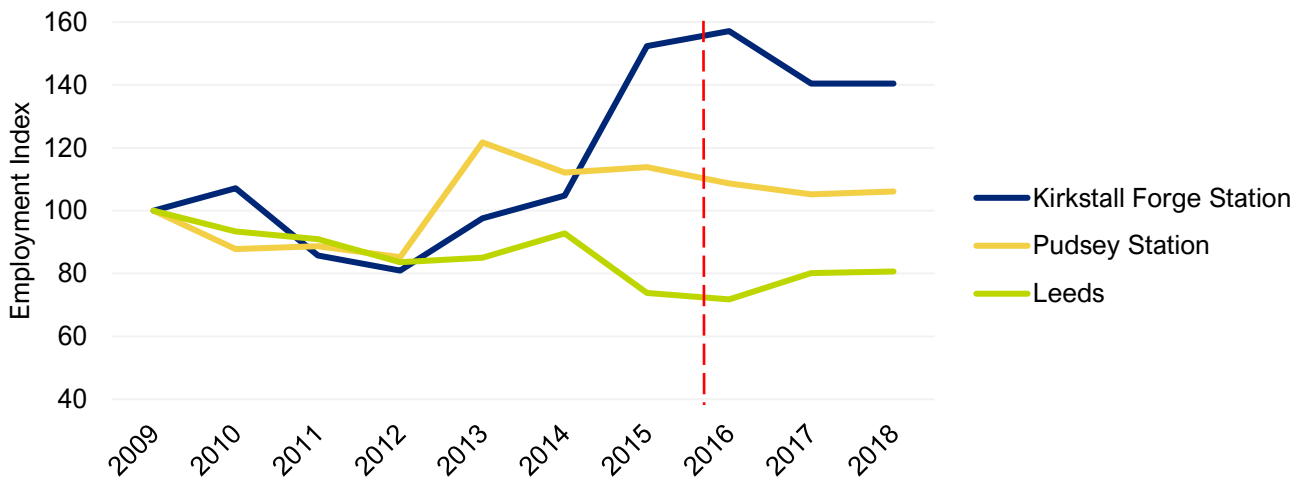
Figure 12-7: Manufacturing Employment (100=2009)



Source: Arup analysis

Figure 12-8 however, shows a pattern which may point towards a retail-led transformation. Retail employment increased over 2014 and 2015, directly prior to the opening of the station. This may be due to the anticipated impact of the station opening and/or general construction activity in the area, incentivising retailers to locate close to the station. However, the positive trajectory declines a year after the opening which suggests only a temporary impact.

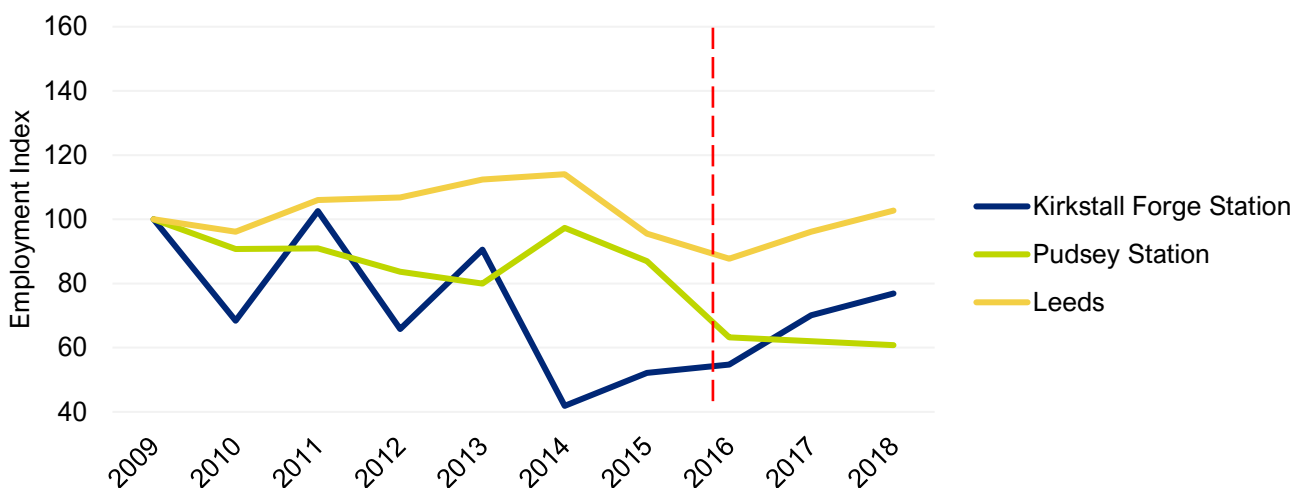
Figure 12-8: Retail Employment (100=2009)



Source: Arup analysis

Figure 12-9 shows that business services have been in general decline for all three areas; the 2016 opening of the station does not appear to have had any material impact.

Figure 12-9: Business Services Employment (100=2009)



Source: Arup analysis

The analysis of employment impacts overall, suggests that the Kirkstall Forge Rail opening was successful in positively impacting the local economy, through increased employment levels. However, there is limited evidence to suggest the scheme had a transformational impact, as the sectoral shares did not change significantly.

## Firm Entry

We have not found any evidence of firm entry linked to the scheme.

## Land Value

As discussed above, the city region overall is experiencing a period of growth. Employment growth was steady prior to and following the station opening, and as such it has not yet been possible to ascertain any attributable employment impacts.

Similarly, though the evaluation did consider development approvals and property values as part of the economic impact assessment, one year of data was not sufficient to identify reliable trends or demonstrate robust links. Three office buildings are set to open in the development. The first of them, opened in 2017, is let to companies including

Zenith Vehicle Hire, CEG, Bupa, Mercedes-Benz Vans UK Ltd and Butlers, whilst the second is in the design stage. Forecast modelling undertaken by DfT prior to station implementation estimated that the Kirkstall Forge residential and commercial developments would result in £30 million of additional land value uplift benefits, and that these benefits would be entirely dependent on the station. Excluding land value uplift benefits left the scheme in a “low” value for money (VfM) category but realising only 18 percent or 40 percent pushed the project to medium or high VfM, respectively.

## Property Prices

We have not found any evidence on property prices linked to the scheme.

## Wages and Productivity

We have not found any evidence on wages and productivity linked to the scheme.

## Housing

We have not found any evidence on housing linked to the scheme having already been delivered. However in June 2021 the planning was approved for the first phase of residential development, suggesting that the amount of residential development delivered during the first five years after station opening is limited.<sup>326</sup>

## Regeneration and Development

The station and development in tandem are surrounded by a general positive sentiment. This brownfield regeneration, described as a “prophetic concept village emerging from dis-used industrial land”<sup>327</sup>, provides both required housing and convenient access to it from growing city centres, encouraging modal shift away from cars and hoping to support economic growth in the north. DfT noted in its evaluation that the two stations are “supporting and facilitating economic activity in the Leeds area”.<sup>328</sup>

## 12.5. SOURCES

CEG (undatedundated) “Kirkstall Forge Brochure”

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Government Office for Yorkshire and the Humber (May 2008) “The Yorkshire and Humber Plan: Regional Spatial Strategy to 2026” available [online](#)

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<sup>326</sup> (June 2021) “First Phase of Residential Development at Kirkstall Forge” available [online](#).

<sup>327</sup> Hower (July 2018) “Kirkstall Forge - could this be the Zen existence we’ve always craved?” available [online](#).

<sup>328</sup> DfT (2018) “Capturing housing impacts in transport appraisal - Case studies” available [online](#).



### 13. CORBY NEW STATION AND RAIL SERVICE

#### Summary of key messages

- Corby is a town in the East Midlands, about 80 miles north of London. Steel works dominated employment in Corby from around 1930 to 1980. When British Steel closed its Corby plant in 1980, around 10,000 people lost their jobs, with a further 10,000 lost in allied businesses. Corby began to regenerate from 2001 when the Labour government established ‘Catalyst Corby’, an urban regeneration company.
- In April 2007, Network Rail committed funding to reopening Corby station opposite the original, to support new housing developing and regional employment growth, as the town experienced above average levels of population growth.
- Prior to the opening of Corby Station in 2009, the town was one of the largest in Western Europe without a railway station. The nearest railway station was at Kettering about 20 minutes away by road.
- The opening of the station, and new passenger services, was expected to improve the accessibility of Corby, and make it more attractive for living, working, and locating a business.<sup>329</sup>
- The new rail services and station at Corby improved the convenience of rail travel for local people, encouraging additional rail trips. 115,000 trips were made to/from the station in 2009/10, rising to 278,000 in 2015/16.
- Previous evaluations have not identified any significant aggregate impacts of the station opening, and new rail services, on investment, employment, or productivity, although there was a statistically significant increase in employment in the retail and transport and storage sectors. This may be a result of the limited availability of rail services to/from the station, only hourly, and without direct links to regional hubs, such as Peterborough and Leicester.
- **The key contextual factors relevant to this scheme are:**
  - Business cycle: station opened during a period of economic recession in the UK.
  - Quality of existing transport access: prior to the station opening and new rail services, the town was predominantly served by the road network, and public transport was largely limited to local bus routes.
  - Commercial development: from the 1930s to 1980 steel works dominated employment in Corby, but the main plant closed in 1980, and around 20,000 jobs were lost. Regeneration started in 2001, with the town centre redeveloped, and the opening of a new library, theatre and Olympic-sized swimming pool, also encouraging private sector investment in a shopping centre and cinema.

Figure 13-1: Rail services to the towns and cities around Corby



Source: Steer Davies Gleave (January 2018)

<sup>329</sup> Steer Davies Gleave (January 2018) “New or improved rail lines – Evaluation of case studies of local economic impacts: Corby case study” available [online](#).

### 13.1. SCHEME SUMMARY

Background information	
<b>Scheme type:</b>	New station and reopened infrastructure
<b>Type of transformational impact planned:</b>	None found
<b>Location:</b>	Northamptonshire, East Midlands
<b>Geography:</b>	Inter-urban rail link
<b>Promoter:</b>	TBC
<b>Start of construction:</b>	February 2008 (BBC, 2009)
<b>Opening date:</b>	2009
<b>Cost:</b>	£8.3m (BBC, 2009)
<b>Sources of funding:</b>	£1.2m from Network Rail, <sup>330</sup> source/s of remaining funding unavailable

Corby is a town in the East Midlands, about 80 miles north of London. The nearest large employment centres are Peterborough, Leicester and Northampton, which are about 35 to 50 minutes away by road. Before the opening of Corby Station in 2009, the town was one of the largest in Western Europe without a railway station. The original station closed in the late 1960s.<sup>331</sup> The railway line through Corby was retained for freight trains only. The nearest railway station was at Kettering, about 20 minutes away by road. The opening of the station and passenger rail services was expected to improve the accessibility of Corby and make it more attractive for living, working, and locating a business.<sup>332</sup>

In April 2007, Network Rail committed funding to reopen Corby station to support new housing development and regional employment growth. Investment included a new platform, station building, car park, and bus interchange, and improving the line to passenger standard. The station is outside the town centre, a legacy of the site of the original station and its role in moving iron ore and coal to the town's steelworks. It is to the east of Corby's retail and commercial centre, and to the south and west of the industrial parks that serve as key local employment sites. Much of the industrial and commercial development that had taken place in Corby recently has not been heavily influenced by the location of the station.<sup>333</sup>

The rationale for the new station and passenger rail services at Corby was linked to the fast-growing population. From 2004 to 2008, before the station opened, the Compound Annual Growth Rate (CAGR) of the local population was 1.9 percent, compared to a national average of just 0.8 percent over the same period.<sup>334</sup>

The station opened in February 2009, with a full timetable launched in April 2009.<sup>335</sup> This included hourly services from Corby to Kettering, Wellingborough, Bedford, Luton and London St Pancras, with a journey time of approximately 70 minutes. Although the town has good links to the strategic road network, it still lacks accessibility

<sup>330</sup> BBC (April 2007) "Railway station plan gets boost" available [online](#).

<sup>331</sup> BBC (February 2019) "Corby railway station's 'massive' impact marked 10 years on" available [online](#).

<sup>332</sup> Steer Davies Gleave (January 2018) "New or improved rail lines – Evaluation of case studies of local economic impacts: Corby case study" available [online](#).

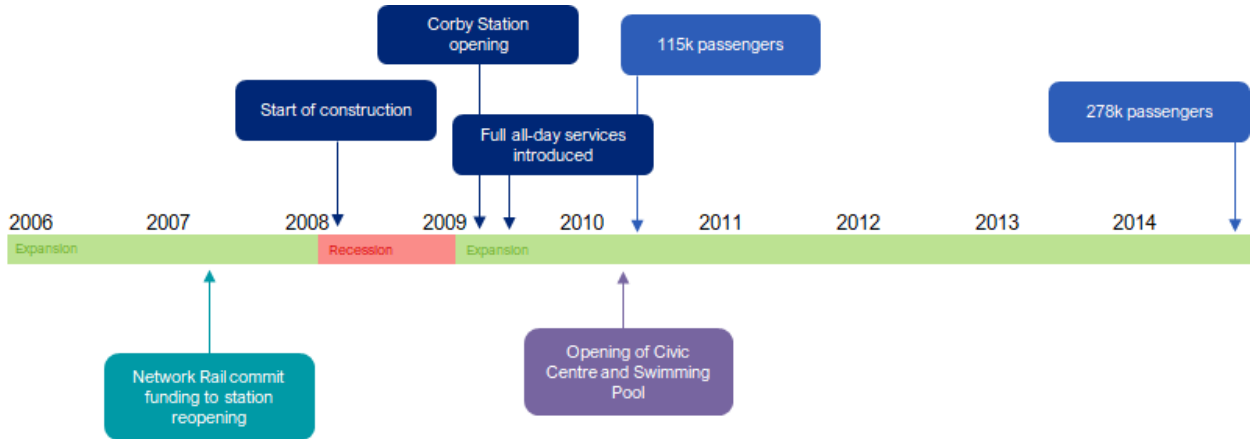
<sup>333</sup> Steer Davies Gleave (January 2018) "New or improved rail lines – Evaluation of case studies of local economic impacts: Corby case study" available [online](#).

<sup>334</sup> Steer Davies Gleave (January 2018) "New or improved rail lines – Evaluation of case studies of local economic impacts: Corby case study" available [online](#).

<sup>335</sup> BBC (June 2009) "Award for railway station project" available [online](#).

to the wider national rail network, particularly towards regional hubs such as Birmingham, Milton Keynes and Peterborough. Journeys to these hubs can be made by changing at Kettering to northbound trains to Leicester and Nottingham, making further changes as necessary, although the journey times mean these are unattractive options.<sup>336</sup> See Figure 13-2 for a detailed timeline of key dates associated with the Corby new station and rail service.

Figure 13-2: Timeline for the Corby new station and rail service



Legend	
<span style="color: #003366;">■</span>	Scheme key dates
<span style="color: #336699;">■</span>	Scheme outputs / outcomes
<span style="color: #666699;">■</span>	Associated investments
<span style="color: #FF9933;">■</span>	Changes in governance
<span style="color: #009999;">■</span>	Major events

<sup>336</sup> Steer Davies Gleave (January 2018) "New or improved rail lines – Evaluation of case studies of local economic impacts: Corby case study" available [online](#).

## 13.2. THEORY OF CHANGE

Figure 13-3 presents the logic map articulating how we expect the creation of a new railway station at Corby may have a transformational impact.

**Inputs / Activities / Outputs.** The scheme consisted of the construction of a new railway station at Corby, and the introduction direct rail services to several destinations including Kettering, Luton, and London St Pancras.

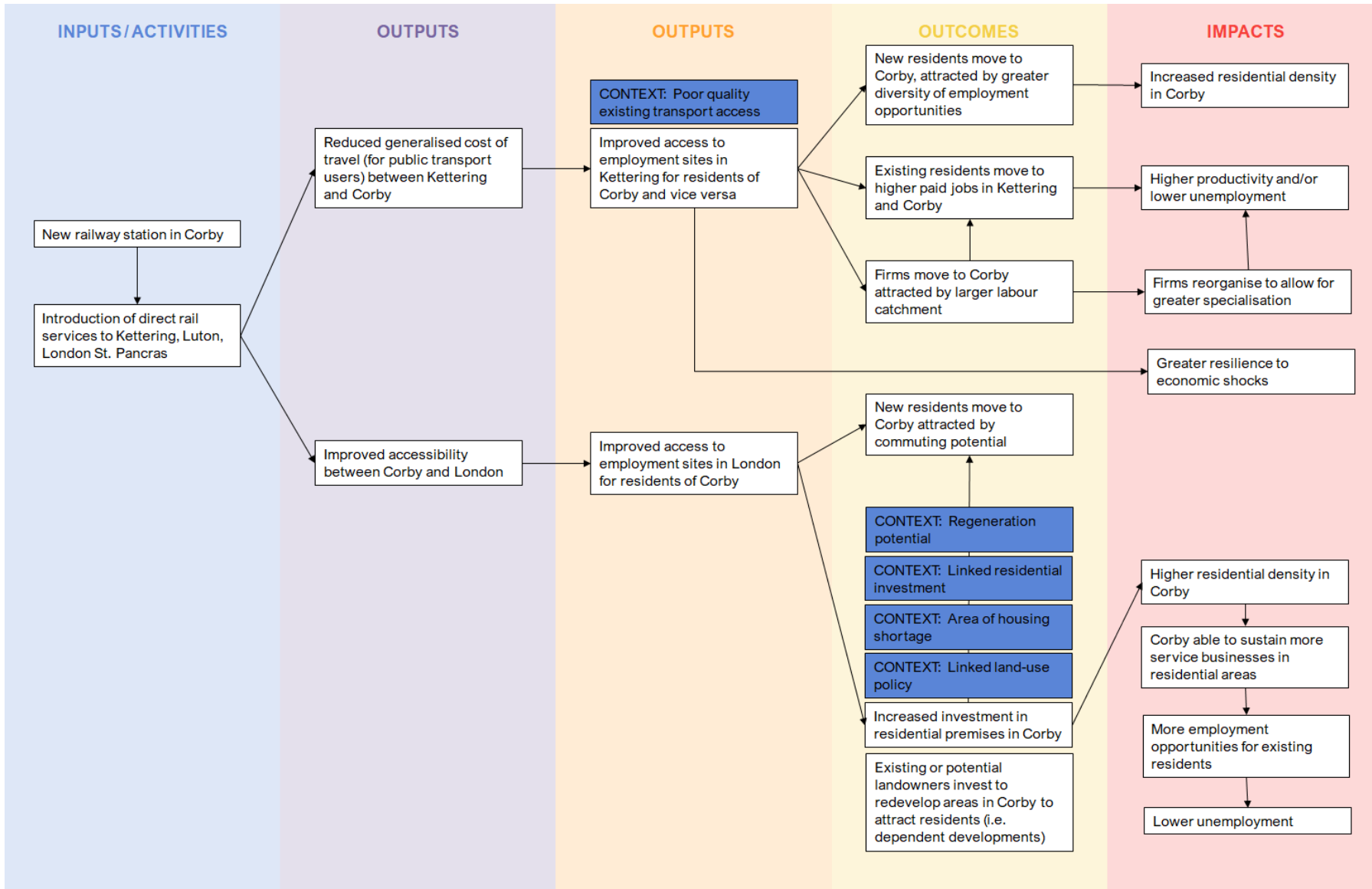
**Outcomes / Impacts.** In the logic map we explore two potential channels of transformational impact that affect different segments of the population:

- **Changes in labour demand, through improved rail connections between Kettering and Corby leading to changes in the structure of economic activity in both towns.** As Kettering and Corby are both similar sized towns with relatively insular labour markets, the introduction of rail connectivity could allow for residents of both towns to access a greater diversity of employment opportunities, potentially improving productivity and employment. The greater diversity of employment opportunities could also make the towns more resilient to economic shocks than they would otherwise have been. The expansion of both towns' labour catchment could attract new firms and in turn, new residents, increasing both employment and residential density.
- **Changes in residential demand, through Corby becoming a more attractive location for potential London commuters.** The introduction of direct rail services to London could increase Corby's attractiveness as a commuter town, giving existing residents access to jobs in London and leading to new residents moving to the town. This would increase the town's population, creating demand for firms that serve the needs of the resident population.

**Context.** For the first channel to materialise we expect there needs to be a genuine step change in transport accessibility for a subset of the population. Kettering and Corby were relatively well connected via the road network before the scheme, and for the scheme to have a transformational impact we would expect there to be a substantial part of the population without car access.

For the second channel to materialise, we expect there may need to have been several complementary or associated policies to support Corby's attractiveness as a commuter location. For example, the housing stock may need to be redeveloped so they better match the preference of potential residents.

Figure 13-3: Logic Map for Corby Station



### 13.3. SURROUNDING CONTEXT

#### 13.3.1. Characteristics of the area at time of investment

##### Business cycle

Corby station opened in 2009, during a period of economic recession in the UK.

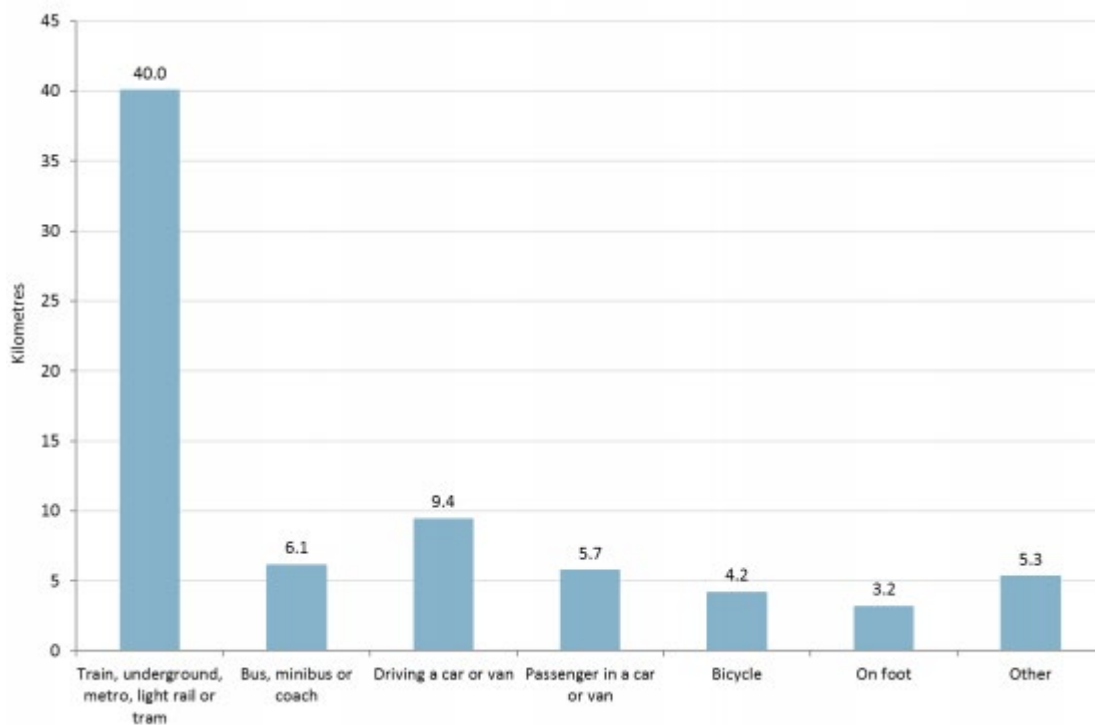
##### Quality of existing transport access

Before the station opened and the new rail services, the town was predominantly served by the road network, and public transport was largely limited to local bus routes and National Express long distance coach services.

Before the new rail services, the majority (69.1 percent) of Corby employed working-age residents (aged 16-64) travelled to work by car or van (as drivers or passengers). A minority of Corby employed residents used public transport to travel to work (9.6 percent), and of this, only 0.6 percent used rail - travelling to nearby stations such as Kettering or Market Harborough. Whilst rail users made up a marginal proportion of Corby-based commuters, these individuals tended to make much longer journeys on average, as shown in Figure 13-4.

In 2001 also, only 0.6 percent of all Corby employed residents travelled to London, which is possibly a reflection of the poor rail connectivity.

Figure 13-4: Average distance travelled to work (by mode) from Corby, 2001



Source: SDG analysis of ONS Census 2011 Travel to Work data

##### Housing

The town has faced many well documented challenges,<sup>337</sup> including the proportion of Council housing being over double the national average and owner occupation less than half the national average, which is likely to indicate that the town had a relatively low-income population. An interviewee of this study, who was at the time was the director

<sup>337</sup> Tom Fleming Consultancy (April 2009) "Corby Priority Place – Living Places Partnership: Audiences & Participation Research" available [online](#).

of investment and marketing at the North Northants Development Company, indicated there was a lot of pent-up demand for housing in the wider Northamptonshire area.

## Commercial development

From the 1930s to 1980 steel works dominated employment in Corby. When British Steel closed the Corby plant in 1980, around 10,000 people lost their jobs, with a further 10,000 lost in allied business. In 2001 Corby began to develop plans for regeneration when the government established 'Catalyst Corby', an urban regeneration company, and planned to double the town population from 52,000 to over 100,000, alongside the creation of over 30,000 jobs, by 2030.<sup>338</sup> In 2007, consents were granted for over 5,000 new homes at Priors Hall.<sup>339</sup> Money to redevelop the town centre was raised through the sale of land for houses, alongside UK government and European Union development grants. This led to the opening of a new library, theatre and Olympic-sized swimming pool, also encouraging private sector investment in a shopping centre and cinema.<sup>340</sup>

## Regeneration potential

The local economy had suffered after a period of deindustrialisation and closure of the steelworks. But between 2004 and 2008, it had higher employment growth than the national average. The majority of this however, occurred in lower-value, lower-skilled areas, such as the retail sector.<sup>341</sup>

The town has faced many well documented challenges,<sup>342</sup> including:

- **Poor health** - it has 18 Super Output Areas in the top 20 percent nationally for health with 4 of these in the top 10 percent. Corby also, in 2010, had the second highest smoking levels, and third highest obesity levels in England, as well as shorter life expectancy than the wider region and high drug and alcohol abuse<sup>343</sup>.
- **Crime and community safety** - in 2001, over 48 percent of Corby stood in the top 20 percent most deprived nationally for crime;
- **Employment and skills** - employment in manufacturing is far higher than average, and adults in Corby are significantly lower skilled than the national average; and
- **Housing** - the proportion of Council housing is over double the national average and owner occupation less than half the national average.

According to the UK's Index of Multiple Deprivation in 2010, the district of Corby was above average for income and employment which means that Corby was towards the least deprived end of the scale on these measures. This suggests that there was a need to improve economic opportunities within Corby.<sup>344</sup>

Before new rail services, SDG analysis indicated that the majority (78.9 percent) of Corby employed residents (aged 16-74) worked within the Corby area. Those working outside of Corby tended to be in nearby surrounding areas within and around Northamptonshire. Between 2004 and 2008, Corby experienced a larger growth rate in employment than Northamptonshire, East Midlands and nationally, as shown in Figure 13-5.

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<sup>338</sup> BBC (June 2010) "Thirty years of rebuilding Corby" available [online](#).

<sup>339</sup> Network Rail (2020) "Passenger Rail Study Phase One: Baseline Assessment of the current network – a technical report produced for the England's Economic Heartland evidence base" available [online](#).

<sup>340</sup> Economist (April 2019) "How Corby became England's fastest growing town" available [online](#).

<sup>341</sup> Steer Davies Gleave (January 2018) "New or improved rail lines – Evaluation of case studies of local economic impacts: Corby case study" available [online](#).

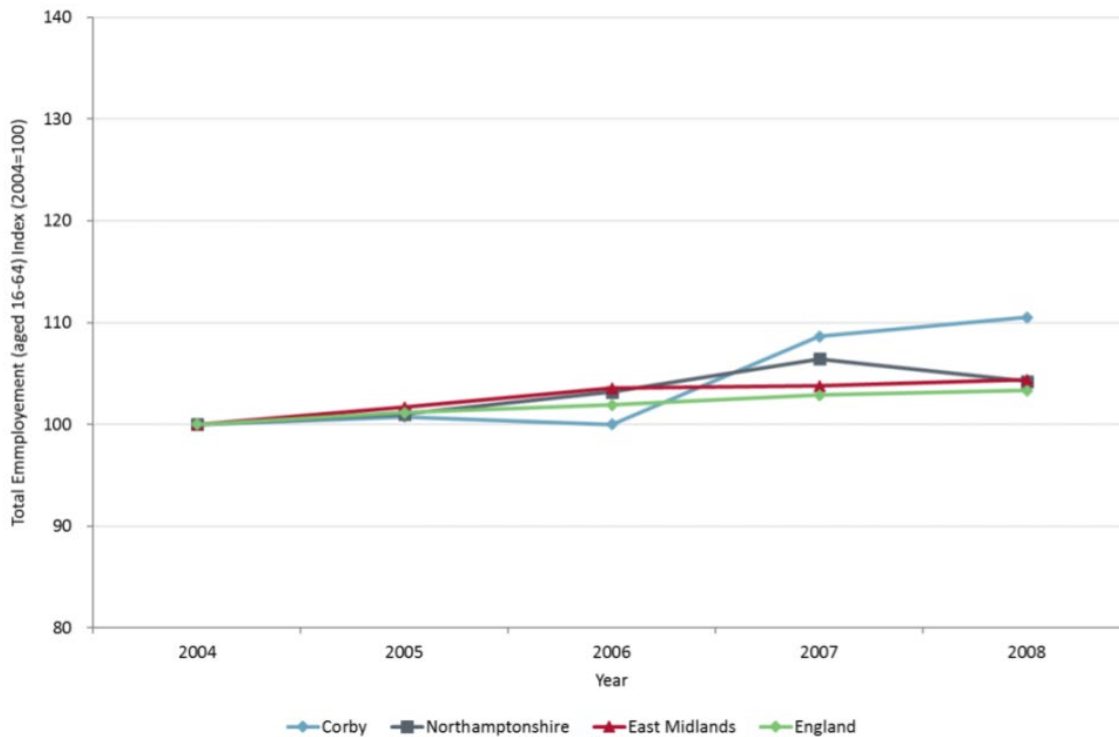
<sup>342</sup> Tom Fleming Consultancy (April 2009) "Corby Priority Place – Living Places Partnership: Audiences & Participation Research" available [online](#).

<sup>343</sup> BBC (June 2010) "Thirty years of rebuilding Corby" available [online](#).

<sup>344</sup> Ministry of Housing, Communities & Local Government (March 2011) "English Indices of Deprivation 2010" available [online](#).



Figure 13-5: Employment Index (aged 16-64) in Corby, 2004-2008



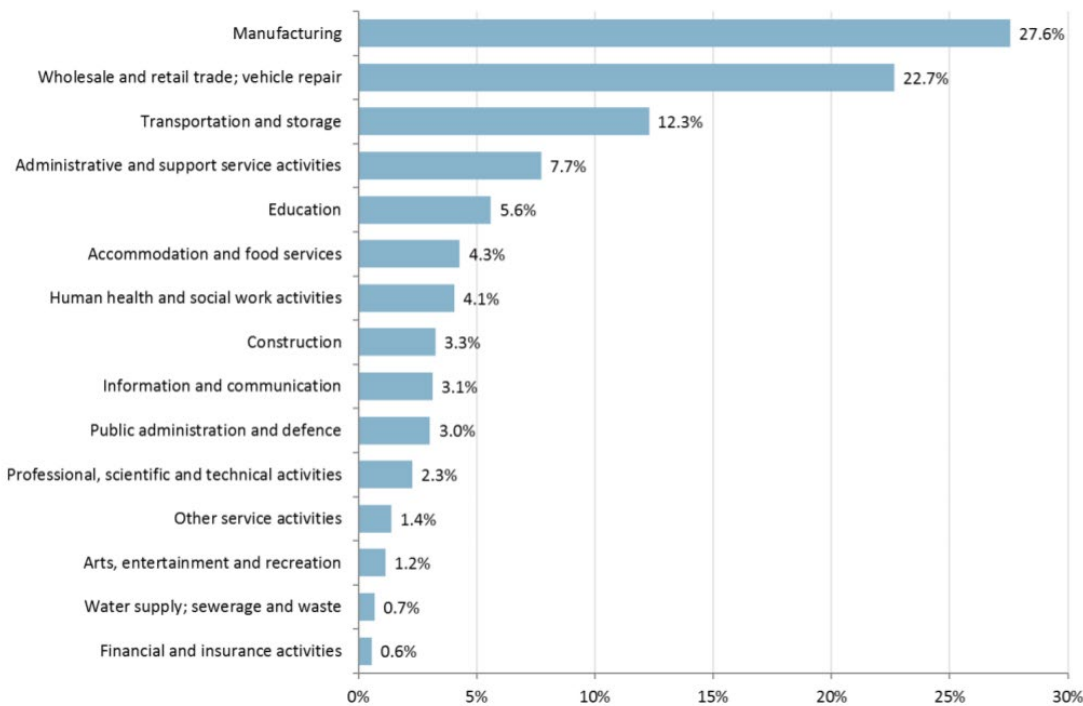
Source: SDG analysis of ONS Annual Population Survey

Corby was dominated by the steel industry until the closure of the large steelworks in 1980. The town retained a specialism in steel manufacturing, but also diversified into light manufacturing, services, and distribution. As shown in Figure 13-6, employment is dominated by manufacturing and wholesale/retail, which is concentrated in large industrial parks that house major employers such as Avon Cosmetics and Tata Steel.<sup>345</sup> The proportion of employment in high-value service industries, however, is notably lower than the national average. Just 0.6 percent of jobs in Corby were within the Financial and Insurance sector, against a national average of 4 percent.

The productivity of workers in Corby before 2009, measured by GVA per worker, increased by 15 percent between 2004 and 2008, comparable with the East Midlands region and national average. But this was lower than Northamptonshire, which achieved 20 percent growth.

<sup>345</sup> Steer Davies Gleave (January 2018) "New or improved rail lines – Evaluation of case studies of local economic impacts: Corby case study" available [online](#).

Figure 13-6: Employment by industry in Corby local authority, 2008



Source: SDG analysis of ONS Business Register and Employment Survey (2008)

## Underutilised skills

We found no information on underutilised skills in our research.

### 13.3.2. Associated activities and actions alongside transport investment

#### Benefits realisation

We found no evidence of a benefits realisation plan linked to the scheme however there was a community development plan which aligned with the objectives of the scheme – the Sustainable Communities Plan. There was also a regeneration framework published in 2003 which considered the new station and rail service.

#### Unlocking development

We found no evidence of unlocking development linked to the scheme however the interviewee noted that the opening of the rail station helped change the perception surrounding Corby which he believes contributed to housing inquiries from outside the immediate vicinity of the town. The perception change combined with pent up demand for housing in Northamptonshire more widely naturally attracted housing developers.

Also, around 2014/15 there was an influx of Europeans employed in the logistics and manufacturing industry in the immediate area which increased demand for housing. There was also a targeted campaign to attract London house hunters looking for more space with the intention that at least one member of the household would eventually work locally. The strategy was not to make Corby a dormitory town but also to have an impact on jobs locally.<sup>346</sup>

#### Regeneration programme

While we found no evidence of a regeneration programme specifically linked to the scheme. There were significant regeneration activities starting in the early 2000s, and continuing to the present day, according to the interviewee formerly of the North Northants Development Company.

<sup>346</sup> Interview with Nick Bolton.

## Skill investment

We found no evidence of skills investment linked to the scheme.

### 13.4. SCHEME OUTPUTS, OUTCOMES, AND IMPACTS

The new Corby station and reintroduction of passenger rail services aimed to make rail travel more convenient for the local population, encourage additional rail trips, and make the area a more attractive place to live, work, and locate a business. Businesses within the station catchment area could potentially also benefit from improved access to employees, customers and suppliers, thereby improving productivity.

Steer Davies Gleave (SDG) undertook an evaluation of the new rail service and station in Corby, using Daventry, also located in the East Midlands, as the comparison area due to its comparability with Corby before the introduction of services and station opening. The comparison area of Daventry was selected due to its comparable employment, sectoral composition profile and transport usage patterns. Neither of the towns had their own rail stations, or direct rail links, were not closely linked with other urban hubs, and are a similar distance from London and other employment centres. Employment rates and employee growth were similar across the 2004 to 2008 period.

#### 13.4.1. Passenger growth compared to original forecasts

The original business case and passenger forecasts were not available for this review, so in this section we focus on actual passenger growth.

SDG analysed a range of datasets to determine whether the new station and Corby service generated an increase in rail usage, including: Census Travel to Work data (to understand mode of travel to work); bespoke resident/station user surveys gathered by SDG to understand frequency of rail usage; and ORR station entry/exit data as a proxy for actual station usage.

The ORR station usage data shows significant year-on-year growth in passenger demand. By 2010-11, two years after the station opened, entries and exists had grown by over 50% relative to 2009-10. This continued to rise to around 140% of that seen in 2009-10 by 2015-16 (seven years post-opening). Usage grew at a faster rate than both the regional and national average, although SDG found that the rate of growth was slowing to comparable levels to the regional and national average.<sup>347</sup>

Although there was significant growth to and from Corby, SDG also concluded from the ORR data that this was partly abstraction of demand from other nearby stations.<sup>348</sup> This was difficult to quantify with precision in the immediate years after Corby opened because of the impact of the 2008-09 recession, but growth to/from the other nearby stations continued to underperform even over the following years in the analysis. Despite this, SDG concluded there was enough evidence from the station user surveys and trips to/from Kettering (a flow not previously possible by rail) to attribute at least part of the overall demand growth to the new station.

SDG's analysis shows that the most common destinations travelled to from Corby are King's Cross St Pancras (London), followed by Kettering. Services are only hourly. This suggests that the new service primarily allows for longer-distance travel and improved connectivity with London. It is also being used for some local trips, mainly Kettering. But there are no direct services or convenient connections to nearby hubs such as Leicester and Peterborough. So in practice local rail connectivity often remains poor. For example, Peterborough and Corby are 19 miles apart, but by rail it requires a minimum 2-hour journey including two interchanges.<sup>349</sup>

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<sup>347</sup> Steer Davies Gleave (January 2018) "New or improved rail lines – Evaluation of case studies of local economic impacts: Corby case study" available [online](#). p40.

<sup>348</sup> Kettering, Market Harborough, Melton Mowbray and Oakham.

<sup>349</sup> Network Rail (2020) "Passenger Rail Study Phase One: Baseline Assessment of the current network – a technical report produced for the England's Economic Heartland evidence base" available [online](#).

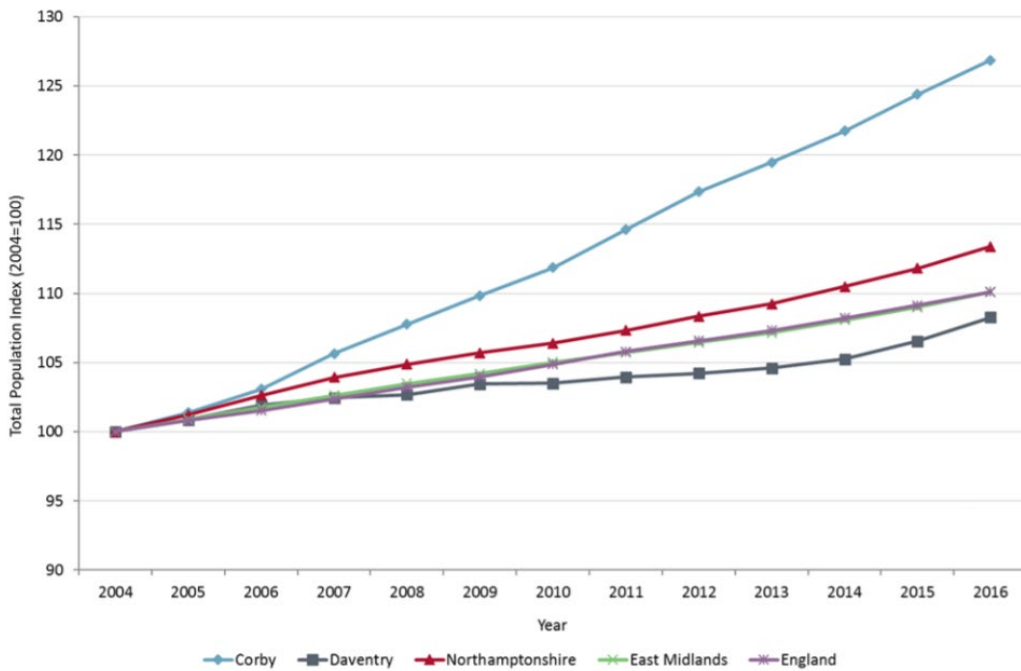
The analysis of transport impacts overall, suggests that the Corby station opening, and commencement of passenger rail services, was successful only in marginally increasing rail usage for commuting from Corby, whether by generation of new trips, modal shift, or abstraction from nearby stations.

### 13.4.2. Impact of transport investment on economic outcomes

#### Population

Population growth in Corby was strong before the introduction of rail services in 2009, and SDG analysis highlights that it has continued to be the fastest-growing town in England following the opening of rail services, as shown in Figure 13-7. Whilst the improved rail accessibility may have had some contribution to the growth experienced, it has not been found to be solely attributable.

Figure 13-7: Population Index (2004-2016)



Source: SDG analysis of ONS mid-year population estimates (2015)

For a time, EU workers arrived to take up employment in the industrial estates and food processing plants, manufacturing and logistics companies. These are business types who value access to the strategic road network, and freight interchanges, rather than passenger rail stations.

#### Employment

SDG analysis identified a marginal increase in overall employment in Corby, relative to Daventry, although it was not statistically significant. The Retail and Wholesale, and Transport and Storage sectors experienced a statistically significant employment increase of 7 percent and 6 percent respectively across a 6-year period, compared to the change in employment in these sectors in Daventry. SDG were not able to identify the cause of this employment increase specifically but suggest the station investment could have resulted in a footfall increase, benefiting retailers and transport and storage employers. Employment also continued to grow strongly in the period after the station opening, despite the wider UK economy being in recession, which could relate to the local regeneration programme and population growth.

SDG research found that the majority (87 percent) of Corby residents reported increased rail accessibility to a workplace as being not important, which suggests the attractiveness of Corby as a place to commute from was only marginally improved as a result of the new station.

In summary, SDG's analysis of employment impacts overall, suggests that the Corby station did not have a transformational impact. There was a slight increase in employment in certain sectors, but SDG did not identify any strong causation from the station opening.

## **Firm Entry**

SDG analysis suggests that the opening of the station, and new services, has encouraged businesses to relocate to Corby, with several technology firms moving to Corby, aiding in the diversification of the local economy.

## **Land Value**

We found no evidence of land value changes linked to the scheme.

## **Property Prices**

SDG explored whether there was any evidence of an impact on house prices between 2009 and 2016. No impact was found, but SDG note that may be a time lag associated with this affect, and that house prices had been significantly impacted by the 2008-09 recession. Average house price data might also be impacted by the large volume of new local housing development, due to the widespread availability of land in the area. However, local stakeholder interviews did perceive there to have been a notable housing increase, partly attributable to the new station and services, which has resulted in positive perceptions of Corby as a place to live.

Overall, there is no clear indication on whether the new station has significantly improved the attractiveness of Corby as a commuter town. There has been significant population growth in Corby and, subsequently, a significant growth in rail travel – with London being amongst the most popular destinations. But there is no robust evidence of an increase in local property values which might be expected as new commuters move into the area, although this could be masked by other factors including whether in-migrants make up a significant share of local transactions. Whilst journey times are just over an hour, the frequency of service (only one London service per hour) was probably insufficient to support a large commuter population, although service frequency has recently been improved and there are now 34 direct trains per day to Corby.<sup>350</sup>

## **Wages and Productivity**

The local economy in Corby grew rapidly (25 percent) between 2013 and 2018, with the borough, in 2020, generating a GVA (gross value-added) of £1.6bn<sup>351</sup>. However, SDG's analysis of the change in GVA per worker (a measure of total productivity) suggests that Corby has underperformed relative to Daventry, as well as the wider economy. This is notably the case for businesses close to Corby station.

Overall, the opening of Corby station, and commencement of new rail services, has not had any notable impacts upon business productivity in Corby, which is likely to be a result of the limited value to businesses of rail connectivity.

## **Housing**

Housing development in Corby was strong both before and after 2009, which was influenced by local and regional planning policies and land availability. SDG's analysis concludes that the station is unlikely to have played a key role in housing changes. SDG also note that most of the housing that has been developed in Corby has not been close to the station, but rather in fringe areas of town that have good road access.

## **Regeneration and Development**

The opening of the railway station in 2009 was seen as a pivotal moment for Corby. Since then, a string of high-profile regeneration projects have been developed. The Corby Cube, a civic centre costing £32m, opened in 2010

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<sup>350</sup> East Midlands Railway website (accessed August 2021).

<sup>351</sup> Network Rail (2020) "Passenger Rail Study Phase One: Baseline Assessment of the current network – a technical report produced for the England's Economic Heartland evidence base" available [online](#).

alongside the £20m Corby international swimming pool. Sovereign Centros, the property manager of Town Centre, a large retail development in central Corby, is reported in the press as planning to regenerate the areas of the town that have yet to undergo redevelopment, as demand for retail, office and residential space is strong.<sup>352</sup>

### **13.5. SOURCES**

BBC (April 2007) “Railway station plan gets boost” available [online](#)

BBC (June 2009) “Award for railway station project” available [online](#)

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BBC (February 2019) “Corby railway station's 'massive' impact marked 10 years on” available [online](#)

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The Guardian (May 2016) “How the town of Corby dusted off the ashes of post-industrial decay” available [online](#)

The Times (October 2019) “Britain’s most thriving communities: from Wokingham to Colchester, Milton Keynes and Corby” available [online](#)

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<sup>352</sup> The Guardian (May 2016) “How the town of Corby dusted off the ashes of post-industrial decay” available [online](#).



## 14. FALMOUTH RAIL IMPROVEMENTS (PENRYN LOOP)

### Summary of key messages

- In 2009 a passing loop was opened on the branch of the Maritime Line connecting the coastal town of Falmouth to the main rail interchange at Truro. This enabled a doubling of services from 1 to 2 trains per hour. An increase in the number of carriages followed two years later.
- Falmouth had a population of around 21,000, many of which were locally employed in the tourism and maritime sectors. Falmouth ranks relatively poorly across measures of education, employment, income and living environment, but the area did not exhibit any signs of a housing supply shortage.
- The scheme resulted in notable increases in rail patronage. Much of this has been for leisure purposes, reflecting the town's popularity as a tourist destination and the existing patterns of employment and skills. The evidence suggests that the scheme has had positive impacts on the tourism sector, enabling further growth based on the town's existing employment structure. But an accurate and reliable quantification of these impacts is difficult as the period of study coincides with the 2008 financial crisis, which affects the counterfactual analysis.
- Overall, the scheme has benefited the town of Falmouth and improved the performance of the tourism sector. However, it has not transformed the structure of local economy or its performance.
- **The key contextual factors relevant to this scheme are:**
  - Quality of existing transport: The existing rail service allowed for one train per hour while road access into Cornwall is via the A30, which at the time was reportedly one of the most congested sections of road in the UK.
  - Commercial development: Around the time of the intervention, the nearby Falmouth University campus was growing, and the Tremough Innovation Centre was due to start construction imminently.
  - Regeneration potential: Much of the economy was focused on food services, accommodation and tourism, and manufacturing services.

Figure 14-1: Falmouth rail station





## 14.1. SCHEME SUMMARY

Background information	
<b>Scheme type:</b>	Rail infrastructure upgrade
<b>Type of transformational impact planned:</b>	Consumer demand impacts
<b>Location:</b>	Penryn, Cornwall, South West
<b>Geography:</b>	Rural
<b>Promoter:</b>	Network Rail
<b>Start of construction:</b>	October 2008
<b>Opening date:</b>	May 2009
<b>Cost:</b>	£7.8m <sup>353</sup>
<b>Sources of funding:</b>	Jointly funded by European Regional Development Fund Convergence Programme, Cornwall Council and Network Rail <sup>354</sup>

Falmouth is a coastal town in the South West of the UK, within Cornwall county, which had a population of approximately 40,000 people in 2004. The Maritime Line operated by Great Western Rail connects Falmouth to the interchange for the Cornish mainline at Truro via three stations - Penmere (western residential area), Falmouth Town (town centre) and Falmouth Docks (industrial docks). Travel time by rail between Truro and Falmouth is twenty minutes, where passengers can connect for services to London Paddington.

In 2008 works started to create a passing loop at Penryn station, approximately halfway between Falmouth and Truro. The scheme included the 400m passing loop, signalling, a platform extension, car park and waiting shelter at Penryn station. This enabled a doubling of services to 2 trains per hour by allowing trains to pass alongside one another; previously, service frequency was inhibited by a single track. It allowed for weekend services to be doubled from 13 to 28. The scheme was completed in 2009.

Initially the service changed from an hourly, two carriage service to a half-hourly one carriage service; frequency was increased, but overall capacity remained the same. Two years following the opening, this was increased to two carriages.

According to the business case, the intended outcomes of the scheme were to increase accessibility to support regional economic development, meet the demand for travel without increases in car usage, and to provide capacity that will meet travel demands as a requirement of planning permissions for new development initiatives Truro, Penryn and Falmouth. However, there was no definition of impact pathways, nor details regarding the development initiatives.

The scheme was expected to contribute to a variety of themes / priorities in surrounding strategies. These can be broadly summarised as follows:

- Managing and harnessing the benefits of population growth
- Enhancing economic prosperity

<sup>353</sup> Network Rail (2009) It's the Final Countdown to Extra Rail Services on Falmouth Branchline. Accessed 26 July 2021. Available [online](#).

<sup>354</sup> Network Rail (2009) It's the Final Countdown to Extra Rail Services on Falmouth Branchline. Accessed 26 July 2021. Available [online](#).

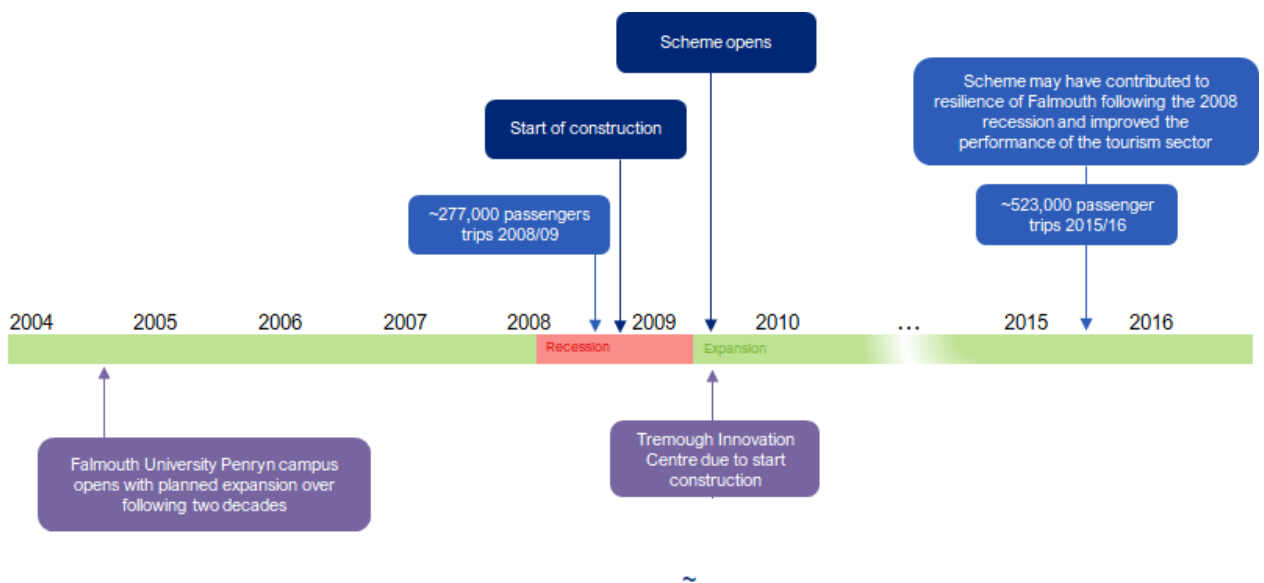
- Improved access to employment, education and services
- Addressing intra-regional inequalities
- Improved quality and sustainability of transport
- Making better use of existing infrastructure assets

It was seen to support various economic development initiatives including:

- Falmouth/Penryn Transport Package
- Combined Universities in Cornwall sites in Truro, Falmouth, and Penryn
- Truro Transport Package
- Peninsula Medical School
- National Maritime Museum
- Falmouth Docks regeneration
- Falmouth’s growing cruise industry

See Figure 14-2 for a detailed timeline of key dates associated with the Falmouth rail improvements.

Figure 14-2: Timeline for Falmouth rail improvements



Legend	
	Scheme key dates
	Scheme outputs / outcomes
	Associated investments
	Changes in governance
	Major events

## 14.2. THEORY OF CHANGE

Figure 14-3 presents the logic map articulating the theory of change of the passing loop at Penryn station.

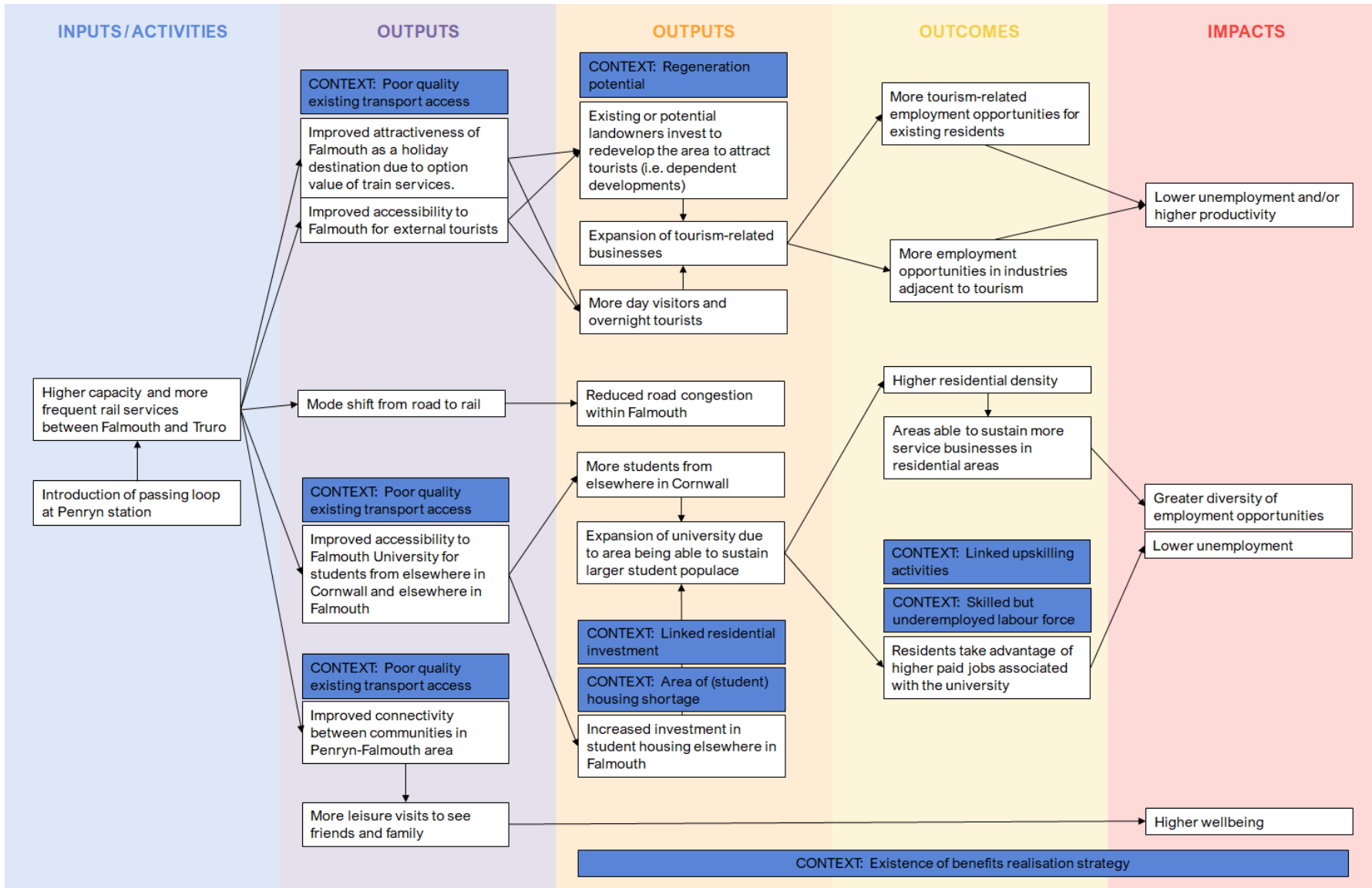
**Inputs / Activities / Outputs.** The scheme consisted of the construction of a passing loop at Penryn station allowing for more frequent services between Falmouth and the nearby town of Truro.

**Outcomes / Impacts.** In the logic map we explore several potential avenues of transformational impact:

- **Changes in consumer demand, where the upgrades to the rail line leads to higher demand for leisure and retail activities, supporting more economic activity and more employment.** Similar to the WCML ToC relating to impacts on the Lake District and other tourism destinations, we theorise that the line upgrade could have increased the attractiveness of Falmouth as a destination both for direct users of the railway line and those that value the option of rail connectivity. This may lead to more visitors to Falmouth, increasing demand for leisure, retail, or tourism services, supporting employment, but also potentially inducing further investment. This could lead to a virtuous cycle of economic growth and investment.
- **Changes in labour demand, where the upgrades to the rail line allows Falmouth to accommodate a larger Falmouth University campus.** We anticipate that the railway improvement allows more student housing to be located off campus near other stations on the Falmouth-Truro line. We also anticipate that the railway improvements make it easier for students from elsewhere in Cornwall to commute into Falmouth University. Both these outcomes make it easier to sustain a larger university within the town, increasing demand for services for students (e.g. bars) and increasing direct employment opportunities at the university.
- **Improvements in well-being through better connectivity to other nearby towns.** A non-economic outcome explored within the logic map is the potential well-being benefit from the line upgrade, by making it easier and more convenient to visit friends and relatives nearby.

**Contexts.** Beyond the contexts considered elsewhere, we consider a key potential contextual factor is how insufficient student housing was acting as a constraint to growth at Falmouth University.

Figure 14-3: Logic Map for Falmouth rail improvements – Consumer impacts



## 14.3. SURROUNDING CONTEXT

### 14.3.1. Characteristics of the area at time of investment

#### Business cycle

The Penryn passing loop station opened in late-2008, during a period of economic recession in the UK.

#### Quality of existing transport access

The existing rail service allowed for one train per hour. Before scheme opening, variations in Falmouth rail usage were aligned to the national average.

Non-rail transport access to Falmouth includes ferry services to Truro (at high tide), St Mawes, St Anthony Headland, Flushing and Trelissick Garden. Road access consisted of single carriageway roads that provide a connection to the A30. This was considered one of the most congested roads in the UK, with no scope for road expansion. Rail solutions were consequently sought to improve connectivity.

#### Housing

According to multiple deprivation data, Falmouth was in the 6<sup>th</sup> decile for barriers to housing and essential services, suggesting that the area was not experiencing acute housing shortages. But the growing number of students in the area had raised concerns over housing affordability. This was despite the planned building of student residences both on and off campus. Cornwall Council noted that there was competition between students, tourism and local housing, and a need for greater affordable housing going forward.<sup>355</sup>

Prices in Falmouth, and in Cornwall more generally, rose considerably between 2001 to 2005. Cornwall Council reported that this was likely driven by investment in the area (such the university and the Maritime Museum), coupled with competing demand between resident, tourism and student accommodation. This consolidated in 2005 and prices declined following the 2008 financial crisis, though it appeared that the strong demand for properties in Falmouth and the surrounding area had dampened the impact on the housing market somewhat.<sup>356</sup>

#### Commercial development

Some relevant initiatives and trends in the surrounding area around the time of the intervention include:

- The Cornwall Local Community Plan released in 2010 (following the opening of the scheme) included an objective to “maintain Falmouth as a strategic shopping centre and provide opportunities for new retail development”. Though there was no explicit mention of rail improvements, the plan hoped to enhance the area through prioritising pedestrians and supporting “public realm improvements”.<sup>357</sup>
- The Tremough Innovation Centre, near Penryn, was due to start construction in 2009-10. The business acceleration facility was intended to house 64 businesses and create 300 jobs, providing skilled opportunities to those in the region. 25.5 percent of Cornwall population qualified to NVQ4+ relative to 29 percent nationally.<sup>358</sup>

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<sup>355</sup> Cornwall Council (2011) “Cornwall LDF: Core Strategy Place-Based Issues Paper: Falmouth and Penryn Community Network” available [online](#).

<sup>356</sup> Cornwall Council (2009) Falmouth and Penryn Strategic Investment Framework. Evidence report.

<sup>357</sup> Cornwall Council (2010) “Cornwall Local Plan Strategic Policies 2010 – 2030 – Community Network Area Selections” available [online](#).

<sup>358</sup> Cornwall Council (2009) Falmouth and Penryn Strategic Investment Framework. Evidence report.

- The nearby Falmouth University campus, opened in 2004, was also growing. There were a number of departmental relocations to Falmouth in following years. The number of students using the campus was expected to increase from 3000 to 5000 by 2016 and 7000 by 2026.<sup>359</sup>

## Regeneration potential

Being a coastal town, much of the economy is tourism based, predominantly focused on food services, accommodation and tourism, as well as manufacturing services, mainly activities associated with the port.

Despite Falmouth town centre benefiting from a regeneration between 2000-2005,<sup>360</sup> the performance of the retail sector had been in decline between 2007 to 2009. While this decline may reasonably have been due to the financial crisis, it also somewhat coincided with the opening of a large supermarket opening near Penryn.<sup>361</sup>

According to deprivation index data from 2008, Falmouth was in the most deprived decile in relation to employment, education and productivity. The dominance of tourism sector meant labour tended to be employed in less productive and lower paid roles, relative to urban areas. The GVA per worker in 2008 was £35,326, 71 percent of the national average at the time (£49,355).<sup>362</sup> Earnings across the county are low; Cornwall ranked 164 of 171 upper tier authorities in Great Britain.<sup>363</sup>

## Underutilised skills

The town had a relatively self-contained labour market; most employees commuted short distances by car. Employment between 2004 and the scheme opening was growing in line with regional and national averages. As noted above, in 2008 Falmouth was in the most deprived decile for employment.

Secondary services constitute much of the job market, with accommodation and food services, and wholesale and retail, each making up ~19 percent. This reflects the town's focus on tourism and student population. Falmouth docks were a major employer in the area, with 17 percent of the employed labour in the manufacturing sector. Unemployment was relatively in line with the regional average.

### 14.3.2. Associated activities and actions alongside transport investment

#### Benefits realisation

We have not found evidence of a benefits realisation strategy in place for the scheme.

#### Unlocking development

In 2005 Cornwall Council released a leaflet regarding the rail improvements. It noted that there was a strong interrelationship between Truro and Falmouth. Rail improvements were described as timely and appropriate given that by 2016 there were expected to be up to 7,000 new dwellings in the area, new employment land, retail developments, university expansion as well as a redevelopment of Falmouth Docks and general regeneration supporting maritime tourism.<sup>364</sup> This suggests that such developments were not a consequence of the rail line, however, there may have been a degree of enablement through integrated planning.

A 2009 Community Development plan makes little reference to the scheme. It does note a desire to promote the rail connection to Truro across key user groups, as well as improve pedestrian access between Station Road and

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<sup>359</sup> Cornwall Council (2009) Falmouth and Penryn Strategic Investment Framework. Evidence report.

<sup>360</sup> The Falmouth Heritage Economic Regeneration Scheme and Penryn Townscape Heritage Initiative were completed in October 2005. Source: Carrick District Council (undated) "Falmouth Heritage Economic Regeneration Scheme – Final Report" available [online](#).

<sup>361</sup> Cornwall Council (2011) "Cornwall LDF: Core Strategy Place-Based Issues Paper: Falmouth and Penryn Community Network" available [online](#).

<sup>362</sup> Steer Davies Gleave (2018) "New or improved rail lines – Evaluation case studies of local economic impacts. Falmouth Case Study" available [online](#).

<sup>363</sup> Cornwall Council (2009) Falmouth and Penryn Strategic Investment Framework. Evidence report.

<sup>364</sup> Cornwall Council, Network Rail, Wessex Trains (2005) The Truro-Falmouth Rail Improvement.

the town centre. This is alongside other improvements such as parking provision. This plan was non-statutory, did not align with existing land use policy and thus ultimately had low priority when planning and investment decisions were made.<sup>365</sup>

The Falmouth Harbour Masterplan noted an intention to improve pedestrian access from the railway station.<sup>366</sup>

## **Regeneration programme**

The scheme was not part of a wider regeneration programme, nor did it coincide with one. However, Falmouth town had benefitted from a regeneration between 2000-2005.<sup>367</sup>

## **Skills investment**

We found no evidence of skills investment or programmes linked to the scheme.

## **14.4. SCHEME OUTPUTS, OUTCOMES, AND IMPACTS**

### **14.4.1. Passenger growth compared to original forecasts**

DfT commissioned an economic evaluation of the scheme eight years following its opening. This evaluation considered the context of the scheme prior to its opening and used both a differences-in-differences approach, as well as a survey, to assess its impact. A comparator town, Gunnislake, was chosen for this assessment. It was considered broadly economically similar, though having its population is only about 12% of Falmouth, and has comparatively little local employment.

The evaluation found that by 2014/15 there has been a “significant increase in local rail patronage” since the 2009 improvement. Across all stations in Falmouth, the 8 percent increase in patronage was over and above the increase seen in Gunnislake (by 1 percent), and above the regional and national averages (3 percent and 4 percent, respectively). Usage declined in the final years of the evaluation period (2014-16); the evaluation suggests that this may mean the scheme benefits have been fully captured within the evaluation period.

- The survey supports these findings. 12 percent of respondents described themselves as new users of the service, with 22 percent respondents noting they had increased their use by “a little” or “a lot”. A small proportion of additional passengers were captured from bus and car users.
- The majority of the additional trips were for leisure purposes. A 2016 survey found that 19 percent of passengers were visitors while 31 percent were students. Commuter usage over the evaluation period was in line with that seen at Gunnislake. This was corroborated through stakeholder interviews, who suggested the residents continued to commute by car, using rail mainly to access the Falmouth nightlife. According to the evaluation this was expected the limit the typically measured economic impacts.
- Most trips (64 percent) were within the Falmouth branch in 2014/15. Many of the trips originating at Penmere end at Truro, a local employment centre, suggesting that this area may be more of a commuting base. Trips within the Falmouth line, but originating from Falmouth Docks and Falmouth Town stations, may have been driven the popularity of Penryn and the campus.

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<sup>365</sup> Cornwall Council (2018) “Falmouth Neighbourhood Development Plan” available [online](#). Community Plan Management Group (CPMG) (2009) “Falmouth & Penryn Community Plan” available [online](#).

<sup>366</sup> Tibbalds (2011) “Port of Falmouth Masterplan” available [online](#).

<sup>367</sup> The Falmouth Heritage Economic Regeneration Scheme and Penryn Townscape Heritage Initiative were completed in October 2005. Source: Carrick District Council (undated) “Falmouth Heritage Economic Regeneration Scheme – Final Report” available [online](#).



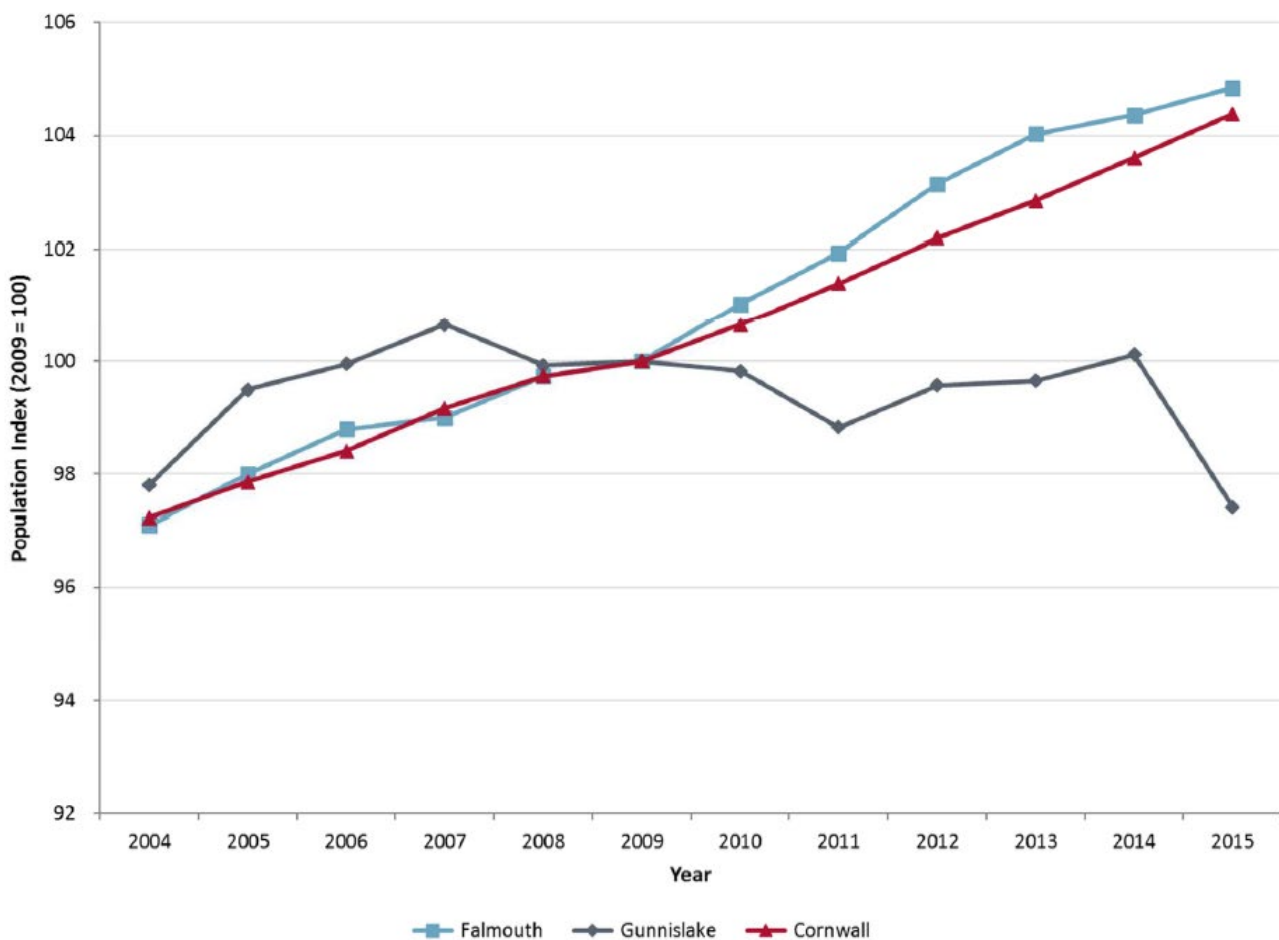
### 14.4.2. Impact of transport investment on economic outcomes

Overall, in relation to the objectives, the scheme did increase accessibility and meet demand for travel, though the continued usage of vehicles to commute likely impacted the economic benefits. Though there has been a suggestion that certain green investments may have been enabled by the scheme, there has been no clear evidence of other investments beyond this. Overall, the available evidence suggests that the scheme has benefitted the town of Falmouth and improved the performance of the tourism sector, although it is not possible to robustly attribute these outcomes to the scheme specifically because of the analytical difficulties of identifying a comparator town that was similarly affected by the 2008-09 financial crisis and recession. We think there is a lack of evidence to suggest that the scheme transformed the structure of local economy or its performance.

### Population

The population of Falmouth had been growing in line with the regional and national average prior to the intervention. Following the scheme opening, the population of Falmouth increased over and above Gunnislake trends, but in line with Cornwall, as shown in Figure 14-4 below.

Figure 14-4: Population of Falmouth, Cornwall and Gunnislake 2004-2015. Index = 2009



Source: Steer Davies Gleave (2018) “New or improved rail lines – Evaluation case studies of local economic impacts. Falmouth Case Study” available [online](#).

### Employment

Falmouth has historically been a tourist destination, but tourism may have increased in importance. The proportion of employees working across food, retail and accommodation has increased since the scheme opening relative to Gunnislake. The two areas experienced different employment trajectories following the opening of the scheme.

Between 2010 and 2015, Falmouth experienced an 8% growth in the number of employees, relative to a 15% drop in Gunnislake. The scheme may have contributed to this impact, though attribution is challenging.

### **Firm entry**

The evaluation commissioned by DfT found that the scheme has made Falmouth more attractive for business investment, though this was challenging to prove. When considering why rail connectivity is important, business survey respondents noted customer access reasons above client and supplier access or distributing goods, suggesting the tourism sector sees higher benefits from the improved connectivity. This is mirrored in the findings of tourist surveys, where 38 percent indicated that rail services were very or fairly important when selecting a holiday destination.

According to the scheme evaluation, enterprise turnover declined in both Falmouth and the comparator town of Gunnislake after 2010, though more significantly in Gunnislake. Taken together, employment and enterprise turnover data suggest that Falmouth may have been more resilient to the effects of the financial crisis relative to Gunnislake. The evaluation notes that it is possible that the increased accessibility of Falmouth for tourists due to the rail intervention contributed to its resilience.

### **Land value and property prices**

30 percent of residents and 39 percent of those moving house believed rail connectivity to be an “important consideration” when selecting a location to live. There was no further evidence to suggest that the scheme impacted land value or property prices.

### **Productivity and wages**

As noted above, tourism continued to make up a significant proportion of economic activity following the scheme. This suggests limited changes in the economy, employment or land use.

The scheme evaluation concludes that there is no evidence of a productivity uplift in the local economy that is attributable to the scheme. There is no evidence regarding wage impacts. More generally, because the scheme coincided with the financial crisis, isolating the impact is challenging.

### **Housing**

Data to 2011 shows the percentage of student lets in Falmouth and Penryn continued to increase following the opening of the station, while second homes experienced a small decline.<sup>368</sup> This aligns with stakeholder feedback we received, which highlighted that Falmouth University built student accommodation at Penryn station and described this as a “direct result” of the improved rail connectivity. One stakeholder similarly pointed to student accommodation constructed by a private developer at Falmouth Docks. This investment was not additional, however; the rail line enabled it to be distributed more widely rather than centrally to the campus, which had been the original intent.<sup>369</sup>

### **Regeneration and development**

Feedback from Falmouth Town Council indicated they are working on a series of green investments, such as cycle paths, linking up the station’s campuses and towns. They believe that obtaining approval / funding for these would have been more challenging, perhaps prohibitively so, without the improved service

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<sup>368</sup> Fountain (2012) Number of second homes in decline across Falmouth and Penryn – the figures in full. Accessed 28 July 2021. Available [online](#).

<sup>369</sup> Stakeholder interview: Falmouth Town Council.

## 14.5. SOURCES

- Carrick District Council (undated) “Falmouth Heritage Economic Regeneration Scheme – Final Report” available [online](#)
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## 15. GREAT YORKSHIRE WAY

### Summary of key messages

- The Great Yorkshire Way is a 7.1 km (4.41 miles) dual carriageway link which runs from the M18, just north of Rossington, to Doncaster Sheffield Airport (DSA). It opened in part in 2016 and fully in 2018.
- Before the scheme, the Doncaster area was suffering from deprivation, with employment, income and skill levels lower than the national average.
- This scheme is part of a wider regeneration strategy, considered a catalyst for private investment, job creation and improved housing in Doncaster, as well as better connectivity in the South Yorkshire region. Rather than a transport scheme, it has more perceived as a lever to facilitate economic growth.
- Three notable commercial investments are connected to the scheme: DSA and its planned expansion, the inland port (iPort) and a housing development in Rossington. While these investments are not consequential, they were contingent, and have attracted employers to the area.
- The Great Yorkshire Way, in conjunction with other investments, has clearly contributed to the improvement of Doncaster. Whilst this cannot be attributed solely to the road itself, it nonetheless represents an important part of a wider strategic plan, on which large, contingent investments were made. The extent of job creation and suggestions of ongoing regeneration suggest a possible transformative impact, though it may be somewhat early to assess. The extent of this impact, and its significance will rely on generating opportunities with higher levels of productivity.
- **The key contextual factors relevant to this scheme are:**
  - Business cycle: The UK was undergoing expansion under both phases.
  - Quality of existing transport access: Doncaster lacked effective radial routes, causing traffic to pass through the city centre. This was anticipated to worsen with commercial developments.
  - Commercial development: The local airport was planning expansion, including a technology park, supporting Doncaster's positioning as a logistics hub. A variety of housing developments were underway.
  - Regeneration potential: The region, and Doncaster more specifically, have suffered from deprivation.
  - Underutilised skills: Doncaster's employment and skill levels were below the national average.

Figure 15-1: Great Yorkshire Way



## 15.1. SCHEME SUMMARY

Background information	
<b>Scheme type:</b>	New link road
<b>Type of transformational impact planned:</b>	Residential impacts, industrial and freight impacts
<b>Location:</b>	Doncaster, Yorkshire, northern England
<b>Geography:</b>	Urban periphery
<b>Promoter:</b>	Doncaster Metropolitan Borough Council (DMBC)
<b>Start of construction:</b> <sup>370</sup>	Phase 1: October 2013 Phase 2: June 2017
<b>Opening date:</b> <sup>371</sup>	Phase 1: February 2016 Phase 2: June 2018
<b>Cost:</b>	Phase 1: £56 million Phase 2: £10.55million <sup>372</sup>
<b>Sources of funding:</b>	Phase 1: £34 million from the private sector partners (Peel Group, Harworth Group, Verdion), £18 million from the Regional Growth Fund and the remainder from Doncaster Council  Phase 2: £9.1m from Sheffield City Region Investment Fund (SCRIF), remainder from Doncaster Council's Capital Programme

The Great Yorkshire Way, previously known as the Finningley and Rossington Regeneration Route Scheme (FARRRS), is a 7.1 km dual carriageway link which runs from Junction 3 of the M18, just north of Rossington, to Doncaster-Sheffield Airport (DSA, formerly Robin Hood Airport Doncaster Sheffield or RHADS).

The FARRRS scheme was implemented in two phases, starting in 2013, and was undertaken in conjunction with a number of other investments, both transport and non-transport. The original scheme business case sets out eight objectives for FARRRS under three overarching headings, as shown in Table 15-1 below.

*Table 15-1: Objectives of the Great Yorkshire Way scheme*

<b>Transport</b>	<ol style="list-style-type: none"> <li>1. Reduce congestion on the local road network, particularly mitigating the impacts of the airport.</li> <li>2. Improve access from Rossington and surrounding communities to the motorway network</li> <li>3. Allow improved facilities for cyclists and pedestrians</li> <li>4. Improve surface access to DSA to facilitate: <ul style="list-style-type: none"> <li>▪ Continuing economic development of the sub-region by efficient access to air services.</li> <li>▪ Increased accessibility to the employment opportunities at Finningley from deprived communities.</li> </ul> </li> </ol>
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<sup>370</sup> Doncaster Council (undated) Great Yorkshire Way – driving jobs and growth. Accessed 11 August 2021, available [online](#).

<sup>371</sup> Doncaster Council (undated) Great Yorkshire Way – driving jobs and growth. Accessed 11 August 2021, available [online](#).

<sup>372</sup> iPort (2017) Second phase of transformational road scheme ready for take off. Accessed 11 August 2021, available [online](#).

	<ul style="list-style-type: none"> <li>▪ Expansion of the Airport and the air related employment area.</li> <li>▪ Enhanced public transport access to the airport for passengers and employees as identified in the Integrated Transport Strategy.</li> <li>▪ Maximise accessibility from sub-regional economic zones and to the Airport's potential catchment area.</li> </ul>
<b>Economic, Social and Environmental</b>	<ol style="list-style-type: none"> <li>5. Facilitate the Objective 1 and DMBC priorities of economic regeneration, environmental improvement and reduction in social inequalities.</li> <li>6. Minimise the adverse impacts on and where possible, enhance environmental quality and landscape character of the area</li> </ol>
<b>Local and National Plans</b>	<ol style="list-style-type: none"> <li>7. Contribute to national, regional and local strategies and plans.</li> <li>8. Contribute to the Strategic Transport Priorities of the region.</li> </ol>

Source: Parkman (2005) *Major Scheme Business Case - Finningley and Rossington Regeneration Route Scheme*

The scheme is intended to drive economic regeneration through improved infrastructure and road access to DSA and the inland port (iPort), encouraging regional investment, linking people to jobs, reducing journey times and improving the local environment.<sup>373</sup>

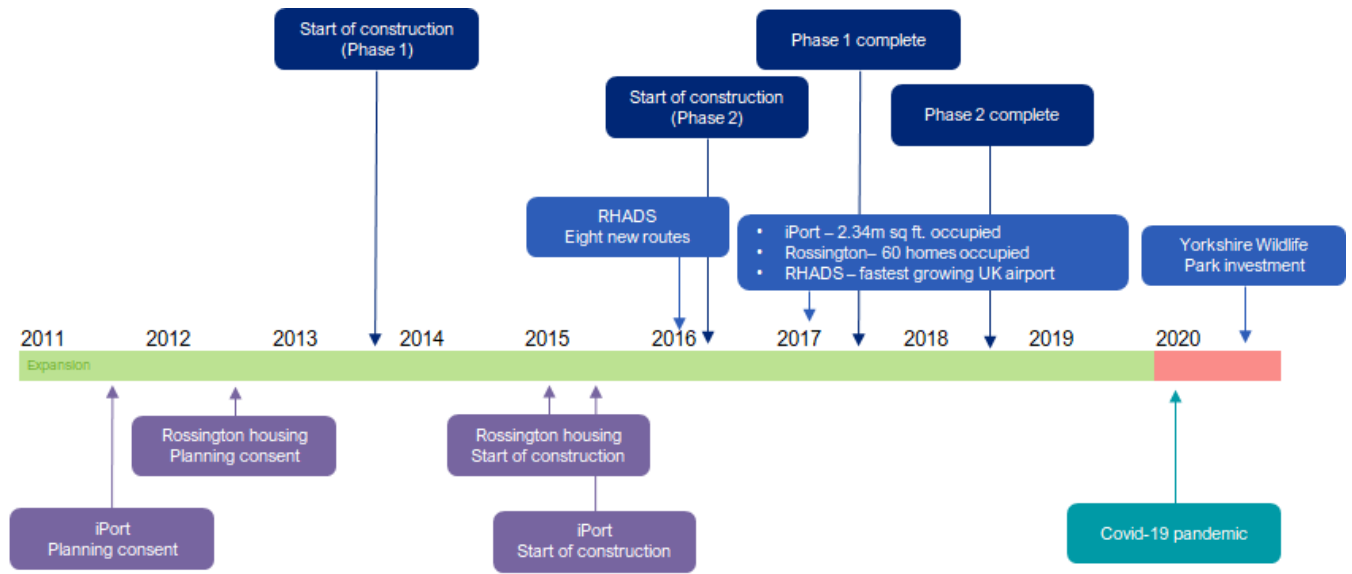
Doncaster Council originally sought funding from the Department for Transport. However, with the scheme focused on regeneration, as opposed to improving typically measured transport metrics such as journey times, the Council found that demonstrating the necessary benefit cost ratio was challenging. This also related to a partial reliance on commercial investments to achieve certain impacts. As such, the Council subsequently changed their funding strategy, approaching the Regional Growth Fund, which required the meeting a target number of jobs within five years, as well as three private investors:

- Peel Group, the owner of DSA that was seeking to expand operations and develop the surrounding area;
- Harworth Group, which planned to build a housing development in Rossington; and
- Version, the iPort developer.

See Figure 15-2 for a detailed timeline of key dates associated with Great Yorkshire Way.

<sup>373</sup> DMBC (undated) The Finningley and Rossington Regeneration Route Scheme. Available [online](#).

Figure 15-2: Timeline for the Great Yorkshire Way



Legend	
	Scheme key dates
	Scheme outputs / outcomes
	Associated investments
	Changes in governance
	Major events



## 15.2. THEORY OF CHANGE

Figure 15-3 and Figure 15-4 present logic maps articulating the ToC for the Great Yorkshire Way.

**Inputs / Activities / Outputs.** The scheme consisted of a new dual carriageway link between the M18 (south of Doncaster) and Doncaster Sheffield Airport (southwest Doncaster). One of the outputs we anticipate is the reduction in journey times between the village of Rossington, situated just south of the new road, and nearby employment sites such as in Doncaster itself. The second output, which formed a key part of the business case, was the reduction in journey times between the iPort, located next to Rossington, and the motorway network and airport.

**Outcomes / Impacts.** We expect both of these outcomes lead to different channels of transformational impact:

- **Changes in residential demand, where improvements in the connectivity of Rossington makes it a more attractive location to live.** Here, we theorise that improvements in the connectivity of Rossington to the other locations in and around Doncaster, provides improved access to jobs and services, making Rossington a more attractive place to live. This in turn induces new housing development in Rossington, attracting new residents and increasing demand for locally based services.
- **Changes in economic activity and land-use, where the road link enables the creation of a logistics cluster.** We note that this outcome was one of the key objectives of the scheme, with the dual carriageway improving freight access between the airport, iPort and the motorway network. This had the potential of inducing further investment in the iPort and associated industrial developments to host a logistics cluster, creating employment opportunities for residents and potentially improving productivity.

**Contexts.** We have identified three potential contextual factors that are likely to be most relevant to this scheme:

- Linked land-use policies to support further investment in residential and industrial developments.
- Linked developments that work alongside the transport investment, as an anchor to attract further investment.
- Linked policies to support local residents to access the jobs created in the area.

Figure 15-3: Logic Map for Great Yorkshire Way – Residential Impacts

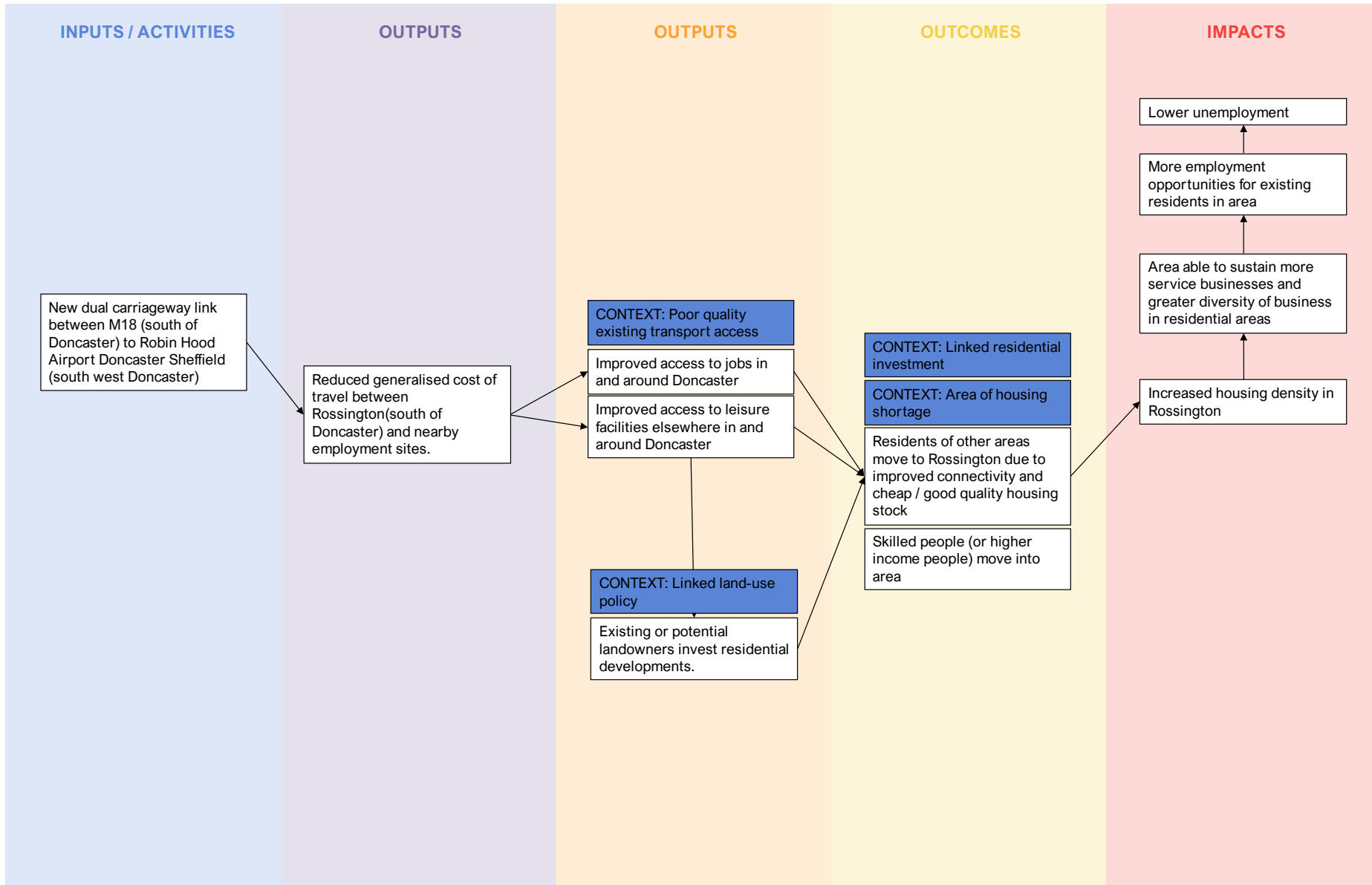
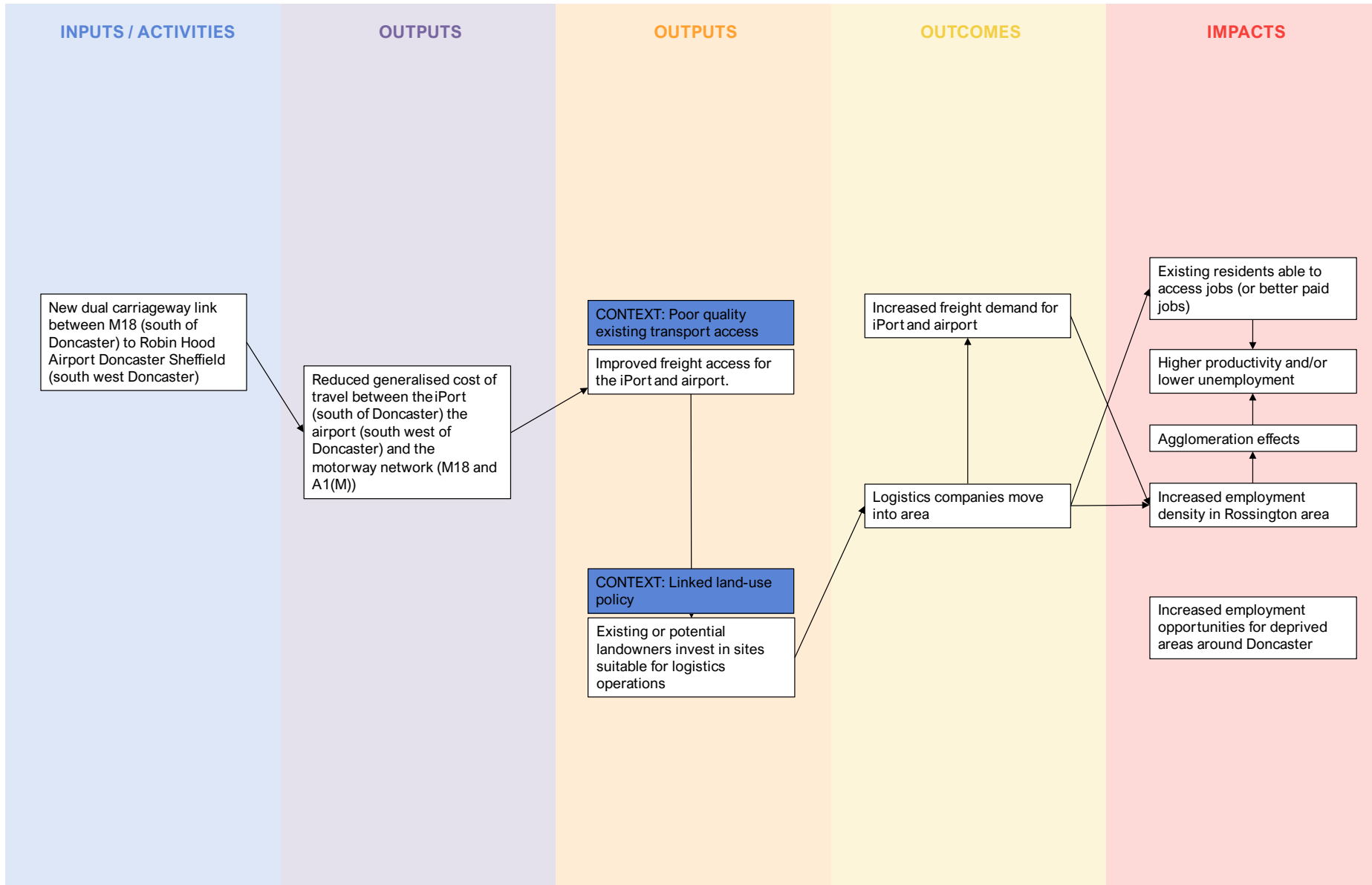


Figure 15-4: Logic Map for Great Yorkshire Way – Industrial Impacts



## **15.3. SURROUNDING CONTEXT**

### **15.3.1. Characteristics of the area at time of investment**

#### **Business cycle**

The UK economy was undergoing expansion at the time of scheme opening, under both phases.

#### **Quality of existing transport access**

Despite the A1(M) and M18 providing motorway routes to the East and West of Doncaster, their effectiveness as radial routes were restricted due to lack of efficient access to the M18. Traffic often passed through central Doncaster to access the motorways, leading to congestion in the town centre. These issues were expected to worsen as the popularity and usage of DSA grew.

Motorway access was a particular challenge to communities to the south-east of Doncaster, such as Rossington, and had been a long-standing issue. Poor transport links had been identified as a barrier to economic growth.

The area also had and continues to have a relatively low level of car ownership, making public transport access particularly important.

#### **Housing**

According to 2004 IMD data, the Doncaster area was not suffering significantly from barriers to housing and services, being relatively normally distributed, though skewed slightly more to the lower deciles. However, there were issues with housing stock, much of which was social housing. Three-to-four-bedroom executive homes were lacking.

#### **Commercial development**

There are strong business linkages with South Yorkshire and the rest of the UK, but such linkages are less strong with the remainder of the Yorkshire and Humber region.

At the time of scheme inception, airports and universities were considered key to unlocking economic growth. Accordingly, Doncaster intended to leverage the newly opened commercial airport. FARRRS was promoted by DMBC and Peel Airports Ltd (owners of DSA). The airport's service offering was expected to increase, with future planning applications anticipated to allow this expansion. A technology park associated with the airport was undergoing a regeneration.<sup>374</sup>

Doncaster is attractive to the distribution sector due to its transport network and the available labour. The Council's employment strategy sees the airport and logistics sectors offering the second and third greatest number of potential jobs, following only the "health, education and other" sector. Infrastructure such as FARRRS is intended to support this, enabling the rail/road/air interchange that is integral to the growth of the distribution sector.

There are also a wide variety of housing and community improvements in the surrounding area expected between 2011 and 2028 to support a transition away from historic industries and encourage economic growth (e.g. in Armthorpe, Mexborough and Conisbrough, among others).

#### **Regeneration potential**

Doncaster developed in a similar manner to other areas of South Yorkshire, focused on heavy industry, notably coal, steel and engineering, the decline of which has had negative economic consequences. The region has since faced challenges in developing the right infrastructure and skills to improve its economic position.

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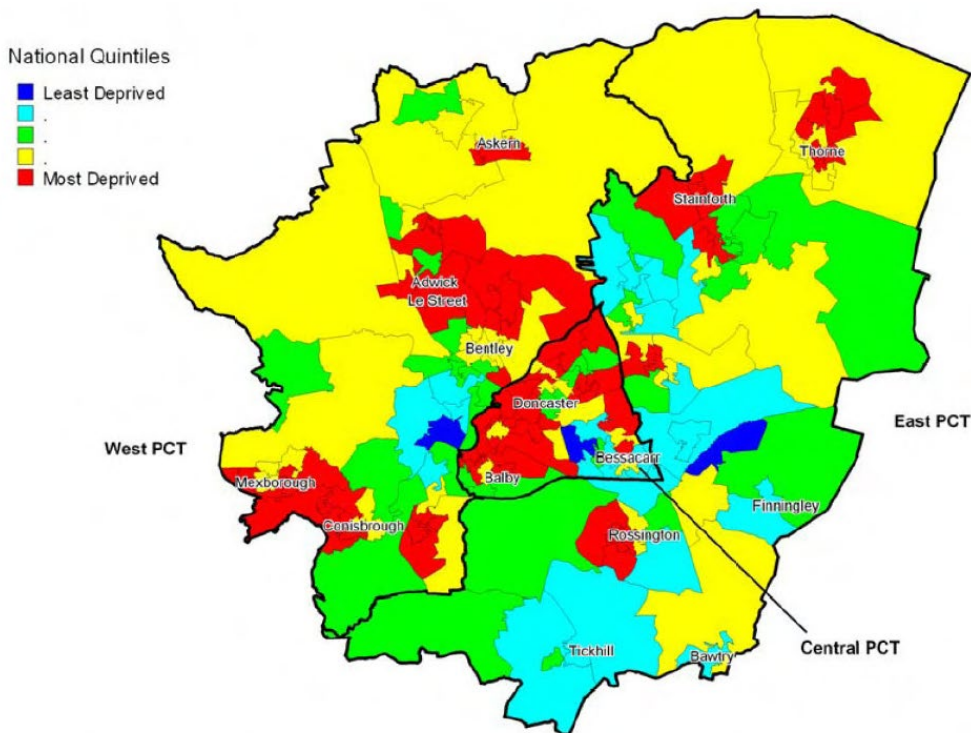
<sup>374</sup> Doncaster MBC (2005) "Major Scheme Business Case. Programme Entry. Finningley and Rossington Regeneration Route Scheme".

The South Yorkshire region had, for a number of years, held Objective 1 status under the European Structural Funds as the average level of GDP is less than 75 percent of the European Union average, demonstrating the economic underperformance of the region.

The city of Doncaster was suffering from deprivation across the borough. Under the 2004 IMD data, 20 percent of the Super Output Areas were in the most deprived decile for England overall, and over 40 percent were in the two most deprived deciles. One area of 192 in Doncaster was in the least deprived decile.

Rossington was in particular an area of deprivation, as shown in the figure below. The area expanded with the opening of the colliery, which lacked longer term viability.

Figure 15-5: IMD in Doncaster - 2004



Source: Parkman (2005) Major Scheme Business Case - Finningley and Rossington Regeneration Route Scheme

Out of 354 Councils, Doncaster ranked 26<sup>th</sup> on the income scale, and 13<sup>th</sup> on employment and 40<sup>th</sup> in terms of overall deprivation. The Borough's Community Development Unit concluded that poverty was endemic in multiple Doncaster wards.

## Underutilised skills

The employment rate in 2004 was 71.6 percent, below the 75 percent average for Great Britain. Similarly, the inactivity rate was 26 percent relative to 22 percent average. Unemployment is higher in deprived areas. Available jobs tended to be in less productive sectors, with lower wages.<sup>375</sup> Access to opportunities also posed an issue, particularly for areas such as Rossington with no connection to the motorway, and low car ownership rates.

Skill levels in Doncaster were relatively low compared both regionally and nationally, and even more so for those not in work. 20 percent the working age population have low skill levels and lack qualifications. Only 41 percent of pupils attained 5 or more GCSE grades A\* to C in 2004, relative to the national average of 53.7 percent.

<sup>375</sup> DMBC (2012) Doncaster Council Core Strategy 2011-2028.

## 15.3.2. Associated activities and actions alongside transport investment

### Benefits realisation

We have not found evidence of a benefits realisation strategy in place for the scheme.

### Unlocking development

An Integrated Development Plan was prepared for the M18 Corridor, under the guidance of Yorkshire Forward. FARRS is considered to be the catalyst for this strategy. As set out above, a number of commercial investments were linked to FARRRS, and their investors contributed to the financing of the scheme.

#### DSA and Peel Group investments

- With the second longest runway in England, the airport has been operating commercial and freight services since 2005. Passenger numbers initially grew but fell back in the financial crisis. There are now routes to over 40 destinations and passenger numbers were forecast to surpass 10 million by 2030.<sup>376</sup>
- Without FARRRS, growth of commercial operations would be limited to around 2.3m passengers p.a.<sup>377</sup>
- DSA was a promoter of the scheme to enable growth of commercial and freight operations.
- Peel has plans to further develop the surrounding area, which includes a business park, a logistics hub, and a residential investment, all at varying stages of completeness.

#### Harworth Estates<sup>378</sup>

- This housing development in Rossington includes 1,200 new homes, commercial development and community facilities on site of former Rossington Colliery that closed in 2007. Construction started in 2015.

#### iPort<sup>379</sup>

- This is set to be the largest logistics complex in the UK, totalling £300 million. It entails 6 million sq.ft. of rail linked warehousing, as well as road, rail, and air freight connectivity/interchange.
- Overall, it is expected the iPort will generate 5,500 jobs.

Other transport schemes were developed around a similar time, and relevant to one another, including the A638 Quality Bus Corridor, Parrot's Corner Park & Ride and Interchange, M18 Junction 2 to Junction 3 Widening scheme, Woodfield Link Road and White Rose Way.<sup>380</sup>

### Regeneration programme

Great Yorkshire Way is a central part of the Sheffield City Region Growth Plan,<sup>381</sup> as well as the wider regeneration initiatives of the South Yorkshire authorities, the PTE, Yorkshire Forward and others. It represents part of a wider multi-modal strategy to improve access between communities to the south east of Doncaster, (including the regeneration sites of Rossington and Finningley), to the motorway; and support continued growth of the airport to support regional regeneration.<sup>382</sup>

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<sup>376</sup> DMBC (undated) The Finningley and Rossington Regeneration Route Scheme. Available [online](#).

<sup>377</sup> Parkman (2005) Major Scheme Business Case - Finningley and Rossington Regeneration Route Scheme

<sup>378</sup> DMBC (undated) The Finningley and Rossington Regeneration Route Scheme. Available [online](#).

<sup>379</sup> DMBC (undated) The Finningley and Rossington Regeneration Route Scheme. Available [online](#).

<sup>380</sup> DMBC (undated) The Finningley and Rossington Regeneration Route Scheme. Available [online](#)., DMBC, ERDF (2013) Monitoring and Evaluation Plan for the Doncaster Southern Gateway White Rose Way Improvement Scheme.

<sup>381</sup> iPort (2017) Second phase of transformational road scheme ready for take off. Accessed 11 August 2021. Available [online](#).

<sup>382</sup> Parkman (2005) Major Scheme Business Case - Finningley and Rossington Regeneration Route Scheme.

Based on a social impact assessment undertaken as part of the business case, FARRRS was seen as a tool to help in addressing the following issues in the area:

- Lack of technical skill sets, appropriate job opportunities and related high levels of unemployment
- Lack of physical access and difficulty in travelling for residents of New Rossington residents to skills training and job opportunities
- Poor health and poor access to medical facilities and resources
- Dependency on car ownership to access healthy lifestyles

## **Skills investment**

Effort was directed at ensuring the resulting job opportunities were taken up locally. Verdion (the iPort developer) and Business Doncaster partnered to establish the iPort Academy to support iPort employers in meeting their recruitment and training needs, as well as promote job opportunities to local residents. Supply chains have also been strongly encouraged to have high local content.

### **15.4. SCHEME OUTPUTS AND ASSOCIATED OUTCOMES**

The Great Yorkshire Way, in conjunction with other investments, is widely considered to have contributed to the improvement of Doncaster. Whilst this cannot be attributed solely to the road itself, it nonetheless represents an important part of a wider strategic plan, on which large, contingent investments were made. The extent of job creation and suggestions of ongoing regeneration suggest a possible transformative impact, though it may be somewhat early to assess. The extent of this impact, and its significance will rely on generating opportunities with higher levels of productivity.

#### **15.4.1. Traffic impacts**

Finally, following opening of Phase 1, news sources reported that the scheme has reduced traffic in the town centre.<sup>383</sup> This was supported by stakeholder feedback, noting that those connecting to the motorway network from the south no longer had to travel through the town centre. Public transport access has also been supported through, for example, dedicated stops at iPort.

There are not traffic evaluations of this scheme available in the public domain.

#### **15.4.2. Impact of transport investment on economic outcomes**

A full evaluation of the scheme impacts does not appear to have been undertaken to date, though there has been evaluation of an adjacent schemes, White Rose Way.

## **Population**

We found no evidence pertaining to the population impacts of the scheme.

## **Employment**

We understand from stakeholders that the Great Yorkshire Way was able to reach its five employment targets, as set by the RGF, within 18 months of opening.

Following the development of Phase 1 in 2018, Ros Jones, the Mayor of Doncaster was quoted describing the scheme as a “game changer”, claiming it has enabled the creation of 1,400 new jobs.<sup>384</sup> The impact claims vary by

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<sup>383</sup> Great British Life (2016) What impact will the new £56 million Great Yorkshire Way have on Doncaster? Accessed 11 August 2021. Available [online](#).

<sup>384</sup> Doncaster Free Press (2018) How a £56 million Doncaster road scheme has already generated over 1000 jobs. Accessed 11 August 2021. Available [online](#)



source; there has yet to be an evaluation specific to this scheme to verify these claims. It is likely that much of this is related to the private investments connected to the scheme.

## **Firm entry**

The most prominent and directly linked source of firm entry is in relation to iPort:<sup>385</sup>

- In the 18 months following the opening of FARRRS, iPort was two-thirds built and let.
- By 2017 2.34 million sq.ft. of high-quality space was occupied by Amazon, Ceva, Fellowes and Lidl. Amazon was the anchor tenant but would not sign the lease until the road was complete, demonstrating the value of the scheme in bringing in employment-creating tenants. Though Amazon did have a pre-existing facility in the area, it was significantly smaller; this represented a step-change.
- A second Amazon facility is also expected, which plans to employ 1,500 people. The developer is withholding the remaining space for high-quality tenants given the level of demand.

Though these investments were not made following the scheme, nor as a result of it, we understand that they were nonetheless contingent. The Council informed us that it is unlikely they would have otherwise obtained planning permission.

## **Land value and property prices**

We found no evidence to suggest changes in land value or property prices.

## **Productivity and wages**

The Council recognises that the jobs created by these commercial investments are, in many cases, low-skilled, though opportunities within the airport and select iPort tenants may be less so. While this may improve employment figures, productivity and income are less likely to increase.

## **Housing**

In 2018 Mayor of Doncaster claimed the scheme has resulted in the development of hundreds of new homes.<sup>386</sup> The impact claims vary by source; there has yet to be an evaluation specific to this scheme to verify these claims. It is likely that much of this is related to the private investments connected to the scheme.

Harworth Estates housing development:

- By 2017 there were 60 new occupied homes, 100 more expected in 18 months.
- Stakeholder feedback suggests that this has sparked a gentrification, as the new cohort of residents have higher expectations. A supermarket has been built, and old retailers refurbished.

## **Regeneration and development**

In 2018 Mayor of Doncaster claimed the scheme has brought in hundreds of millions of pounds worth of private sector investment.<sup>387</sup> The impact claims vary by source; there has yet to be an evaluation specific to this scheme to verify these claims. It is likely that much of this is related to the private investments connected to the scheme.

Doncaster Sheffield Airport (DSA):

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<sup>385</sup> Stakeholder interview with Doncaster Council. iPort (2017) Second phase of transformational road scheme ready for take off. Accessed 11 August 2021. Available [online](#).

<sup>386</sup> Doncaster Free Press (2018) How a £56 million Doncaster road scheme has already generated over 1000 jobs. Accessed 11 August 2021. Available [online](#)

<sup>387</sup> Doncaster Free Press (2018) How a £56 million Doncaster road scheme has already generated over 1000 jobs. Accessed 11 August 2021. Available [online](#).

- The Great Yorkshire Way has increased the catchment area of the airport. There are now one million people within a 30-minute drive (double the previous level) and six million within a one-hour drive (previously five million).<sup>388</sup>
- FlyBe, which opened a base at DSA in 2006, commenced the operation of eight new routes in 2016, including major European hubs.”<sup>389</sup>
- By 2017 it was claimed that the airport was experiencing the busiest year on record and was the fastest growing UK airport.”<sup>390</sup>

The scheme also stimulated a recent, significant investment in Yorkshire Wildlife Park, which can now be accessed directly off the highway rather than via residential communities, as was the situation prior to FARRRS. It is aiming to challenge Chester as the largest zoo in the country, with an extended visitor centre, hotel, leisure facilities.

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<sup>388</sup> Mott MacDonald. A regeneration road second to none. Accessed 11 August 2021. Available [online](#).

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## 16. MARKHAM VALE (MEGZ)

### Summary of key messages

- Markham Vale is a 200-hectare business park which opened in 2009 near to Chesterfield, Derbyshire with direct access to the M1 motorway via the construction of Junction 29A. It is located on the site of the former Markham Colliery, and provides serviced development land and facilities for industry, and in particular the manufacturing, technology, environmental and logistics sector. In 2017, the Seymour Link Road opened, connecting the northern plots of Markham Vale to the highway network, to bring the land into productive economic use.
- Markham Vale is Derbyshire County Council’s flagship regeneration scheme, set up in 2006 to act as a catalyst for regeneration in the deprived northern coalfield area of Derbyshire, and in the long term to bring in business rate revenue for reinvestment in the Derbyshire economy. The primary mechanism of regeneration is through redevelopment of the land to address issues of dereliction and contamination, and through attracting new businesses to relocate in the area to provide employment opportunities for the local community.
- As of March 2019, 2,236 full time jobs had been created at Markham Vale. Derbyshire County Council has also implemented a complementary scheme “Markham Vale Grow Your Workforce” which seeks to connect businesses with other organisations and resources to help secure employment and training opportunities for local people. However, there is little evidence that the M1 Junction 29A scheme (and therefore the Markham Vale development) has led to wider transformation in the area.
- **The key contextual factors relevant to this scheme are:**
  - Business cycle: Markham Vale business park opened in 2009, at the height of the global financial crisis, which may have meant that plots at the site took longer to fill than original anticipated.
  - Regeneration potential: Markham Vale is situated on the site of a former coalfield, in an area which has suffered historically from the loss of employment in heavy manufacturing industry and coal mining.
  - Unlocking development: an Enterprise Zone was created at Markham Vale in 2011 with tax incentives to encourage commercial development at the site.

Figure 16-1: M1 Junction 29A and Seymour Link Road (highlighted in red) in relation to the Markham Vale development



Source: Orion Markham Vale

## 16.1. SCHEME SUMMARY

Background information	
<b>Scheme type:</b>	Phase 1 - New motorway junction, associated roundabouts and carriageways Phase 2 – New link road
<b>Type of transformational impact planned:</b>	Industrial and freight impacts
<b>Location:</b>	North East Derbyshire, UK
<b>Geography:</b>	Inter-city
<b>Promoter:</b>	Derbyshire County Council
<b>Start of construction:</b>	Phase 1 – Unknown Phase 2 – August 2015
<b>Opening date:</b>	Phase 1 – June 2008 Phase 2 – March 2017
<b>Cost:</b>	Phase 1 - £30m Phase 2 - £7.56m
<b>Sources of funding:</b>	Phase 1 - £14.5m from Department for Transport, £15.5m from third parties. Phase 2 - £3.78m from Sheffield City Region Local Enterprise Partnerships, £2.5m from D2N2 Local Enterprise Partnership, £1.26m from Derbyshire County Council.

Markham Vale (also known as Markham Employment Growth Zone (MEGZ)) is a major business park in North East Derbyshire located adjacent to the M1 motorway, 5 miles from Chesterfield, 15 miles from Sheffield and 3 miles from Bolsover.<sup>391</sup> The development of the business park was directly facilitated via the construction of a new motorway junction on the M1 (J29A) (Phase 1), along with a new roundabout where the B6418 and the A632 meet and a new 7.3 metre wide carriage way along Markham Lane to the new junction located on Markham Road, at a cost of £30m.<sup>392</sup> The objectives of Phase 1 (the construction of M1 J29A) and the associated development of Markham Vale were: to provide employment opportunities to the area; to remediate and reclaim brownfield land; to improve the area by the creation of a new motorway junction and local roads infrastructure; and to produce a scheme that works with and positively enhances the environment.<sup>392</sup>

Later, the Seymour Link Road (Phase 2) was constructed at a cost of £7.56m<sup>393</sup> to connect J29A to the development plots at Markham Vale North, allowing for the further expansion of the business park on top of the existing Markham Vale East and West plots.<sup>391</sup> The aim of Phase 2 (Seymour Link Road) was to provide a major new highway to connect 33 hectares of serviced development land at Markham Vale North to the M1 motorway at junction 29A and the wider highway network. Providing this connection was intended to enable the land to meet the requirements of large-scale industrial occupiers and facilitate the growth of good quality regional companies.<sup>391</sup>

Prior to the construction of the Seymour Link Road, the only remaining large scale serviced plot at Markham Vale was compromised by the HS2 Phase 2 proposed line of route. To address this, the government extended enhanced capital allowances to Markham Vale North and provisionally approved Enterprise Zone capital funding to create serviced development plots with tax incentives. However, the plots required links to the highway and motorway network to be brought into productive economic use. The Seymour Link Road was proposed and constructed to

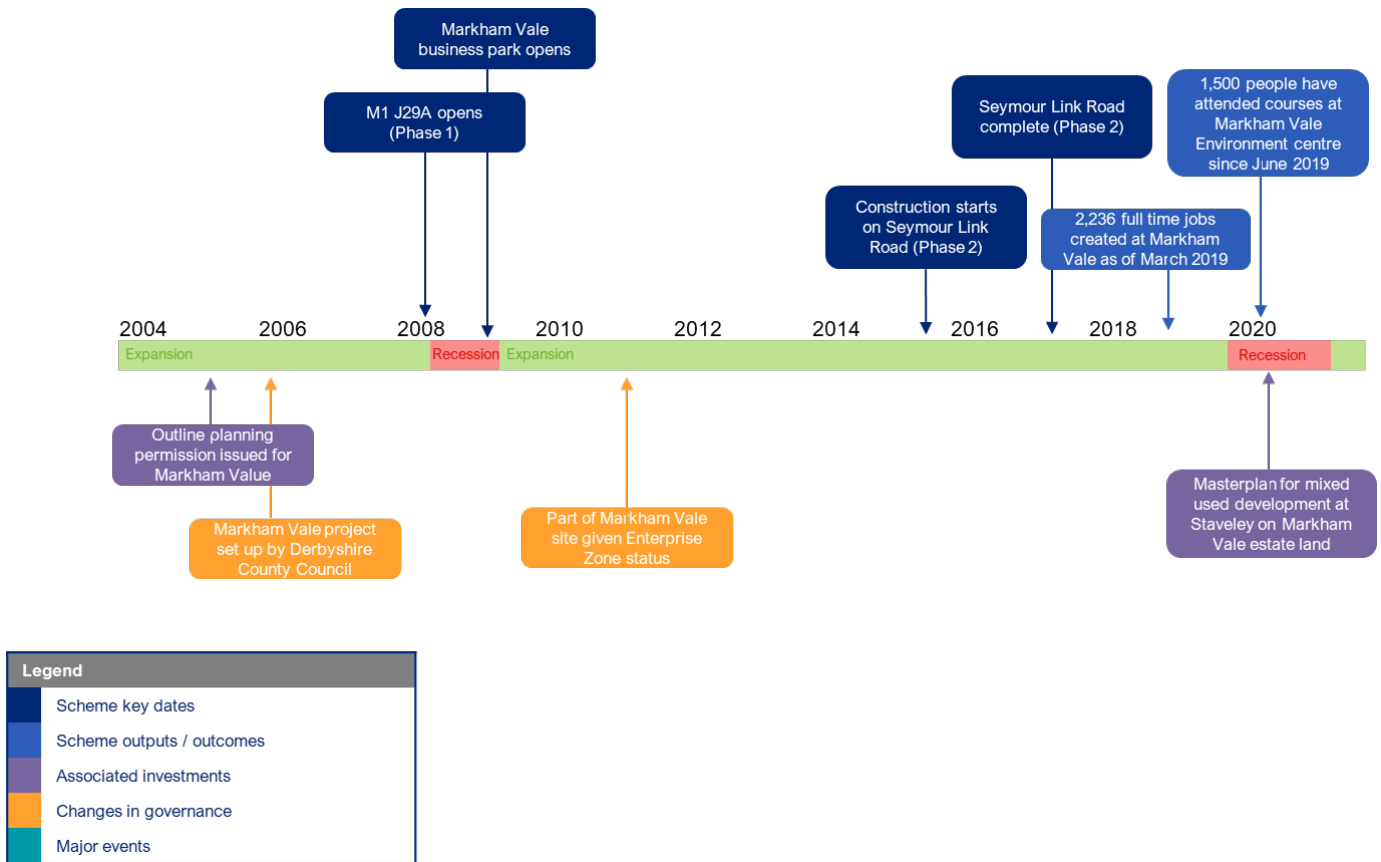
<sup>391</sup> Derbyshire County Council (May 2008) "Report of the Resources Improvement and Scrutiny Committee 'Maximising the Benefits of Regeneration'" available [online](#).

<sup>392</sup> Ipsos (2021) "Markham Vale Evaluation Report".

<sup>393</sup> Sheffield City Region Investment Fund "Stage 1A Outline Business Case for Seymour Link Road" available [online](#).

fulfil this requirement.<sup>391</sup> See Figure 16-2 for a detailed timeline of key dates associated with the Markham Vale Scheme.

Figure 16-2: Timeline for Markham Vale



## 16.2. THEORY OF CHANGE

Figure 16-3 presents a logic map articulating the ToC for the Markham Vale road schemes.

**Inputs / Activities / Outputs.** The scheme broadly consists of new roads and junctions to connect the Markham Vale development to the M1, connecting a previously derelict site to the motorway network.

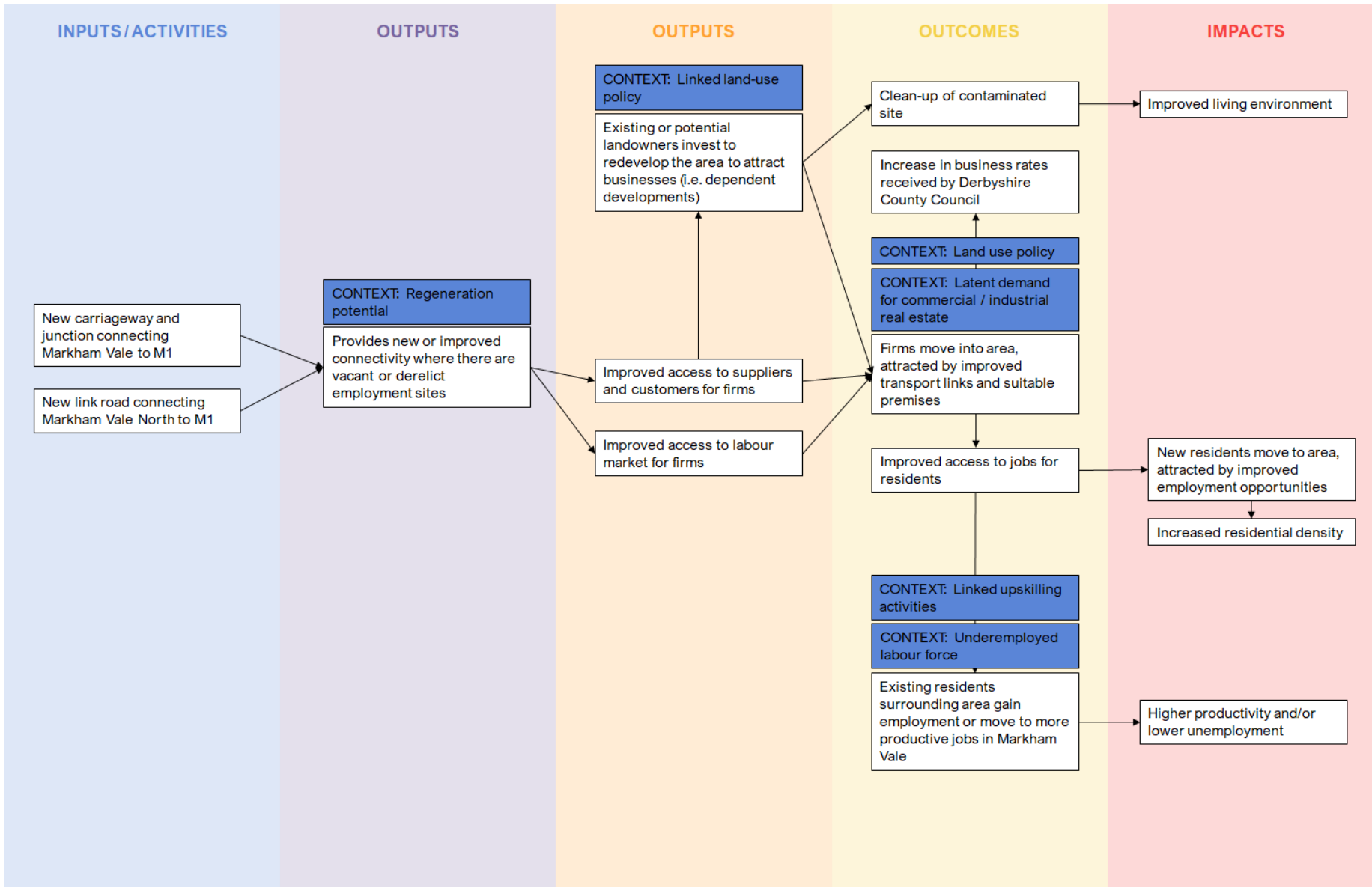
**Outcomes / Impacts.** We expect the scheme to have one key channel of transformational impact:

- **Changes in economic activity and land-use, where the introduction of motorway connectivity unlocks the economic potential of an area.** We expect that the introduction of motorway connectivity will have enhanced the attractiveness of Markham Vale as a location for firms that require easy freight access. This will have supported the business case for developing the Markham Vale business park, which in turn may have induced further investment in the area. We expect the combination of the business park and improved transport access will have attracted new firms, benefitting local communities by creating employment opportunities.

**Contexts.** We have identified three potential contextual factors that are likely to be most relevant to this scheme:

- Linked land-use policies to support further investment in residential and industrial developments.
- Linked developments that work alongside the transport investment, as an anchor to attract further investment.
- Linked policies to support local residents to access the jobs created in the business park.

Figure 16-3: Logic Map for Markham Vale



### 16.3. SURROUNDING CONTEXT

Markham Vale is a 200-acre (85 hectare) business park which opened in 2009 with direct access to the M1 motorway via J29A.<sup>394</sup> It is located on the site of the former Markham Colliery, and provides serviced development land for industry, particularly the manufacturing, technology, environmental and logistics sectors.<sup>395</sup>

The Markham Vale project was set up in 2006 to act as a catalyst for regeneration in the deprived northern coalfield area of Derbyshire and in the long term, to generate business rates income for re-investment in the Derbyshire economy.<sup>396</sup> It is a major regeneration and development project, involving Derbyshire County Council and developers Henry Boot, to address problems of industrial dereliction and contamination and to bring employment to the area. Outline planning permission for the scheme was issued by Chesterfield, North East Derbyshire and Bolsover District Councils in April 2005.<sup>397</sup> M1 Junction 29A was opened in 2008 to provide access to the site.<sup>398</sup> Part of the Markham Vale site was given Enterprise Zone status in 2011, which provides tax relief and other benefits to businesses which locate there.<sup>399</sup>

The Seymour Link Road connects the Markham Vale North area of the business park to Junction 29A of the M1 motorway. This area comprises up to 1.5 million sq.ft. of new commercial floor space. Unlike the Markham Vale East or Markham Vale West areas, Markham Vale North is capable for accommodating large scale plots and provides the biggest economic development opportunity within the Markham Vale Business Park site.<sup>399</sup>

#### 16.3.1. Characteristics of the area at time of investment

##### Business cycle

Markham Vale business park opened in 2009, at the height of the global financial crisis and ensuing recession. There is some evidence to suggest that the crisis and associated decrease in demand and business confidence meant that the rate of development at Markham Vale was slower than expected.<sup>400</sup>

##### Quality of existing transport access

Markham Vale lies adjacent to the M1 motorway. However, prior to the construction of M1 Junction 29A, the nearest access to the M1 was at Junctions 29 and 30 (J29 and J30). For southbound journeys, J29 is approximately 6 miles from Markham Vale on non-motorway roads via Bolsover. For northbound journeys, J30 is approximately 5 miles from Markham Vale on non-motorway roads via Staveley. The construction of M1 J29A was critical for Markham Vale to be an attractive location for businesses, but also improves access to the nearby towns of Staveley and Bolsover.

##### Housing

Analysis of the 2015 English Indices of Multiple Deprivation reveals that the LSOAs containing and adjacent to Markham Vale, and in the local towns of Staveley and Bolsover Rank in the middle deciles for the housing domain, suggesting there is not an acute housing shortage in the area.

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<sup>394</sup> Destination Chesterfield, “Markham Vale” available [online](#).

<sup>395</sup> D2N2 (March 2017) “Seymour Link Road Now Complete” available [online](#).

<sup>396</sup> Derbyshire County Council (November 2018) “Joint Report of Strategic Director – Economy Transport and Environment and the Director of Finance & ICT – Markham Vale Progress (Economic Development and Regeneration)” available [online](#).

<sup>397</sup> Chesterfield Borough Council “Markham Vale Development” available [online](#).

<sup>398</sup> BBC News (June 2008) “New £8m motorway junction opens” available [online](#).

<sup>399</sup> Derbyshire County Council (February 2014) “Cabinet Meeting – Report of the Strategic Director – Economy, Transport and Environment – Markham Vale North – Seymour (Jobs, Economy and Transport)” available [online](#).

<sup>400</sup> Highways England (May 2017) “Post Opening Project Evaluation: M1 Junction 25 to 28 Widening – Five Years After Opening Evaluation” available [online](#).



## Commercial development

The brownfield land at Markham Vale required connecting to the highway network to be brought into productive commercial use. A connection to the M1 motorway was also seen as essential to meet the requirements of large-scale industrial occupiers and facilitate the growth of good quality regional companies at the site.

## Regeneration potential

Markham Vale itself is situated on brownfield land, the site of a former coalfield. The Markham Vale scheme sought to remediate and reclaim this brownfield land and enhance the natural environment. The scheme also aimed to provide employment opportunities to the local area,<sup>391</sup> which has suffered historically from the loss of employment in heavy manufacturing industry and coal mining.<sup>391</sup> According to the English Indices of Deprivation 2007, Bolsover District ranked as the 40<sup>th</sup> most deprived area out of the 354 districts in England.

Of the 486 LSOAs in Derbyshire, 16 ranked in the 10 percent most deprived in England. 12 of these 16 areas lie in the former coalfield areas in north east Derbyshire (i.e., near to Markham Vale), and five of these areas are directly adjacent to the Markham Vale development. In each of the subdomains of income, employment, health, education, housing, crime and living environment deprivation, the majority of the LSOAs in Derbyshire which are in the 10 percent most deprived areas in England are located in north east Derbyshire. Within the vicinity of Markham Vale, in 2007 there were pockets where worklessness exceeded twice the national average.

## Underutilised skills

Analysis of the 2015 English Indices of Multiple Deprivation reveals that the LSOAs containing and adjacent to Markham Vale, and in the local towns of Staveley and Bolsover frequently rank in the bottom 3 deciles in the education, skills & training domain, indicating a low-skilled workforce. They also rank mostly in the low to middle deciles (i.e., generally more deprived) in the income and employment domains.

### 16.3.2. Associated activities and actions alongside transport investment

#### Benefits realisation

Markham Vale is a flagship regeneration and development project for Derbyshire County Council. Our research has not found documents explicitly setting out a benefits realisation strategy for the scheme. However, activities associated with the scheme (such as skills investment) and the establishment of an enterprise zone suggest that Derbyshire County Council has considered how to maximise the positive impacts of the scheme.

#### Unlocking development

To help unlock development at Markham Vale, an Enterprise Zone was created in 2011 with tax incentives to encourage commercial development at the site. The land was acquired for the scheme via a compulsory purchase order.<sup>401</sup>

#### Regeneration programme

The Markham Vale scheme is part of broader efforts to regenerate the deprived northern coalfield area of Derbyshire. As of June 2020, a Masterplan had been prepared for a mixed-used development on Markham Vale estate land at Staveley Town Basin, and a business case for the proposal was under preparation. **Error! Bookmark not defined.**

#### Skills investment

Derbyshire County Council have assisted new businesses in identifying and fulfilling their recruitment needs via the “Markham Vale Grow Your Workforce” service, aiming to connect businesses with other organisations and resources to help secure employment and training opportunities for local people. As of June 2020, such was the

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<sup>401</sup> Derbyshire County Council “Markham Vale” available [online](#).

rate of new jobs being created at Markham Vale that details of several vacancies were being published on a daily basis via the Markham Vale Grow Your Workforce service.<sup>403</sup>

In the 18 months to November 2018, over 100 training courses were held at Markham Vale Environment Centre, covering topics including Health and Safety, Human Resources, Teach Training, and Business Start Up. Markham Vale Lane Services provides users with training and support across areas such as landscape and horticulture, as part of Derbyshire County Council's commitment to supporting employment and developing employability skills for vulnerable adults. **Error! Bookmark not defined.** Between June 2019 and June 2020, almost 1,500 people had attended 88 training courses at the Markham Vale Environment Centre. **Error! Bookmark not defined.**

## **16.4. SCHEME OUTPUTS, OUTCOMES AND IMPACT**

Markham Vale is perceived to be a success by the local stakeholder we interviewed, with respect to its original objectives of creating jobs and gross value added in the area. However, there is limited data available in the public domain regarding the direct outputs, outcomes and impacts of the scheme and whether these are in line with expectations. There is some evidence to suggest that development at Markham Vale has been slower than expected, due to the impact of the global financial crisis.

It was also suggested that the unique selling point of Markham Vale was its attractive transport links and tax advantages thanks to the enterprise zone. However, according to the interviewee, it is likely that the development is associated with displacement effects, where businesses have simply moved from one location to another. Thus, for a scheme to be 'truly' successful, it is key that there is a coherent plan to 'backfill' locations affected by displacement effects.

### **16.4.1. Traffic impacts**

Our research has found limited information regarding the traffic impacts of Markham Vale. As of May 2017, traffic growth and the rate of development at Markham Vale had been slower than expected – this is attributed to the economic slowdown following the global financial crisis. This in turn contributed to lower-than-expected levels of traffic on the M1.<sup>400</sup>

### **16.4.2. Impact of transport investment on economic outcomes**

#### **Population**

We found no evidence linking the Markham Vale scheme to population changes.

#### **Employment**

The entire Markham Vale site was expected to create 4,100 jobs by the time it is fully developed, while the Seymour Link Road was expected to enable the creation of 2,500 jobs at Markham Vale North.<sup>402</sup>

As of June 2020, 173 of the 200 acres available for development had been brought forward for development. Of the 173 acres brought forward, 135 were either fully developed or had buildings under construction. As of March 2019, 2,236 full time jobs had been created at Markham Vale.<sup>403</sup>

In the Staveley Town Investment Plan, Markham Vale is cited as a key source of employment in the area but is also described as being difficult to reach from Staveley, due to insufficient public transport infrastructure.<sup>404</sup>

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<sup>402</sup> Destination Chesterfield (February 2016) "New road to bring more jobs to Markham Vale" available [online](#).

<sup>403</sup> Derbyshire County Council (June 2020) "Joint Report of the Executive Strategic Director – Economy, Transport and Environment and the Director of Finance and ICT: Update on Development Progress at Markham Vale (Clean Growth and Regeneration)" available [online](#).

<sup>404</sup> Staveley Towns Fund (December 2020) "Staveley Town Investment Plan" available [online](#).

## Firm entry

As of November 2018, the following businesses had commenced works to locate at Markham Vale North:<sup>405</sup>

- Great Bear – 480,000 sq.ft. distribution warehouse with 400 new jobs.
- Sterigenics (medical equipment company) – 58,000 sq.ft. building with 35 new jobs initially, expected to double as the company meets its growth plans. **Error! Bookmark not defined.**
- Ferdinand Bilstein (German auto-parts company) – 225,000 sq.ft. distribution and office complex with 150 employees recruited for the initial phase of new jobs, with the potential for a further 250 to be created.
- Gist Ltd – 90,960 sq.ft. chilled distribution centre with 120 people employed at the site as of November 2018 and 80 further new jobs expected.
- Inspirepac Ltd (printing company) – 100,000 sq.ft. factory warehouse and office building. 55 jobs had been created as of November 2016, with 125 in total expected by 2021.

## Land values

We found no evidence regarding the impact of Markham Vale on land values in the area.

## Property prices

We found no evidence regarding the impact of Markham Vale on property prices in the area.

## Wages and Productivity

We found no evidence regarding the impact of Markham Vale on wages and productivity in the area. However, it is possible that the scheme improved local employment opportunities and enabled local residents to move to higher paid jobs.

## Housing

Markham Vale is primarily a commercial development. However, there is a mixed-use development planned on Markham Vale estate land at Staveley Town Basin.

## Regeneration and development

The development of Markham Vale has allowed for the environmental transformation of the brownfield ex-coalfield site, via environmental landscaping, new planting and trails and the creation of habitats for plants and wildlife.<sup>401</sup>

## 16.5. SOURCES

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<sup>405</sup> Derbyshire County Council (November 2018) “Joint Report of Strategic Director – Economy Transport and Environment and the Director of Finance & ICT – Markham Vale Progress (Economic Development and Regeneration)” available [online](#)

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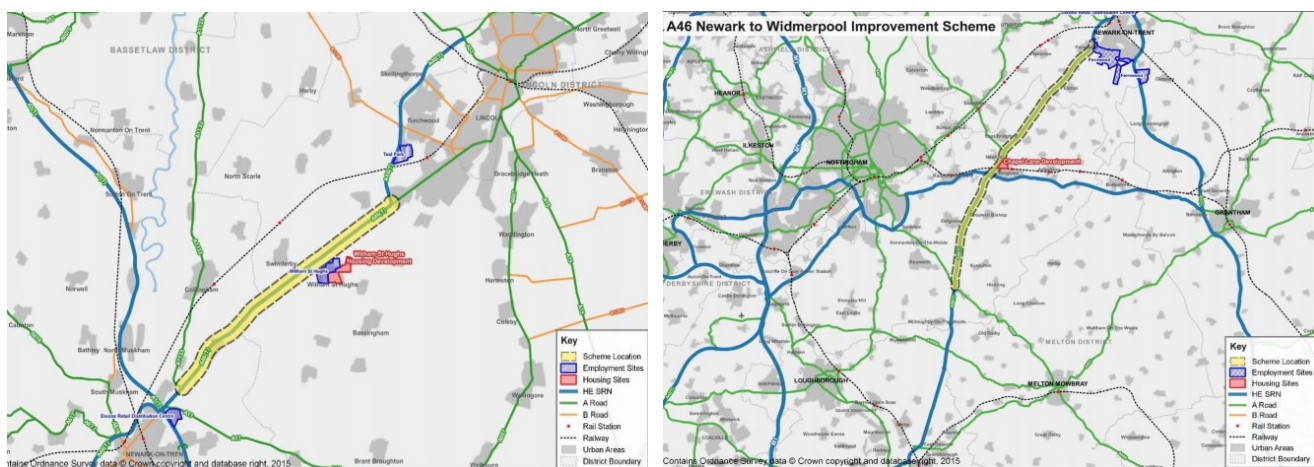
Staveley Towns Fund (December 2020) “Staveley Town Investment Plan” available [online](#)

## 17. A46 NEWARK TO LINCOLN AND NEWARK TO WIDMERPOOL IMPROVEMENTS

### Summary of key messages

- The A46 is a major A-road and important freight link from Grimsby and Immingham, Lincolnshire to the East Midlands and the South-West. These schemes, completed almost a decade apart, were intended to boost the regional economy by relieving some of the worst congestion and safety-related issues along the route; improve journey time reliability for freight operators; improve links between the A1 and the M1; and unlock land for new housing development.
- The schemes helped to unlock new residential developments at Witham St Hughs (1,000 homes in phase 1 and another ~1,200 under construction) and supported further development at Newton Garden Village (under construction – up to ~500 homes) and Hollygate Park in Rushcliffe (complete, ~470 homes).
- But evaluations of the schemes to date find that they had a ‘neutral’ impact on wider economic developments.
- Although new employment sites have been supported by the schemes, we found insufficient evidence to conclude that the scheme has had a *net* positive impact on employment. Although in theory the scheme will be beneficial to both freight and business users who may experience improved productivity, no evaluation has been completed to determine whether this impact has materialised. Distinguishing between firms that received the ‘treatment’ and those which did not would be challenging, given that the firms and businesses who use the A46 may not be located close to the site of the improvements, or use it to lesser or greater extents.
- Overall, we find that the schemes have not been ‘transformational’ – but we recognise that the ambitions for these schemes may not have been ‘transformational’ in the same way as other case studies in our report.
- **The key contextual factors relevant to this scheme are:**
  - Business cycle: The construction and sale of new homes at Witham St Hughs and other related developments was likely facilitated by the period of sustained economic expansion and stability after the Newark – Lincoln section completed.
  - Quality of existing transport access: Demand for commercial and industrial units was likely supported by strong existing links to the Strategic Road Network, and to East Midlands Airport. Quality of road infrastructure and journey times to nearby cities (e.g. Nottingham and Lincoln) may also have supported the viability of residential developments.

Figure 17-1: A46 Newark to Lincoln (left) and A46 Newark to Widmerpool (right)



Source: Highways England (2016)

## 17.1. SCHEME SUMMARY

Background information	
<b>Scheme type:</b>	Road improvements (upgrading single to dual carriageway)
<b>Type of transformational impact planned:</b>	Residential demand Industrial and freight demand
<b>Location:</b>	Newark, Nottinghamshire, East Midlands
<b>Geography:</b>	Rural
<b>Promoter:</b>	Highways Agency
<b>Start of construction:</b>	Newark to Lincoln, 2001; Newark to Widmerpool, 2009
<b>Opening date:</b>	Newark to Lincoln, 2003; Newark to Widmerpool, 2012
<b>Cost:</b>	~£300m
<b>Sources of funding:</b>	Jointly funded by the Department for Transport and the East Midlands Regional Development Agency

The A46 is major A-road that runs from the M5 near Tewkesbury in Gloucestershire (South West) to Cleethorpes in Lincolnshire (East Midlands) although the route is not contiguous. It is an important freight corridor with ports at either end of the corridor and East Midlands Airport (commonly used for cargo flights) close by. Approximately 16 percent of GVA generated across the A46 corridor is from manufacturing industries and 20 percent from distribution businesses, according to Midlands Connect.<sup>406</sup>

In this case study, we look at two improvement schemes that were part-funded by DfT during the period of interest:

- a 13km dual carriageway scheme running north of Newark to Hykeham, south of Lincoln, including a 2.5km by-pass of the village of Brough. Construction started in 2001 and the scheme opened in 2003; and
- a 28km dual carriageway scheme between Newark and Widmerpool announced as part of public investment programme to help the economic recovery after the 2008-09 financial crisis.<sup>407</sup> The scheme was known locally as a ‘missing link’ as it was the last remaining single-carriageway section of the A46 between the M1 north of Leicester and Newark western relief road: a section that was prone to accidents and unreliable journey times. Construction started in 2009 and the scheme opened in 2012.

The main objectives of these schemes were to:

- Reduce congestion and improve safety on the sections between Widmerpool, Newark and Lincoln;
- Improve connections between the local urban centres, and improve links between the M1 and the A1;
- Improve journey time reliability for valuable road uses, particularly freight traffic from the Lincolnshire ports travelling towards central England and the South-West, thereby reducing business costs, increasing trade and improving productivity<sup>408</sup>; and
- Open up opportunities for development, both residential and employment, in the local area.<sup>409</sup>

<sup>406</sup> Midlands Connect (November 2020) “A46 Corridor Study – Phase 2 Task 1: Final Report” available [online](#).

<sup>407</sup> HM Treasury (December 2009) “Pre-Budget Report – Securing the recovery: growth and opportunity” available [online](#).

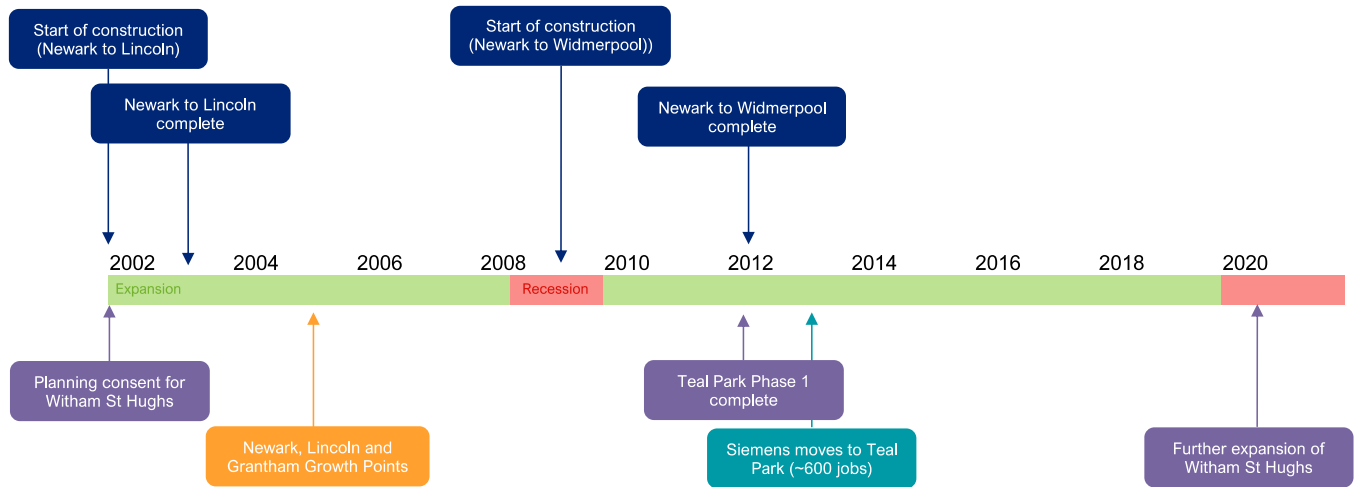
<sup>408</sup> The A46 between Newark and Widmerpool carries between 16,200 and 25,300 vehicles a day, of which up to 15% are heavy goods vehicles. See BBC (25 November 2011) “New A46 widening plan road in Nottinghamshire opens” available [online](#).

<sup>409</sup> Highways England (July 2016) “Assessment of growth impacts” available [online](#).



See Figure 17-2 for a detailed timeline of key dates associated with A46 Newark to Lincoln and Newark to Widmerpool Scheme.

Figure 17-2: Timeline for the A46 Newark to Lincoln and Newark to Widmerpool Improvements



Legend	
<span style="color: #003366;">■</span>	Scheme key dates
<span style="color: #4F81BD;">■</span>	Scheme outputs / outcomes
<span style="color: #666699;">■</span>	Associated investments
<span style="color: #FF9933;">■</span>	Changes in governance
<span style="color: #009999;">■</span>	Major events

## 17.2. THEORY OF CHANGE

Figure 17-3 presents a logic map articulating the ToC for the improvements to the A46 from Newark to Widmerpool.

**Inputs / Activities / Outputs.** The upgrades to the A46 from Newark to Widmerpool consisted of the replacement of a single carriageway with a dual carriageway and improvements to the junctions to reduce congestion, improve journey times and reliability.

**Outcomes / Impacts.** We expect the scheme to have a series of disparate impacts depending on the origin and destination of traffic using the upgraded link. For the purposes of the ToC, we have isolated one channel of transformational impact that aligns with the other two case studies considered within this project:

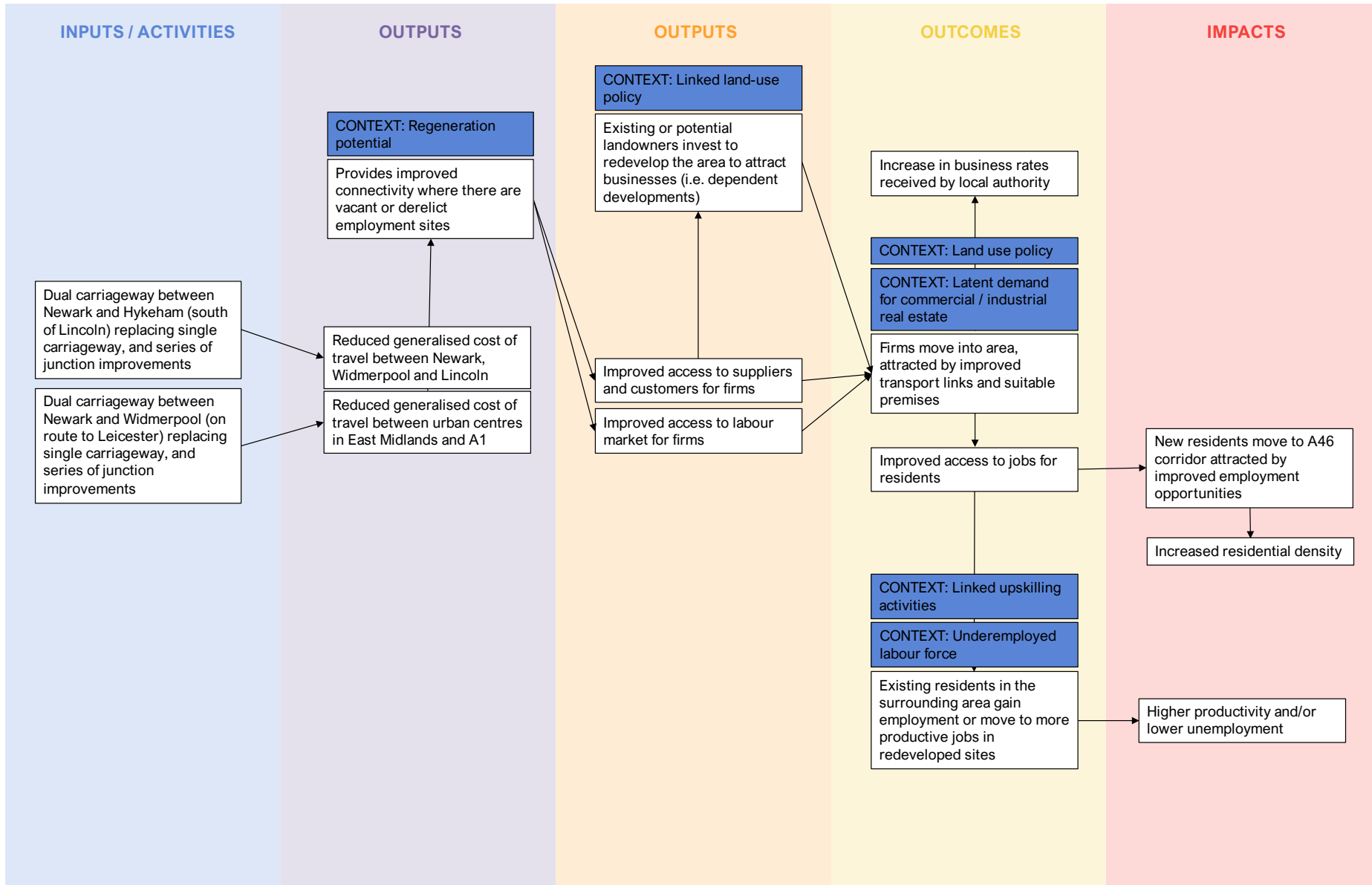
- **Changes in economic activity and land-use, where the improved road connectivity unlocks the economic potential of areas.** As with the Great Yorkshire Way and Markham Vale schemes, we expect that the introduction of motorway connectivity will have enhanced the attractiveness of many nearby locations for firms that require easy freight access. This will have supported the business case for redeveloping these areas, which in turn may have induced further investments. The combined effect of this would be to create new employment opportunities for local residents.

**Contexts.** We have identified three potential contextual factors that are likely to be most relevant to this scheme:

- Linked land-use policies to support further investment in residential and industrial developments.
- Linked developments that work alongside the transport investment, as an anchor to attract further investment.
- Linked policies to support local residents to access the jobs created in the business park.



Figure 17-3: Logic Map for A46 Newark to Lincoln and Widmerpool



## 17.3. SURROUNDING CONTEXT

### 17.3.1. Characteristics of the area at time of investment

The following factors, which were pre-existing conditions at the time the A46 schemes opened, may have influenced the realisation of the economic outcomes and impacts predicted by our Theory of Change.

#### Business cycle

The impacts predicted by our Theory of Change are likely to be influenced by wider macroeconomic conditions through one of two channels:

- the rate of traffic growth, and
- wider business and consumer confidence.

The first section (Newark to Lincoln) Phase 1 opened in 2003 during a period of sustained economic growth. This is likely to be a factor which supported higher than forecast traffic usage (see Section 17.4.1 below).

The second section (Newark to Widmerpool) opened in 2012 during the recovery from the 2008-09 recession and 2011-12 sovereign debt crisis. Productivity growth has been notably weaker since the 2008-09 recession, which means that actual GDP growth underperformed the forecasts that informed the scheme business case. As a result, traffic growth on the second section has not been as strong as predicted. Combined with the impact that the sluggish recovery may have had on investment decisions by firms and consumers in the region, the economic cycle may have undermined the delivery of associated economic impacts.

Newark and Lincoln are both towns in good economic health, but performance over the past fifteen years has lagged slightly behind national trends. Average annual GVA growth in North Nottinghamshire (0.9 percent) and Lincolnshire (1.2 percent) has been below the UK average (1.5 percent) over the period 2004-2019.<sup>410</sup> Important sectors of activity in the local region include agriculture, distribution, tourism, manufacturing, transport and communications.

#### Quality of existing transport access

The quality of existing transport access is also important because, all else equal, our Theory of Change suggests that the impacts should be larger in places where the change (improvement) in transport connectivity is greatest.

In this case, Newark and Lincoln were already relatively attractive and accessible locations within the Nottinghamshire/Lincolnshire region, being close to the A46, A52 (towards Nottingham and Derby) and the A1 (towards the North-East). Our review of the existing evaluation literature suggests that the quality of existing access to the towns along the route was good, but the A46 and surrounding network could be heavily congested at peak times, particularly north of Newark and south of Lincoln.

The most congested link was the section of the A46 north-east of Newark, between the A1 and A1133. Other congested links include the Newark bypass, and north-west of Lincoln between the A1434 and A57. Traffic flows between Lincoln and Newark towards Nottingham via the A52 from the A46 are affected by long delays during peak periods, although junction improvements planned for delivery during RIS1 were expected to improve network efficiency and reduce congestion between the A46 and Nottingham.<sup>411</sup>

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<sup>410</sup> ONS (May 2021) "Regional gross value added (balanced) by industry: chained volume measure, 2018 prices" available [online](#).

<sup>411</sup> Highways England (July 2016) "Assessment of growth impacts" available [online](#).

## Housing

New housing development is more likely to be stimulated in areas where the demand for housing is already high, and the supply constrained. Whilst we do not observe particularly acute housing affordability pressures in the Lincolnshire area, housing affordability pressures have grown across most of the UK over the past 20 years.

Newark, Lincoln and nearby Grantham were given “Growth Point” status by the UK government in 2005. The New Growth Points initiative was designed to support local communities which wanted to pursue large scale and sustainable growth, including new housing, to help alleviate what was perceived at the time as a national housing supply shortage. Local authorities received additional funding for new infrastructure projects and growth-related projects, and to unlock sites for new housing. Newark and Lincoln were designated as New Growth Points because of their location, the potential for regeneration, the need for substantial affordable housing and the need for new infrastructure improvements. Around 24,500 homes were proposed for Newark and Lincoln between 2006 – 2016, although only around half of these were delivered due to the financial crisis of 2008–09.<sup>412</sup>

## Commercial development

We also expect that it is more likely that new commercial, industrial and warehousing development is stimulated in areas where demand was already greater than supply. This is more difficult to demonstrate quantitatively in out-of-town areas than urban centres, and we didn’t find any publicly available quantitative indicators which demonstrated that there was pent-up demand for new commercial and/or industrial development along the A46 route. We recognise that there may have been some unsatisfied demand for this space but based on the evaluation literature we reviewed we conclude that any pre-existing “pent up” demand was not material.

## Regeneration potential

We didn’t find any publicly available quantitative indicators which demonstrated that there was the existing potential to regenerate any of the towns along the route. We did note qualitative evidence from an existing evaluation which noted that there was a disused former RAF airfield which had been earmarked for development in the local plans.

We recognise that there may have been some potential for the redevelopment of small sites in Newark and Lincoln but based on the evaluation literature we reviewed we conclude that the potential for regeneration was not material.

## Underutilised skills

Our Theory of Change suggests that the change in transport connectivity should facilitate a reduction in unemployment and/or an improvement in productivity in places where there where “underutilised skills” in the labour force – i.e. local workers have the potential to produce more output and/or move to a more productive sector, or if local unemployment is higher than the “natural rate”.

We have not found any quantitative indicators to suggest that the areas along the A46 had underutilised skills. Lincoln has tended to have above average rates of unemployment over the past ten years, but the rest of the area has experienced low or average unemployment. Both towns have relatively low levels of deprivation.<sup>413</sup>

Demonstrating that the labour force is underutilised is difficult, particularly in relation to skills. It often depends on survey data, asking employees whether they believe they have more skills than are necessary for their current job.

### 17.3.2. Associated activities and actions alongside transport investment

The following factors, which occurred alongside the construction and/or opening of the A46 schemes, may have influenced the realisation of the economic outcomes and impacts predicted by our Theory of Change.

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<sup>412</sup> MHCLG (November 2020) “Live tables on housing supply – table 122: net additional dwellings by local authority” available [online](#).

<sup>413</sup> Highways England (July 2016) “Assessment of growth impacts” available [online](#).

## **Benefits realisation**

Our Theory of Change posits that transformational impacts are facilitated by a coherent plan to realise the benefits of the investment in the Strategic Road Network. But we were not able to locate a benefits realisation plan for either of the A46 improvement schemes.

It is not the existence of a benefits realisation plan that matters, as that will not in and of itself determine the success of the scheme. What matters is the overall coherence of the local economic development strategy to realise the benefits that improved road connectivity brings, which in this case would require a wider assessment of the local plans for Newark, Lincoln and other towns affected by the A46 route.

## **Unlocking development**

Our Theory of Change recognises that a change in transport connectivity may not ‘unlock’ associated changes in land use (via residential and/or commercial real estate investment) unless there is an associated change in land use policy<sup>414</sup> to enable that development to take place.

## **Regeneration programme**

Our research did not identify any material regeneration programmes or activities that were implemented alongside the investment in the A46, to better realise and/or maximise the local economic impacts.

## **Skills investment**

With economic transformation we would expect a change in the sectoral distribution of employment. The UK’s competitive strengths lie in higher valued added industries, and (in theory) we would expect to see a transition towards higher value-added activities in the areas after the intervention. To facilitate this transformation, local actors may need to invest in the human capital of the labour force.

However, in this case we were not able to identify any notable skills policies which were specifically implemented alongside the A46 schemes to improve and/or better match the skills of the labour force in the areas along the line of route, and therefore raise productivity.

## **17.4. SCHEME OUTPUTS, OUTCOMES AND IMPACT**

In this subsection, we consider whether there is evidence to demonstrate that the A46 improvement schemes contributed to “transformational” changes in the main economic outcomes of interest - employment, productivity and housing – as well as some other close proxies for economic change in the areas closest to the improvements.

### **17.4.1. Traffic impacts**

Once completed, we understand that the Newark to Lincoln scheme (Section 1, opened 2003) saw significant traffic growth approx. 50 percent above forecast levels.<sup>415</sup> Highways England also found that the subsequent Newark to Widmerpool scheme also increased traffic on certain sections of the A46 by around 34 percent to 51 percent on an average weekday, with the highest increases on the northern sections. Highways England also found a reduction in traffic on local roads which no longer directly provide access to the A46, and an increase on local roads which now provide direct access, due to local re-routing.<sup>416</sup>

For the Newark to Lincoln improvements, Highways England’s post opening evaluations found higher than forecast journey time savings. But, partly as a result of increased traffic flows on the A46, overall journey time benefits for

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<sup>414</sup> We use a broad definition of ‘land use policy’ to include, for example, the creation of an urban development company with powers over land use planning and development control.

<sup>415</sup> CPRE (March 2017) “The Impact of Road Projects in England” available [online](#).

<sup>416</sup> Highways England (August 2017) “A46 Newark to Widmerpool Improvement Scheme – Five Years After Opening” available [online](#).

the Newark to Widmerpool improvements were not as high as originally forecast in the business case, although the scheme was still in the 'high' value for money category.

## **17.4.2. Impact of transport investment on economic outcomes**

### **Population**

We did not identify any previous studies which assessed the impact of the A46 improvement schemes on the local population of the towns along the route.

### **Employment**

A previous study commissioned by Highways England concluded that the A46 schemes had been important in attracting businesses to the local area by improving accessibility. Opportunities for new local employment sites are important for due to the shortage of available land within Newark and Lincoln. But it was conceded that these developments might have been brought forward even without the A46 schemes.<sup>417</sup>

The study noted that North Kesteven (a local authority in west Lincolnshire) has been working to develop employment land at Witham St Hughs – the former RAF Swinderby airfield – since its closure in 1993. It lies close to the A46 between Newark and Lincoln. Possibilities for development were previously limited due to poor road access to the site. The roundabout construction that took place as part of the Newark to Lincoln scheme was therefore identified as critical for unlocking the site for development and the dualling made the site more attractive. Various distribution and engineering businesses are now located at the site, including Siemens, a major employer (~600 jobs) who relocated their industrial gas turbine service from the city centre, as well as the council's energy to waste facility, and several smaller businesses and retail and car dealership units.<sup>418</sup>

The study also notes that in nearby Rushcliffe, a total of 26.5 ha of proposed mixed-use employment land is associated with three developments based around the A46 Newark to Widmerpool at Bingham, former RAF Newton and Cotgrave Colliery. D2N2 suggests 2,000 jobs could result from these developments, although the basis of this estimate is not clear.<sup>419</sup>

It also cites a major investment by KnowHow (after-sales support and distribution for Dixon Carphone) at a site on the A46/A17 roundabout. The study claims this is associated with the strong connectivity in Newark that the A46 schemes have contributed to. The company employs 800 staff in Newark and has recently expanded, with an expected additional 700 jobs.<sup>420</sup>

Overall, we find that there is a good basis to believe that businesses value the improved connectivity and reduced travel costs that result from the A46 improvements, and that this has encouraged them to move into new sites. This has employment benefits for local residents, which are enabled or supported by the schemes. But there has been no evaluation of the extent to which these jobs are 'additional' in net terms, and the amount of displacement from other areas could be significant.

### **Firm entry**

We did not identify any previous studies which sought to assess the impact of the A46 improvement schemes on firm entry and exit by using established datasets. Previous work commissioned by Highways England showed that several large employers moved into new employment spaces developed close by (see section on '*Regeneration and development*' below) but did not examine the overall net effect on enterprise units in the places most closely affected by the upgraded route.

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<sup>417</sup> Highways England (July 2016) "Assessment of growth impacts" available [online](#).

<sup>418</sup> <https://tealpark.co.uk/>

<sup>419</sup> D2N2 (2014) "Strategic economic plan" p18, available [online](#).

<sup>420</sup> Highways England (July 2016) "Assessment of growth impacts" available [online](#).

## Land values and property prices

We did not identify any previous studies which sought to assess the impact of the A46 improvement schemes on local land and property values.

## Productivity and wages

We have not found any evidence of the impact of these schemes on firm level productivity, or on local wages, which makes it difficult to positively determine that the schemes have contributed to a change in local economic performance. Whilst this is not surprising given the weakness of local economic evaluation generally, it is harder to make the case that there is strong evidence that such schemes raise the productivity of freight and business users, given the prominence of these objectives within the original stated case for the schemes.

In the context of this study, it is unfortunate that a more detailed evaluation does not yet exist for the translation of journey time and reliability benefits for business and freight users into increased productivity and/or employment opportunities in the region, nor the consequent impact of population growth on consumer and business spending in the region. Such impacts are often estimated, but can be challenging to demonstrate through quantitative analysis, because it is difficult to separate firms and/or places which received the ‘treatment effect’ of the improved roads, versus those that did not. Whilst there are good theoretical links between the Strategic Road Network and economic performance,<sup>421</sup> and anecdotal support for similar investment schemes amongst national businesses, we suggest that the DfT considers how the evidence base in this area could be further developed. Given the strong emphasis in such schemes on supporting local economic growth based around transport intensive sectors (i.e. in manufacturing, construction and engineering, storage and logistics), there should be a particular emphasis on the impact of road improvements on firm-level productivity, employment and household wages.

## Housing

Previous studies have concluded that the A46 schemes directly facilitated the development of major residential sites which previously were unviable because of accessibility constraints – in particular, land at former RAF Swinderby, now known as Witham St Hughs, where the first phase of development delivered 1,000 homes. Another 1,200 are under construction and close to completion.

Improved connectivity as a result of the schemes has supported other completed and proposed housing development to the south of Newark, including Newton Garden Village (under construction – up to ~500 homes) and Hollygate Park in Rushcliffe (complete, ~470 homes). Including the Newark South strategic project, where there is planning permission for 3,150 homes subject to the delivery of a new Southern Link Road to the A46, it is claimed that the combined improvements to the A46 could support up to 8,000 new dwellings by 2036.<sup>422,423</sup>

Whilst some of these sites might not have been viable without the road improvements, for the subsequent scheme it is likely that the improvements improved the viability of these developments. Therefore, it is difficult to prove how much of this new housing development might have come forward even without the improvements to the A46.

For example, with regards to the Witham St Hughs development, the local authority had identified the former airfield as a potential site for housing development some time ago. Whether this housing development is ‘additional’ would depend on whether new housing would have been accommodated at other development sites in the region to

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<sup>421</sup> An important paper in this space is Gibbons, S. *et al* (May 2017) “New road infrastructure: the effects on firms”. This study found that improvements to the road network increase the number of firms and employment in places that gain through better access, and that incumbent firms make productivity improvements, but was not able to determine whether this was the result of improved access to markets, intermediate inputs or workers, or just improved travel times in general. In common with all empirical work that estimates causal effects from statistical comparisons across time and place, it is impossible to know for sure whether these employment increases are additional to the aggregate UK economy.

Separately, Highways England has published a series of papers on how it supports economic growth, available [online](#), but the ex-post evaluation of the wider economic impacts of previous schemes is limited.

<sup>422</sup> Highways England (July 2016) “Assessment of growth impacts” available [online](#).

<sup>423</sup> Urban & Civic (accessed August 2021) “Middlebeck – Newark” available [online](#).



deliver on local housing allocations, which seems likely to some degree. Without the original business case, it is difficult to say how quickly the new residential developments were built out relative to expectations before the scheme was built, or whether more homes were eventually delivered than were originally planned. Overall, the residential developments appear to have been successfully delivered, which is linked to both the improvement schemes and a relatively supportive macroeconomic backdrop.

## **Regeneration and development**

We were not able to identify any notable regeneration impacts associated with the A46 improvement schemes.

A previous study commissioned by Highways England noted that two sites to the south of Newark have also been allocated for industrial and commercial development. This consists of 40 ha of employment land known as “Land South of Newark” and a 15-ha business park for serviced offices at Fernwood. The dualling of the A46 from Newark to Widmerpool is expected to benefit both of these developments, though both would have occurred without it.<sup>424</sup>

Additionally, planning permission has been granted for three supermarkets in the Bingham and Chapel Lane area. The transport assessment prepared to support planning permission for housing and residential land north of Bingham notes that the A46 dualling must be completed before construction work can commence and that the A46 scheme eliminates the need for road improvements.

## **Other perceived impacts on the local economy**

The scheme has contributed to improving the accessibility of Lincoln via the A1 and East Coast Main Line in Newark and therefore to London and other core cities. Previous studies have noted that some businesses, particularly head offices in Newark and those that require specialist labour such as tech firms, are expected to have benefited from easier commuting other urban centres. Strong connectivity has been associated with expansion of various businesses, including food processing in Newark, though it is difficult to separate this from business growth following increased economic growth in recent years.<sup>425</sup>

## **17.5. SOURCES**

BBC (23 March 2012) “A46 widening 'could bring in £2m' to Lincolnshire” available [online](#).

BBC (25 November 2011) “New A46 widening plan road in Nottinghamshire opens” available [online](#).

CPRE (March 2017) “The Impact of Road Projects in England” available [online](#).

Gibbons, S., Lyytikäinen, T., Overman, H. and Sanchis-Guarner, R. (May 2017) “New road infrastructure: the effects on firms” available [online](#).

Highways England (August 2014) “A46 Newark to Widmerpool Improvement – One Year After Study” available [online](#).

Highways England (July 2016) “Assessment of growth impacts” available [online](#).

Highways England (August 2017) “A46 Newark to Widmerpool Improvement Scheme – Five Years After Opening” available [online](#).

Midlands Connect (November 2020) “A46 Corridor Study – Phase 2 Task 1 Final Report” available [online](#).

Newark and Sherwood District Council (2008) “Economic growth and prosperity – supporting paper” available [online](#).

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<sup>424</sup> Highways England (July 2016) “Assessment of growth impacts” available [online](#).

<sup>425</sup> Highways England (July 2016) “Assessment of growth impacts” available [online](#).



## **APPENDIX A LIST OF INTERVIEWEES**

We interviewed individuals from the following organisations:

- Transport for Scotland
- Devon and Cornwall Rail Partnership
- Cornwall Council
- Ipsos Mori
- Doncaster Metropolitan Borough Council
- Transport for Greater Manchester
- Bank of Spain
- University of Castilla-La Mancha
- Bristol University
- Transport for London
- Nottingham City Council
- Falmouth Town Council
- Gravesham Borough Council
- Former employee of the Corby Development Corporation Reading Borough Council
- Rochdale Borough Council
- Salford City Council
- Sheffield City Region Combined Authority
- West Yorkshire Combined Authority

## Appendix B STRENGTH OF EVIDENCE BASE

Table B-1 below summarises the type of evidence we found for each of the case studies. We also provide an assessment of the strength of that evidence base. While the table is binary our assessment reflects for example the depth of the evaluations not just the presence of an evaluation. In some cases the focus of the evaluations or the studies while informative were not directly focused on our research questions and therefore did not strengthen the evidence based for the case study.

Table B-1: Summary of the evidence base for each case study

Case study	Evidence Base							Overall strength of evidence
	Business case	Primary research*	Evaluation**	Academic studies	Interviews	Misc reports	News stories	
Greater Manchester Metrolink	Y – Phase 3	N	Y	Y	Y	Y	Y	Strong
Jubilee Line Extension	N	N	Y	Y	Y	Y	Y	Strong
Nottingham Express Transit	Y	Y	Y	Y	Y	Y	Y	Strong
High Speed 1	N	N	Y	Y	Y	Y	Y	Reasonable
High Speed Rail Network – Spain	N	N	N	Y	Y	Y	Y	Reasonable
West Coast Mainline upgrades	N	N	Y	Y	Y	Y	Y	Reasonable
Borders Railway	Y	Y	Y	N	Y	Y	Y	Weak
Edinburgh-Glasgow Improvement Programme	Y	N	Y	N	Y	Y	Y	Weak
Reading station redevelopment	Y	N	N	N	Y	Y	Y	Weak
Kirkstall Forge	N	Y	Y	N	Y	Y	Y	Reasonable
Corby new station & rail service	N	N	Y	Y	Y	Y	Y	Reasonable
Falmouth rail improvements	Y	N	Y	N	Y	Y	Y	Reasonable
Great Yorkshire Way	Y	N	N	N	Y	Y	Y	Reasonable
Markham Vale	Y	N	Y	N	Y	Y	Y	Weak
A46 Newark to Lincoln & Newark to Widmerpool	N	N	Y	N	N	N	Y	Weak

\* The primary research undertaken as part of this study for the case studies marked as “Y” are at level 1 on the Maryland Scale.

\*\* Where there is an evaluation marked for a scheme but the evidence base is considered weak overall it is because we did not consider the evaluation to be sufficiently robust to reach similar to level 1 on the Maryland scale on the areas of interest for this study.



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