

# Preface

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Worcestershire County Council (WCC) and Worcestershire Local Enterprise (WLEP) are pleased to be able to submit a Full Business Case (FBC) to the Department for Transport to obtain construction funds from the Large Local Major Transport Schemes' fund. The scheme being promoted by WLEP/WCC is the completion of the dualling of the A4440 Worcester Southern Link Road (SLR). This Full Business Case builds on the work presented in the Outline Business Case and subsequent Addendum report, presented to the department in January 2018.

The scheme is the final phase of the four phase programme which upgrades the A4440 Worcester SLR to dual carriageway standard. Prior to the commencement of the upgrade programme, the A4440 Worcester SLR was largely a single carriageway route that was subject to congestion and unreliable journey times meaning that long distance trips currently use the City centre infrastructure to cross Worcester. The upgrade of the whole route to dual-2 carriageway standard with associated junction improvements will significantly increase the attractiveness of the bypass route making it the route of choice for East West movements.

Hence, the scheme will reinforce the role of the bypass as a strategic East West route, as well as a bypass to the City centre, and underpins the market confidence in the public sectors ability to deliver this key infrastructure required to drive the delivery of the economic growth ambitions contained in the Worcestershire Strategic Economic Plan (SEP) and the Local Development Plans.

The A4440 Worcester SLR Phase 4 scheme is supported by a robust case for change, demonstrates very high value for money, has a sound commercial footing, is very well supported by stakeholders and is deliverable by 2021, as illustrated by the comment below:

*“As a global business based in St John’s Worcester, we would welcome any infrastructure improvements that will help our employees, suppliers and customers to access our site. We currently experience extreme delays on this stretch of road; Phase 4 completion is therefore essential to the economic growth of our business and Worcester as a whole.”*

Source: Letter of support from Joy Global (worldwide leader in high-productivity mining solutions)

Phases 1 and 2 have already been successfully completed, with Phase 3 in construction and almost complete. However, the fourth phase is a large and potentially transformative local scheme that is outside the financial limits placed on WLEP within the regular Growth Deal allocations. Without the Large Local Major Transport Schemes fund, this regionally important scheme could not be funded.

The A4440 Worcester SLR is the main route that takes traffic to and from Junction 7 of the M5 motorway into South West Worcestershire and towards our County borders. Growth in this area has meant that for many years, this road has been operating at well over 120% of its original design capacity. Many large employers’ key concern is that the resultant congestion is a significant factor in deciding whether to locate to, or more worryingly away from, the county's high tech employment sites spawned by the likes of Qinetiq. Strategically the scheme addresses the key national priorities as follows:

- **Congestion Relief:** Improvements to the A4440 Worcester SLR will reduce the negative effects of congestion and improve accessibility and journey times across south Worcestershire. Overall the scheme increases traffic flow on the A4440 Worcester SLR by 45 to 66% and journey times on the A4440 would improve by 53% in the AM/PM peaks in 2031.
- **Economic Growth:** The scheme will not only secure existing businesses but would also enable WLEP/WCC aspirations for the expansion of county's 'Gamechanger' sites such as Malvern Hills Science Park, South Worcester etc. The scheme will support economic growth by releasing an additional 15 ha of employment land. In addition, relieving Worcester City congestion enabling the addition of 2000- 3,000 jobs in the City over time and repositioning the City as a leading Cathedral City,. Finally, and not least, the scheme can remove the perception that Worcester is 'closed' at time of serious flood.
- **Housing Growth:** A4440 Worcestershire SLR Phase 4 will help advance Policy SWDP45/1 Broomhall Community and Norton Barracks Community (Worcester South urban extension) which will comprise

2,600 dwellings and 20 Ha employment together with supporting services and facilities. This quantum of development could sustain more than 3,600 jobs and generate nominal GVA in the region of £195m per annum upon completion. In addition, A4440 Worcester SLR Improvements Phase 4 will help to unlock the development of 2,150 dwellings, 5Ha of employment land and a range of supporting services and facilities including a neighbourhood centre as part of the Worcester West urban extension (see: Policy SWDP45/2 Temple Laughern – (Worcester West) urban extension). This quantum of development could sustain more than 900 jobs and generate nominal GVA in the region of £49m per annum upon completion. Further, the SLR is considered critical to unlocking development at North East Malvern (see Policy SWDP 56), where 800 homes and 10ha of employment land will be delivered. This quantum of development could sustain more than 1,800 jobs and generate nominal GVA in the region of £97m per annum upon completion. In total, these strategic development sites could generate 5,600 new homes and 35ha of employment land, supporting in excess of 6,300 jobs and providing GVA uplift of £340m per annum.

In addition to above, the connectivity to the Strategic Road Network from the west is notably poorer in the peak periods, in the Worcester area, due to congestion. This has meant that employment development to the West of Worcester is not attractive. Indeed, there has been a case where a site allocated for employment use has been developed for residential use due to lack of market interest in employment development to the West of Worcester. Feedback from the business community has shown this is due to connectivity, particularly lack of certainty of travel times to the Strategic Road Network. The scheme would address this issue.

The unattractiveness due to congestion and unreliability on the A4440 Worcester SLR results in trips routeing through the City, rather than using the Southern Link Road. Worcester's current high levels of congestion reduce the attractiveness of the City as a location for business and thus growth and regeneration opportunities are not taken forward. Removing strategic traffic from the city centre will enable Worcester to meet its socio-economic aspirations.

As set out above, the improvements to the A4440 Worcester SLR (Phase 4) will provide much needed network resilience to combat River Severn flooding, which has impacted the city centre during recent floods in 2003, 2007, 2012 and 2014.

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# 1 Introduction

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## 1.1 Full Business Case (FBC)

The A4440 Worcester SLR Phase 4 scheme is supported by a robust case for change, a strong economic case, is well supported by stakeholders and is deliverable. It is embedded within both the Local Transport Plan 4 (and previous Local Transport Plan) and the South Worcestershire Development Plan (SWDP) and as such has a clear policy context. It also has strong community support and political backing and is a key part of the Worcestershire Strategic Economic Plan (SEP). The SEP has highlighted the A4440 Worcester SLR scheme as a critical element of the infrastructure package required to support planned levels of development in Worcester and therefore has a highly important role to play in supporting the economic growth of the local area.

As such, Worcestershire County Council (WCC) is committed to delivering the much needed improvements to the highly constrained A4440 Worcester SLR; a key network corridor linking the M5 Junction 7 and the eastern side of Worcester with Worcestershire's Primary Road Network (PRN) to the west of Worcester.

The Corporate Plan (2017-2022) states "Our continued investment in Worcestershire's transport and digital infrastructure is essential to provide businesses with improved access to markets and to support economic growth.

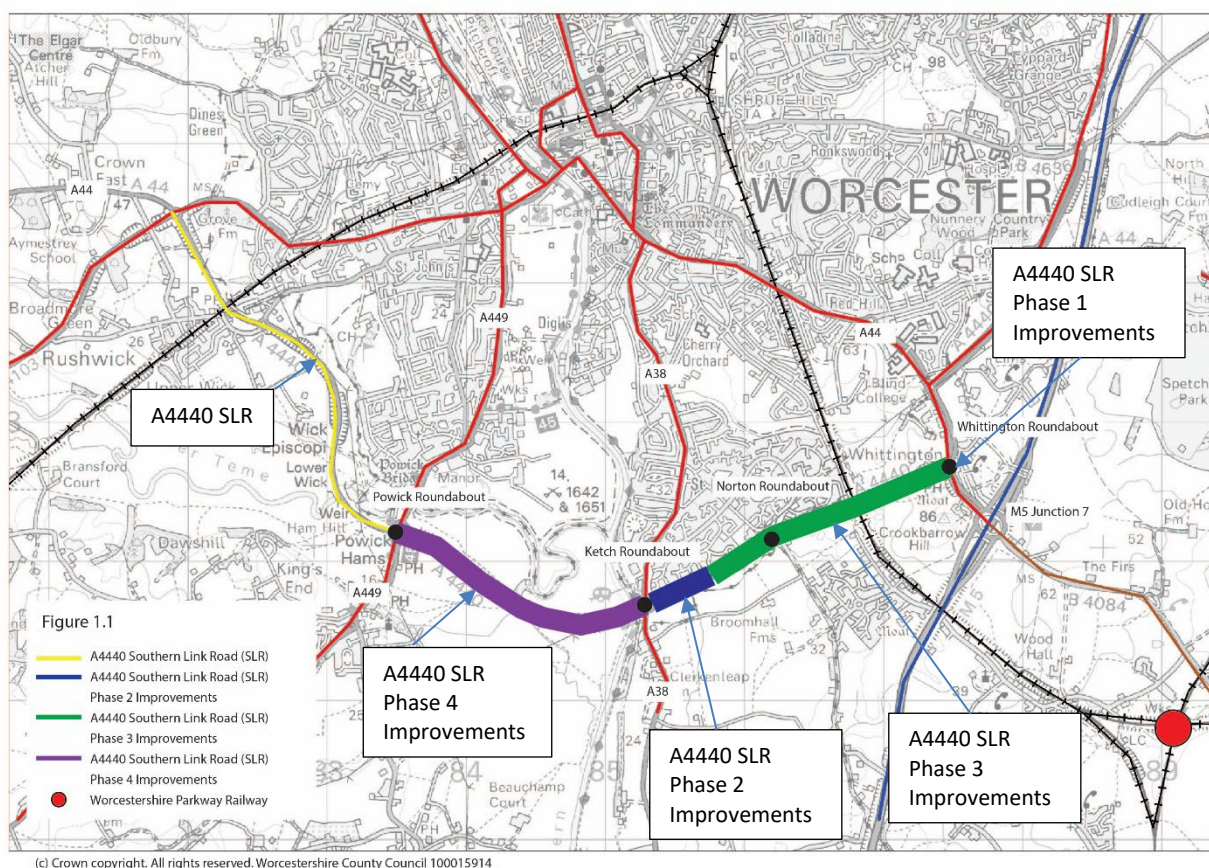
Transport infrastructure investment will be targeted to unlock the potential of key employment and housing development sites across the county.

Reducing journey times across the county and beyond is a key ambition, with investment focusing on improving access to national and global markets and enhancing connectivity between key economic centres."

This strategically important link is one of only two river crossings in and around Worcester with the other in the highly congested city centre. The A4440 Worcester SLR is currently a significant constraint to growth in Worcestershire with the situation only set to worsen. Due to the limited number of river crossings, current network resilience is poor, particularly in times of flooding.

The first two phases of the planned improvements have been delivered and the third phase commenced construction in October 2015 and is due for completion in 2019/2020 (the location and phasing of the improvements are shown in Figure 1.1 ).

Figure 1.1: Scheme Location



The A4440 Worcester Southern Link Road Improvements Phase 4 (the “scheme”) includes (see visualisation of the scheme in Figure 1.2):

- Construction of an additional carriageway adjacent to the existing single carriageway to form a 1.2 mile (1.9km) dual-2 carriageway from Ketch Roundabout to Powick Roundabout;
- Two new bridge structures to carry the additional 2 lane carriageway, at Carrington Bridge and at Powick Common viaduct;
- Capacity Improvements and junction revisions to allow dual carriageway connections at Ketch Roundabout;
- Widening of the existing footway to accommodate a shared pedestrian/cycle route on northern side;
- New road markings, some widening of carriageway on west approach to accommodate movements to new dual carriageway section at Powick Roundabout;
- Upgrade of dedicated left hand turn to Malvern to fully segregated facility at Powick Roundabout;
- Provision of a foot/cycle bridge linking the north and south cycle routes, located on the west approach, at Powick Roundabout; and
- Upgrade of grade separated pedestrian route for north to south movements at Ketch Roundabout.

Figure 1.2: Scheme visualisation



This Full Business Case (FBC) for the scheme updates the detailed scheme appraisal presented in the Outline Business Case, and is undertaken in line with WebTAG guidance.

The planned improvements are a key component of the Worcester Transport Strategy (WTS) which is a multi-modal response to increasing traffic volumes and development pressures in Worcester and surrounding areas. To deliver the WTS in full, WCC and partners would have needed to secure over £200 million of investment. Clearly, the possibility of accruing this level of funding at any one time was impossible. Therefore, the Council has adopted a strategy of delivering the full Worcester Transport Strategy through a phased approach, delivering parts of the strategy as funding becomes available.

Phase 4 of the improvements to the A4440 Worcester SLR is the final stage of a programme of works to increase the capacity of the A4440 Worcester SLR route between Powick Roundabout and Whittington Roundabout. This phase includes improvements to the river crossing and unlocks the potential of the A4440 Worcester SLR improvement strategy by increasing the future year traffic by between 45% and 66%. This additional capacity is taken by East West trip diverting from the city centre, trips re-routeing from less suitable routes and from new economic and housing growth to the west of Worcester.

The significant increase in future traffic released by A4440 Worcester SLR Improvements Phase 4 provides a number of real benefits to residents and businesses in and around Worcester and the wider Worcestershire area including:

- Reduced journey times on the A4440 Worcester SLR. In the 2031 Do Something forecast journey times are 4-8.5 minutes less than the 2031 Do Minimum journey times
- Increased journey time reliability, as the congestion delays are minimised; and
- Improved access to Malvern, Worcester and the surrounding areas therefore increasing attractiveness of sites for development and aiding the delivery of South Worcestershire Development Plan, thus stimulating economic growth.

Evidence of the impacts of the scheme are documented in Sections 3 and 4 of this FBC.

The design of the A4440 Worcester SLR Phase 4 Scheme improvements has been developed to DMRB design standards based upon the predicted traffic flows from the latest 2031 WTM traffic flows. Highway cross sections, 2D roundabout layouts, and 2D highway alignments have been included within Appendix A of this Full Business Case.

The scheme is strongly supported by businesses.

*“The development of the Southern Link Road (A4440) is crucial to supporting local businesses and to removing barriers to economic growth.”*

Source: Letter of support from Worcestershire LEP.

## 1.2 Background to the scheme

The A4440 Worcester SLR forms part of Worcestershire's Primary Road Network (PRN). It passes to the south of the existing urban area. It links the Strategic Road Network (SRN) at M5 Junction 7 and the eastern side of Worcester with the A38, A449, A4103 and A44 and the associated radial corridors to/from Worcester and the wider area to the west and south of the City. In providing this orbital link, it provides for journeys between radial routes in Worcester as well as longer distance trips within the County and beyond.

The A4440 Worcester SLR also serves existing development and employment areas and the South Worcestershire Development Plan (SWDP) major residential allocations on the southern and western side of Worcester City and in Malvern Hills District to the west. Most notably, the A4440 Worcester SLR programme is associated with the South Worcester Urban Extension (SWUE), which is located immediately to the south. The A4440 Worcester SLR provides a vital highway link between the M5 (and the wider SRN) and South and West Worcester, Great Malvern, the wider Malvern Hills District, Ledbury, Upton and Herefordshire.

Constructed in the 1980's, the A4440 Worcester SLR was designed to a single carriageway standard, with a series of at-grade junctions with key radial routes to/from Worcester city centre. These junctions were of roundabout form with some widening of the A4440 Worcester SLR on the approaches to provide additional stop line capacity. With the growth of Worcester in more recent years, the original design standard has resulted in severe delays during peak periods, a problem which transport model forecasts are indicating will worsen as a result of the development growth planned for South Worcestershire and the wider county and region. Transport modelling has also shown that the original design standard has become a constraint on the use of the A4440 Worcester SLR and some trips are finding alternative, less appropriate, routes around or indeed through Worcester. The Worcester city river crossing accommodates 40,000 daily trips compared to 30,000 on the A4440 Worcester SLR

The scale of the A4440 Worcester SLR and associated Worcester traffic problems and the costs that these impose on the businesses, transport operators and users are such that, if left unresolved, will constrain the ability of south Worcestershire to accommodate planned development and support economic growth. Hence, the scheme will address a significant constraint on the performance of the transport network in Worcester and wider South Worcestershire. It will provide additional link and junction capacity over a key section of the A4440 Worcester SLR.

The scheme will increase capacity of the SLR and make access to the west of Worcester significantly quicker and more reliable. This will in turn make development sites, such as Worcester West Urban Extension and North-East Malvern more attractive and thus more development to be realised (3,000 dwellings and 15 Hectares of employment land).

The scheme is a component part of the WTS. Through the preliminary assessment of the WTS and recognising that it was not possible to be granted funding for the complete WTS at one time, an exercise was undertaken to identify an initial Phase 1 package and then subsequent components which complemented and enhanced the benefits that could be realised from the initial Phase 1 package. As these subsequent phases are each significant projects in their own right, it was further necessary to programme the schemes to meet with funding availability. Hence, through this process, WTS was divided into the following phases:

- WTS Phase 1: The appraisal showed it to deliver strong positive benefits across DfT appraisal criteria (this phase included the sustainable measures in the City and A4440 Worcester Southern Link Road Phase 1 and Phase 2 schemes); and
- Subsequent phases of WTS: The case for the subsequent phase of the WTS is as robust as Phase 1 in terms of the value for money offered (this phase includes the A4440 Worcester Southern Link Road Phase 3 and Phase 4 schemes).

A4440 Worcester Southern Link Road improvements have been split into four phases, these are shown on Table 1.1 .

Table 1.1: A4440 Southern Link Road Phasing

Phase	Scheme	Status
Phase 1	Whittington Junction minor Improvements	Completed
Phase 2	Ketch Junction improvements and provision of 600 metres of dualling towards Norton Roundabout	Completed
Phase 3	Norton Roundabout improvements and completion of dualling between Whittington and Ketch junctions	To be completed by Autumn 2019
Phase 4	Further capacity enhancements between Powick and Ketch junctions	To be implemented by 2021 – subject of this FBC

Phase 1 of the A4440 Worcester SLR improvements were completed in July 2012 and consisted of capacity enhancements to the Whittington Roundabout. Phase 2 works have recently been completed and provide enhancements to the Ketch Roundabout and 600 metres of dualling of the A4440. Phase 3 comprises dualling between Whittington and Ketch junctions and Norton Roundabout improvements.

### 1.2.1 History of the A4440 Worcester SLR strategy

The A4440 Worcester SLR strategy has been in development for some time. Previous work pertinent to the conception and the development of the Southern Link Road schemes includes:

- 2006 – Local Transport Plan 2;
- 2010 – Worcester Transport Strategy (2010);
- 2010 – Worcester Transport Strategy – Preliminary Appraisal Report (2010);
- 2011 – Local Transport Plan 3;
- 2014 – Phase 3 Business Case;
- 2015 – Phase 4 SOBC considered by the LEP;
- 2016 (May) - Phase 4 SOBC and ASR issued to DfT;
- 2016 (July): Phase 4 Emerging OBC issued to DfT;
- 2016 (October): Phase 4 LLM £500K Development Funding awarded;
- 2017 (January): Phase 4 OBC issued to DfT;
- 2017 (November): Local Transport Plan 4 adopted;
- 2017 (November): Phase 4 DfT Programme Entry Gained; and
- 2018 (April): Planning Consent Granted.

### 1.2.2 Structure of Business Case

The Appraisal Framework that is being used in this study is based on DfT's Transport Business Case Guidance and uses the best practice five case model approach. The methodology adopted for the following cases is as follows:

- Strategic case – this sets out the rationale of the proposal, making the case for change at the strategic level. This will facilitate the assessment to the degree to which the locally developed objectives and other relevant local, regional and national objectives are expected to be achieved.
- Economic case – this sets out the value for money that each option delivers. Evidence on economic, environmental, social and distributional impacts should be identified.
- Financial case – this presents the financial profile of the different options and the impact of the proposed funding arrangements.

- Management case – this assesses whether a proposal is deliverable by testing the project planning, governance structure, risk management, communications and stakeholder management, benefits realisation and assurance.
- Commercial case – this sets out the financial implications of the proposed procurement strategy, presenting evidence on risk allocation and transfer, contract timescales and implementation timescales.

## 1.3 Structure of remainder of this document

Following this introductory section, the report is structured as follows:

- Section 2: Strategic Case;
- Section 3: Transport modelling;
- Section 4: Economic Case;
- Section 5: Commercial Case;
- Section 6: Financial Case; and
- Section 7: Management Case.



## 2 Strategic Case

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### 2.1 Introduction

The A4440 Worcester Southern Link Road (SLR) improvement strategy has a very strong strategic case. It is a scheme that is embedded within both the Local Transport Plan 4 (and previous Local Transport Plans) and the South Worcestershire Development Plan (SWDP) as an integral component of the future highway network in Worcestershire and as such has a clear policy context. It also has strong business community support and political backing and is seen as a scheme that is vital to achieving the Worcestershire Strategic Economic Plan (SEP). That is, the Worcestershire SEP has highlighted the A4440 Worcester SLR scheme as a critical element of the infrastructure package required to support planned levels of development in Worcester and therefore has an important role to play in supporting the economic growth of the local area. The improvement of the A4440 Worcester SLR has been divided into four phases and with Phases 1 to 3 either complete or underway, this Business Case is prepared in respect of phase 4.

This section sets out the strategic case for Phase 4 of the A4440 Worcester SLR Improvement schemes in detail. It explains the wider context, presents the rationale for the scheme and makes the case for why the investment is required. Specifically it:

- Describes the business strategy and relevant business/economic plans it has taken into consideration (Section 2.2);
- Look at various similar economic and transport studies around Worcester (Sections 2.3 to 2.5);
- Describes the problems identified and the justification for intervention (Section 2.6);
- Explains the impact/consequences of not changing (Section 2.7);
- Explains the strategic scheme impact (Section 2.8)
- Outlines the objectives and how they align with Worcestershire's strategic aims (Section 2.9);
- Presents the key measures for success for the scheme (Section 2.10);
- Sets out the scope of the project (Section 2.11);
- Identifies high level constraints (Section 2.12);
- Explains the factors (interdependencies) upon which the successful delivery of the project is dependent (Section 2.13);
- Outlines how stakeholders and the local community have been involved in the development of the scheme (Section 2.14); and
- Sets out all the options identified and explains how the option now being taken forward was identified (Section 2.15).

### 2.2 Business strategy

The programme of A4440 Worcester SLR improvement schemes is described within the Worcestershire SEP, WTS, Worcestershire's adopted Local Transport Plan (LTP3 and LTP4) and the SWDP and associated Infrastructure Delivery Plan (SWIDP). It is a key element of transport strategy designed to meet the challenges of increased demand for travel as a result of economic growth including significant new housing and employment development.

The delivery of the A4440 Worcester SLR improvement strategy is a priority for WCC, the Worcestershire Local Enterprise Partnership (WLEP), Herefordshire and Worcestershire Chamber of Commerce, Members of Parliament and the Worcestershire District Authorities. The A4440 Worcester SLR improvement strategy is aligned with agreed priorities, in particular in terms of supporting economic growth in Worcestershire.

The Worcestershire SEP identifies the A4440 Worcester SLR as one of the top transport priorities for Worcestershire. The LEP has, within its funding remit and using funds from other sources, progressed the other priority schemes including Worcestershire Parkway and Hoobrook Link Road schemes such that a full funding commitment has been made. For the A4440 Worcester SLR the County Council has committed funds to complete Phases 1-3 (in addition to funding from developers), which fall within its funding remit. Due to its scale, the LEP cannot fund the A4440 SLR Phase 4 scheme, thus it remains the outstanding priority.

The scheme also has strong support from the neighbouring Marches Local Enterprise Partnership (MLEP) which covers Herefordshire. The A4440 Worcester SLR is regarded as a key strategic route connecting Hereford and Leominster with the motorway network and current congestion has an effect on businesses and jobs.

### 2.2.1 Worcestershire LEP SEP

The SEP (2014), prepared by the WLEP, aims to create a world class location, world class skills and world class innovation in order to achieve the overall vision for Worcestershire which is “To be an internationally recognised, highly competitive and innovative business location by stimulating investment, improving productivity and supporting the creation of sustainable economic growth and employment in Worcestershire.” The ten year strategy sets ambitious targets: 25,000 new jobs, 10,000 apprenticeships, 9,400 homes and a £2.9 billion increase in GVA by 2025 – overall growing the economy over the 10 year period by a third.

The ambition of the SEP is already being realised. The 2017 Annual Report of the LEP states the following, WLEP is

- 1<sup>st</sup> strongest growth in higher level workforce skills (Of all LEPs between 2010 – 2015)
- 1<sup>st</sup> highest growth in productivity (Of all LEPs between 2010 – 2015)

The 2016 Annual Report of the LEP states that “WLEP is responsible for developing and delivering Worcestershire’s 10-year Strategic Economic Plan which was agreed by all partner organisations and submitted to Government in March 2014. WLEP is, therefore, working to create 25,000 jobs, increase Gross Value Added (GVA) by £2.9bn and contribute towards the delivery of 21,500 new homes by 2025.”.

Supporting economic growth through the provision of reliable infrastructure networks is a key priority. The SEP recognises that pinch points to the strategic transport networks are constraining economic growth and that investment in Worcestershire’s transport infrastructure and service networks is essential to provide businesses with improved access to markets and employees and to encourage economic growth.

The SEP identifies four major schemes transport related infrastructure projects. These are:

- Hoobrook Link;
- M5 Junction 6;
- Worcestershire Parkway; and
- A4440 Worcester SLR Improvements (Phases 1-4).

Progress is being made on three of these four schemes, but the A4440 Worcester SLR Phase 4 scheme cost is beyond that for which WCC and WLEP can fund, hence the bid to DfT under the Large Local Majors programme is being made to allow the completion of this scheme.

Indeed, the SEP specifically notes that *“Over the medium term (to 2020/21) investment will be targeted to complete the dualling of the A4440 Worcester SLR across the Carrington Bridge.”*

Without the A4440 Worcester SLR Phase 4 scheme, the ambitions for economic growth set out in the SEP, will not be realised. For example, key employment locations, such as Worcester City Centre and

Malvern Hills Science Park will not be provided with the high quality transport networks they require to reach their full economic potential as thus growth will be constrained.

The importance of the scheme is also confirmed by stakeholders, as illustrated below.

*“The resulting congestion on the bridge not only means that commuters who use the road on a daily basis to travel to work face unpredictable and often costly delays in their journey, but puts significant strain on businesses such as ours who cannot avoid using the A4440 to get our products to our UK customers but also adds significant uncertainty in ensuring the timely delivery of >90% of our sales (=£100million) to our customers around the world, prejudicing our hard won market-leading position in key markets such as the USA, China and Japan.”*

Letter of support from Malvern Instruments Limited

*“As a business owner living in Malvern, I have travelled regularly along this road at all times of the day. I find it time consuming and frustrating that the road is slow during the day and at times static. The roundabouts at either end can be treacherous to join.*

*I now actively avoid this route and will continue to do so until the conditions improve. This adds time and associated costs to my journey, but the impact on my day is worth it.*

*Failure to complete Phase 4 will negatively impact the development of this area, and the regions feeding into it.*

*I am considering expanding my business to include a facility which will need good road links for logistics. I cannot consider any site which involves transport using this road, at present, because of the impact on journey times, both of goods and people.”*

Letter of support from Alimenti Food Sciences Ltd.

The Worcestershire LEP, in conjunction with Worcestershire County Council, has identified four strategic investment or ‘Gamechanger’ sites.

The ‘Gamechanger’ employment sites are the top level of new employment location. The three categories or portfolio of sites are targeted at three potential markets:

- International and National markets – sites with the scale and wider business environment attractive to footloose and or foreign direct investment, characteristics include the need to be located close to a large urban area with excellent links to the SRN and railway network;
- National and Regional markets, where location and scale of site target specific requirements where ease of access to SRN and larger urban areas remain key; and
- Local Markets, where occupiers know local infrastructure networks, often supplying local markets and able within the grain of existing locations.

The work on the Gamechanger programme with key sites at Malvern Science and Technology Park, Worcester 6 (in the south of the County), Redditch Eastern Gateway and the Kidderminster Employment Zone is expected to underpin up to 16,000 new jobs across Worcestershire.

### **2.2.2 The Marches Local Enterprise Partnership Strategic Economic Plan**

The Marches Strategic Economic Plan (SEP) reports the LEP are aiming to improve connectivity to national and regional markets and airports, support their growth ambitions. The SEP vision for The Marches is of a strong, diverse and enterprising business base, operating in an exceptional and connected environment, where the transfer of technology and skills foster innovation, investment and economic growth. The SEP identifies transport as a barrier to growth.

The Executive Summary of The Marches SEP, states:

*“The Marches is also faced with challenges. There are high levels of young unemployed people who are not in work or further education or training. Companies report finding the right people for their business more difficult. The road and rail network needs upgrading with infrastructure that in many places is stymying the high levels of housing and employment development that is possible. As cited by the Chair of a local business board, just getting from A to B in the Marches is a problem. Our road and rail network is not good enough for our businesses to really excel. “*

A letter from The Marches LEP is included in Appendix Q of the FBC, which states:

*“... we support proposals for progressing a dual carriageway at Carrington Bridge noting the potential benefits it could provide for the economic prosperity of Herefordshire.”*

### **2.2.3 “Shaping Worcestershire’s Future” – Corporate Plan 2017 - 2022**

An updated Corporate Plan for 2017-2022 has been produced. The Corporate Plan contains four main priorities:

- Open for Business;
- Children and Families;
- The Environment; and
- Health and Well-Being.

Encouraging economic growth is a key theme which is continued by the WCC Corporate Plan. A key theme within the Corporate Plan relates the County being ‘Open for Business’. The plan states “Our continued investment in Worcestershire’s transport and digital infrastructure is essential to provide businesses with improved access to markets and to support economic growth.

Transport infrastructure investment will be targeted to unlock the potential of key employment and housing development sites across the county.

Reducing journey times across the county and beyond is a key ambition, with investment focusing on improving access to national and global markets and enhancing connectivity between key economic centres.”

The Corporate Plan states the one of the priorities for investment is:

“Completing the dualling of the Southern Link Road (A4440) from the M5 across the River Severn to the Powick roundabout”.

As part of the environment priority the Corporate Plan says that there is a “commitment to improve our transport networks and deliver resilient infrastructure”. The Plan also says that “a sustainable environment is important for people’s wellbeing, the economy and for the natural environment”. The Plan also recognises that there is an ongoing need to “minimise the impact of flooding” on the Worcestershire transport network and reduce the impact of closures related to flooding so that people will be able to continue to undertake business and commerce.

### **2.2.4 Worcestershire LTP**

#### **2.2.4.1 LTP3 (2011 to 2026)**

Worcestershire's LTP3 highlights that an efficient multi-modal transport network is important in sustaining economic success in modern economies, and that slow and unreliable transport networks will inhibit economic performance. The economic objective of the LTP3 is to support Worcestershire’s economic competitiveness and growth through:

- Prioritising limited funding towards improving the transport infrastructure and services and reducing transport costs along the busiest /most used transport corridors and in congested urban areas, such that the Worcestershire economy obtains the greatest benefits from investment; and
- Dealing with 'pinch points' on Worcestershire's transport networks, to ensure the efficient movement of people and goods around Worcestershire.

The need for the A4440 Worcester SLR Improvements Phase 4 scheme is specifically identified in the LTP3.

#### **2.2.4.2 LTP4 (2018-2030)**

WCC adopted its fourth Local Transport Plan (LTP) in November 2017.

The A4440 Worcester SLR is listed as a proposed major transport scheme during the LTP 4 period. LTP4 introduces the proposal to create a Worcester Western Link Road scheme to link the A4440 to Martley Road (B4204). This will serve existing and new development to the west of Worcester. The scheme links to the A4440 Worcester SLR resulting in a high quality route for journeys to the SRN and Worcestershire Parkway. Hence the A4440 Worcester SLR phase 4 scheme will, in the future, also be a link to an improved highway network to the west of Worcester.

### **2.2.5 South Worcestershire Development Plan (SWDP)**

The SWDP is the Joint Local Plan of Malvern Hills District, Worcester City and Wychavon District Councils. The plan was adopted and published on 25 February 2016. The SWDP aims to improve, protect and manage sustainable growth through a set of overarching aims:

- Delivering economic prosperity with Worcester at the heart;
- Locally justified housing; and
- Infrastructure-led development.

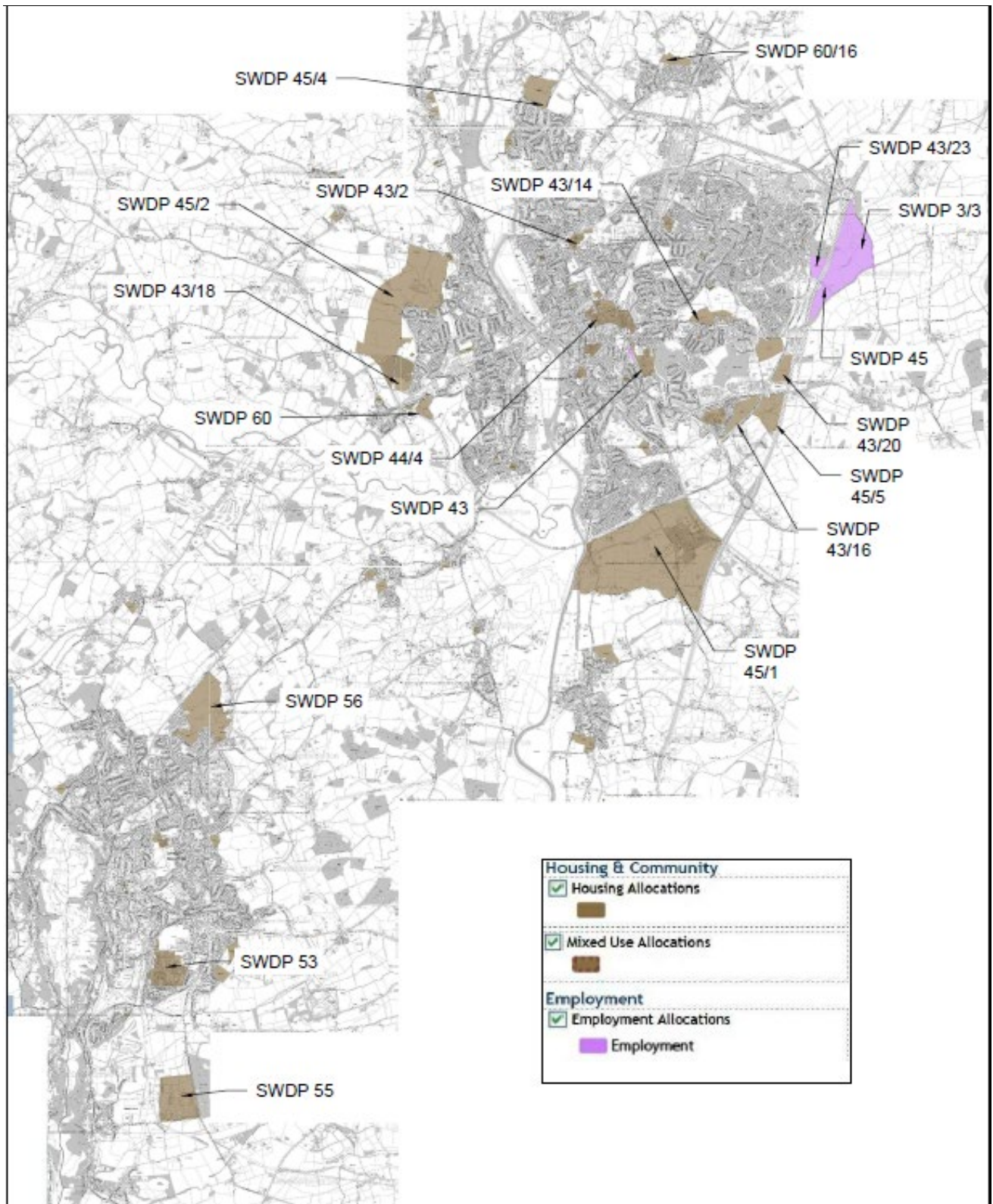
The SWDP identifies the land allocations for various housing, employment and mixed-use development schemes over the plan period.

Figure 2.1 shows the location of development allocations in the Worcester area.

The SWDP policies of particular note to the scheme are:

- Policy SWDP 3 sets out the proposed employment and housing allocations. Following the Inspector's Stage 1 feedback, the housing allocation has increased from 23,200 to 28,400. The majority of this increased in the Wider Worcester area.
- Policy SWDP45/2 Temple Laugherne (Worcester West Urban Extension) outlines the development of 2,150 dwellings, 5Ha of employment land and a range of supporting services and facilities including a neighbourhood centre. The Policy states the requirements include:  
*Measures, including proportionate contributions directly related to the development, to support and safeguard the implementation of relevant schemes set out in the Worcestershire LPT3, including the adopted Worcester Transport Strategy, such as: improvements to the A4440 (including phased dualling)*
- Policy SWDP45/1 Broomhall Community and Norton Barracks Community (Worcester South urban extension) which indicates 2,600 dwellings and 20 Ha employment together with supporting services and facilities. The policy also states that improvements to the A4440 including phased dualling will be required to support the development.
- Policy SWDP 56: Development at North-East Malvern which indicates 800 dwellings and 10Ha of employment-generating uses.

Figure 2.3: Proposed SWDP Development Allocations



The relationship and dependency of the proposed development on capacity improvements to the A4440 Worcester SLR was considered in the development of the SWDP.

The plan to increase the capacity of the A4440 Worcester SLR is a specific transport infrastructure improvement stated within the SWDP and associated South Worcestershire Infrastructure Development Plan (SWIDP). The need to improve the capacity of the A4440 Worcester SLR is also referenced by the Highways England in their comments on the SWDP and their inputs to the SWIDP.

The SWDP highlights that the four Phases of improvements to the A4440 Worcester SLR form a critical integrated element of the Plan's transport schemes identified to support growth in South Worcestershire. The SWDP policy which sets out the approach to providing transport infrastructure is: SWDP 4 - Moving around South Worcestershire. This is the key transport policy within the plan. Also, specifically, the "A4440/Southern Link Road capacity enhancements (phases 3 & 4, Whittington - Ketch - Powick/)" scheme is included in the SWDP Infrastructure Delivery Plan.

In the section of Policy SWDP 4; Delivering transport infrastructure to support economic prosperity it states that:

*"Phase 1 of the Worcester Transport Strategy only addresses existing transportation needs at 2010 along with projected background growth in travel demand. The provision of 12,200 dwellings and 120Ha of employment land in the Wider Worcester Area up to 2030 will, therefore, require the phased implementation of additional elements of the Worcester Transport Strategy, including:*

- i. Dualling of the A4440 Southern Link Road between Powick Hams and Whittington, including the Carrington Bridge."*

The combination of transport improvements and new development sites will attract inward investment, which will have a direct effect on the economic growth within the County.

Furthermore, Policy SWDP 45/1 Broomhall Community and Norton Barracks Community (Worcester South Urban Extension) specifically states that deliverability of SWUE is contingent on proposed improvements to the A4440 Worcester SLR. The Proposed Modifications state that "The rate of delivery will be dependent upon the phased implementation of the Worcester Transport Strategy and in particular the dualling of relevant sections of the A4440 Southern Link Road." This site has the following applications:

- Wellbeck application 2204 dwelling and associated infrastructure (13/00656/OUT); and
- St Modwen application 225 dwellings (13/01617/OUT).

The importance of dualling the A4440 Worcester SLR is also mentioned in Policy SWDP45/2 Temple Laugherne (Worcester West Urban Extension). The rate of delivery of this site will be dependent upon the phased implementation of the Worcester Transport Strategy and, in particular, the dualling of relevant sections of the A4440 Southern Link Road. The disposition of proposed uses within the allocation boundary will need to ensure the comprehensive development of the allocation as a whole and provide an integrated and cohesive urban design facilitating movements within the site and to / from the City. The current applications in for:

- Bloor Homes (16/01168/out) – 1400 Homes; and
- Hallam Land (15/01419/OUT) – 975 dwellings, employment land and primary school.

## 2.3 Worcester City Centre Regeneration Progress Review, Zeta Economics

Zeta Economics undertook a review for Worcester City Council of the progress of regeneration since the production of the Masterplan in 2011. The report stated that Worcester City Council has undertaken a lot of work to facilitate the Masterplan delivery, whilst improving the wayfinding and environmental quality of the City centre.

The report states:

*"The bulk of development projects identified as progressing or emerging can be expected to be realised between now and 2020/2025. Future city centre masterplan projects can attract more than £800 - £855 million of private sector investment with required public sector funding estimated between £31 and £53 million. The public sector funding would therefore leverage more than £16 of private sector development finance per £1 invested.*

*This could create an estimated 8,700 completely new net additional FTE jobs in the Worcestershire economy generating £480 - £670 million of GVA per year and other benefits (e.g. public realm related pedestrian user benefits and additional regeneration benefits).*

*The city centre masterplan can be expected to contribute to narrowing the wealth gap between Worcester and the national average measured by GVA. Public sector leadership of the Masterplan delivery would increase the Strategic Value Added and would address some of the identified information asymmetry and uncertainty market failures associated with larger scale delivery in Shrub Hill Opportunity Area.”*

This assessment aligned to the SWDP objective to “promote the sub-regional role of Worcester as the major leisure, retail, tourist and university centre and support the sustainable growth of the city.”

## 2.4 The Marches Strategic Transport Corridors Report, May 2016

This study recognises four ‘Strategic Road Corridors’. The Wales and Marches to Midlands corridor is seen as being based on the A4103, A4440/M5 and A44/ A4440/ M5 routes. These routes are seen as providing connections to the West Midlands, North West and South West. The Wales and Marches to Midlands corridor provides an important link between the historically close areas of Herefordshire and Worcestershire, and then onward to the West Midlands conurbation. The A44 and A4103 (from Leominster and Hereford respectively) are important links to the M5 motorway at Worcester. The report notes that the A44 / A4103 / A4440 roads provide “a vital link to the whole of the West Midlands conurbation for freight movements in particular. The areas to the south and west of Birmingham are particularly important as they are easily accessible from the M5 / M42”.

The reports identified priority investment projects in each of the Strategic Road Corridors as those which, on the basis of existing evidence, are likely to provide good value for money and be deliverable within realistic timescales. For each corridor the pipeline is split into Category 1 (projects for which there is an existing evidence base) and Category 2 (projects requiring further development). The Worcester Southern Link Road Improvement Scheme is specifically identified as a Category 2 scheme in the report.

The Wales and Marches to Midlands Strategic Road Corridor objectives are:

- Enabling greater economic integration between The Marches and Worcestershire through support to the priority sectors.
- Providing additional transport capacity where there are physical constraints, in order to deliver faster and more reliable journeys for commuters and freight flows.
- Providing transport infrastructure to support the growth of Leominster, and to improve its links to Worcester and the M5 motorway.

The benefits of the scheme to The Marches are seen as:

- (1) Greater certainty / acceleration of planned growth in Worcester, which could benefit residents and business in The Marches through closer economic links.
- (2) Reduces costs of freight transport for business by enabling faster / more reliable access to the motorway network.

The report notes that the Worcester Southern Link Road Improvement Scheme is “to be progressed by Worcestershire LEP and Worcestershire County Council, with support from The Marches LEP and local authorities will be an important aspect of cross-boundary collaboration”.

### **Cabinet Member for Infrastructure, Herefordshire Council (March 2015)**

“The bridge sits on one of the key strategic transport routes linking Herefordshire and the South Worcestershire towns of Ledbury and Malvern to Worcester city centre, key industrial sites on the outskirts of Worcester and junction 7 of the M5.....If people wish to travel from Herefordshire or South Worcestershire to reach the M5 North motorway they have no choice but to travel on this route, or face



a minimum of 30 extra miles on their journey by going to the M50, then joining the M5 a mile outside Tewkesbury. We support proposals for progressing a dual carriageway at Carrington Bridge noting the potential benefits it could provide for the economic prosperity of Herefordshire.”

## 2.5 Midlands Connect

### 2.5.1 Economic Impact Study, May 2015

This report, prepared by Atkins for the Midlands Connect Partnership’s, considers the Midlands area and the connectivity of key centres within the area and to adjoining areas. The report divides the various linkages into a series of corridors, which are assessed for both road and rail journey times.

It is notable that the reporting of road journey times shows that the corridor to the south west quadrant of Birmingham does not feature on the fastest journey times, and the corridor between Worcester and Hereford is reported for slow journey times. The report identifies the benefits of decreases in Generalised Journey Time for the corridors identified. For the South West corridor, that includes Worcester, the report suggests that improving highway connectivity could help unlock 19,000 jobs by 2031.

### 2.5.2 Emerging Strategy November 2016 – Midlands Connect Strategy

In March 2017, Midlands Connect published the ‘Midlands Connect Strategy: Powering the Midlands Engine’. This strategy describes the benefits of investment in transport infrastructure, and particularly recognises investment in highway capacity to address slow journey times as a result of congestion and improve journey time reliability. The main emphasis of the Midlands Connect Strategy is to capture the benefits and opportunities over the whole of the Midlands created by HS2. The Midlands Connect Strategy has recognised the importance of east west links in the area and specifically notes improvements to the A4440 Worcester SLR - ‘Through our engagement with the Welsh Assembly, connectivity between north and south Wales has been identified as one of their economic Priorities... this includes improvement to the Worcester southern ring road in order to provide improved links within this south western corridor to locations such as Hereford’.

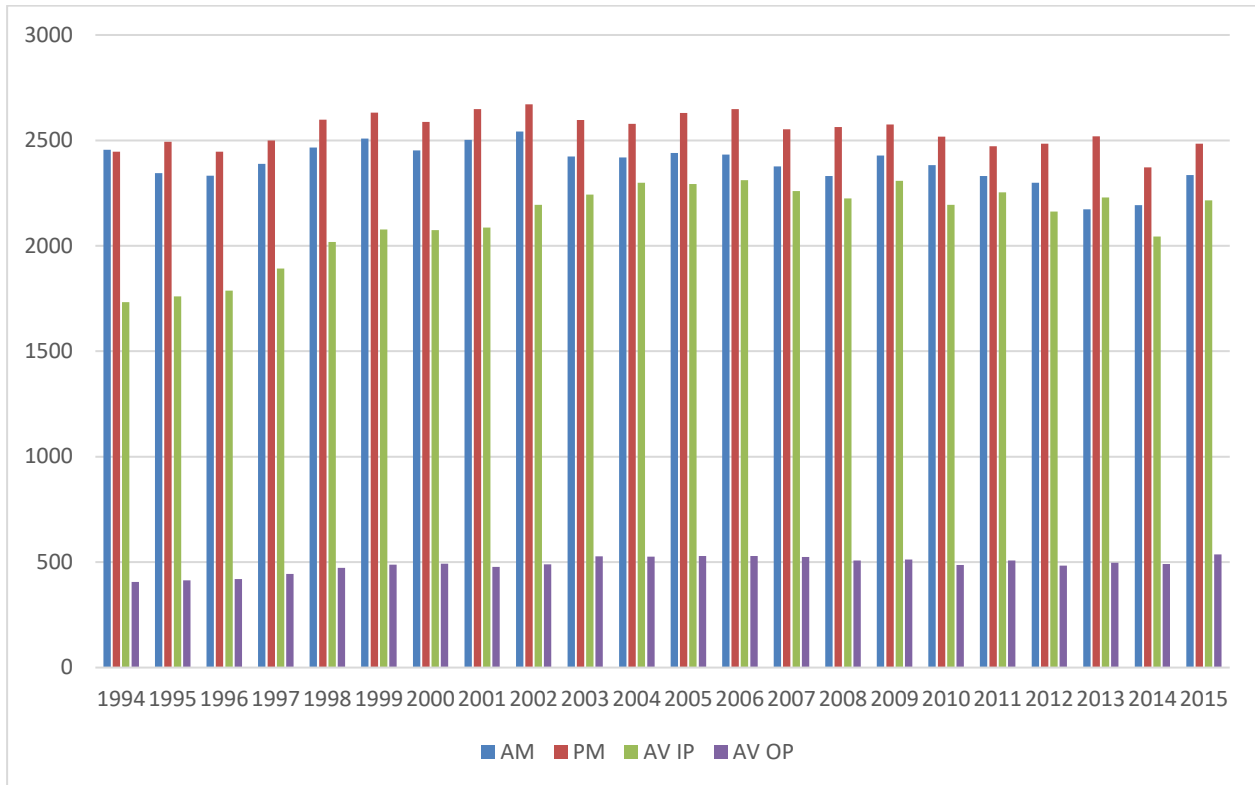
## 2.6 Problems identified

### 2.6.1 Congestion

As identified in the Worcestershire LTP2, and subsequently in LTP3 and LTP4 as well as in the SEP, a number of individual sections of the Worcester highway network are performing poorly in terms of congestion and delays. This includes the A4440 Worcester SLR. The congestion currently identified through data is confirmed by daily experience. This was recognised in LTP4, which focuses on delivering transport infrastructure and services to tackle congestion and improve the quality of life. In particular, the LTP identifies key pinch points which act as barriers to economic growth.

Figure 2.2 shows Peak Hour and Inter-peak Traffic Flows 1994 – 2015 on the A4440 Worcester SLR Temeside Way section. Analysis of this historical traffic data from 1994 to 2015 indicates that a peak hour flow in the region of 2400 - 2600 vph has been recorded since 1994. This peaked at just over 2500 vph in 2002 in the AM peak and 2670 vph also in 2002 for the PM peak and has stabilised in more recent years. The inter-peak traffic count has shown a steady increase since 2001 and is close to reaching AM peak averages. The increase in inter-peak movements further highlights congestion along the A4440 Worcester SLR along the Phase 4 section, as it appears that “peak spreading” is occurring.

Figure 2.4 : A4440 Temeside Way Peak Hour and Inter-peak Traffic Flows 1994 – 2015



Figures 2.3-2.6 show journey time and speed data from the County Councils C2 monitoring data. The data is averaged over 15 mins and collected between August-September 2015. The graphs illustrate that the current performance of the A4440 Worcester SLR is poor in the peak periods.

Figure 2.5: WB Ketch to Powick journey time data (averages over 15 mins Aug-Sept 2015 C2 data)

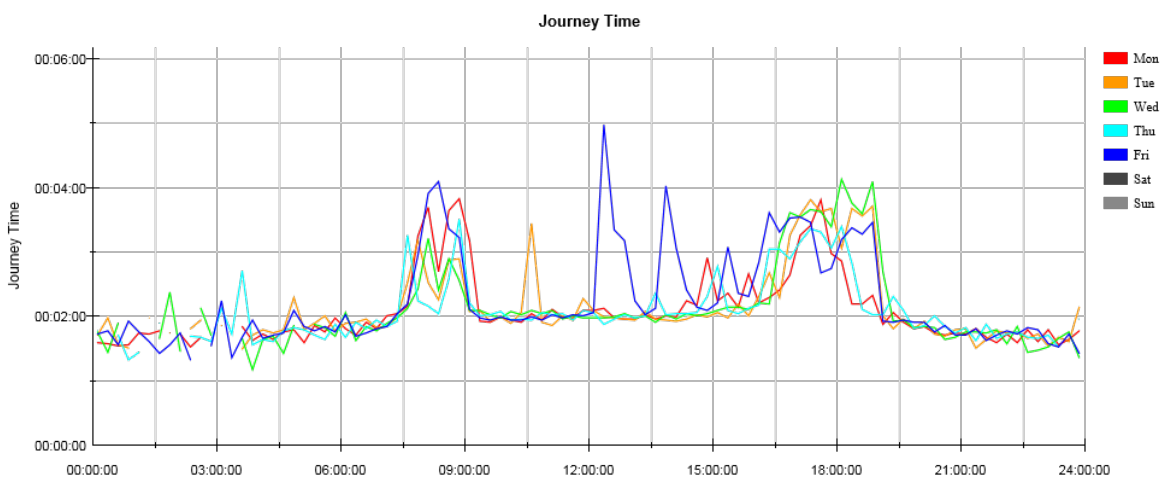


Figure 2.6: WB Ketch to Powick speed data (averages over 15 mins Aug-Sept 2015 C2 data)

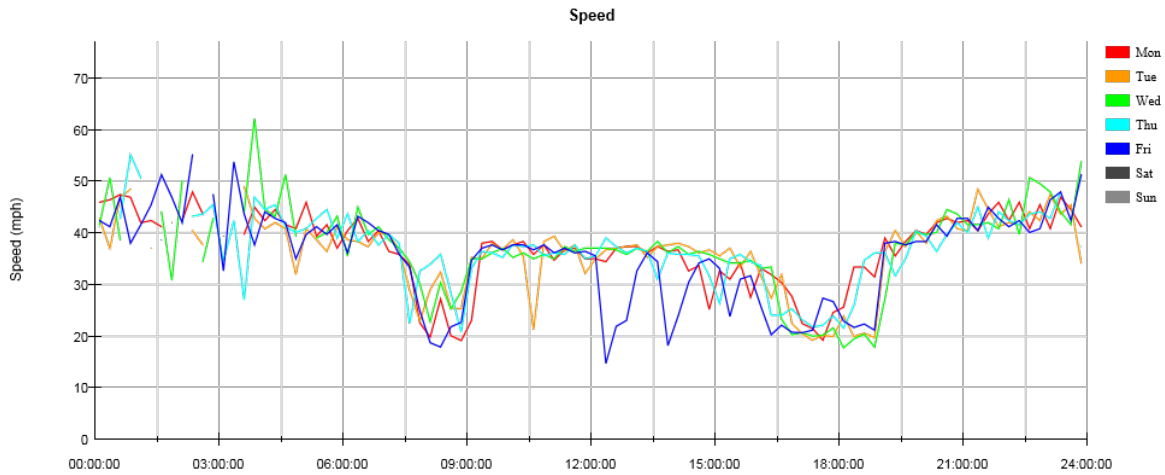


Figure 2.5: EB Powick to Ketch journey time data (averages over 15 mins Aug-Sept 2015 C2 data)

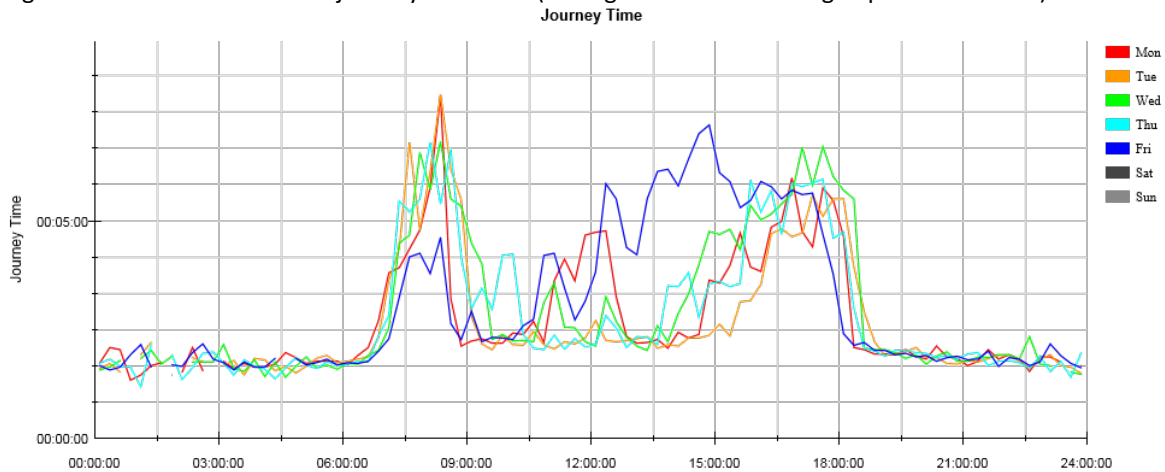
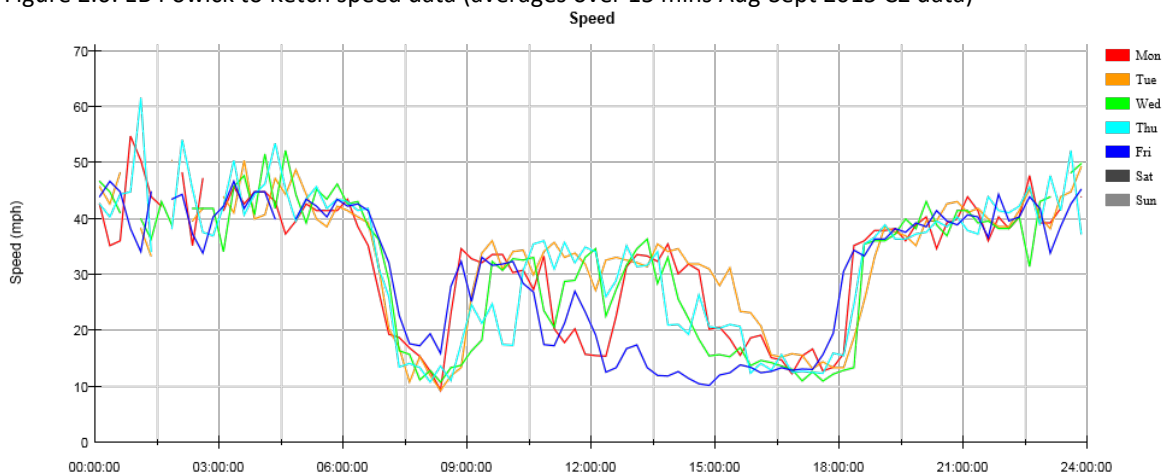


Figure 2.6: EB Powick to Ketch speed data (averages over 15 mins Aug-Sept 2015 C2 data)



Figures 2.7 to 2.10 show a snapshot of the impact from January 12<sup>th</sup> 2016 in terms of the typical levels of congestion experienced, taken from Worcestershire County Council JTMS system, the AM peaks show traffic conditions at 08:45, whilst in the PM peak this is taken as 17:30.

Figure 2.7: EB Crown East Roundabout to Whittington Roundabout (AM Peak – 08:45)

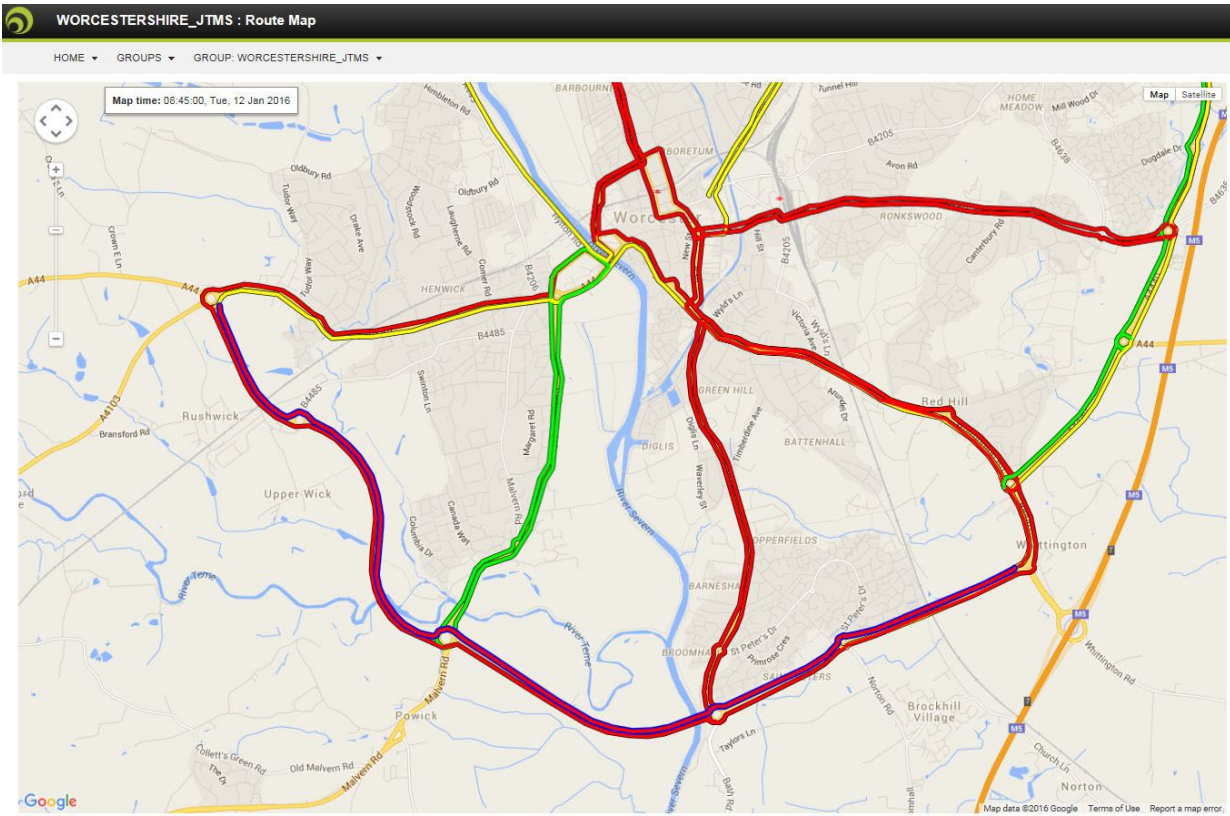


Figure 2.8: WB Whittington Roundabout to Crown East Roundabout (AM Peak – 08:45)

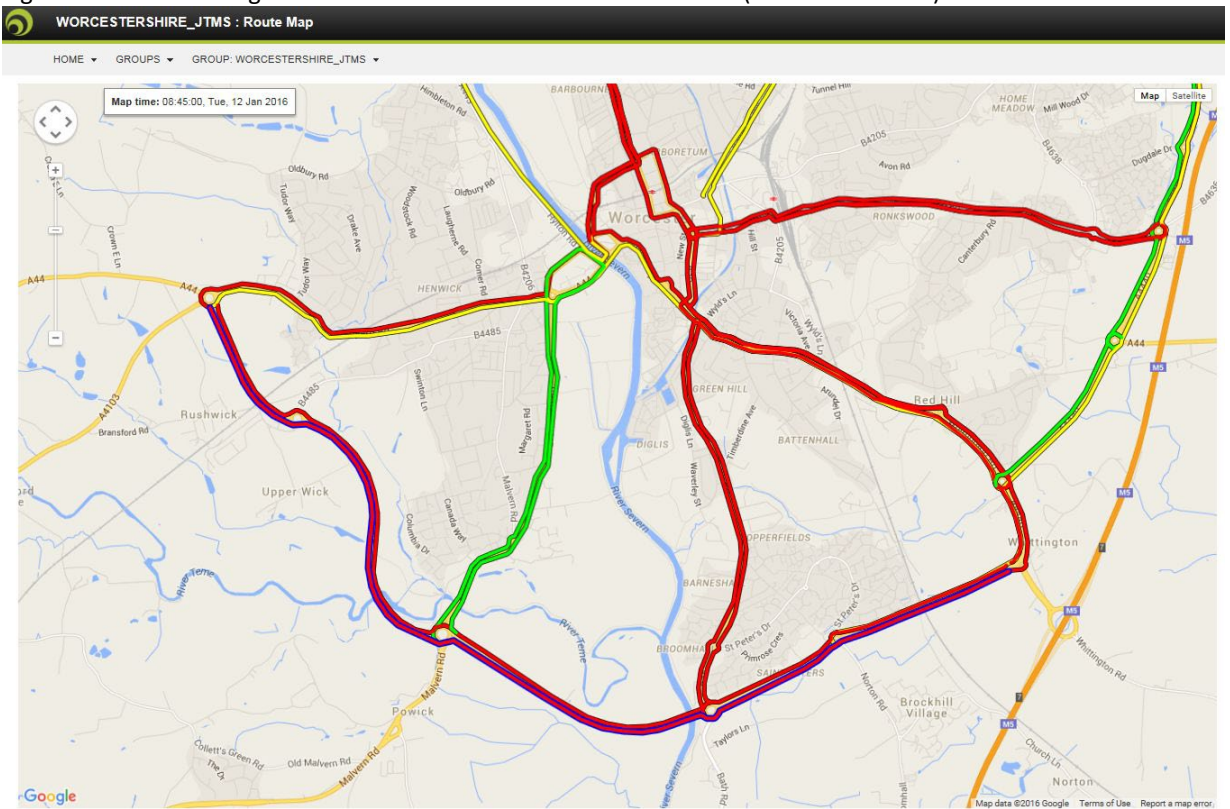


Figure 2.9: EB Crown East Roundabout to Whittington Roundabout (PM Peak – 17:30)

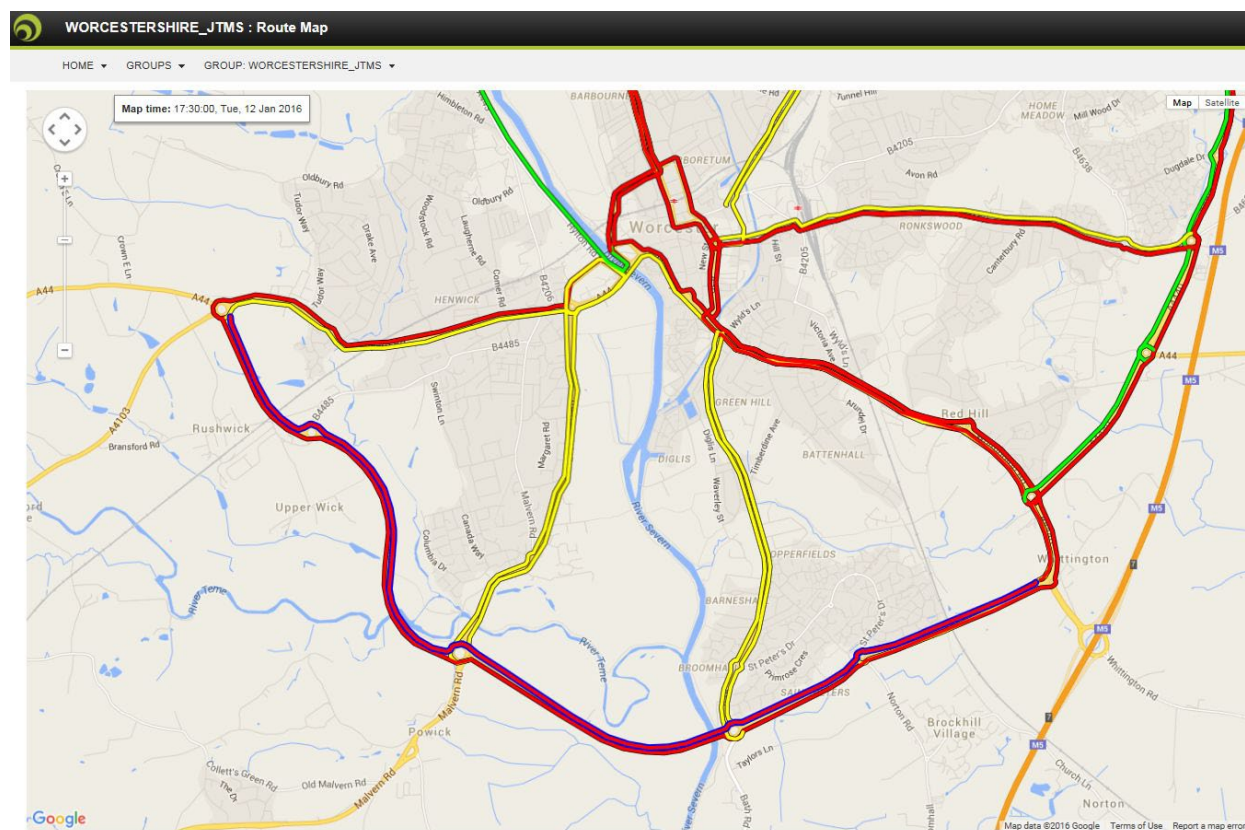
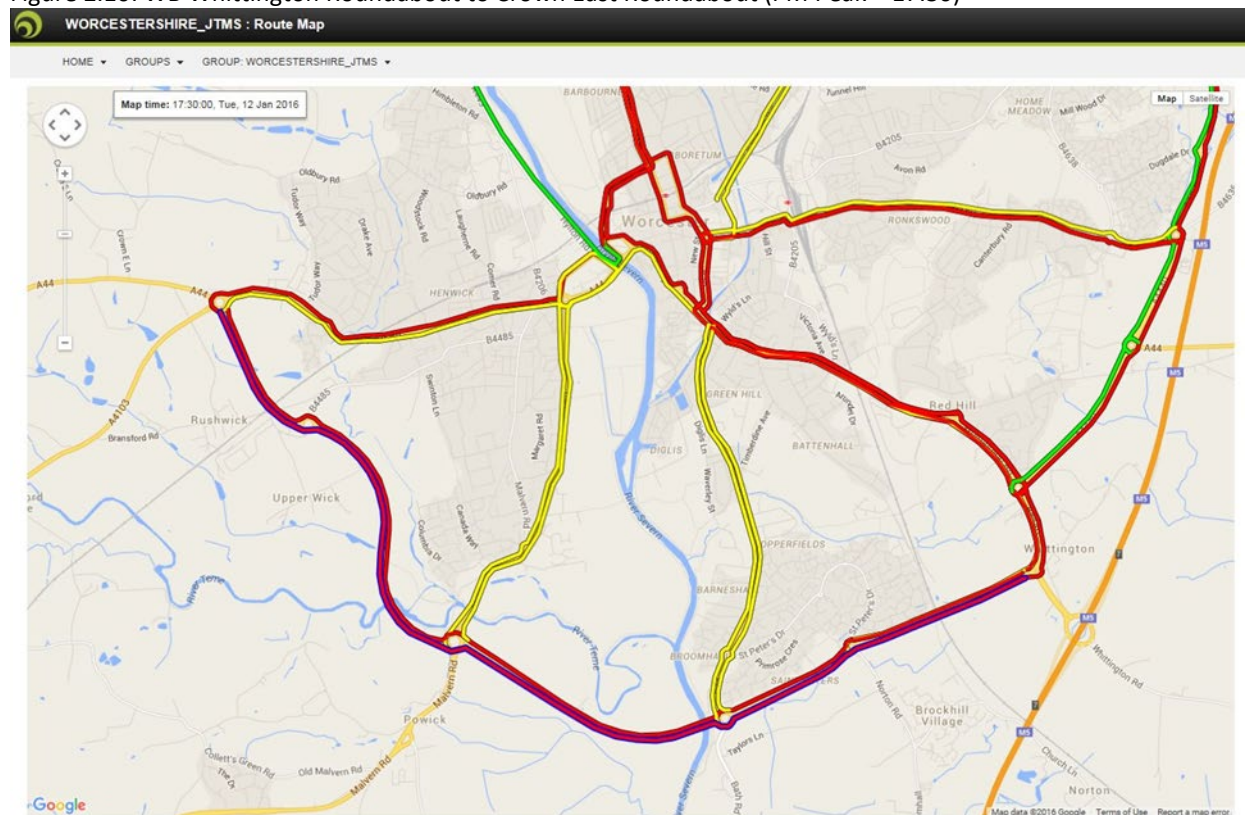


Figure 2.10: WB Whittington Roundabout to Crown East Roundabout (PM Peak – 17:30)



The congestion on the A4440 Worcester SLR will limit ability of the network to accommodate additional journeys, and thus the area's attractiveness to business and ability to accommodate further housing and employment growth. In addition, the data shows that due to high levels of congestion in the peak

periods, journey time reliability is poor. The inter-peak data is showing that as traffic volumes approach capacity and congestion occurs, journey times can increase significantly and quickly in an erratic manner which means users suffer from uncertain journey times leading to a lack of confidence in the network.

### 2.6.2 Lack of strategic highway connectivity

The connectivity to the Strategic Road Network from the west is notably poorer in the peak periods, in the Worcester area, due to congestion. This has meant that the take up of employment development sites to the West of Worcester is not attractive to new or relocating businesses. There are been a case where a site allocated for employment use has been developed for residential use due to lack of market interest in employment development to the West of Worcester. Feedback from the business community has shown this is due to connectivity, particularly lack of certainty of travel times to the Strategic Road Network.

With the improvements to the A4440 Worcester SLR between the Ketch roundabout and M5, the overall performance of the Powick to Ketch section of the A4440 Worcester SLR will worsen, due to additional demand. That is, the Powick to Ketch section of the A4440 Worcester SLR becomes a pinch point on the corridor for strategic movements. Therefore as more traffic is attracted to the Ketch to M5 section of the route, the capacity of the Powick to Ketch section becomes a more significant constraint. Thus, there would be accessibility problems for the areas to the west of Worcester due to increased journey times and poor journey time reliability.

### 2.6.3 Current economic issues

South Worcestershire covers the largely rural districts of Malvern Hills and Wychavon, and the predominantly urban area of Worcester City. Although south Worcestershire has relatively high levels of economic participation and low levels of unemployment, economic trends in the sub-region over the past decade have been mixed. The area's employment grew slowly between 2003 and 2008, prior to the global economic downturn. The September 2015 WCC Economic Summary noted that the unemployment claimant level in Worcestershire was at the level recorded before the recession started. The August 2018 WCC Economic Summary highlights that the unemployment claimant level in Worcestershire is now 1.5% of the 16-64 population <sup>1</sup>.

Longer term, the SEP (March 2014) notes that Worcestershire has seen one of the highest long-term growth rates in Gross Value Added (GVA) (1997-2011) outside the Greater South East. However, the SEP stated that, despite this longer term trend, the county has not realised its full potential and has been 'punching below its weight'. This trend is consistent with more up to date information presented below.

Specifically concerning highway connections, the SEP notes that parts of the County are well-connected to other parts of the UK, particularly through the Highways England managed Strategic Road Network (SRN) including the M5, M42 and M50 motorways and the A46 Trunk Road. These run through the centre and east of the County and provide good access to London, Birmingham (and the North), and to Wales and the South West. However, access to/from the SRN is constrained in parts of the county due to capacity constraints on the local highway network, with Worcester having particularly acute problems.

Malvern, which is located to the south west of Worcester, is particularly remote from the SRN and the main highway links to the SRN use the A4440 Worcester SLR. The congestion and unreliability of the A4440 Worcester SLR therefore impacts on the attractiveness of Malvern as a location for new business, as well as impacting on the businesses that are currently located in the Malvern area. Malvern Hills Science Park state:

*"The variability of journey times between MHSP and the M5 is now a cause for concern and may limit the growth of MHSP. It is 9.7 miles from here to Junction 7 of the M5 and it can take anywhere from 16 minutes to 50 minutes, depending upon the time of day. For example, this means that the bulk of the journey from MHSP to Birmingham Airport is the first 9.7 miles taking 50 minutes, with the remaining*

<sup>1</sup> [http://www.worcestershire.gov.uk/info/20044/research/673/information\\_on\\_the\\_worcestershire\\_economy](http://www.worcestershire.gov.uk/info/20044/research/673/information_on_the_worcestershire_economy)

*34 miles taking just 35 minutes. The situation is now so bad that some tenants have taken to heading south to Junction 8 in order to head north on the M5. If we are to succeed as a business, we need this problem addressed in the very near future.”*

Therefore, the scheme is essential to releasing housing and commercial development and addresses problems related to:

- The barrier effect that transport and existing infrastructure is having in terms of constraining economic growth;
- Congestion and the cost of delay;
- The way in which transport and inadequate infrastructure limits housing and employment growth; and
- The way that traffic currently routes inappropriately through the city centre.

WCC’s Local Economic Assessment helps to give an overview of economic activity. Figure 2.11 shows Gross Value Added (GVA) per resident head relative to England and Figure 2.12 shows GVA relative to neighbouring authorities. Despite total GVA increasing over time, until the recession, both the West Midlands and Worcestershire were decreasing in comparison to England. However, following the recession, the GVA for both the West Midlands and Worcestershire began to increase in comparison to England, with a faster rate of increase in Worcestershire. GVA per head in Worcestershire is; however, historically lower than its neighbours, such as Warwickshire and Gloucestershire.

Considering this data, the assessment notes that to make the Worcestershire economy stronger and reduce the difference between Worcestershire and England attention needs to be focused on improving the skill levels of the population and encouraging and supporting new business creation. However, it is important to note that a lack of available employment land in the county could be a limiting factor in increasing GVA per resident head.

Figure 2.11: GVA per resident head relative to England (England = 100), Office for National Statistics. Regional Accounts

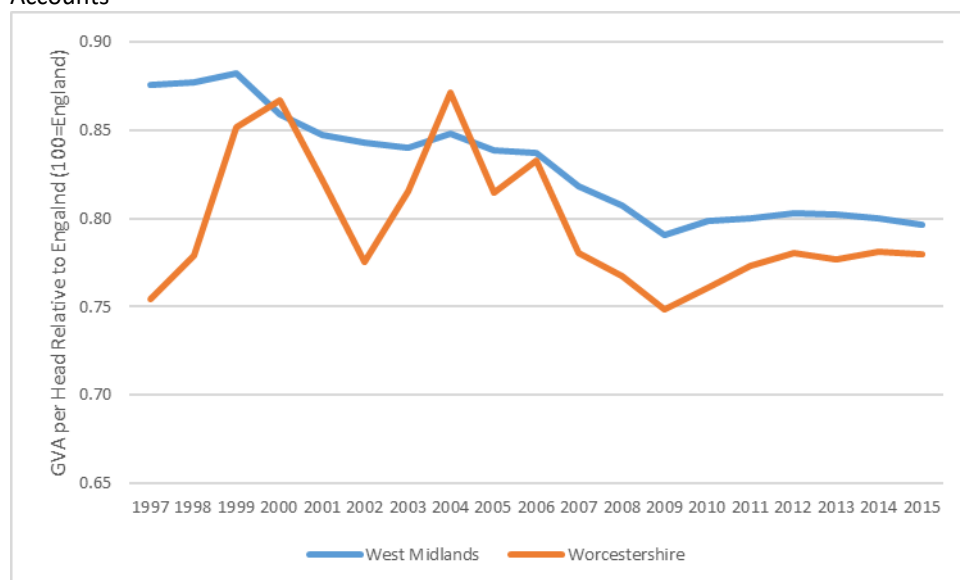
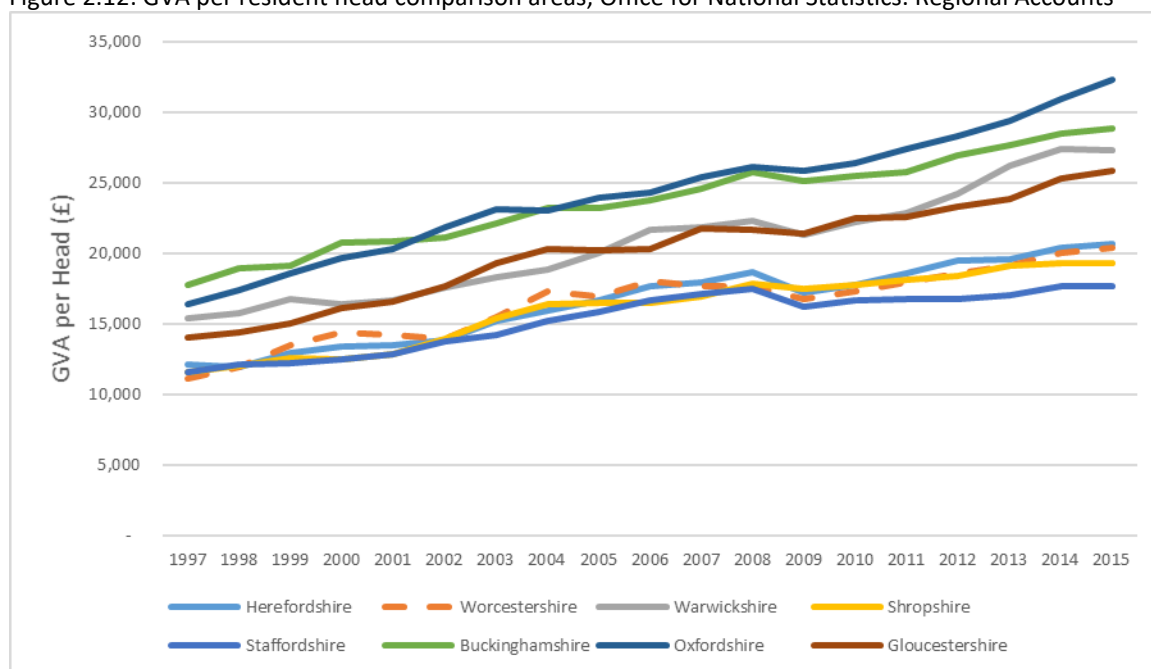


Figure 2.12: GVA per resident head comparison areas, Office for National Statistics. Regional Accounts



### 2.6.3.1 How the scheme directly affects the local jobs

There are two ways in which this scheme directly affects local jobs. Firstly, as a result of the scheme, there will be people employed to plan, design and construct the scheme. Additionally, the scope of the construction phase will aim to provide new jobs to the area, it is important that the scheme contributes to the local economy, including potential to reduce welfare spending by the procurement of works. WCC are looking at how to optimise local economic impact through the procurement process. The procurement will seek to ensure local contractors are utilised to support the main contractor”, while training initiatives, such as apprenticeships, will be a contractual requirement.

Secondly, the scheme will provide improved network capacity and resilience which will enable housing growth, employment growth. This growth will provide employment during the planning, design and construction of the developments, as well as unlocking the wider benefits.

### 2.6.3.2 Constraint to development

As reported in the A4440 Worcester Southern Link Road Dualling Phase 3: Strategic Outline Business Case (May 2013), the core reasons for south Worcestershire’s poor performance against its employment and housing targets are beyond the consequences of a weak economic climate. In particular, the area’s poor transport infrastructure, including the highway network, is identified as a major constraint to bring forward development sites which are critical for achieving south Worcestershire’s growth aspirations. That said, the prevailing economic conditions, which impact the financial viability of developments, significantly reduce the prospect of private sector led investment and delivery of important highways (and other transport) infrastructure, which is typically classed as a “public good”.

In response, the adopted SWDP and supporting SWIDP has identified the need for approximately £226.3 million for SWDP transport schemes. The £226.3million plan includes:

- £20.4 million of Highways England schemes; and
- £205.9 million of local road network infrastructure, of which £170.8 million is related to the Worcester Transport Strategy.

The capacity issues on the A4440 Worcester SLR result in some longer distance trips routing through the City, rather than use the Southern Link Road. This illustrates the issue that congestion on the A4440 Worcester SLR is preventing it fulfilling its role as a primary route, avoiding the City centre. The resulting levels of congestion in the City centre constrains business growth and regeneration



opportunities. Removing strategic traffic from the City centre will enable Worcester to meet its socio-economic aspirations.

#### 2.6.4 Poor network resilience (River Severn Flood Impact)

Worcester Bridge is located close to the centre of Worcester and carries the A44 over the River Severn. The A44 corridor carries a significant volume of traffic both to and from and through the centre of Worcester. This strategic corridor is constrained at Worcester Bridge as a number of routes meet to use the bridge to cross the River Severn. The approach roads to the bridge (Hylton Road, New Road and North Parade) are within the flood plain of the River Severn. Hylton Road, New Road and North Parade have been flooded and impassable during recent floods in 2000, 2003, 2007, 2012 and Feb 2014. See photographs below.

Figure 2.13: Flood Event, looking from Hylton Road towards Worcester Bridge



Figure 2.14: Flood Event taken from Worcester Bridge looking towards North Parade/Newport Street



In each of these flood events one or all of the roads has had to be closed due to the river levels being high enough to make the roads impassable to traffic. This has the effect of traffic being forced to use one of the two remaining bridges, either the already congested Carrington Bridge located approximately 3 miles to the south of the City resulting in a detour of approximately 6 miles and significant delays, or via the Holt Fleet bridge located 8 miles to the north and a detour of approximately 16 miles.

The closer proximity of the Carrington Bridge and the A4440 Southern Link Road means that the bulk of the traffic chooses to use the Carrington Bridge, which creates a much higher demand than normal conditions, or alternatively people do not travel into the City centre overall.

Whilst the impact of the flooding tends to be short term and typically only lasts one or two weeks, the long term impact on the Worcester economy is much greater, and this is set out in the following section for both a short term closure and the longer term impact should the Worcester Bridge be destroyed by flood water.

It is noted that a small scale scheme was implemented to reduce the impact of flooding in New Road, Worcester. This scheme was developed to address the local need to retain, if possible, some limited capacity to cross the River Severn at times of flood. The scheme revises the traffic management arrangements on two sections of one-way road to allow temporary two way operation, and the raising of the level of a section of highway to make it less prone to flooding. The capacity of the scheme is much reduced from normal operation, but the significance of the scheme is to maintain a limited connectivity between the City centre and west Worcester. As a result, despite this scheme maintaining some accessibility to the City centre, reduced capacity at Worcester Bridge is likely to cause considerable ongoing pressure at Carrington Bridge in the wake of a flood event, even with a small scale scheme in place.

In relation to the economic impacts of a flood event, even with provision the small scale alleviation scheme mentioned above, there are three key areas to consider:

- Direct impacts – capital damage to property, equipment and infrastructure.
- Indirect impacts (i) –business downtime as firms recover from the direct consequences of flooding and short term closure of Worcester Bridge.
- Indirect impacts (ii) – wider economic resilience in the wake of flooding and longer term or permanent closure of Worcester Bridge. This relates to severance between communities on either side of the River Severn in the event of Worcester Bridge becoming unsafe to use. This would restrict access to Worcester City centre and the wider communities in central Worcester for residents in West Worcester. Similarly, access to west Worcester’s local centres such as St John’s and nearby employment sites would be restricted for residents on the eastern bank of the River Severn in Worcester.

A high level appraisal has been undertaken of the economic impact of flooding of the River Severn on Worcester’s economy. In relation to the scheme for Southern Link Road Phase 4, consideration should be given to the indirect impacts in the short term (flooding), and long term (bridge resilience), identified as bullet points two and three above. In particular, emphasis should focus on the economic resilience elements of the assessment which relate to long-term or permanent closure of Worcester Bridge, as detailed in the third bullet point above. A technical note providing further information on the high level appraisal is set out in Appendix B, however the key findings are:

- Central Worcester has 1,425 businesses, of which 1,105 (78% are classed as micro businesses employing fewer than ten employees, with the remainder in the SME category, employing up to 250 employees;
- Micro and SME businesses are disproportionately affected by flood impacts and more prone to closure as a result of flooding than large enterprises;
- The 1,425 businesses generate an estimated £77 million per annum of GVA, and there is a retail expenditure of nearly £350 million, with £64 million of this from west of Worcester;

- £1.5 million of GVA per week is at risk, due to business downtime as a result of flood impact on central Worcester's economy;
- In the wake of long term bridge closure,
  - £1.2 million of retail expenditure per week is at risk in Worcester city centre from residents in west Worcester;
  - £1.8 million of GVA per week is at risk in central Worcester from employees who reside in west Worcester;
  - £20k of retail expenditure per week is at risk in St John's local centre from residents in east Worcester;
  - £430k of lost GVA per week is at risk in west Worcester from employees who reside in east Worcester;
- There is a risk that a proportion of the figures above may not return after a flood event as business, labour market trends and retail spend transfer away from Worcester, although this would need to be quantified; and
- Completion of the A4440 Worcester SLR improvement programme will give real and perceived benefits to the flood resilience of Worcester City and the County in mitigating the impact of future severe weather events. There is a risk to future levels of inward investment into Worcester should the resilience of opportunities to cross the River Severn not be increased.

The calculation of the direct financial impact of flooding events is difficult to calculate as the scale of the impacts are widespread and a result of direct impact and secondary knock impacts. A comprehensive assessment undertaken by the Worcestershire Partnership on the 2004 flood events in Worcestershire concluded that the economic impact on the County was estimated to be £6.4million per week.

### **2.6.5 Failure to meet planned housing growth targets**

The housing need assessment that lead to the housing demand forecasts used to inform the SWDP results in challenging housing growth targets. Covering the administrative areas of Malvern Hills District Council, Wychavon District Council and Worcester City Council, the SWDP, over the plan period 2006 to 2030, makes provision for 28,400 dwellings.

In addition, the Hereford Local Plan Core Strategy, adopted in October 2015, covers the plan period 2011 to 2031 and over this period the Herefordshire plan has a target to deliver a minimum of 16,500 homes. Hereford is the focus for new housing development to support its role as the main centre in the county. Outside Hereford, new housing development will take place in the market towns of Bromyard, Kington, Ledbury, Leominster and Ross on Wye, on existing or new allocations to enhance their roles as multi-functional centres for their surrounding rural areas. It is notable that Bromyard, Kington and Leominster are on the A44 which directly connects to the A4440 Worcester SLR.

To meet the housing allocations in these plans, development sites will need to be attractive to secure investment from developers. The poor connectivity is a known issue; this may discourage investment in these areas. Specifically, the poor connectivity will make development sites, such as Worcester West urban extension and North-East Malvern, less attractive to future residents/employers and thus developers. This would mean that the full plan allocations may not realised (2,950 dwellings and 15 Hectares of employment land).

### **2.6.6 Perceptions of transport issues**

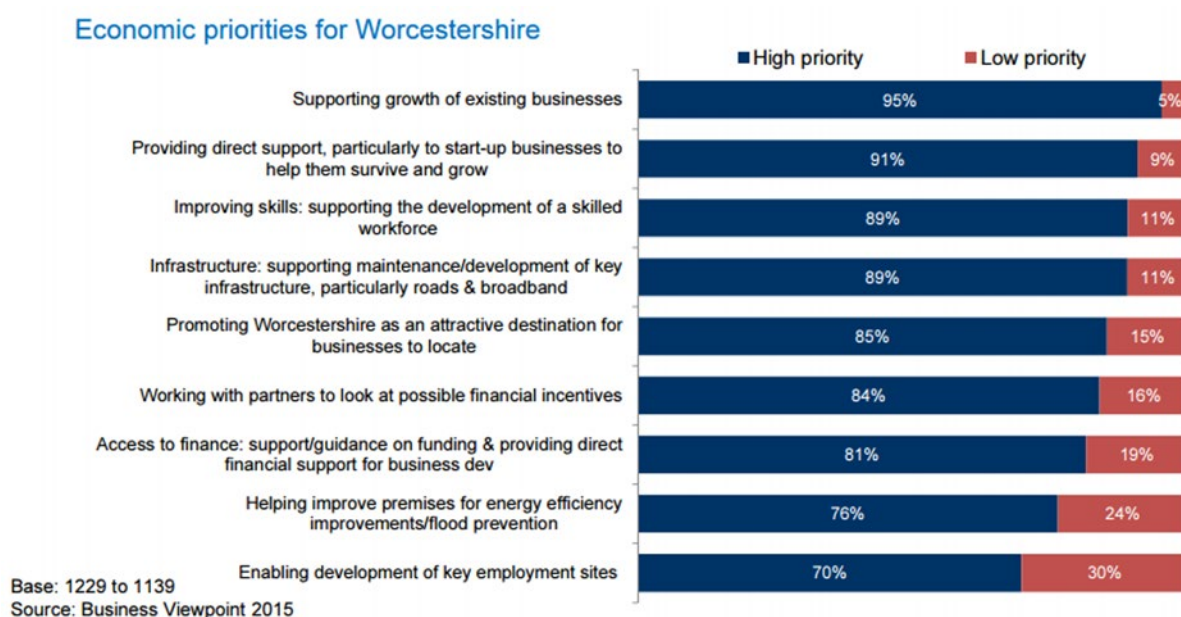
The perceptions of both businesses and residents have been considered. Consistently, the importance of roads/highways is raised in WCC public engagement.

#### **2.6.6.1 Views from Businesses**

A Business Viewpoint survey targeting the economic priorities of mixed (micro to large) local businesses in Worcestershire was conducted between May and June 2015. The results of this survey show that transport infrastructure is considered a high economic priority; 89% of business participants stated that supporting maintenance/development of key infrastructure, particularly roads as a high priority. Figure 2.15 is taken from the September 2015 survey and shows the comparison between other economic priorities.

Furthermore, the survey highlighted the likelihood of increased demand on the road network as 22% of the local businesses are looking to increase their workforce over the next 12 months. The SLR is already at capacity and the A4440 Worcester SLR Improvements Phase 4 scheme will seek to minimise the impact additional commuters will bring to the road network.

Figure 2.15: Economic priorities for Worcestershire

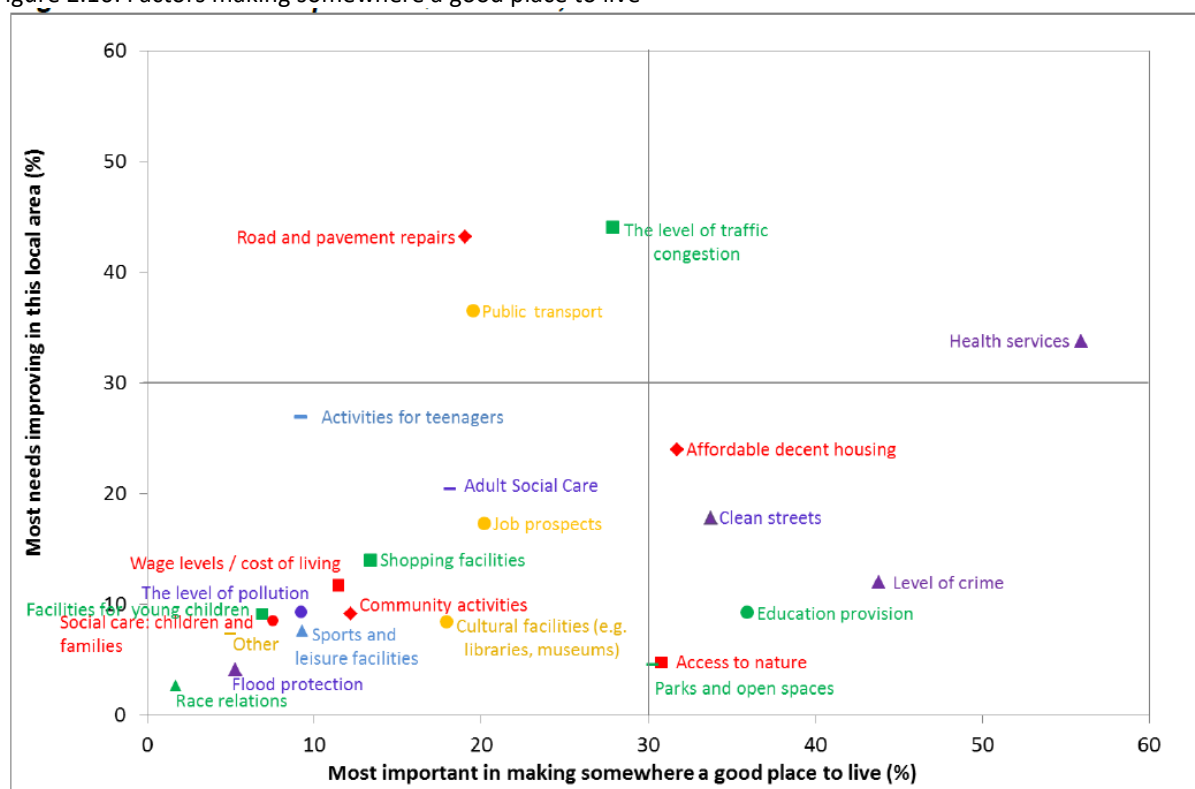


Further detail at: [http://worcestershire.moderngov.co.uk/documents/Economy\\_and\\_Environment\\_Overview\\_and\\_Scrutiny\\_Panel](http://worcestershire.moderngov.co.uk/documents/Economy_and_Environment_Overview_and_Scrutiny_Panel)

### 2.6.6.2 Views from Residents

A countywide survey was conducted by WCC in May/June 2016 to gather perceptions help by local residents regarding perceptions of the local area and public services. A total of 2,371 responses were received from panel members and households across the seven districts.

Figure 2.16: Factors making somewhere a good place to live



\*Base: 2,022 responses for most important; 2,259 responses for most need improving

\*\*Note the lines creating quadrants (arbitrarily at 30% on each axis) are to aid visual interpretation and do not define specific categories

Source: Worcestershire Viewpoint Survey 2017

The issue of “the level of traffic congestion” was rated as the issue most in need of improvement in the local area by participants.

## 2.7 Impact of not changing

Without the scheme the problems and issues outlined above will continue and, in the longer term, be exacerbated as described below.

- Development sites, such as Worcester West urban extension and North-East Malvern will not be attractive and thus planned development will not be realised (2,950 dwellings and 15 Hectares of employment land);
- Economic development would be constrained, particularly in the centre of the City. Inability to attract private sector investment to realise redevelopment/regeneration opportunities and support increased socio-economic activity. Growth of existing businesses may be compromised;
- Congestion will continue to increase, leading to increased delay and more irregular journey times resulting in cost to both individuals and businesses;
- Negative long-term impact on Worcester’s economy due to lack of network resilience, resulting in long term change to retail and labour market trends; and
- Traffic will continue to find alternative routes to avoid congestion resulting in traffic levels through sensitive areas of the City (including designated Air Quality Management Areas) continuing to rise.

This would jeopardise the ability to meet the overall aims of the WTS, Worcestershire LTP, the Worcestershire SEP and the SWDP.

## 2.8 Scheme impact

The impact of the scheme will be felt both locally in Worcester and over a wider area to the west of Worcester. The A4440 Worcester SLR Phase 4 scheme includes improvements to one of limited number of River Severn crossing points and will result in a new high capacity crossing. The impacts of realising this scheme are set out below.

### 2.8.1 Less congestion

The scheme will result in less congestion in the City centre and on the A4440 SLR. When compared to the Do Minimum scenario, the dualling of the A4440 Worcester SLR between Powick and Ketch and the improvements to the roundabouts at each end will reduce travel times, especially during peak hours, thus benefiting business travellers and haulage, as well as commuters. The benefit is measured as a change in the road user cost due to the time savings for the users pre and post dualling. On a broader scale, the dualling of the A4440 Worcester SLR between Powick and Ketch will impact a wider consumer group through reduced congestion and improved traffic operations.

The transport modelling shows that with the scheme in place, traffic flows could increase by between 45% and 66% on the A4440 Worcester SLR. Also modelled journey times on the A4440 Worcester SLR improve as a result of the scheme modelled through the Do Something scenario. In the 2031 Do Something forecast journey times are 4-8.5 minutes less than the 2031 Do Minimum journey times.

### 2.8.2 Improved access and connectivity

The scheme is the final phase of the four phase programme which upgrades the A4440 Worcester SLR to dual carriageway standard. Failure to deliver the A4440 Worcester SLR Phase 4 will adversely impact realisation of benefits of the earlier investment in Phases 1-3. This final phase ensures the route attracts trips currently using the City centre infrastructure to cross Worcester. It completes a major upgrade to the A4440 Worcester SLR, which reinforces the role of the SLR as a strategic East West route, as well as a bypass to the City centre.

The completion of the dualling of the A4440 Worcester SLR also supports the Worcestershire Parkway scheme by improving access from west of Worcester to the location of the new station. The scheme also provides better connection to the M5 for residents and businesses to the west of Worcester.

Linking the SLR then provides better access to:

- Birmingham Airport; and
- the proposed HS2 station at Birmingham Interchange, located close to Birmingham Airport/M42.

Figures 2.17 and 2.18 illustrate the journey time benefits of the scheme. They show that the opening of the scheme results in reduced journey times, over current experience, to locations to the west of Worcester including Malvern District. The plots show that as a result of the scheme a significant proportion of the A44, A4103 and A449 now fall within a 20 minute journey time to the SRN at Worcester.

Figure 2.17: 2014 AM Peak Journey times by car

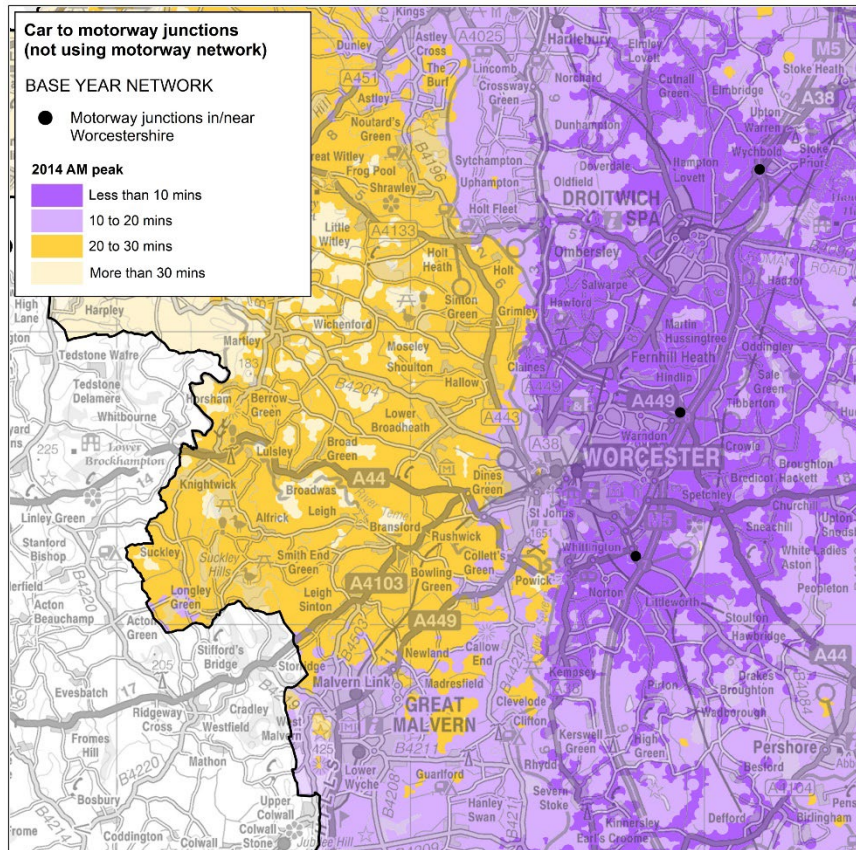
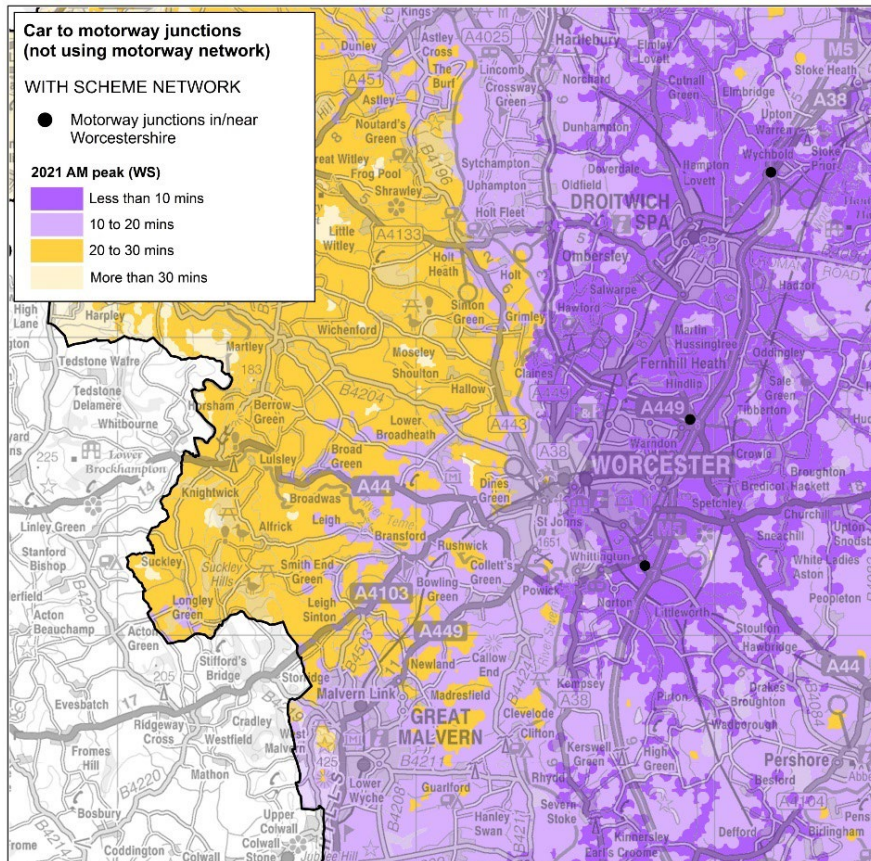


Figure 2.18: 2021 AM Peak Journey times by car, With Scheme



### 2.8.3 Unlocking economic growth

The A4440 SLR Phase 4 scheme unlocks economic growth in a variety of ways. These include:

- Improved access to housing and employment development sites;
- Improved access to existing employment areas to the west of Worcester; and
- The ability to enhance the environment in Worcester, because of the removal of through traffic.

The Strategic Economic Plan (SEP) for Worcestershire will see an addition 25,000 jobs, and additional £2.9bn GVA and 21,500 new homes built by 2025. The SEP recognises that pinch points to the strategic transport networks are constraining economic growth and that investment in Worcestershire's transport infrastructure and services is essential to provide businesses with improved access to markets and employees and to encourage economic growth.

Worcestershire LEP, in conjunction with WCC has identified four strategic investment or 'Gamechanger' sites. The work on the Gamechanger programme with key sites at Malvern Science and Technology Park, Worcester 6 in the south of the County and Redditch Eastern Gateway and the Kidderminster Employment Zone is expected to underpin up to 16,000 new jobs over time. The SLR scheme removes barriers to investment in the south of the County, supporting the delivery of related Gamechanger sites. The scheme also enables Worcester City to realise its ambition to contribute significant additional jobs.

Worcester has the ability to become an attractive place for development. It has a strong cultural heritage including a Cathedral which provides a real opportunity for additional and exciting growth including significant new employment and potential for additional City centre living as well as accommodating urban extensions. However, the capacity of the A4440 Worcester SLR has meant that some trips route through the City, rather than use the bypass route meaning that Worcester's high levels of congestion constrains business growth and regeneration opportunities.

The completion of the programmed improvements on the A4440 Worcester SLR will enable it to fulfil its purpose as a strategic bypass to Worcester City. In turn, this will provide opportunity to develop demand management measures at select locations in the City to address air quality issues and enhance the environment. The enhanced environment will allow greater priority to be given to pedestrians and cyclists, with the consequential health benefits. The opportunity to introduce demand management measures to reduce the impact of vehicles in the City centre will result in economic and environmental benefits. It will create a more attractive environment for visitors to the City centre which in turn will help encourage growth and maintain the vitality of the City centre.

The completion of the programmed improvements on the A4440 Worcester SLR also enables an additional 15 Ha of employment land to be brought forward. Furthermore, the certainty of improved access to the SRN opens up the wider employment land allocations in Malvern and west of Worcester.

The opportunities that will be generated by National and International inward investments on the Gamechanger sites are considerable. However, the potential number of sites that could be brought forward is currently suboptimal; a principle demonstrated by the number of employment sites outside the 20 minute isochrones in Figures 2.17 and 2.18. These sites include for example 5Ha at West of Worcester, 6Ha at University Park Worcester and 10Ha at Newlands in Malvern. In addition, the scheme also overcomes constraints on existing businesses, for example Joy Mining PLC, Malvern Instruments and Morgan Cars, who, as market leaders in their respective sectors, are significant exporters to world markets and who suffer the frustration of absolute and variation in journey times for customers and supplies/goods to and from the SRN.

The Worcestershire SEP notes that "Worcester City – the main urban area and civic and cultural centre of the County - has the potential to develop as an 'engine' for growth.....Access improvements, both by road and rail, will be key to realising this potential". The Strategic Economic Plan (SEP) for Worcestershire will see an addition 25,000 jobs, and additional £2.9bn GVA and 21,500 new homes built by 2025. The SEP recognises that pinch points to the strategic transport networks are constraining economic growth. Work has begun on a new masterplan for the City that could see several thousand new jobs in the city with the development of Shrub Hill railway station, the development of key sites



along the river front and the creation on new professional office quarter – providing commercial accommodation for a missing part of the Worcester City economy.

### **2.8.4 Improved network resilience**

The A4440 Worcester SLR Phase 4 scheme provides additional highway capacity over the River Severn as a result of the dualling the existing carriageway. This additional capacity provides much needed resilience if there is a problem close to or on the river crossing in the City centre. This is particularly true at times when the River Severn has flooded the roads leading to the City centre bridge meaning that it is no longer available.

### **2.8.5 Realise planned housing growth**

Without the scheme the growth identified in the SWDP for 28,400 dwellings and the Hereford Local Plan Core Strategy for a minimum of 16,500 homes could not be fully realised. To meet the allocations in these plans, development sites will need to be attractive to secure investment from developers. The poor connectivity is a known issue; this may discourage investment in these areas.

Looking at a wider geography, the SEP outlines a priority to improve the routes linking with Herefordshire in order to create better access and enhance strategic links between the two geographical areas. This aspect is mainly important for businesses trading and/or supplying other businesses or customers within the local geographic area. With enhanced links, trading and deliveries can be made more easily and more reliably. Given the strategic importance of the A4440 Worcester SLR linking Worcester, Worcestershire and Herefordshire with the M5, the benefits would span the West Midlands and beyond.

## **2.9 Objectives**

Due to the way in which this scheme has originated it is important that the specific scheme objectives are seen in the context of the WTS. Two sets of objectives are therefore set out below. Strategic objectives (the objectives of the WTS) to which this scheme will contribute and scheme objectives which are more specific.

### **2.9.1 WTS objectives**

It is important that the A4440 Worcester SLR Improvement Phase 4 scheme is seen in the wider context of the WTS which, as a broad package of measures, aims to:

- Deliver an integrated and balanced network of transport infrastructure and services which supports the delivery of National, Regional and Local Government policies on climate change, sustainable economic growth and sustainable transport;
- Support the local economy through long term job creation and retention and support successive growth of the central technology belt;
- Consolidate and expand the City's role as one of the nation's premier cathedral cities, providing a focus for tourism and investment;
- Create balanced and sustainable communities in which people can live and work;
- Deliver a better quality of life for the City's residents and visitors through significantly improved and sustainable accessibility to services, facilities and opportunities in a manner which enhances the health of the individual and vitality of the area;
- Form the basis for achieving the levels of sustainable housing in 'self-contained communities' and employment growth identified for Worcester; and
- Provide transport improvements which make a positive contribution to local air quality, road safety, accessibility and traffic congestion.

The WTS objectives specifically note, in respect of the A4440 Worcester SLR dualling strategy, that the scheme is specifically intended to address the following objectives:

- Reduce current congestion issues at the Powick, Ketch, Norton and Whittington Roundabouts; and
- Deliver significant primary route network capacity enhancements at key pinch points along this route, through dualling of the existing carriageway whilst meeting relevant highway design standards where economically achievable.

### **2.9.2 Scheme specific objectives**

The A4440 Worcester SLR Worcester Phase 4 scheme will:

- Unlock the potential of the A4440 Worcester SLR by removing the capacity constraint at Temeside Way;
- Support the growth of the economy of Worcestershire and the surrounding area by reducing travel times and costs imposed on businesses, transport operators and other network users by the current and forecast traffic congestion on the A4440 Worcester SLR;
- Improve the resilience of the transport network to extreme weather events and unforeseen disruptions, particularly flood incidents;
- Support the delivery of the planned growth set out in SWDP up to 2030. This includes development sites, such as Worcester West urban extension and North-East Malvern (totaling 3,000 dwellings and 15 hectares of employment land);
- Improve the performance and attractiveness to users of the A4440 Worcester SLR as a bypass for Worcester City centre, thereby helping to better manage traffic conditions in the constrained central area;
- Improve access to the Strategic Road Network from areas to the west and north west of Worcester, including Malvern Hills District, Herefordshire and parts of the Welsh Marches;
- Improve access to key hubs, including Birmingham International Airport and Worcestershire Parkway Station (and therefore further improving important links to Manchester, Cross Country the south); and
- To reduce transport-related emissions of carbon dioxide and other greenhouse gases in Worcester City centre.

## 2.10 Measures for success

Table 2.1 presents the key measures for success for the A4440 Worcester SLR Improvements Phase 4 scheme.

Table 2.1: Measures for Success

Objective	What success will look like	How measured
Unlock the potential of the Southern Link Road	Reduced travel time and more reliable travel times Higher volumes of traffic on the SLR	Journey time surveys Traffic flow data to show total volume of traffic being carried by the SLR
Support the growth of the economy	Reduced travel time and more reliable travel times	Journey time data
Improve network resilience	Increased traffic on the SLR when there are disruptions on the transport network	M monitoring of traffic flows on the SLR and identify changes resulting from network disruptions.
Support the delivery of the SWDP and its planned growth to 2030	SWDP allocations are realised with predicted future traffic conditions	Development applications
Improve the performance and attractiveness to users of the A4440 Worcester SLR as a bypass for Worcester City centre	Reduction in through traffic in City centre	Traffic count data. Data to show total volume of traffic being carried by the SLR, key city centre routes and crossing screenlines and cordons
Improve access to the Strategic Road Network from areas to the west and north west of Worcester, including Malvern Hills District, Herefordshire and parts of the Welsh Marches	Reduction in congestion on SLR at peak time	Stakeholder surveys and journey time data
Improve access to key hubs, including Birmingham International Airport, High Speed 2 stations and Worcester Parkway station	Reduced travel time and more reliable travel times	Stakeholder survey and journey time data
To reduce transport-related emissions of carbon dioxide and other greenhouse gases in Worcester City centre.	Reduction in through traffic in the City centre	Stakeholder surveys (and other relevant surveys as specified in the Environmental Statement) in the City centre and on A4440 Worcester SLR

## 2.11 Scope

The A4440 Worcester SLR forms a key part of Worcestershire's Primary Road Network (PRN) and links the SRN (M5, J7) and the eastern side of Worcester City with the A38 (to Tewkesbury), A449 (to Great Malvern), A4103 (to Hereford) and A44 (to Leominster). In doing so, it also acts as an important link between existing and planned residential and commercial developments on the southern and western side of the City. It is important to note that the A4440 Worcester SLR is one of only two road crossings of the River Severn at Worcester and as such provide a key link between east and west Worcester as well as an important bypass around the south of the City for longer distance traffic movements.

The proposed scheme includes:

- Construction of an additional carriageway adjacent to the existing single carriageway to form a 1.2 mile (1.9km) dual-2 carriageway from Ketch Roundabout to Powick Roundabout.
- Two new bridge structures to carry the additional 2 lane carriageway, at Carrington Bridge and at Powick Common viaduct;
- Capacity Improvements and junction revisions to allow dual carriageway connections at Ketch Roundabout;
- Widening of the existing footway to accommodate a shared pedestrian/cycle route on northern side;
- New road markings, some widening of carriageway on west approach to accommodate movements to new dual carriageway section at Powick Roundabout;
- Upgrade of dedicated left hand turn to Malvern to fully segregated facility at Powick Roundabout;
- Provision of a foot/cycle bridge linking the north and south cycle routes, located on the west approach, at Powick Roundabout; and
- Upgrade of grade separated pedestrian route for north to south movements at Ketch Roundabout.

The outline scheme layout is shown in a series of plans in Appendix A.

The project also aims to meet the criteria outlined by CEEQUAL. CEEQUAL is a sustainability assessment tool, which can be used to assess civil engineering, infrastructure, landscaping and public realm projects. It uses evidence-based criteria as well as external verification in order to provide results that can then be presented to the public. Additionally, integrating the CEEQUAL assessment within the development of a project can produce positive results.

The benefits of using CEEQUAL include:

- Embedding sustainable practices from early in a project's life, often resulting in long-term cost savings
- Reputational benefits and reducing reputational risk
- Demonstration of delivery of environmental, sustainability and/or corporate social responsibility policies, and positive reinforcement of high performance - Measurement of the sustainability of development projects and their comparison with other inhouse projects and competitors

Using CEEQUAL provides a single standard industry benchmark for sustainability performance. Helping to develop a positive performance attitude and promoting project team cohesiveness

## 2.12 Scheme Constraints

There are a number of constraints that have defined the parameters within which the scheme has to be designed. In general terms, the effects of constraints can either be eliminated or mitigated through the design process. However, the final design layout of a scheme is largely defined by its specific constraints. Mitigating constraints is a matter of balancing the physically achievable with the economic and environmental impacts, whilst working within acceptable parameters of Highway Design standards. The aim of the design development is to establish how the scheme objectives can be achieved in the most economically advantageous way within the constraints. Table 2.2 presents a summary of the key constraints.

Table 2.2: Key Constraints

Constraint	Issue	Design Response
Flood plain	The scheme falls within a flood plain	Designers are to ensure flooding mitigation issues are understood and accommodated within the design. Consultation with statutory environmental bodies undertaken and Flood Mitigation planning conditions has been discharged. Close liaison with Environment Agency to continue.
Common Land	The scheme is located through Powick Hams Common.	After consultation with the Commoners and the relevant landowner appropriate Exchange Land has been identified, is being secured through legal processes and is in the process of being de-registered.
Highway design standards	The design will not result in an upgrade to the existing carriageway width to minimise scheme costs, new carriageway to be built to current standards	Apply for appropriate departure from standards if required for existing carriageway. Early engagement with TAA.
Registered Battlefield	The scheme is close to a registered battlefield	Scheme designed to avoid impacting on registered battlefield.
Navigation of River Severn	River Severn is a navigation route at this location	New structure is to consider design requirement for River Severn traffic. Continue consultation with Canals & River Trust.
Underground Services	Investigations are required	Utility searches undertaken and negotiations are well underway
Drainage and SUD's	Consideration of attenuation required	Ensure drainage mitigation needs are understood accommodated. Close consultation with Environment Agency undertaken. LDC to be obtained.
Proximity of Residential Property	Property is located close to Temeside Way, and a number of properties are located close to the Ketch Roundabout	Ensure impacts of new scheme are identified and mitigated in accordance with DfT guidelines and good practice.

### 2.12.1 Electricity Pylon

At the time of the OBC, the electricity pylon located to the west of Carrington Bridge was raised as a constraint, however this constraint has now been resolved.

A meeting was held with Western Power and Distribution (WPD) in order to decide whether the pylon to the south of Carrington Bridge could remain in place as part of the permanent scheme works. However, it was decided that because this existing pylon would be so close to the new road alignment and due to the extensive civil engineering work required to provide a suitable retaining wall option, the pylon would be relocated.

This enabling work to relocate the pylon took place from June to September 2018 ahead of the main construction work. It was completed during the summer as this work could only be undertaken in low electrical demand periods.

If not relocated, the pylon would have been impacted by the new embankment that will be built south of the existing. Therefore, the existing pylon was replaced by a new pylon approximately 47m to the west of the existing pylon, and the foundations of the existing pylon dismantled and removed. Re-conductor works on the double circuit overhead line, which passes over the A4440, were also necessary. This involved installing a safety net catenary under the existing 132kV cables across the road and night-time road closures to install and remove the safety net.

Figure 2.19 and Figure 2.20 show images during the pylon replacement and after the pylon has been relocated removing this significant constraint and schedule risk from the project.

Figure 2.19: Image of Scaffold Erection South of Carrington Bridge



Figure 2.20: Aerial view showing relocated new pylon



## 2.13 Inter-dependencies

### 2.13.1 Worcester south and west urban extension areas

The SWDP contains major proposals for urban extensions to the south and the west of Worcester. As urban extensions, they will have a close relationship with the A4440 Worcester SLR.

The importance of dualling the A4440 Worcester SLR is mentioned in Policy SWDP 45/2 Worcester West Urban extension. The site allocation is at Temple Laugherne which is situated on the western edge of Worcester, within Malvern Hills District area. Access to the M5 and Worcestershire Parkway would be via the A4440 Worcester SLR.

Housing dependency analysis has been undertaken and is reported in the economic case.

### 2.13.2 Worcester Transport Strategy

There is an inter dependency between the elements of the WTS.

In LTP2 (2006-2011) it was noted that Worcester City has been identified to take a sub-regional role from 2011 and beyond. To elevate Worcester to this new role it was noted that Worcester would have to accommodate significant growth. Thus, a major land use and transportation study was carried out to identify how the already constrained transport network could accommodate such growth. The outcome of this study identified a transport strategy for the next plan period 2011-16. The strategy that resulted from this study was the WTS. Notwithstanding the work that was undertaken on this strategy, the LTP2 documentation had already identified the A4440 Worcester SLR as a congested corridor and suggested that to achieve the growth anticipated, schemes to enhance the capacity of the A4440 Worcester SLR would be necessary. The development of the WTS strategy reinforced this requirement.

The WTS has been developed to identify a comprehensive programme of investment in transport infrastructure for Worcester, to address existing and future transport challenges, whilst contributing towards the long-term prosperity of Worcester and south Worcestershire to 2030.

The WTS involves a package of investment in a wide range of transport infrastructure and service enhancements. This will deliver benefits not only locally, but also across the wider region, improving access and network efficiency for all users travelling into, through and/or around the Worcester transport network. In particular, this investment will make Worcester more attractive to business, supporting the local and regional economy.

The composition of the WTS has been driven by a set of 'desired outcomes' (economic growth, increased accessibility, reduced congestion and more sustainable travel) which in turn have been derived from agreed policies and objectives. In addition, it was necessary to consider the future development of Worcester and the future transport needs of the City. Inputs included the then Regional Spatial Strategy (RSS) for the West Midlands and the South Worcestershire Joint Core Strategy (SWJCS) which was developed to plan the delivery of this growth (this was a predecessor to the current SWDP).

In developing and updating the WTS, it was apparent that without increased transport capacity, Worcester's ability to grow and remain a key centre in Worcestershire and the wider region would be significantly constrained. Traffic congestion was forecast to increase, access to key services reduced, and negative environmental impact would occur due to reduced air quality, resulting in a decline in the quality of life for residents and reduction in the overall attractiveness of the City for businesses and visitors.

Bringing together the desired outcomes, issues and policy guidance, WCC is aware that a wide-ranging package of transport measures is required to deliver improvements to the existing network, including the following measures:

- Highway infrastructure improvement schemes to increase transport capacity for local and strategic movements, supporting proposed new land-use developments;
- Improvements to multi-modal transport infrastructure along key corridors;
- New walk and cycle schemes, including improvements to the public realm in the city centre;

- Adoption of an intelligent transport system to maximise the capacity of the existing road network and including elements such as real time passenger information for bus passengers and variable message signing for car drivers;
- Improved bus stop facilities and information;
- Smarter Choices measures to encourage sustainable travel; and
- Measures aimed at reducing traffic demand.

## 2.14 Stakeholders

The scheme is well supported by key stakeholders and local businesses, as illustrated in the letters of support presented in Appendix Q.

### 2.14.1 Stakeholder Management and Engagement Plan

The Southern Link Road: Phase 4 Stakeholder Management and Engagement Plan, December 2018 is presented in Appendix C.

The Plan has been put together to pinpoint the communication channels that should be utilised to ensure all relevant parties are kept informed as the project develops. Communications will be tailored to meet the needs of each stakeholder and will take into consideration the objectives for the scheme.

#### 2.14.1.1 Audiences

The key audiences for the Stakeholder Management and Engagement Plan are:

- Worcestershire County Council (Councillors/Staff)
- Worcestershire Local Enterprise Partnership
- Herefordshire and Worcestershire Chamber of Commerce/Federation of Small Businesses/Institute of Directors
- Worcester Business Improvement District
- Department for Transport
- Secretary of State for Transport
- Worcester City Council
- Wychavon District Council
- Malvern Hills District Council
- Local Councillors
- Parish and Town Councils
- Herefordshire Council
- The Marches Local Enterprise Partnership
- Highways England
- Environment Agency
- Developers
- Local Members of Parliament
- Local residents
- Commuters
- Local businesses
- Local media and Trade Press organisations



- Road Haulage Association
- Sustrans and local cycling promotion groups
- Living Streets
- RoSPA
- Ramblers Association
- Campaign for Protection of Rural England
- Open Space Society
- Natural England
- Historic England
- Wildlife Trust
- Canals and Rivers Trust
- Bus/taxi Operators
- Education establishments (e.g. sixth forms, University of Worcester)

In addition to the stakeholders listed above, the project development has included a number of detailed consultations with the following stakeholders:

- Discussions with Statutory Undertakers (C3 Estimates) – National Grid (Nov 2016); Severn Trent Water (Dec 2016); CLH (Oil Pipeline) (Nov 2016); BT Openreach (Nov 2016);
- Discussions with Western Power Distribution regarding pylon relocation process (Nov 2016);
- Environment Agency Consultation regarding Flood Risk Assessment;
- Environment Agency Consultation regarding Flood Modelling Assessments;
- Place Partnerships initial liaison with main land owner for land affected by scheme and commoners;
- Meeting with WCC Development Control – Re Planning Application requirements in relation to Environmental scoping;

As part of Environmental Assessment, meetings undertaken with Malvern Hills District Council; County Ecologist, County Archaeologist, Environment Agency, Worcestershire Regulatory Service, Historic England, Natural England, Worcester City Council, Worcestershire Wildlife Trust, the Severn River Trust.

### **2.14.2 Support from stakeholders**

The scheme is well supported, as evidenced by the letters of support presented Appendix Q, and extracts below.

#### **Harriett Baldwin MP, MP for West Worcestershire (writing to WCC in November 2018)**

“...there are still significant delays at the pinch point of the A4440 where the road crosses the river Severn and I still receive complaints, particularly from members of the business community, about serious day-time congestion for drivers travelling from Malvern and its surrounding areas towards the west of Worcester and the M5”

#### **Robin Walker MP, MP for Worcester (writing to WCC in October 2015)**

“It is the number one transport priority for businesses in my constituency and is considered vital by many of my constituents to reduce congestion in the city of Worcester.”

“The substantial investment that has already been made in dualling, the upgrade of our motorway junctions and the delivery of Worcestershire Parkway Station will only deliver their full potential if this work is completed.”

“The completion of Phase 4 is essential to the economic growth of our businesses and Worcester as a whole but also of the wider South Worcestershire area.”

“The dualling of this route would substantially improve flood resilience.”

**Nigel Huddleston MP, MP for Mid Worcestershire (writing to WCC in October 2015)**

“If the bid is successful, it will greatly benefit Worcestershire’s economic growth agenda and increase accessibility for businesses and other used, which will benefit the whole of Worcestershire.”

**Worcestershire LEP (writing to WCC, November and December 2018)**

“...The Phase 4 improvements to the SLR (dualling of the A4440 between the Ketch and Powick Roundabouts including the Carrington Bridge) is absolutely necessary to reduce congestion and improve journey times which currently cause difficulties to many businesses.

This scheme would also help the economy further as it will enable development sites, both commercial and residential (delivering jobs and new homes), and improve transport links which would allow businesses to attract and retain skilled staff and engage with customers more easily across a wider geographical area.”

“Reduced congestion, increasing journey time reliability and better connectivity with lower transport costs will benefit everyone in Worcester City, as well as the wider area, and the Business Board believes that the benefits that Phase 4 would bring to the local economy are critical.”

“The A4440 Phase 4 Bid will support our 10 year Strategic Economic Plan”

**The Marches LEP (writing to Robin Walker MP, March 2015) and Cllr Price, Cabinet Member for Infrastructure, Herefordshire Council (writing to Robin Walker MP, March 2015)**

“We support proposals for progressing a dual carriageway at Carrington Bridge noting the potential benefits if could provide for the economic prosperity of Herefordshire.”

**Worcester Council (writing to WCC, October 2015)**

Confirms the Authority’s support for Phase 4 and notes that “Theme 1 of our Corporate Plan 2015-2020 is ‘increasing prosperity through successful business and great jobs’. In order for us to fulfil this aim we must have the infrastructure in place that supports business success and growth.”

**Cllr Linda Robinson, Leader of Wychavon District Council (writing to WCC, October 2015)**

“The South Worcestershire Councils and the Worcestershire Local Economic Partnership share the common goals of delivering economic prosperity, business growth, inward investment, job creation and the release of strategic housing sites. Phase 4 of the Worcester Southern Link is both vital and integral to all of these goals.”

“The implementation of Phase 4 of the Worcester Southern Link would directly support the release of strategic urban extensions at Worcester, as well as game changer and strategic employment site in key employment sectors in both Wychavon and Malvern Hills Districts. We are also mindful that implementation of this project could also have positive benefits for the operation and success of planned investment in the Malvern Hills Science Park and the Worcestershire Parkway Station to the south east of Worcester.”

“...we are also conscious that this particular project has other wide ranging benefits across south Worcestershire and beyond, such as the importance of the Worcester southern link with respect to motorway access from Herefordshire.”

“...there is unlikely to be another project with such area wide benefits and strategic importance as the planned improvements associated with Phase 4 of the Worcester Southern Link.

**Fortis Living, largest social housing provider in Worcestershire**

“Our ability to attract the right quality staff to key positions has been adversely affected by the problems of the Southern Link Road, particularly crossing the Carrington Bridge, and dualling of the Bridge and the A4440 would make a massive difference to our business.”

**Joy Global, global business based in St John’s Worcester**

“We currently experience extreme delays on this section of road; Phase 4 completion is therefore essential to the economic growth of our business and Worcester as a whole.”

**Malvern Instruments Limited (writing to WCC, Oct 2015)**

“The resulting congestion on the bridge...puts significant strain on businesses such as ours who cannot avoid using the A4440 to get our products to our UK customers.”

“Without completion of this ‘missing link’, the key issues of inadequate logistics will continue and the challenge of recruiting and retaining highly-skilled staff who will avoid at all costs talking up roles in companies where a commute across the bridge is required” will also continue.

“There is no doubt that the growth potential of our company, together with that of many others in the county is being compromised by this long-standing bottleneck and I believe it is the single most important infrastructure investment in the country that will have a very rapid payback through the acceleration of economic growth.”

**Alimenti Food Sciences Ltd. November 2018**

“Failure to complete Phase 4 will negatively impact the development of this area, and the regions feeding into it. I am considering expanding my business to include a facility which will need good road links for logistics. I cannot consider any site which involves transport using this road, at present, because of the impact on journey times, both of goods and people.”

**Worcestershire Regulatory Service - body that undertakes local air quality management duties on behalf of all six Worcestershire authorities (writing to WCC, November 2018)**

“Providing a more attractive alternative for drivers undertaking unnecessary journeys through the City Centre is considered a key requirement to improving poor air quality within the City and the health of local residents.”

**Environmental Health & Licensing. November 2018**

“Providing a more attractive alternative for drivers undertaking unnecessary journeys through the City Centre is considered a key requirement to improving poor air quality within the City and the health of local residents.”

**Heart of Worcestershire College. November 2018**

“Improving access to the Strategic Road Network from areas to the west of Worcester, including the Malvern Hills District, Herefordshire and parts of the Marches, helping businesses, such as HoW College, to attract quality staff and opening up the possibility of gaining customers from further afield.”

#### **Microferm Ltd, November 2018**

“Congestion on the route needs to be addressed to improve journey times and costs to our businesses. We export in excess of 2,000 tonnes / annum mainly containers which need to travel along this route and for us to control transport costs journey times from Malvern Link to the motor way network must be reduced.

It is difficult to recruit staff in Malvern so subsequently we target staff from Worcester but it’s problematic attracting people due to daily congestion on the A4440 at peak times with traffic queuing back up the Malvern Road from Powick roundabout, significantly increasing journey times.”

#### **Counter Point Courses. November 2018**

“Counterpoint is an SME in consultancy and training, and our livelihood depends on us travelling to clients or training venues. ....With the current situation of only single lane traffic on the Carrington bridge, we are often held up in traffic and, even if we are not, we have to factor in time to allow for hold ups. This causes a huge waste of time to our business. It would therefore make a great improvement in efficiency to our business if Phase 4 of improvements to the SLR were to be completed.”

#### **Highways England (writing to WCC, December 2018)**

“...The SLR is the key local route for distributing traffic to and from the M5 Motorway at this location. As we have previously identified in our observations on the South Worcestershire Development Plan existing congestion on the SLR has negative impacts upon the operation of M5 Junction 7. The planned improvement scheme will therefore be beneficial for the operation of our network as well as wider transport networks in south Worcester.”

#### **Wychavon District Council (writing to WCC, December 2018)**

“By completing the dualling scheme, Phase 4 will help to:

- Ensure that development sites (both for housing and employment) as set out in the South Worcestershire Development Plan can be brought forward
- Reduce congestion and improve journey times in the South Worcestershire area and access to the west of the county– helping to reduce the cost to businesses
- Improve access to the Strategic Road Network from areas to the west of Worcester
- Improve the attractiveness of the A4440 as a bypass for Worcester City Centre
- Improve access to key international hubs, including Birmingham International Airport.”

“...The A4440 Phase 4 Bid will certainly support the County Council's objectives outlined in the Corporate Plan since it will support the economy through reducing congestion and increasing journey time reliability.”

#### **Herefordshire and Worcestershire Chamber of Commerce (writing to WCC, December 2018)**

“...believe that this scheme is essential for the delivery of business, economic sustainability and growth.”

“...express my strong support for the Worcester Southern Link Road Phase 4, which I believe will greatly reduce congestion, improve journey times throughout the whole south Worcestershire area – helping to reduce cost to business, and improve the business productivity/efficiency.”

## **2.15 Options**

The option development work for the A4440 Worcester SLR Phase 4 scheme is set out in the Option Assessment Report (January 2017) and subsequent addendum report, see Appendix E. This section provides a brief overview of this work.

Scheme options were firstly considered within the context of Worcester Transport Strategy (WTS). Then high level options on how the upgrade for Phase 4 of the A4440 Worcester SLR improvements could be achieved were considered. These options then went through an initial appraisal for any issues that would potentially impact on their deliverability and operation and resulted in the conclusion that the dualling scheme was preferred. This analysis can be found in Table 5.1 of the Options Assessment Report (January 2017).

Following this appraisal, a number of key design options were considered. The full list of options can be found in Table 5.2 of the Options Assessment Report (January 2017). This analysis concluded that the scheme should have a design speed of 60mph, provide additional carriageway on the southern side of the existing road and provide a new bridge for westbound carriageway and use the existing structure for eastbound traffic.

Junction layout options for Ketch and Powick roundabouts were then considered based on turning movements from the Worcestershire Traffic Model. These were analysed against strategic fit, technical soundness, stakeholder acceptability, deliverability and value for money (further detail of the analysis process can be found within table 5.3 of the Options Assessment Report). Following this initial sift, options that were considered viable were taken forward to be considered further and modelled to produce a preferred option for both roundabouts.

## 2.16 Summary of Strategic Case

In summary, this Section sets out a robust case for change that fits with wider public policy objectives. The scheme has a clear business strategy and is closely aligned with the aims of WCC and the WLEP. The scheme is also supported by the Marches LEP. The scheme addresses a number of problems relating to the economy, transport and infrastructure as a barrier to economic growth, congestion and constraints to development (e.g. Worcester West urban extension and other developments to the west of Worcester) and network resilience.

Improvements to the A4440 Worcester SLR will reduce the negative effects of congestion and improve accessibility and journey times across south Worcestershire. In turn, the area's attractiveness to business and ability to accommodate more housing will increase.

South Worcestershire Development Plan (SWDP) makes provision for 28,400 dwellings for the plan period 2006 to 2030 and the Hereford Local Plan Core Strategy, aims to deliver a minimum of 16,500 homes over the period 2011 to 2031. To meet the development allocations set in the SWDP, development sites will need to be attractive to secure investment.

The connectivity to the Strategic Road Network from the west is notably poorer in the peak periods, in the Worcester area, due to congestion. This has meant that employment development to the West of Worcester is not attractive. Indeed, there has been a case where a site allocated for employment use has been developed for residential use due to lack of market interest in employment development to the West of Worcester. Feedback from the business community has shown this is due to connectivity, particularly lack of certainty of travel times to the Strategic Road Network. The scheme would address this issue.

The unattractiveness due to congestion and unreliability on the A4440 Worcester SLR results in trips routing through the City, rather than using the A4440 Worcester SLR. Worcester's current high levels of congestion reduce the attractiveness of the City as a location for business and thus growth and regeneration opportunities are not taken forward. Removing strategic traffic from the City centre will enable Worcester to meet its socio-economic aspirations.

Improvements of the A4440 SLR Phase 4 will provide much needed network resilience against River Severn flooding, which has impacted the City Centre during recent floods in 2003, 2007, 2012 and 2014.

The scheme is the final phase of the four phase programme which upgrades the A4440 SLR to dual-carriage standard between Powick roundabout and the M5. This final phase ensures the routes attract trips currently using the city centre infrastructure to cross Worcester. It completes a major upgrade to

the A4440 Worcester SLR, which reinforces the role of the SLR as a strategic East West route, as well as a bypass to the city centre.

The scope of the scheme includes:

- Construction of an additional carriageway adjacent to the existing single carriageway to form a 1.2 mile (1.9km) dual-2 carriageway from Ketch Roundabout to Powick Roundabout.
- Two new bridge structures to carry the additional 2 lane carriageway, at Carrington Bridge and at Powick Common viaduct;
- Capacity Improvements and junction revisions to allow dual carriageway connections at Ketch Roundabout;
- Widening of the existing footway to accommodate a shared pedestrian/cycle route on northern side;
- New road markings, some widening of carriageway on west approach to accommodate movements to new dual carriageway section at Powick Roundabout;
- Upgrade of dedicated left hand turn to Malvern to fully segregated facility at Powick Roundabout;
- Provision of a foot/cycle bridge linking the north and south cycle routes, located on the west approach, at Powick Roundabout; and
- Upgrade of grade separated pedestrian route for north to south movements at Ketch Roundabout.

Due to the nature of the scheme, it is not possible to disaggregate this scheme into smaller packages of work.