

REPORT N° 70001991-038-04

PHASE 2 A46 LINK ROAD

OPTIONS ASSESSMENT REPORT



Confidential September 2017

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1 EXECUTIVE SUMMARY

1.1 INTRODUCTION

- 1.1.1 The proposal for an A46 Link Road has been developed by Coventry City Council and Warwickshire County Council in order to cater for current and future transport problems. The potential route for the Phase 2 A46 Link Road will run adjacent to the west of University of Warwick central campus where significant housing development is proposed as part of the University's Masterplan. The new link road will support wider housing and employment policies in the area, including development at Westwood Heath and Kings Hill, increasing resilience on this part of the network and freeing up capacity on the A45 to support the route to become a greater public transport corridor for connectivity to the wider West Midlands, including UK Central.
- 1.1.2 The proposed link road will provide a connection between the A46 south of Coventry and the University of Warwick. The link road will provide an alternative route to the A45 and A46, acting as a relief road for these routes, in particular the A45, diverting trips which would otherwise have to travel into Coventry to travel west.
- 1.1.3 The A46 Link Road route largely runs parallel to the HS2 route in the study area, and will provide essential connectivity northbound towards UK Central for links to the A45 towards the HS2 Interchange Station. In supporting access to the A45, the link road will provide greater access to the wider Greater Birmingham and Solihull Local Enterprise Partnership (GBS LEP) area including Jaguar Land Rover's (JLR) Solihull Plant. The impact of the link road will support network resilience in the local area, where road closures occur on surrounding route to ensure that traffic can continue to operate via an alternative route.
- 1.1.4 The A46 Link Road will support wider strategic connections to the M42, by freeing capacity on the A45 for connections on to the motorway. The M42 acts as a strategic artery connecting other motorway routes including the M5, M40 and M1. The M1 itself forms the primary national north-south artery connecting London in the south with Leeds, connecting the principal East Midlands towns of Leicester, Derby, Nottingham and Sheffield.
- 1.1.5 As well as highway connections, the proposed link road will also provide access from the south of Coventry to the extensive Park and Ride facility at Tile Hill Railway Station as part of the Coventry South Package. The station provides services on a 20 minute frequency between Birmingham and London Euston for much of the day. En route, the trains call at Birmingham International for access to UK Central and in the future connections to the HS2 Interchange Station. As well as London Euston, Tile Hill provides direct services southbound to Milton Keynes and Northampton.
- 1.1.6 There are several developments in the wider area which the link road will enable increased access to, without the traffic needing to travel via the existing, congested links. At the western end, this includes the Eastern Green Sustainable Urban Extension (SUE) which will provide 2,250 dwellings and 15 hectares of employment land. At the eastern end, the link road will provide access from the west to new employment sites at Coventry Gateway and the forthcoming expansions in employment at the National Agricultural Centre / Showground and Abbey Park.
- 1.1.7 In compliance with The Transport Appraisal Process (set out in the Department for Transport's (DfT's) WebTAG series of documents), an Option Assessment Report (OAR) has been produced which sets out the evidence that has led to the preferred option of the A46 Link Road Phase 2.

This chapter summarises the content of the OAR with the aim of providing the reader with the information regarding the process which has produced the preferred option to be assessed in the

Stage 2 (Further Appraisal) with the methodology described at a later stage in the Appraisal Specification Report (ASR).

1.2 VISION

- 1.2.1 The vision for the A46 Link Road Phase 2 scheme has been developed in line with the overarching vision and objectives for the Coventry South Package, as well as key documents at national, regional and local level which the intervention needs to support. The vision sets out what the intervention will need to achieve:

To support planned sub-regional housing and employment growth within Warwick District, Coventry City and the wider A46 corridor as part of the Coventry South package, including the University of Warwick's emerging masterplan. In addition the Vision will reduce the inappropriate use of minor residential roads for traffic accessing the university and surrounding area.

- 1.2.2 The vision has been informed by, and will shape, the overall need for the intervention including the development of the scheme specific objectives. The developments which the vision encompasses are summarised below in Section 1.3.

1.3 FUTURE SITUATION

- 1.3.1 Significant growth is planned in Coventry and Warwickshire up to 2031, in particular in the South Coventry area. These developments need to be supported by the appropriate supporting infrastructure to maximise their potential benefits in terms of supporting economic growth and productivity in the local area. Principal growth sites include the following:
- Stoneleigh Park - 3,000 jobs by 2030¹
 - University of Warwick Masterplan - 5,762 jobs by 2018²
 - Whitley Business Park - 3,800 jobs by 2021³
 - Coventry and Warwickshire Gateway – 10,000 jobs by 2021³
 - Significant provision of new housing planned in the local area, with 38,000 new dwellings proposed in the Coventry and Warwick District Local Plans up to 2031. In addition to this, the University of Warwick Masterplan also identifies the development of a minimum of 2,000 additional student bedrooms on the main campus.
- 1.3.2 Two of the objectives of the wider Coventry South Package, of which the A46 Link Road is part of, are:
- To mitigate and support the housing and employment proposals contained within the Local Plans for Warwick District and Coventry City; and

¹ Warwick District Council, 2017

² University of Warwick Masterplan, 2007

³ Coventry Local Plan Modelling Report, December 2015

- To support the growth aspirations of the University of Warwick and key existing and proposed employment sites within the immediate area and wider A46 corridor.

- 1.3.3 Part of the vision of the Coventry South Package is to support planned sub-regional housing and employment growth within Warwick District, Coventry City, Solihull Metropolitan Borough and the wider A46 corridor. The A46 Link Road will play a key role in fulfilling the requirements to meet these objectives, and to support this part of the vision.
- 1.3.4 The existing constraints and limitations on opportunities will become more significant in the future without the necessary A46 Link Road in place to prevent this from occurring.
- 1.3.5 The developments detailed above have been input to the Coventry Area Strategic Model (CASM) Highway Assignment Model (HAM) with the aim to highlight areas of congestion, delay and deteriorating journey times in a 2019 and 2034 Highways England Do Something (DS) scenario, when compared to 2013 base year models.
- 1.3.6 The Do Minimum models included population and employment growth constrained to the National Trip End Model (NTEM) version 6.2 and Local Plan developments which had been identified in the uncertainty logs as 'More Than Likely' or 'Near Certain'.

1.4 THE IDENTIFICATION OF THE OBJECTIVES

- 1.4.1 Following the study into current and potential future year issues, a number of specific objectives have been identified which, if met, will eliminate or mitigate the issues. These objectives have been reviewed by a range of stakeholders (see Section 6.6) to ensure the objectives will also meet their requirements.
- 1.4.2 The methodology utilised in identifying potential objectives is as follows:
- Establish a Vision – through consideration of local, regional and government policies and strategies, as well as the wider Coventry South Package, establish an overarching vision for the study area and desired strategic outcomes.
 - Analyse of Current and Future Situation – looking at transport network and its users, analysis to provide an understanding of the problems and opportunities that exist or may exist in the future.
 - Set Transport Objectives – By identifying the problems, the opportunities to improve the current and future situation emerge to which measureable objectives can be set against.
 - Set Indicators – For each objective there needs to be at least one indicator that can provide some measure of success. This allows comparison between options during the appraisal and, ultimately, will support the evaluation of the implemented solution.
- 1.4.3 The objectives initially identified have been further reviewed to ensure that they are SMART and thereby can be marked as complete in due course, rather than being open ended. SMART objectives are:
- *Specific* - say in precise terms what is sought;
 - *Measurable* – the means by which satisfaction whether or not the objective has been achieved can be assessed;
 - *Attainable* - general agreement that the objective set can be reached;
 - *Relevant* - the objective is a sensible indicator or proxy for the change which is sought; and
 - *Timed* - the objective will be associated with an agreed future point by which it will have been met.

1.4.4 As a result of this process, the scheme specific objectives are:

1. Maintain journey times following development

To enable the delivery of future housing, employment and educational development whilst maintaining journey times on the local network including on the A45; Cromwell Lane and Stoneleigh Road

2. Provide accessible economic development

To deliver “desirable” average peak hour journey times close to those in the off peak to support accessibility to support future housing, employment and educational development sites in the local area.

3. Improve network resilience

To ensure the transport network within Coventry and Warwickshire is resilient enough to provide a consistent and reliable level of service during (a) planned maintenance and (b) during incidents.

4. Improve University of Warwick accessibility

To support the delivery of future development at the University of Warwick and reduce journey times for those travelling to / from the site.

5. Improve road safety

To reduce the number and severity of accidents on the A45, A429, Charter Avenue, and at the A46 Stoneleigh junction.

6. Improve air quality

To reduce the impact of transport on air quality within the City of Coventry to achieve levels below accepted thresholds for NO₂.

7. Reduce severance

To reduce vehicle flows on the A45, Stoneleigh Road and Gibbet Hill Road, and enable improved pedestrian and cycle crossing facilities and routes on the A45.

8. Reduce rat running

To reduce vehicle flows on local roads including Crackley Lane and Hollis Lane in order to relieve capacity on the local network.

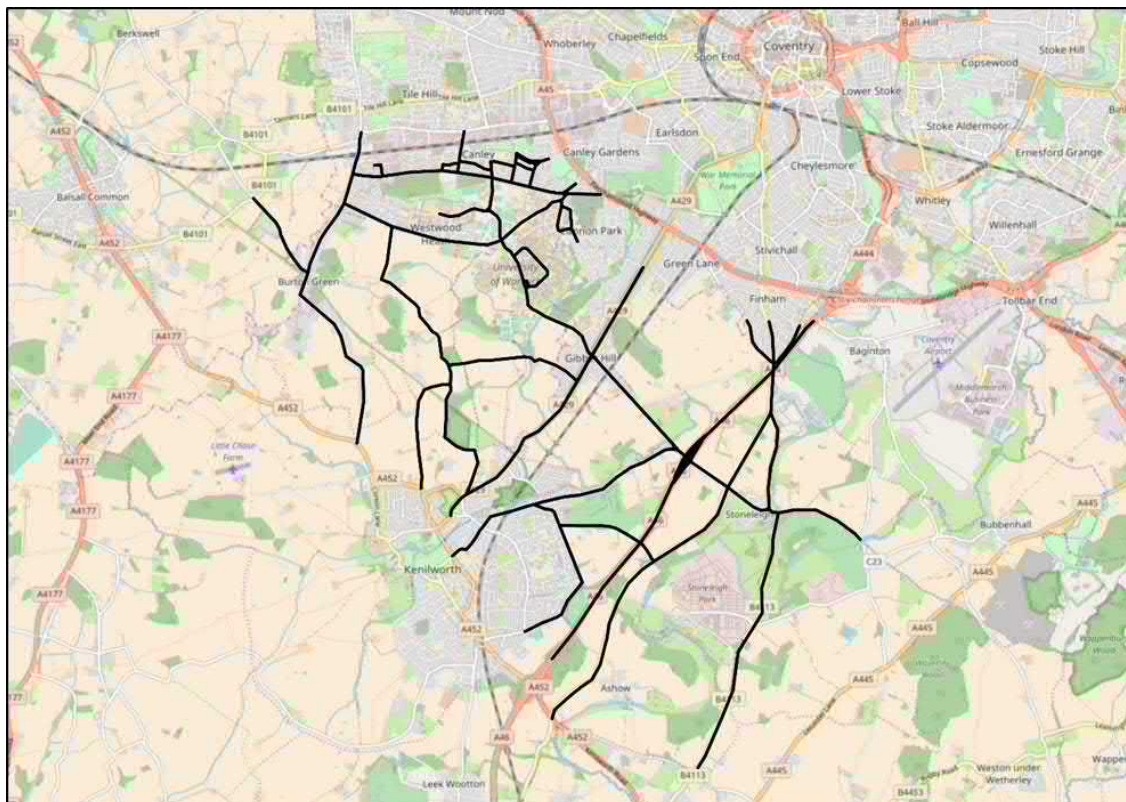
1.5 GEOGRAPHICAL AREA INVOLVED IN THE INTERVENTION

1.5.1 The geographical area of impact has been defined in terms of the area where an intervention has been identified as being required. This draws upon the geographical scope of the key origins, destinations and economic growth sites in the area; as well as analysis of the current and future transport demand. Based on the results of our initial analysis, the key area of focus for the opportunities and constraints in Coventry and Warwickshire is in South Coventry and the north of the District of Warwick in the vicinity of Kenilworth.

1.5.2 The network which is primary involved in the study area is shown in Figure 1-1. Future development sites in the study area are shown in Figure 1-2 and then reviewed further in Chapter 8 of this document.

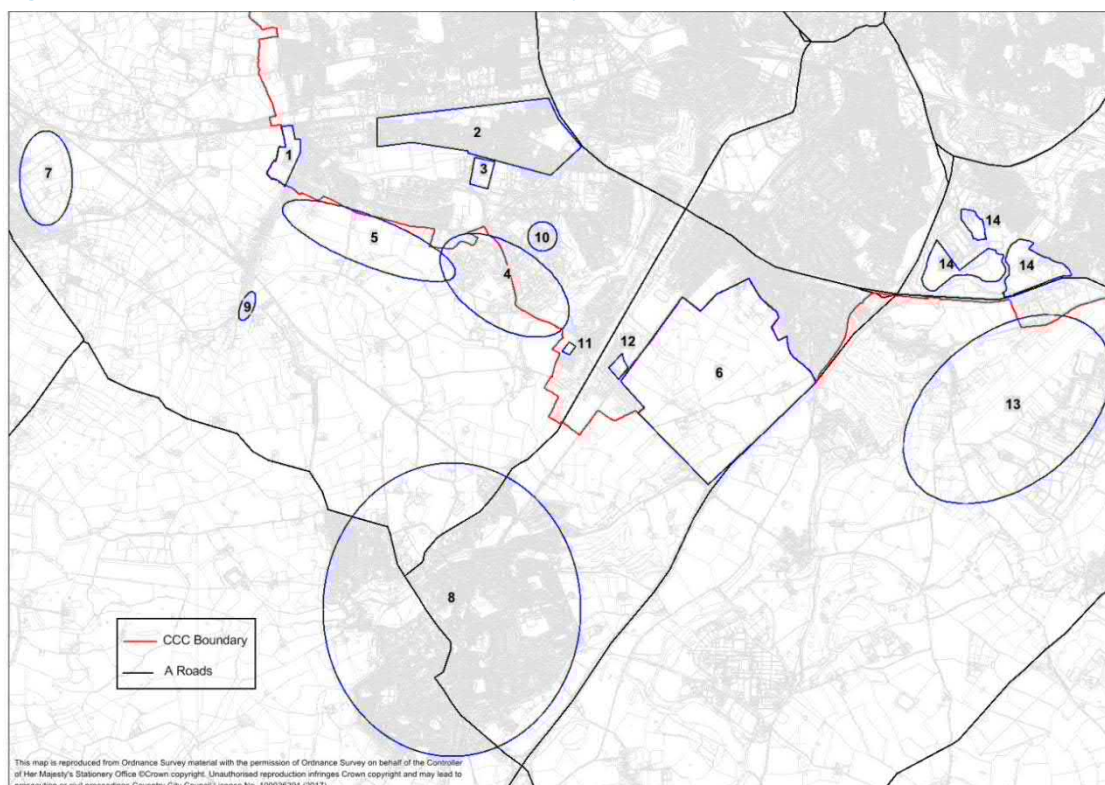
1.5.3 As well as the modern built environment, the study area also encapsulates a range of other land uses, land types and locations of historic interest. As such, any intervention should be designed in a way to minimise the impact on these amenities. This is reviewed in greater detail in Chapters 4 and 5 of this report.

Figure 1-1 - Geographic Scope Highway Network Area Coverage



Source – WSP

Figure 1-2 - Future Development in South Coventry

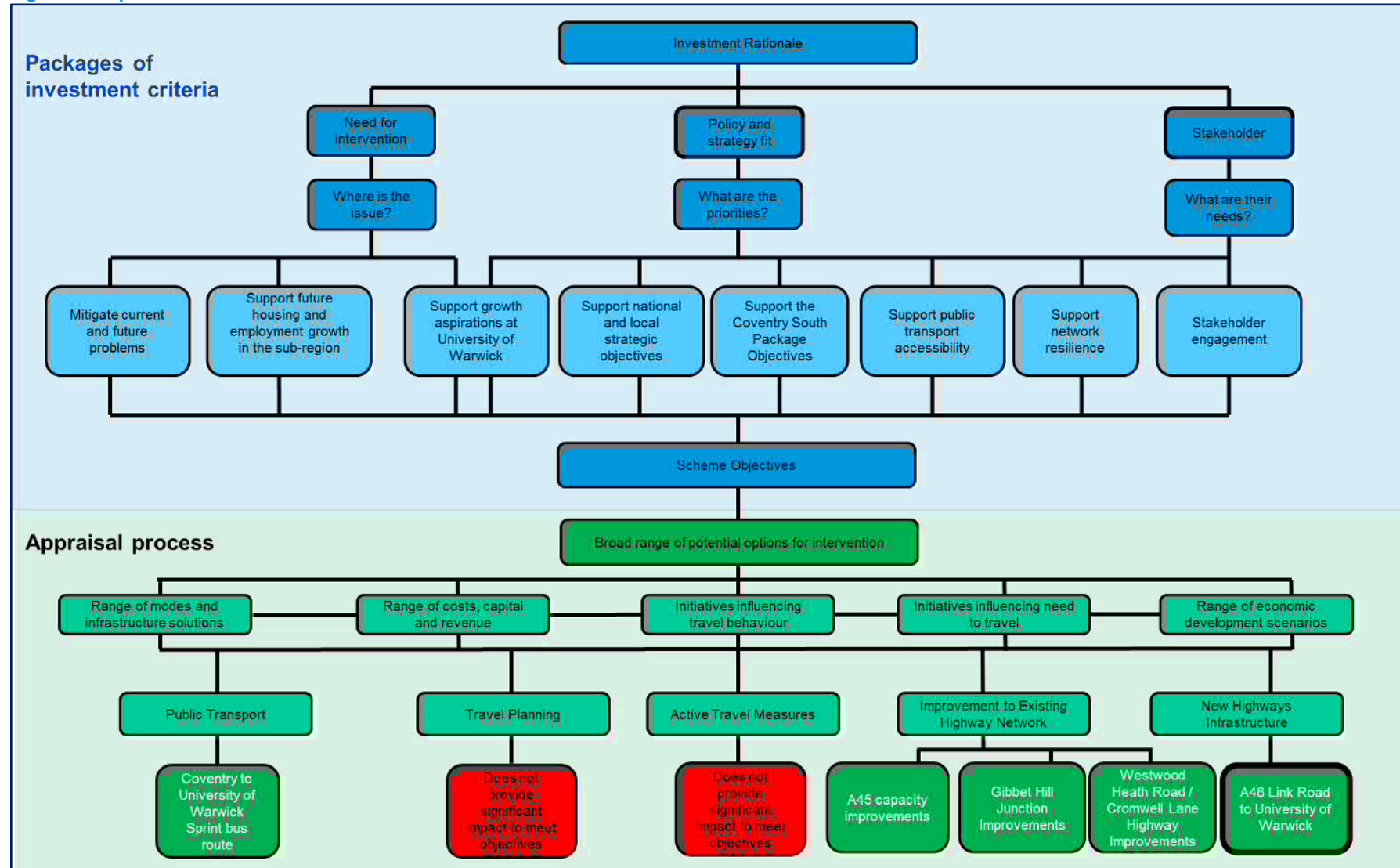


Source: Coventry City Council, 2017

1.6 GENERATING OPTIONS

- 1.6.1 At study commencement a range of options were reviewed for their potential to mitigate the problems identified and achieve the scheme objectives. The process of the options generation is outlined in Figure 1-3 and involved analysis of the following:
- Current conditions on the network;
 - Future conditions on the network;
 - Supporting existing policy and strategy; and
 - Stakeholder engagement including consistent engagement with Highways England (HE) to ensure that options do not interfere with, but compliments their wider programme of works.
 - A range of interventions have been examined previously in local transport plans, local plan and other studies which have been reinvestigated for the purposes of the OAR. The interventions subsequently proposed include the following:
 - Public transport provisions:
 - Coventry to University of Warwick Sprint bus route - The introduction of a new Bus Rapid Transit (BRT) route between Coventry City Centre and the University of Warwick via the A429 and Coventry Railway Station. This would potentially deliver a step change in public transport provision, with improved service frequency, high standard vehicles, priority for public transport along with other amenity and accessibility improvements such as enhanced stop facilities, off board ticketing and staff presence on board vehicles
 - Highways infrastructure.
 - A45 capacity improvements - Highway capacity improvements on the A45 in the form of an underpass at the A429 / A45 junction.
 - Gibbet Hill Junction Improvements - Highway capacity improvements at the Gibbet Hill Road / A429 / Stoneleigh Road junction.
 - Westwood Heath Road / Cromwell Lane Highway Improvements - Highway capacity improvements on Cromwell Lane and the signalisation of the junction with Westwood Heath Road.
 - A46 Link Road to University of Warwick - The development of a new link road between the A46 / Stoneleigh Road junction and the University of Warwick.
- 1.6.2 Travel planning and active travel measures have also been considered as part of the options generation process; however they do not perform well against scheme objectives and have thus been discarded.
- 1.6.3 These options have been assessed against a do-minimum scenario where the developments identified in the uncertainty logs have been included with no supporting infrastructure or public transport (PT) measures delivered to support them.

Figure 1-3 Options Generation Process



1.7 INITIAL SIFTING

- 1.7.1 In order to undertake the initial sifting process, the DfT's formally supported Early Appraisal Sifting Tool (EAST) has been used.
- 1.7.2 EAST has been produced by the DfT to provide an approach to the assessment of a range of options against their ability to address a known problem or meet an agreed set of objectives. The assessment criteria have been designed to present an analysis consistent with the five case business case model (Strategic, Economic, Management, Financial and Commercial).
- 1.7.3 This tool has been established by DfT as a simple and consistent means of:
- Comparing options based on an agreed set of criteria,
 - Allowing the number of options to be filtered based on performance against criteria,
 - Identifying potential packaging and enhancements across options, and
 - Identifying major uncertainties at the early stage of project development, which can be addressed at later stages of appraisal.
 - As part of the process of the methodology of developing the EAST for this options assessment report, the EAST criteria were reviewed under each heading to identify potential areas where more relevant criteria could be used to replace or supplement the existing attributes. Those attributes that have been revised are presented in Table 1-1.

Table 1-1 Appraisal Criteria

CASE	STANDARD EAST CRITERIA	PROPOSED REVISED EAST CRITERIA	COMMENT / JUSTIFICATION
Overall	Name/No.	Name/No.	
	Date	Date	
	Description	Description	
Strategic	Identified problems and objectives of the option	Identified problems and objectives of the option	
	Scale of impact	Scale of impact	
	Scale of impact - Comments	Scale of impact - Comments	
	Fit with wider transport and government objectives	Fit with wider transport and government objectives	
	Wider transport and government objectives - Comments	Wider transport and government objectives - Comments	
	Fit with other objectives	Fit with WMCA and CWLEP SEP objectives	To provide an understanding of fit/agreement with agreed local objectives more specifically.
	Fit with other objectives - Comments	Fit with WMCA and CWLEP SEP objectives - Comments	
		Key opportunities	To support the options appraisal process as outlined in WebTAG Guidance for the individual options.
	Key uncertainties	Key uncertainties	
	Degree of consensus over outcomes?	Degree of consensus over outcomes?	
	Degree of consensus over outcomes? - Comments	Degree of consensus over outcomes? - Comments	
Economic	Economic Growth	Economic Growth	
	Economic growth - Comments	Economic growth - Comments	
	Carbon emissions	Air Quality	Relates directly to supporting the Air Quality Management Area in Coventry.
	Carbon emissions - Comments	Air Quality - Comments	
	Socio-distributional impacts and the regions	Socio-distributional impacts within C&W Area	Making it more locally specific
	Socio-distributional impacts and the regions - Comments	Socio-distributional impacts within C&W Area - Comments	
	Local environment	Local environment	
	Local environment - Comments	Local environment - Comments	

CASE	STANDARD EAST CRITERIA	PROPOSED REVISED EAST CRITERIA	COMMENT / JUSTIFICATION
	Well being	Well being	Outline at this early stage.
	Wellbeing - Comments	Wellbeing - Comments	
	Expected VfM Category	Outline VfM Category	
	Expected VfM Category - Comments	Outline VfM Category - Comments	
Managerial	Implementation timetable	Implementation timetable	
	Implementation timetable - Comments	Implementation timetable - Comments	
	Public acceptability	Public acceptability	
	Public acceptability - Comments	Public acceptability - Comments	
	Practical feasibility	Practical feasibility	
	Practical feasibility - Comments	Practical feasibility - Comments	
	What is the quality of the supporting evidence?	What is the quality of the supporting evidence?	
	What is the quality of the supporting evidence? - Comments	What is the quality of the supporting evidence? - Comments	
Financial	Key risks	Key risks	
	Affordability	Affordability	
	Affordability - Comments	Affordability - Comments	
	Capital Cost (£m)?	Capital Cost (£m)?	
	Capital Cost (£m)? - Comments	Capital Cost (£m)? - Comments	
	Revenue Costs (£m)?	Revenue Costs (£m)?	
	Revenue Costs (£m)? - Details	Revenue Costs (£m)? - Details	
	Cost Profile	Cost Profile	
	Overall cost risk	Overall cost risk	
Commercial	Other costs	Other costs	
	Flexibility of option	Flexibility of option	
	Flexibility of option - Comments	Flexibility of option - Comments	
	Where is funding coming from?	Where is funding coming from?	
	Any income generated? (Y/N)	Outline value of income generated	Outline at this early stage.
	If yes, how much income generated (£m)?		

- 1.7.4 The revised EAST criteria provides a more tailored approach to the initial appraisal of the options, with greater focus on the specific needs of the intervention in comparison to DfT's standard EAST criteria in order to ensure that the right options are scoring the highest in the appraisal process.
- 1.7.5 Following the high level appraisal of each option against the criteria, the options have been ranked with the preferred option scoring the highest across the criteria.
- 1.7.6 The following paragraphs provide a summary of the results produced with the EAST for each of the five options.

STRATEGIC CASE

- 1.7.7 The option with the greatest strategic fit is the A46 Link Road to the University of Warwick. The link road will provide the infrastructure required to support the growth and regeneration required to support committed housing and employment growth in the Local Authority's (LA) local plans, and to complement the delivery of other infrastructure such as HS2. This option has a strong fit with the strategic objectives of local policy and strategy, and provides an intervention that will support a wide range of key opportunities.
- 1.7.8 The highways improvement interventions on the A45, Gibbet Hill and Westwood Heath Road provide improved access to local housing and employment development sites and supporting improved journey times on the existing network in the medium term. However they do not create a step change in the network, to reduce congestion on the existing network and support network resilience at times of accidents and road works, as well as not providing additional capacity to free space on the existing network for greater public transport accessibility.

ECONOMIC CASE

- 1.7.9 The options with the greatest economic growth impact are the Coventry to University of Warwick Sprint bus route and the A46 Link Road to the University of Warwick. Furthermore, the option with the most positive social impact is the A46 Link Road as the development of the new road will reduce congestion and remove trips from some parts of the Air Quality Management Area (AQMA) in the study area.
- 1.7.10 The option with the most positive socio-economic impact is the Coventry to University of Warwick Sprint bus route, as this intervention will support access for non-car households to provide more equal access to opportunities. Furthermore, this option also provides the greatest benefit to wellbeing, encouraging and providing greater opportunity for more efficient, reliable sustainable travel.
- 1.7.11 The option with the greatest negative impact on the local environment is the A46 Link Road to University of Warwick as this option is proposed for construction through existing green belt land. Despite this, this option is likely to provide the greatest value for money in line with the significant range of benefits that it will provide to the local and regional area, as well as the greatest support to access to proposed housing and employment sites.

MANAGEMENT CASE

- 1.7.12 All options at this stage are identified to be implemented within the medium term. The Coventry to University of Warwick Sprint bus route has a number of key risks including the level of demand for the service, and the public and political acceptability of the option.

- 1.7.13 All of the remaining options will require some land take and have a number of associated environmental risks, in particular the A46 Link Road to University of Warwick, due to the scale of land take. A key risk for the highway improvements options is ensuring that the options generate a significant increase in journey time savings with sufficient capacity to continue to do so following the proposed trip increase from developments.

FINANCIAL CASE

- 1.7.14 The most affordable option in terms of the lowest capital expenditure and lowest maintenance options are the Coventry to University of Warwick Sprint bus route, A45 capacity improvements and the Gibbet Hill Junction Improvements. The detailed costs of the options are not yet known at this stage; further development of the capital cost and cost risks of the options will be developed at the next stage of the appraisal.

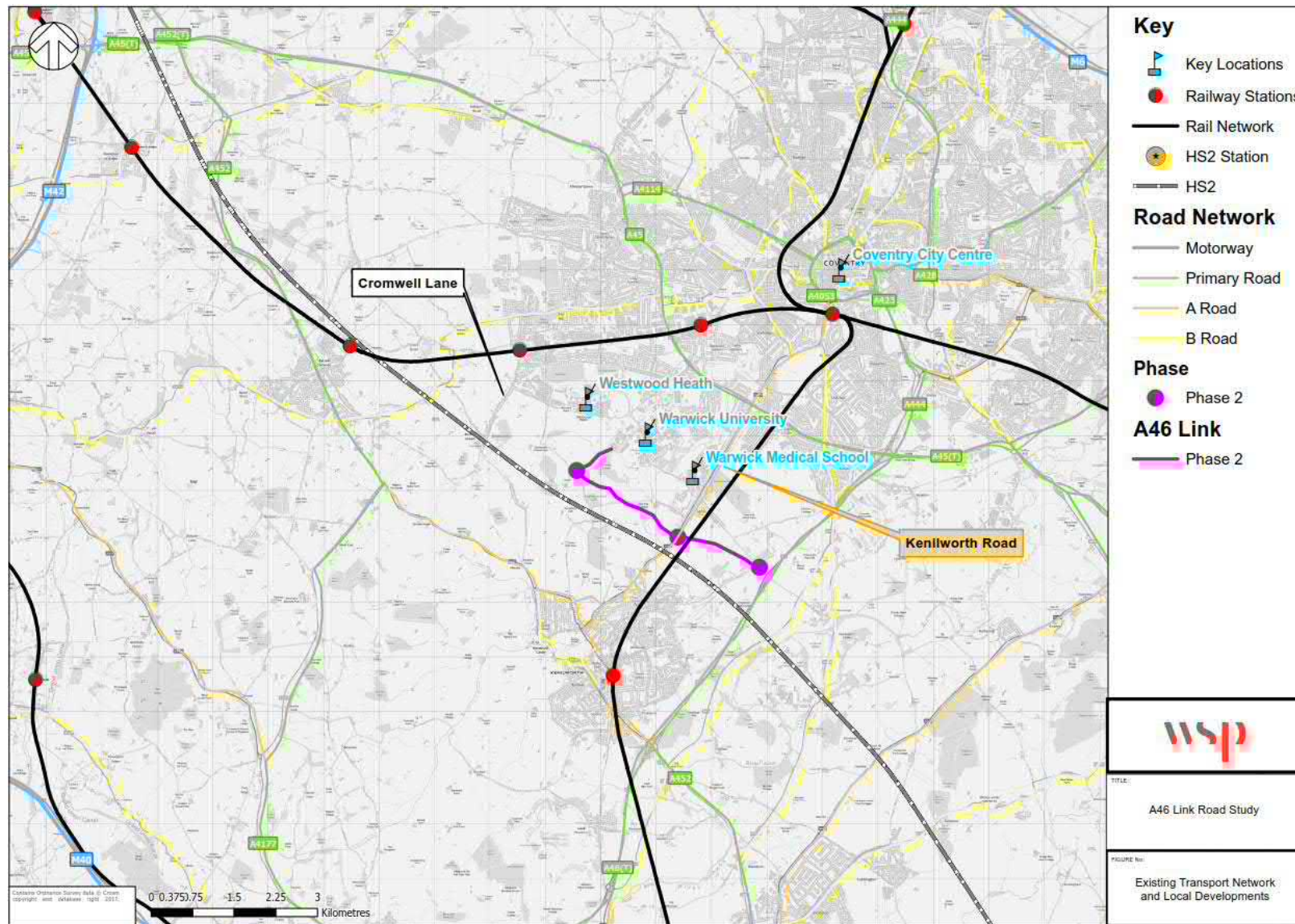
COMMERCIAL CASE

- 1.7.15 No construction funding is committed to any of the options at this stage.
- 1.7.16 As a public transport scheme, the Coventry to University of Warwick Sprint would generate income through revenue and ticketing, however the details of this income are not known at this stage, and would be subject to a commercial agreement with public transport operators in the current deregulated market.

1.8 PREFERRED OPTION

- 1.8.1 Based upon its superior achievement of strategic objectives and anticipated stronger economic performance and following the initial sifting of the generated options for an intervention, the preferred option to be taken forward for the next stage of the options development process is the development of the A46 Link Road to the University of Warwick, when considered across all potential impacts and assessment of these against which the business case is to be assessed and presented.
- 1.8.2 The link road will run east to west, from the A46 / Stoneleigh Road junction, approximately 5km to Kirby Corner / Westwood Heath Road / Cromwell Lane in Westwood Heath. Phase 1 of the A46 Link Road will see junction improvements at the A46 Stoneleigh Junction to provide the necessary capacity at the existing junction to cope with additional demand as a result of the development of the new link road.
- 1.8.3 The route for the A46 Link Road to the University of Warwick will run adjacent to the west of University of Warwick central campus where significant housing development is proposed as part of the University's Masterplan. The new link road will support wider housing and employment policies in the area, including development at Westwood Heath and Kings Hill, increasing resilience on this part of the network and freeing up capacity on the A45 to support the route becoming a greater public transport corridor for connectivity to the wider West Midlands, including UK Central.
- 1.8.4 The proposed route location and study area for the A46 Link Road is shown in Figure 1-4. The map shows that the link road would provide access to and from a considerable number of developments on the border between Coventry and Warwickshire, the details and quantum of which are discussed in Chapter 11 of this report. Critically, it provides direct access to the Warwick University Extension and the Cromwell Lane SUE.

Figure 1-4 - A46 Link Road Study Area and Key Developments



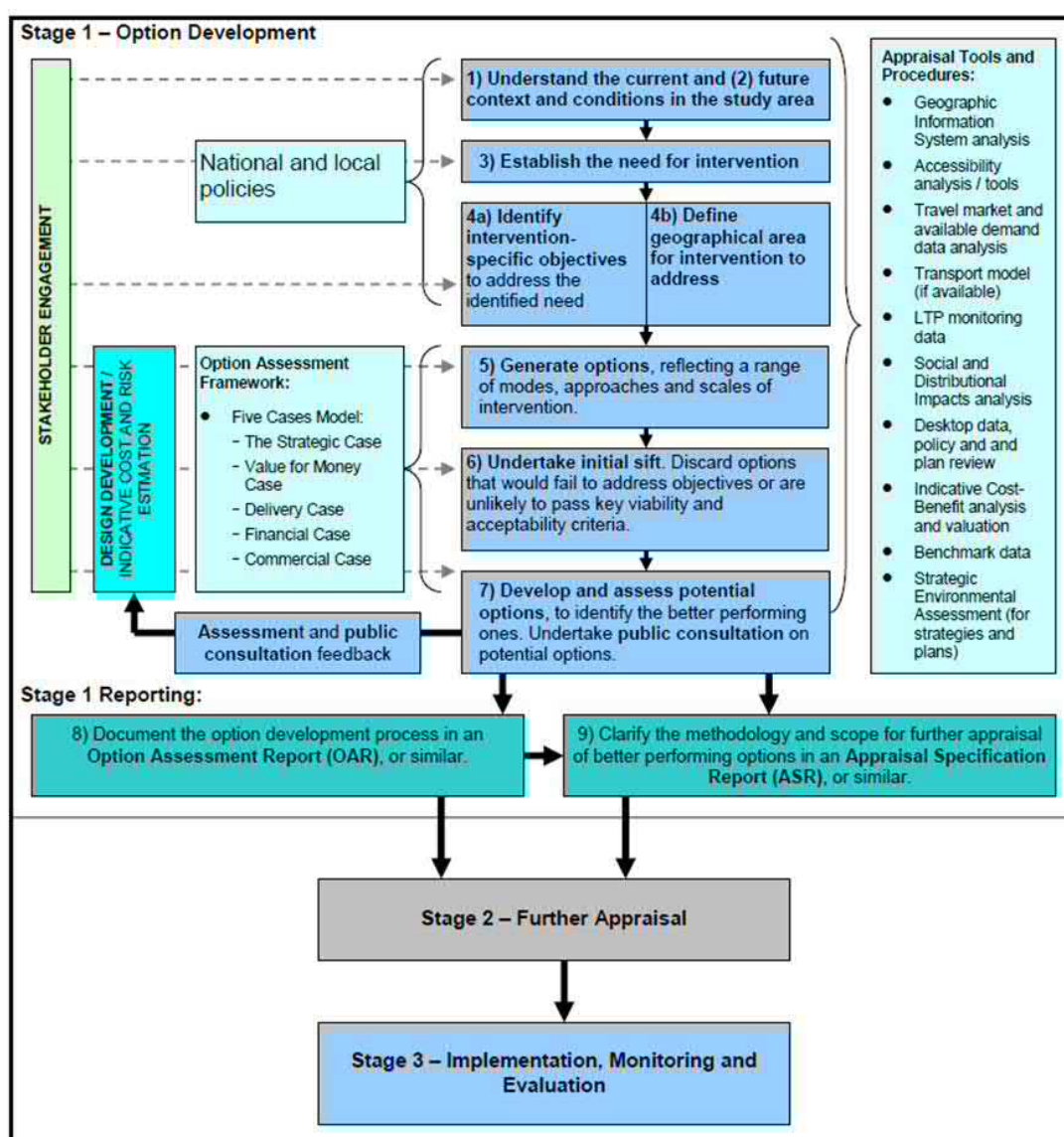
2 INTRODUCTION

2.1 BACKGROUND

2.1.1 Coventry City Council and Warwickshire County Council are working in collaboration to review the current and future problems on the network to assess the need and location for potential transport interventions in the region to unlock public transport, walking and cycling travel on key corridors, and to provide the necessary capacity to support economic growth and cater for forecast traffic growth from housing and employment development.

2.1.2 In compliance with The Transport Appraisal Process (WebTAG), this Option Assessment Report (OAR) has been produced following the DfT's recommended 7-step process, shown in Figure 1-1.

Figure 2-1 Steps in the Stage 1 Process



Source – Transport Analysis Guidance: The Transport Appraisal Process, DfT, January 2014

2.2 STRUCTURE OF OAR

2.2.1

Based on the steps outlined in the Stage 1 Options Development WebTAG guidance, the following structure is proposed for this report:

1. **Developing the Vision** –understanding the overarching vision and objectives for the Coventry South Package, as well as key documents at national, regional and local level which the intervention needs to support
2. **Understanding the Current Situation** - provide a comprehensive review of the existing network conditions in the study area including:
 - a. Context of the scheme in local, subnational and national policy;
 - b. Current travel demand; and
 - c. Key opportunities and constraints affecting the area.
3. **Understanding the Future Situation** – detail of the potential impact of planned future changes to land-use, the transport system and impact on travel demand in the study area which will impact demand on the local network;
4. **Establishing the Need for Intervention** - outline the key issues that exist within the study area including both current and future transport related problems and the underlying causes;
5. **Scheme Objectives** - set out the strategic and specific objectives that underpin the options development;
6. **Define Geographic Area of Impact of the Intervention** - identify the area of impact to be addressed by the intervention;
7. **Generating Options** – provide detail of the methodology used to develop options and list the possible interventions and approaches considered;
8. **Initial Sifting** – undertake initial sifting to identify those options which should not be progressed further at the first stage;
9. **Preferred Option**- based on the outputs of the EAST, identifies the preferred option for the intervention and justification.

3 VISION

3.1 INTRODUCTION

- 3.1.1 Through consideration of local, regional and government policies and strategies, as well as the vision and objectives of the wider Coventry South Package which the proposed intervention(s) will form part of, this chapter establishes an overarching vision for South Coventry and the desired strategic outcomes of an intervention.

3.2 DEVELOPING THE VISION

- 3.2.1 The vision for South Coventry has been developed in line with the overarching vision and objectives for the Coventry South Package, as well as key documents at national, regional and local level which the intervention needs to support.
- 3.2.2 The rationale for the Coventry South Package, as outlined in the Coventry South Package Strategic Outline Business Case, is to improve road and rail connectivity within and through an area that is already subject to significant development pressures, and to relieve congestion on an increasingly constrained local transport network to unlock present and future growth. The key development pressures are from employment and housing to the east and south of Coventry, as well as UK Central and HS2 going forward in Solihull.
- 3.2.3 In terms of key documents at national, regional and local level which an intervention would need to support, it is considered that the following are key for supporting the development of vision and scheme objectives:
- Coventry Local Plan Publication Draft 2016 (March 2017);
 - Warwick District Draft Local Plan 2011 - 2029 (Publication draft) (April 2014);
 - Warwickshire Local Transport Plan 2011-2026;
 - West Midlands Strategic Transport Plan 'Movement for Growth';
 - Midlands Connect Strategy; and
 - The Midlands HS2 Growth Strategy.
- 3.2.4 These documents and their implications for setting the vision and scheme objectives within the context of the intervention are considered below.

COVENTRY LOCAL PLAN PUBLICATION DRAFT 2016

- 3.2.5 The overarching vision of the Draft Coventry Local Plan (2016) has been developed to reflect Coventry City Council's wider corporate plan (The Council Plan). The vision is:
- 3.2.6 ***Coventry – A top ten City that is globally connected and locally committed***
- 3.2.7 The Local Plan Objectives which have been developed to see the realisation of this vision are as follows:
- Objective 1: Supporting businesses to grow
 - Objective 2: Enabling the right infrastructure for the city to grow and thrive
 - Objective 3: Developing a dynamic 21st century city centre

- Objective 4: Raising the profile of Coventry
- Objective 5: Creating an attractive, cleaner and greener city
- Objective 6: Maintaining and enhancing an accessible transport network
- Objective 7: Housing that meets the needs of all people
- Objective 8: Improve the health and wellbeing of local residents
- Objective 9: Support safer communities.

3.2.8 Based on this, any intervention should be designed to accommodate the future transport demand arising from business and housing growth, as well as to support Coventry in becoming greener and safer going forward.

3.2.9 The vision will support these objectives, and the objectives set for the intervention will articulate the desired standard / operation of this “future” transport network within the study area that will help to allow the identification and appraisal of the measures of the intervention.

WARWICK DISTRICT DRAFT LOCAL PLAN 2011 - 2029

3.2.10 Warwick District Council outlines their vision for Warwick District, which is supported by partners, as set out in the Sustainable Community Strategy **to make Warwick District a Great Place to Live, Work and Visit.**

3.2.11 This vision has been developed in line with a number of strategic priorities for the district identified in the Warwick District Sustainable Community Strategy which include:

- Supporting prosperity to support economic growth for business to grow and relocate, including the District’s strong cultural and tourism offer
- Providing the homes the District needs to deliver the housing needs of the District and population growth which will increase demand on the existing transport network.
- Supporting sustainable communities, including health and wellbeing and community safety, including the provision of the right infrastructure, spaces and services to enable healthy and safe lifestyles; regeneration and enhancement of existing communities and environments and the protection of the natural and built environment.

3.2.12 The Warwick District Draft Local Plan Objectives to support their vision and strategic priorities include:

- Objective 1: Providing sustainable levels of growth in the District.
- Objective 2: Providing well-designed new developments that are in the right location and address climate change.
- Objective 3: Enabling the District’s infrastructure to improve and support growth.

- 3.2.13 Any intervention proposed should therefore be developed in such a way to accommodate growth, development and sustainability in the District.
- 3.2.14 In line with this, the vision of the intervention will align to the vision of Warwick District Council and the needs of their objectives.

WARWICKSHIRE LOCAL TRANSPORT PLAN 2011-2026

- 3.2.15 In the wider Warwickshire area, Warwickshire County Council has set its vision within its Local Transport Plan which is **working in partnership to put customers first, improve services and lead communities**.
- 3.2.16 In order to achieve this vision, Warwickshire County Council has established four priorities which are:
- Raising levels of educational attainment and improving services for children, young people and families by enabling people to travel to educational opportunities.
 - Maximising independence for older people and people with disabilities by ensuring that all communities, including rural communities, have the ability to access key services (through improved transport provision and changes to service locations and delivery).
 - Developing sustainable places and communities by reducing carbon dioxide emissions in Warwickshire to meet Warwickshire's transport needs in more sustainable ways.
 - Protecting the community and making Warwickshire a safer place to live by improving road safety in Warwickshire.
- 3.2.17 These priorities will help to develop the priorities and shape the vision for this intervention, as will the overall objectives for Warwickshire's Local Transport Plan 3 (2011 – 2026) which include:
- Objective 1: To promote greater equality of opportunity for all citizens in order to promote a fairer, more inclusive society.
 - Objective 2: To seek reliable and efficient transport networks which will help promote full employment and a strong, sustainable local and sub-regional economy.
 - Objective 3: To reduce the impact of transport on people and the [built and natural] environment and improve the journey experience of transport users.
 - Objective 4: To improve the safety, security and health of people by reducing the risk of death, injury or illness arising from transport and by promoting travel modes that are beneficial to health.
 - Objective 5: To encourage integration of transport, both in terms of policy planning and the physical interchange of modes.
 - Objective 6: To reduce transport's emissions of carbon dioxide and other greenhouse gases, and address the need to adapt to climate change.

WEST MIDLANDS STRATEGIC TRANSPORT PLAN 'MOVEMENT FOR GROWTH'

- 3.2.18 In the wider West Midlands region, the West Midlands Strategic Transport Plan- 'Movement for Growth' identifies its vision:
- 3.2.19 ***We will make great progress for a Midlands economic 'Engine for Growth', clean air, improved health and quality of life for the people of the West Midlands. We will do this by creating a transport system befitting a sustainable, attractive and economically vibrant conurbation in the world's sixth largest economy.***
- 3.2.20 In identifying the core challenges in the West Midlands, and setting out the above vision, nine objectives have been set for the Strategic Transport Plan which have been categorised under the following themes:

ECONOMIC GROWTH AND ECONOMIC INCLUSION

- ECON1 To support growth in wealth creation (GVA) and employment (jobs) in the West Midlands Metropolitan Area, as a prized national economic asset.
- ECON2 To support improved levels of economic well-being for people with low incomes in the West Midlands Metropolitan Area to help make it a successful, inclusive, European city region economy.

POPULATION GROWTH AND HOUSING DEVELOPMENT

- POP1 To help meet future housing needs, by supporting new housing development in locations deemed appropriate by local planning authorities, following their consideration of sustainable development criteria.

ENVIRONMENT

- ENV1 To significantly improve the quality of the local environment in the West Midlands Metropolitan Area.
- ENV2 To help tackle climate change by ensuring large decreases in greenhouse gas emissions from the West Midlands Metropolitan Area.

PUBLIC HEALTH

- PUBH1 To significantly increase the amount of active travel in the West Midlands Metropolitan Area
- PUBH2 To significantly reduce the number and severity of road traffic casualties in the West Midlands Metropolitan Area
- PUBH3 To assist with the reduction of health inequalities in the West Midlands Metropolitan Area

SOCIAL WELL-BEING

- SOC1 To improve the well-being of socially excluded people.

- 3.2.21 The vision of Movement for Growth focuses on providing a transport system that supports a more sustainable, attractive and economically stronger West Midlands. Any intervention proposed by this OAR will need to support this wider vision.

MIDLANDS CONNECT STRATEGY

- 3.2.22 Midlands Connect provides the transport strategy for the wider Midlands Engine to transform the region's strategic transport networks in support of the regional economic goals. The Midlands Engine has a vision for The Midlands **to become an engine for growth through investment in transport infrastructure for this generation and the next**. Midlands Connect has a vision for **an even stronger economy and a Midlands Engine which powers the UK, linking to the rest of the world, is within the region's reach. To maximise economic growth through increasing productivity of existing businesses and unlock the creation of new jobs across the region.**
- 3.2.23 The Midlands Connect Strategy has the objective - to establish a rolling 25-year programme of strategic road and rail improvements...this comprehensive long term approach will give much-needed certainty to businesses, communities and investors whilst also improving quality of life, improving skills and enhancing access to new opportunities – both within the Midlands and beyond.
- 3.2.24 Any intervention in the area should support the sub-regional economy and growth, which will feed into the wider Midlands region.

3.2.25 THE MIDLANDS HS2 GROWTH STRATEGY

- 3.2.26 Ahead of the construction of HS2 Phase 1 from London to the Midlands, with two stations in the West Midlands, including HS2 Interchange Station next to Birmingham Airport, the Midlands HS2 Growth Strategy has been developed to ensure that the region realises the maximum potential of the benefits from the internationally significant rail link.
- 3.2.27 In line with this, the HS2 Growth Strategy vision is **to harness the unrivalled connectivity and investment of HS2 to create a step change in the Midland's economic performance, driving growth and significantly improving outcomes for its people, businesses and places.**
- 3.2.28 Similarly to The Midlands Connect Strategy, The Midlands HS2 Growth Strategy's vision focuses on the wider Midlands area, supporting connections to HS2 and driving economic growth. An intervention should support economic growth in line with visions of these key strategic documents.
- 3.2.29 The above visions and objectives of the wider policy and strategy in the local and regional area have helped to shape the vision for an intervention and the scheme objectives.

3.3 VISION

- 3.3.1 Based upon consideration of the above documents and reports, the vision for South Coventry is as follows:

To support planned sub-regional housing and employment growth within Warwick District, Coventry City and the wider A46 corridor as part of the Coventry South Package, including the University of Warwick's emerging masterplan. As well as to reduce the inappropriate use of minor residential roads for traffic accessing the University and surrounding area. The vision has been informed by and will shape the overall need for an intervention, including the development of the scheme specific objectives.

4 UNDERSTANDING THE CURRENT SITUATION

4.1 INTRODUCTION

4.1.1 The following section provides information on the existing transport strategy and policy, and the transport network in Coventry and Warwickshire to inform the need for intervention going forward. Information on the current transport network includes:

Highway network;
Public transport network;
Airports; and
Active travel network.

4.2 TRANSPORT STRATEGY AND POLICY

4.2.1 As part of establishing an understanding of the need for an intervention, a review of relevant national, regional and local strategy and policy for the area is being undertaken in Table 4-4-1.

Table 4-4-1 Transport Policy and Strategy

No	POLICY AND STRATEGY DOCUMENT	DETAILS OF POLICY AND STRATEGY
National Policy and Guidance		
N1	National Infrastructure Delivery Plan 2016 – 2021 (March 2016)	<p>Outlines the Government's plans for economic infrastructure over the next five years to support delivery of housing and social infrastructure.</p> <p>Outlines the Government's commitment to providing a step change in the SRN for additional road capacity.</p> <p>Outlines the importance of the road network, in particular, the SRN, which carries over four million vehicles a day, despite only accounting for 2% of the network⁴.</p>
N2	Road Investment Strategy 2015/16 – 2019/20 (March 2015)	<p>Highlights the need for a national network of modern roads that meets social, economic and environmental aspirations.</p> <p>Creating a network in 2040 that will be smoother for connecting people and businesses to support economic growth.</p> <p>Providing capacity and connectivity to support national and local economic activity to combat congestion.</p> <p>Connecting communities and providing flexible travel.</p>
N3	Creating Growth, Cutting Carbon – Making Sustainable Local Transport Happen 2011 (January 2011)	<p>Sets out the Government's vision for a: Transport system that is an engine for economic growth, but one that is also greener and safer and improves quality of life in our communities.</p> <p>The White Paper highlights the need to make transport choices that support society as a whole, as well as needing to reduce our carbon emissions to meet national commitments.</p> <p>Highlights the Government's commitment to more equal access to employment, education and healthcare by increasing social mobility.</p> <p>Better design and management of the local network can improve traffic flow and the attractiveness of the local environment.</p>

⁴ Road Traffic Estimates: Great Britain', DfT, December 2015

No	POLICY AND STRATEGY DOCUMENT	DETAILS OF POLICY AND STRATEGY
N4	Roads Investment: The Roads Funding Package (November 2016)	<p>→ Quicker and safer journeys help build a stronger economy, promote jobs and enable a country that works for everyone.</p> <p>The Government is committed to upgrading and renewing the local highway infrastructure and complementing other investment initiatives to help economic growth both locally and nationally and to ensure that all road users have a well maintained and safe network which is fit for the future.</p> <p>The A46 Link Road Phase 2 (named South Coventry Link Road in this document) is one of twelve local major projects to receive funding for the development of business cases to determine if it can be taken forward to construction. The objective of this scheme is to open up land for housing and commercial development.</p>
Regional Policy and Guidance		
R1	Coventry and Warwickshire LEP – Strategic Economic Plan 2014 / Refresh 2016	<p>It is envisaged that investments on local road infrastructure will bring key sites forward for development, which will result in significant business investment and growth and job creation impacts for the local economy.</p> <p>Focus on advanced manufacturing and engineering sector development, to realise the growth potential of this sector.</p> <p>To ensure transport connectivity and employment opportunities to support population growth and demographic change, and linkage to the residents of 76,000 new homes.</p> <p>Enhancing our connectivity locally to UK Central and our national connectivity through the strategic road and rail network, including greater connectivity to the major employment sites of the University of Warwick, Whitley, and Ansty for major national and international gateways.</p> <p>Highlights the A46 corridor's critical importance to the sub-regional economy and the significant demand predicted on the corridor in the next 10 – 15 years due to housing and employment growth.</p> <p>Transport infrastructure and urban centre improvements will play a crucial role in bringing major sites forward for development and attracting business investment.</p> <p>Target improvements to skills levels in Coventry & Warwickshire's priority sectors and ensure the supply of training meets demand from employers, and ensure a stronger fit between education and employment.</p> <p>Focus on growing the visitor economy, in particular around Coventry's opportunity to become UK Capital of Culture in 2021.</p>
R2	Coventry and Warwickshire Growth Deal 2014	<p>Improved links to surrounding economic growth sites including UK Central, Birmingham Airport and HS2 from the University of Warwick, Whitley, Coventry and Warwickshire Gateway and Ansty via the A46 corridor.</p> <p>New infrastructure that will improve connections and tackle congestion and support housing and employment sites.</p> <p>Supports interventions which will accelerate research and development.</p> <p>Transport infrastructure that will enable easier access to further education and training facilities, and enhance greater business investment across Coventry and Warwickshire.</p>
R3	Midlands Connect Strategy (March 2017)	<p>→ If transport connectivity between towns and cities within the Midlands and with key centres elsewhere can be improved, then we could boost economic growth to the benefit of both the Midlands and UK plc.</p> <p>→ Strategic road and rail networks that bring the country's economic regions closer together boosting productivity, access to markets and international gateways.</p> <p>→ Boosting productivity and growth by providing reliable road and rail networks – reducing costs to businesses.</p> <p>→ Nottingham-Leicester-Coventry-Warwick and Thames Valley forms one of the 'intensive growth corridors' in the Strategy which are focused on major transport corridors for future growth in the Midlands.</p>

No	POLICY AND STRATEGY DOCUMENT	DETAILS OF POLICY AND STRATEGY
		<p>→ Aspirations for average speeds of journeys and increased network resilience on the Strategic Road Network (SRN) in line with the Government's vision which is set out in the current Road Investment Strategy.</p>
R4	West Midlands Combined Authority (WMCA) Strategic Economic Plan	<p>Highlights the UK Central growth corridor and the importance of linking Birmingham, Solihull and Coventry to maximise the benefit of HS2 in the region through wider connectivity.</p> <p>Unlocking the full economic potential of UK Central by improving links with Coventry.</p> <p>The key to successful growth will be work to remove barriers to development to create a higher volume of housing.</p> <p>Maintaining and supporting Warwickshire, Solihull and Coventry as areas of relatively high levels of productivity, by creating the right conditions for growth.</p> <p>The eight priority actions include:</p> <ul style="list-style-type: none"> Developing a new manufacturing economy; Maximising the benefits of HS2; Meeting the skills needs of businesses; Accelerating the delivery of current housing plans; Exploiting the economic geography; Enabling further growth of the medical and life sciences sector; Securing transformational environmental improvements; and Further developing the creative and digital sector.
R5	West Midlands Strategic Transport Plan 'Movement for Growth' (June 2016)	<p>An excellent transport system is a solution to:</p> <ul style="list-style-type: none"> Economic growth and inclusion Population growth and housing development Environment Public health Social well-being <p>→ Greater utilisation of the A46 for wider Midlands's movements and resilience to the Motorway Box is included as a key transport priority for the National and Regional Tier of the SRN.</p> <p>→ Introduce a fully integrated rail and rapid transit network that connects our main centres with quick, frequent services, and which is connected into wider local bus networks through high quality multi-modal interchanges.</p> <p>→ Reduce transport's impact on our environment – improving air quality, reducing carbon emissions and improving road safety.</p> <p>→ Facilitate the efficient movement of people on our transport networks to enable access to education and employment opportunities and health and leisure services.</p> <p>→ The strategy has considered options for implementation, after making better use of existing transport capacity:</p> <ul style="list-style-type: none"> ■ Meeting increased demand by providing new road capacity for private car and road freight vehicles ■ Meeting increased demand by providing higher quality and capacity of public transport, better conditions and capacity for walking and cycling.
R6	The Midlands HS2 Growth Strategy (July 2015)	<p>Drive economic growth and prosperity across the Midlands.</p> <p>Targeting new investment to unlock regeneration schemes, form new social and education structure and open up the region's connectivity.</p> <p>Focus of securing significant employment opportunities for local people raising the level of skills across the entire region and utilising our universities and colleges creating the next generation of skilled workers.</p> <p>Focus on three interlinking strands of people, business and place, which coincides with the three core channels used to ensure effective focused delivery in the WMCA Strategic Economic Plan (R4):</p> <p>People – Improving skills and access to training across the Midlands so that the population can benefit from significant economic growth unlocked by HS2.</p>

No	POLICY AND STRATEGY DOCUMENT	DETAILS OF POLICY AND STRATEGY
		<p>Business – Ensuring that supply chains can capitalise on unprecedented business opportunities presented by HS2 and the Midlands promotes itself to attract international inward investment.</p> <p>Place – Utilising the connectivity of HS2 in the Midlands to unlock significant sustainable growth and radical improvement of local connectivity across the region.</p>
R7	CWLEP Strategic Rail Priorities (July 2015)	<ul style="list-style-type: none"> → There is now a common understanding amongst decision-makers that rail has a crucial role to play in supporting economic growth. → Development of the links to other UK cities is now limited by the capacity constraints of all the main lines, as the network is largely full. → The trunk network along the corridor is reaching saturation (such as on the A46 between Warwick and the M69) therefore CWLEP, WCC and CCC with Network Rail and other partners have secured upwards of £75m for the development of rail on the Leamington-Coventry and Coventry-Nuneaton corridors (NUCKLE standing for Nuneaton-Coventry-Kenilworth-Leamington.) → The classic rail network will be of particular importance to those residents in the CWLEP area who are travelling to London from central or east Coventry or eastern and southern Warwickshire as a results of the prospect of travelling north before travelling south and the interchange penalty.
Local Policy and Guidance		
L1	Coventry Local Plan Publication Draft 2016 (March 2017)	<p>The SRN is crucial for national connectivity needs including the A46 corridor. This corridor provides access to several major employment sites including the University of Warwick and Westwood Business Park.</p> <p>The Office for National Statistics recognises Coventry as the fastest growing city outside of Greater London, with job creation continuing to grow and the city's two universities thriving. This Plan embraces this growth and identifies land for new homes, new jobs and new retail and community uses.</p> <p>Focus on working with surrounding authorities and organisations to ensure that cross boundary infrastructure issues are resolved in order to deliver growth. Allow for the city to maximise the benefits and connectivity to the proposed HS2 interchange and supporting development at UK Central as well as continued job creation at Ansty Park, Ryton, ProLogis Keresley, University of Warwick and the planned Coventry and Warwick Gateway</p>
L2	Warwick District Draft Local Plan 2011 - 2029 (Publication draft) (April 2014)	<p>Draft Local Plan objectives include:</p> <p>Providing sustainable levels of growth in the District to maintain high employment levels and mitigate areas of unemployment.</p> <p>Providing well-designed new developments that are in the right location and address climate change. New developments in the right location will reduce the need for car travel, reducing road congestion and carbon emissions, and encouraging people to walk and cycle more.</p> <p>Enabling the District's infrastructure to improve and support growth including the ability for transport providers to provide more integrated public transport, cycling and pedestrian facilities, improve the safety and efficiency of the transport network, and support sustainable economic growth.</p>
L3	Warwickshire Local Transport Plan 2011-2026	<p>Supporting the sub-regional economy including the University of Warwick and surrounding major development sites.</p> <p>The Local Transport Plan objectives include:</p> <ul style="list-style-type: none"> 10. To promote greater equality of opportunity for all citizens in fairer, more inclusive society; 11. To seek reliable and efficient transport networks which will help employment and a strong, sustainable local and sub-regional 12. To reduce the impact of transport on people and the [built and environment and improve the journey experience of transport

No	POLICY AND STRATEGY DOCUMENT	DETAILS OF POLICY AND STRATEGY
		<p>13. To improve the safety, security and health of people by reducing death, injury or illness arising from transport, and by promoting that are beneficial to health;</p> <p>14. To encourage integration of transport, both in terms of policy physical interchange of modes;</p> <p>15. To reduce transport emissions of carbon dioxide and other gases, and address the need to adapt to climate change.</p> <p>→ The Local Transport Plan can influence the economy by improving the reliability of journey times and connectivity; supporting the delivery of housing and growth; supporting Warwickshire as a place to invest; enhancing resilience and enabling the efficient movement of freight.</p>
L4	Warwick District Draft Infrastructure Delivery Plan June 2016	<p>Includes transport infrastructure focused on the A452 Leamington to Kenilworth Corridor, including improvements on the A46.</p> <p>Transport infrastructure associated with sub-regional employment sites is a focus of investment.</p> <p>It is important to ensure the timely delivery of schemes ahead of housing development to help communities to become established and integrated quickly.</p>
L5	Warwickshire Sustainable Community Strategy 2009 – 2026	<p>→ Outlines a Vision for the County in 2026 of Warwickshire being a fair, safe and prosperous place to live under three themes of people, places and prosperity, where:</p> <ul style="list-style-type: none"> ■ Inequalities that exist geographically or within communities are reduced; ■ There is good access to services, choice and opportunity; and ■ Sustainability is pursued through balancing our current needs with those of future generations

4.2.4 Following the review of the strategies, the following key themes emerged which any project in the region must meet:

- Support business and investment growth;
- Support housing growth;
- Support access to education and employment opportunities;
- Improve connectivity and reduce congestion;
- Create a fully integrated transport network; and
- To improve health and safety of communities.

4.2.5 The matrix in Table 4-4-2 indicates which of the policy and strategy documents in Table 4-4-1 support these key emerging themes.

Table 4-4-2 Themes vs Strategic Context

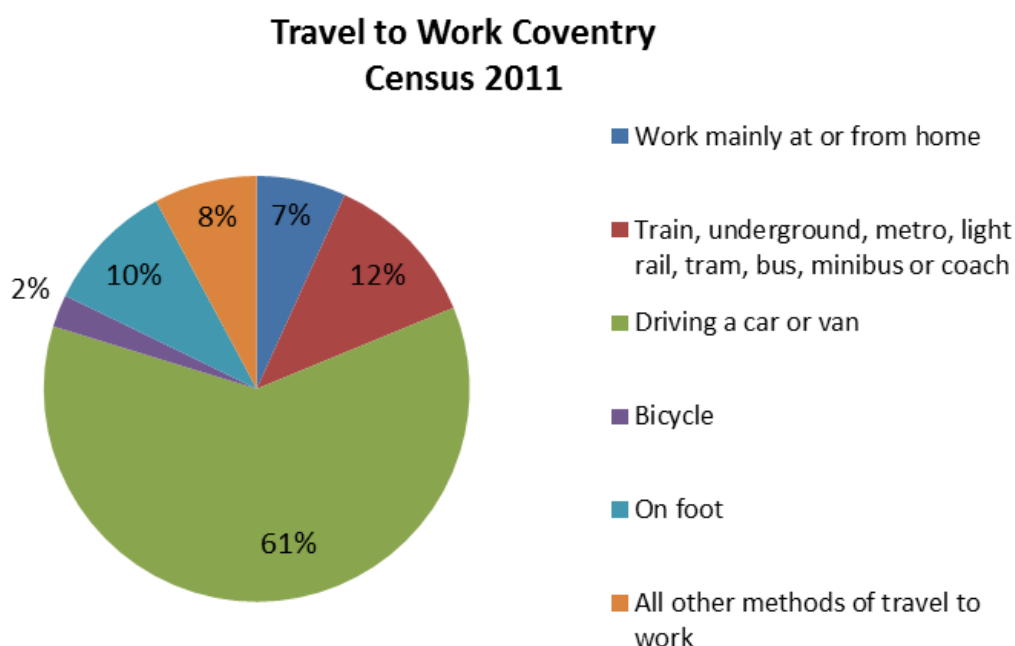
KEY THEMES	N1	N2	N3	N4	R1	R2	R3	R4	R5	R6	R7	L1	L2	L3	L4	L5
Facilitate business, investment and productivity growth	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Support housing growth	✓	✓	✓	✓	✓	✓		✓	✓	✓		✓	✓	✓	✓	✓
Support access to education, skills and employment opportunities	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓
Improve connectivity and reduce congestion	✓	✓	✓		✓	✓	✓	✓	✓			✓	✓	✓	✓	✓
Create a fully integrated transport network by unlocking the benefits and capacity of transport schemes	✓	✓	✓		✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓
Improve health and safety of communities		✓	✓	✓	✓				✓			✓	✓	✓		✓

4.3 CURRENT TRAVEL DEMAND

4.3.1 Data presented in the following graphs shows Journey to Work data for Coventry City and Warwick District in the current situation, taken from the 2011 Census.

4.3.2 Data presented in Figure 4-1 shows the percentage mode shares of Coventry residents travelling to work at the time of the 2011.

Figure 4-1 2011 Census Travel to Work Mode Share Coventry

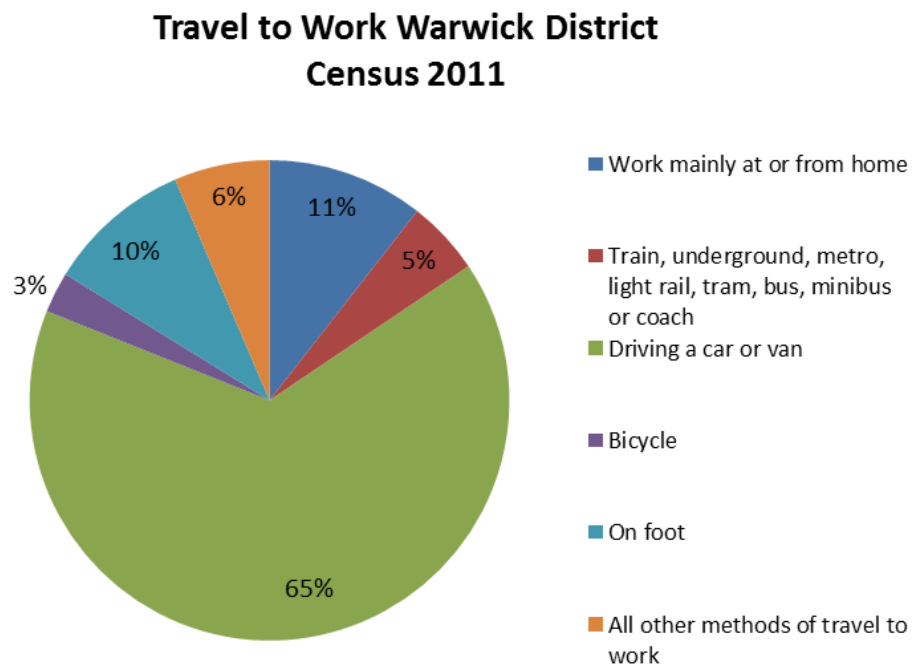


Source – Census 2011

4.3.3 The dominant mode used by residents in Coventry in travelling to work is car or van, forming over 60% of journeys. A further 12% of Coventry residents travel to work by public transport including train and bus. As shown above 12% of residents either walk or cycle to work, and 8% travel by other methods. The remaining 7% of residents work mainly from home.

4.3.4 Data presented in

4.3.5 Figure 4-2 2011 Census Travel to Work Mode Share Warwick District

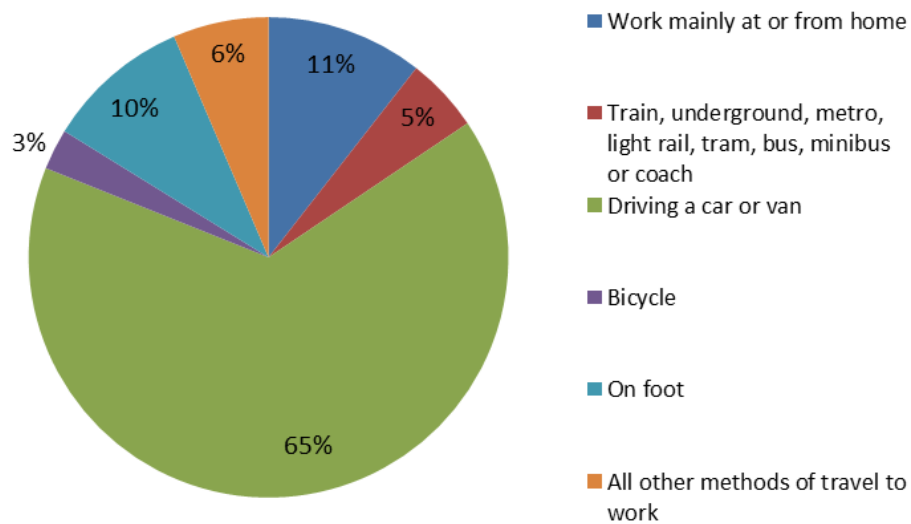


4.3.6

Source – Census 2011 shows the percentage mode share of Travel to Work data from the 2011 Census for residents of Warwick District.

Figure 4-2 2011 Census Travel to Work Mode Share Warwick District

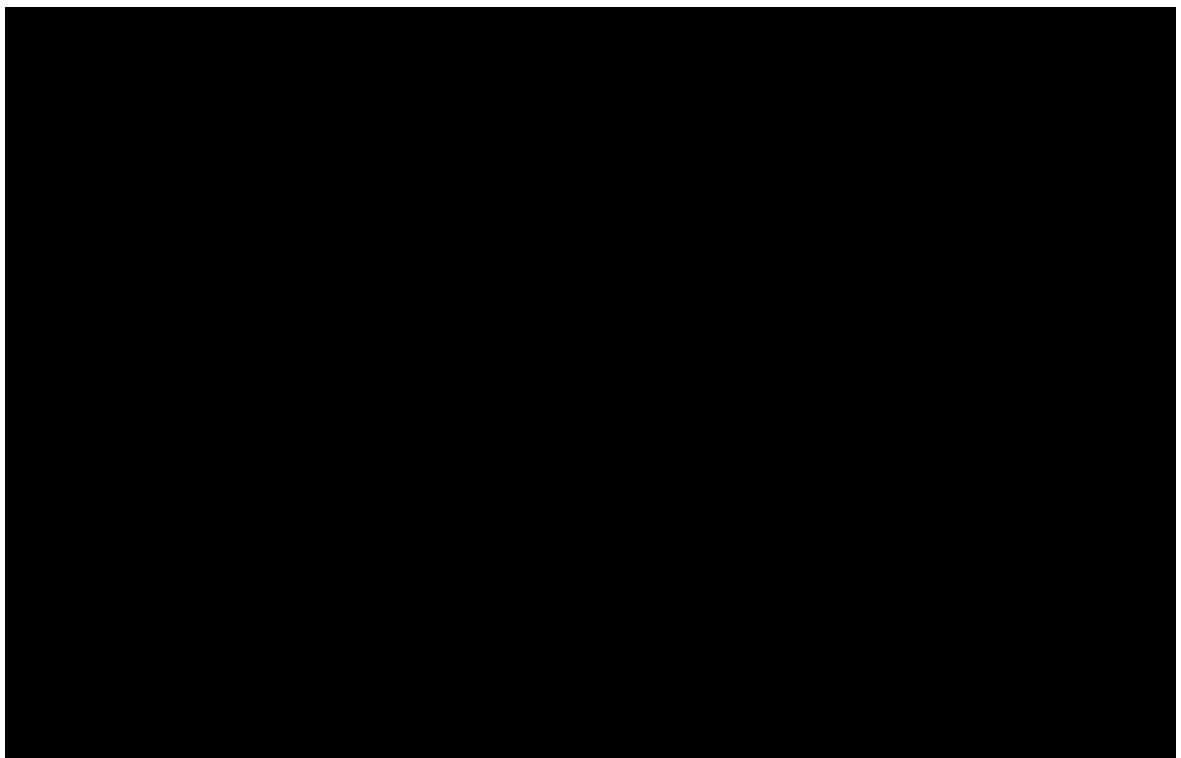
Travel to Work Warwick District Census 2011



Source – Census 2011

- 4.3.7 The dominant mode share of journeys to work made by residents in Warwick District is by car or van, forming 65% of journeys. Of the remaining 35%, only 5% of journeys are made by public transport including train and bus, 13% of journeys are walking or cycling, 6% are made by other modes and 11% of residents work from home.
- 4.3.8 A greater proportion of travel to work journeys are made by car or van in Warwick District than in Coventry; mode share for both is significant and requires the necessary highway capacity to cope with demand.
- 4.3.9 Data in Figure 4-3 shows the mode share results for the 2012 University of Warwick Travel Survey. There were a total of 3,075 respondents to the mode share question, of which 50% of respondents were staff (1,524), 33% of respondents were undergraduate students (1,024) and 17% were postgraduate students (527).

Figure 4-3 University of Warwick 2012 Travel Survey - Mode Share



Source – University of Warwick Travel Survey Summary Report 2012

- 4.3.10 The results of the survey show that the majority of staff (56%) drive to the University with no passengers, with a further 12% of staff car sharing either as the driver or a passenger. As presented in Figure 4-3 15% of staff travel by bus to the University and 3% travel by train. 9% of staff cycle and 4% of staff of walk to the University.
- 4.3.11 Students have a significantly different mode share, with the majority of undergraduate and postgraduates travelling by bus to the University (44% and 34% of respondents respectively), with a significant proportion of students also walking to the University (36% of undergraduates and 39% of postgraduates). Only 10% of undergraduates and 9% of postgraduates cycle to the University.
- 4.3.12 More postgraduate students drive to the University than undergraduates; 11% of postgraduate students drive to the University alone in comparison to 4% of undergraduates. A further 7% of postgraduate students and 6% of undergraduate students car share to the University as either the driver or a passenger.

ORIGINS AND DESTINATIONS

- 4.3.13 To gain an understanding of car commuting patterns around the study area, Origin Destination data from the 2011 Census has been downloaded which the Local Authority for Solihull, Warwickshire and Coventry, by Middle Layer Super Output Area (MSOA). District level data has been added for the wider districts within the West Midlands region, as shown in Table 4-4-3. Car commuting trips have been mapped to the population weighted centroids of MSOAs and district centroids to create origin destination lines.

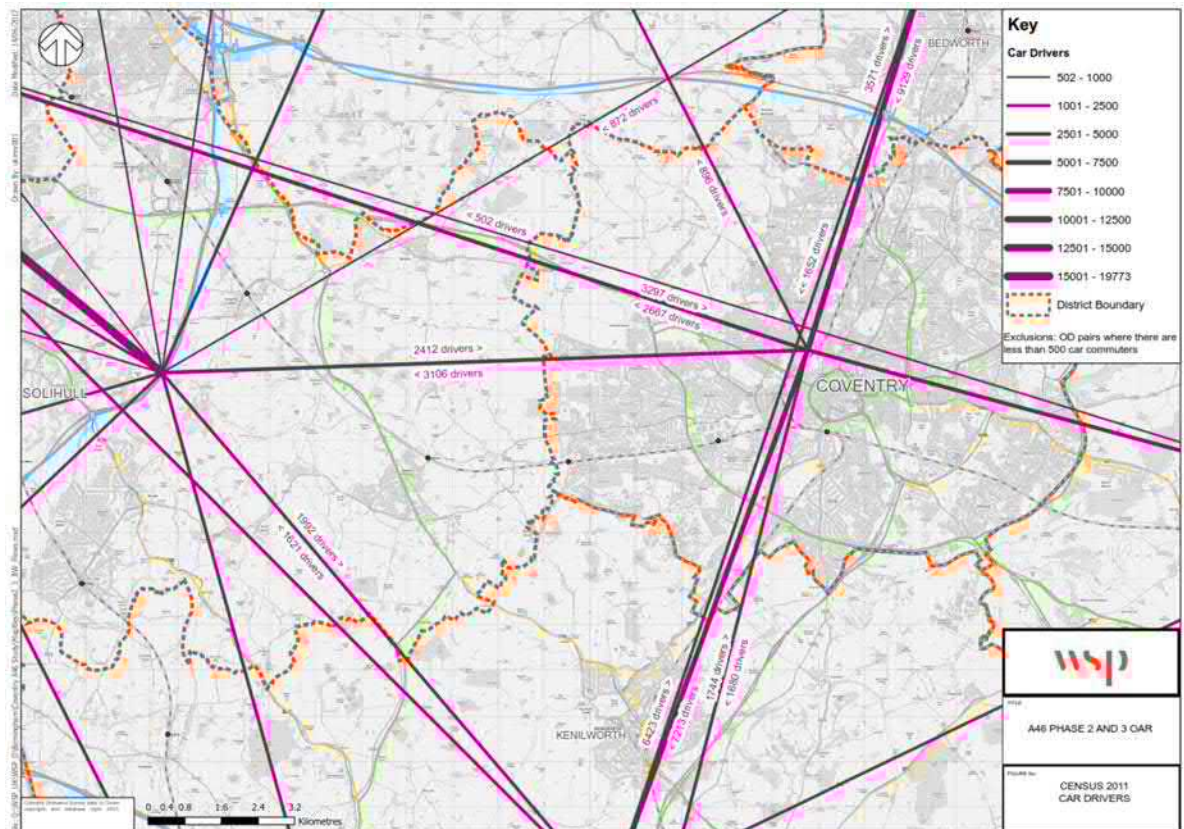
Table 4-4-3 Origin Destination Data

MSOA LEVEL	DISTRICT LEVEL	
Coventry	Bromsgrove	South Staffordshire
Solihull	Cannock Chase	Stafford
North Warwickshire	Dudley	Staffordshire Moorlands
Nuneaton and Bedworth	East Staffordshire	Stoke-on-Trent
Rugby	Herefordshire, County of	Telford and Wrekin
Stratford-on-Avon	Lichfield	Walsall
Warwick	Malvern Hills	Wolverhampton
Birmingham	Newcastle-under-Lyme	Worcester
Tamworth	Redditch	Wychavon
	Sandwell	Wyre Forest
	Shropshire	

4.3.14 Data in

4.3.15 Figure 4-4 shows the origin and destination by Local Authority for Coventry and Warwickshire and Solihull.

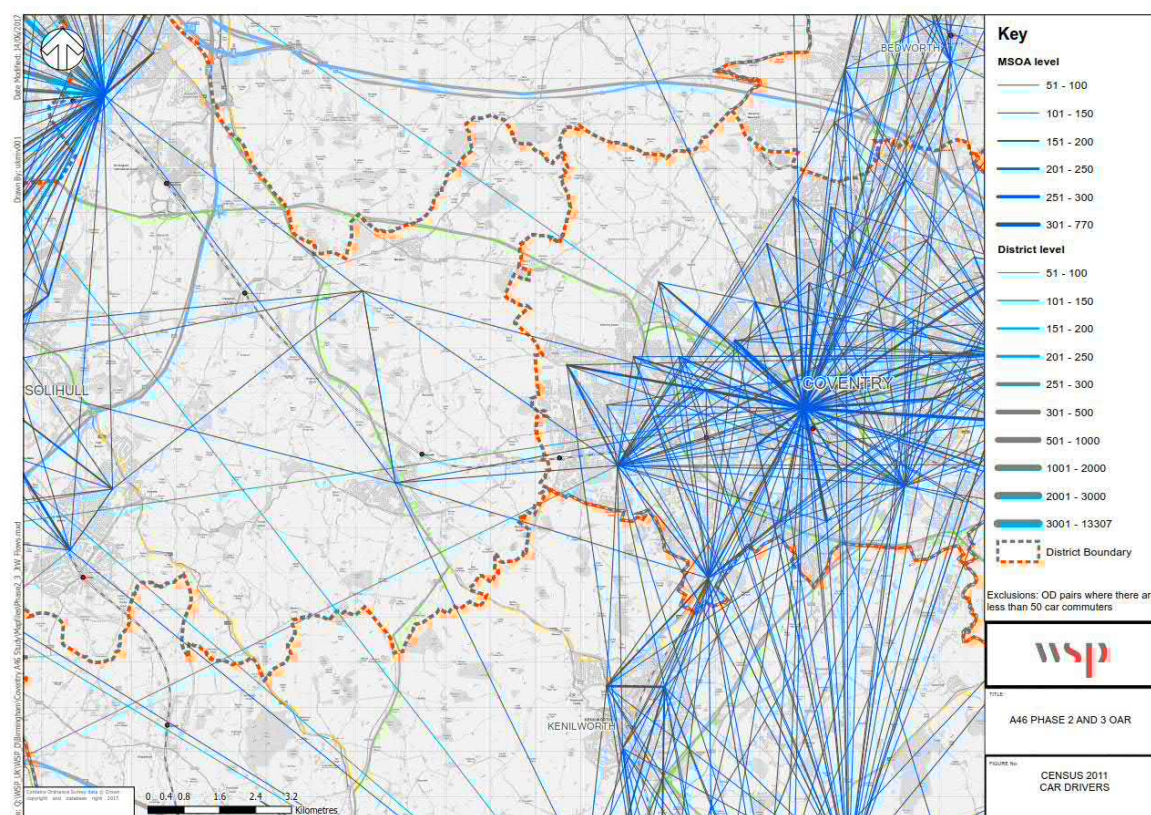
Figure 4-4 Origin and Destination Data by Local Authority District



4.3.16 The predominant flows are in a north and south direction to and from Coventry and Warwickshire utilising routes including the A46. There are also substantial trips through and around Coventry and Warwickshire in an east and west direction. The key route for these trips is on the A45, as well as the A452 in the south east and northwest direction.

4.3.17 Data in Figure 4-5 shows origin and destination data by Middle Layer Super Output Area (MSOA) for Coventry, Warwickshire and Solihull.

Figure 4-5 Origin and Destination Data by MSOA

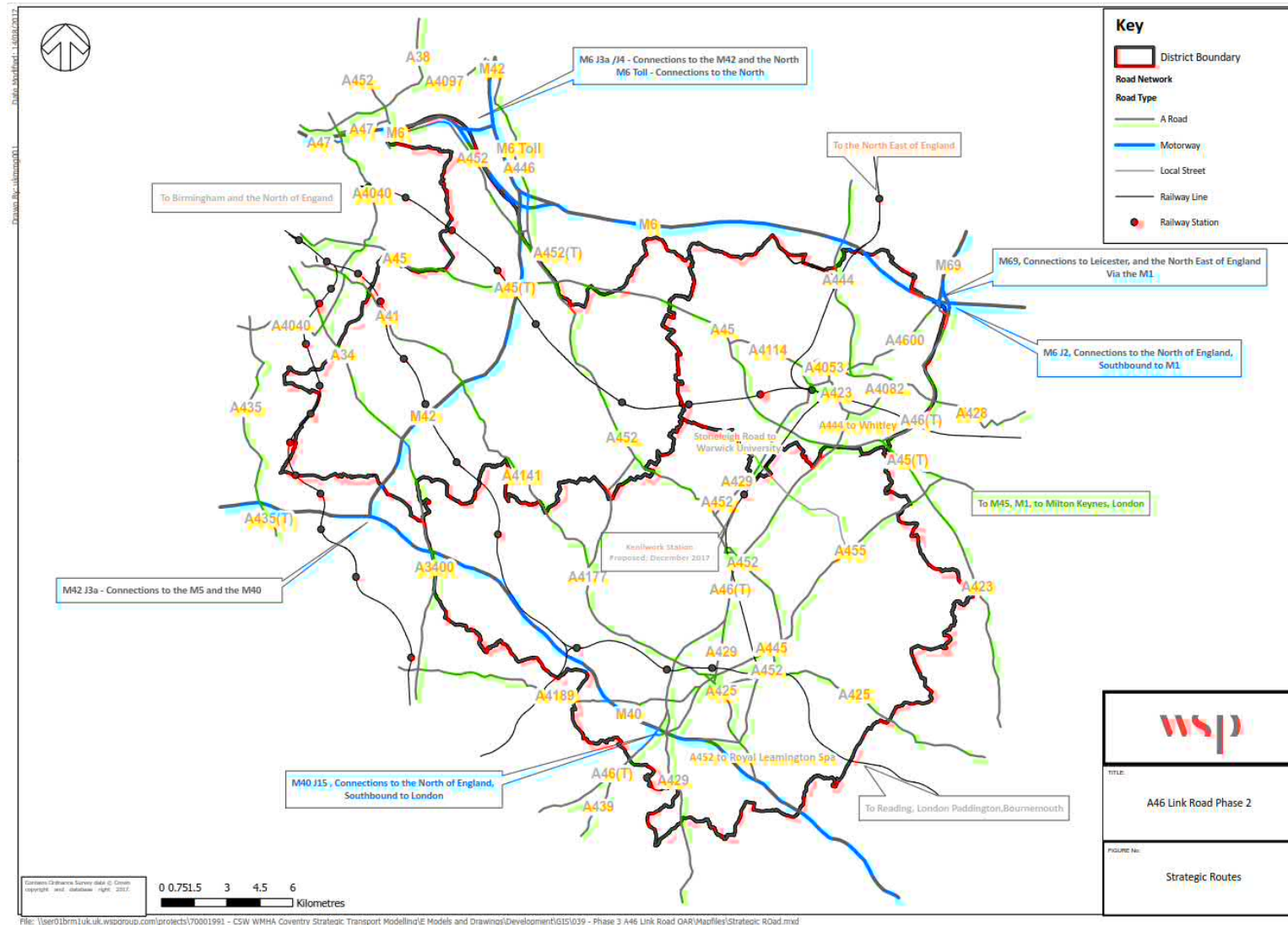


4.3.18 This figure provides a less aggregated understanding of the origins and destinations of commuters. Data in Figure 4-5 shows that there are significant movements in the south west of Coventry, as well as to / from Solihull, Kenilworth and Warwick. It can also be noted that there are significant internal movements within the local authority areas, as well as between Coventry and Warwickshire.

HIGHWAY NETWORK

4.3.19 Coventry and Warwickshire are strategically positioned on the highway network, with a number of key routes providing national and regionally connectivity. Coventry is located with access to the M6 Junctions 2 and 3, and Warwick and Leamington Spa to the M40 Junction 15, as well as a wider number of motorways within a short distance including the M42, M45, M69 and M1. The network of strategic routes and transport links in the area is shown overleaf in Figure 4-6.

Figure 4-6 Local Strategic Transport Network



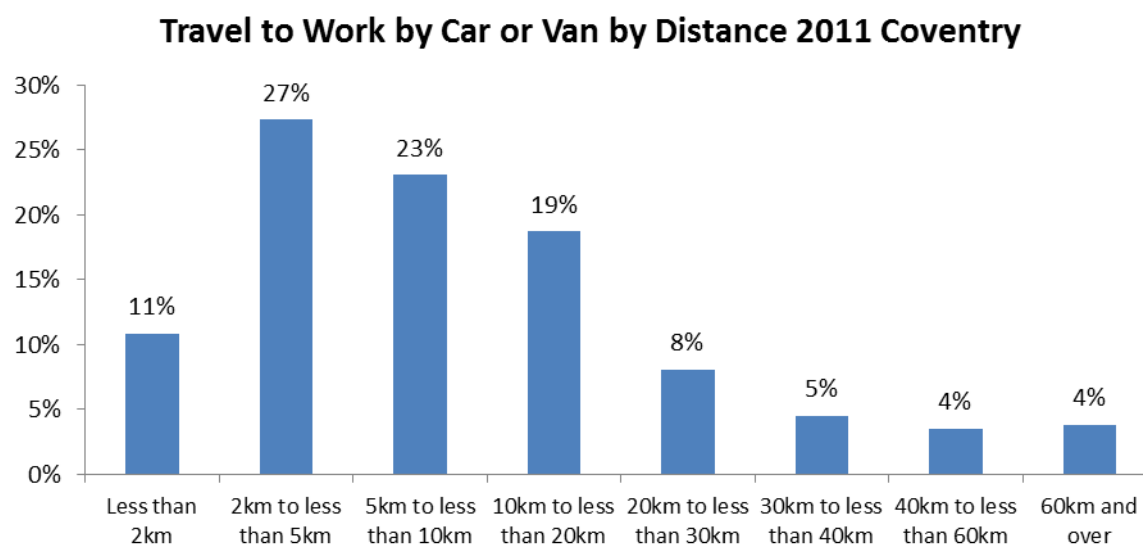
- 4.3.20 The Coventry and Warwickshire LEP area forms part of the 'golden triangle' (the area between Nottingham, Kidderminster, and East Midlands Airport), which is the area which supports logistics access and sector growth in the Midlands. This area is located at the intersection of a number of key strategic routes on the highway and rail network, with over 90% of the UK population within a four hour drive of the Midlands and a host of large distribution centres based within the area.
- 4.3.21 The key strategic routes, as accessed from the study area, are summarised below:
- M6 Junctions 2 and 3 for the national motorway connections to North of England and southbound towards the M1.
 - M40 Junction 15 for national motorway connections to the North of England and southbound towards London.
 - M69 national motorway to provide connections to Leicester, and the North-East of England via the M1.
 - A45 to the West for connections to UK Central, Solihull Town Centre, Birmingham International Airport, Birmingham City Centre, the M42 (Junction 6) and M6 (Junction 4).
 - A45 to the east towards the M45 and M1 southbound for connections towards Milton Keynes and London.
 - A46 linking Warwick and Coventry and providing further connections to Stratford Upon Avon in the south and to the M69 Junction 2 in the North.
 - A444 to the north for connections to Whitley, the location of Jaguar Land Rover's Global Headquarters, and Nuneaton
 - A452 Kenilworth Road to the south for connections to Royal Leamington Spa.
 - A4114 to the north, for connections towards Coventry City Centre
 - Stoneleigh Road westbound for connections to the University of Warwick.

- 4.3.22 The local highway network has undergone recent investment including the £106 million A45 / A46 Tollbar End Improvement scheme, which was completed in December 2016 and introduced a grade separated junction for traffic travelling East-West between the A45 west of Coventry and the A46 east of Coventry. Future transport interventions going forward will aim to complement this scheme, and be focused in alternative priority locations.
- 4.3.23 The A46 forms part of the Highways England (HE) managed Strategic Road Network (SRN), with the section of the road running between the M6 Coventry to the M5 near Tewkesbury the most applicable to this study. The SRN is made up of approximately 2% of the total length of England's road network, yet carries around one-third of the total motor vehicle traffic in England and more than 95% of England residents either as a driver or passenger at least once per year⁵. The A46 is therefore important in supporting the movement of large volumes of vehicle traffic in this area.
- 4.3.24 On this basis, any intervention would need to be considered against its ability to benefit the smooth operation of this nationally critical hub of the road network.

JOURNEYS TO WORK

- 4.3.25 Data presented in Figure 4-7 shows the percentage split of the distance travelled by residents in Coventry who travel to work by car or van taken from the 2011 Census.

Figure 4-7 2011 Census Travel to Work by Car or Van by Distance

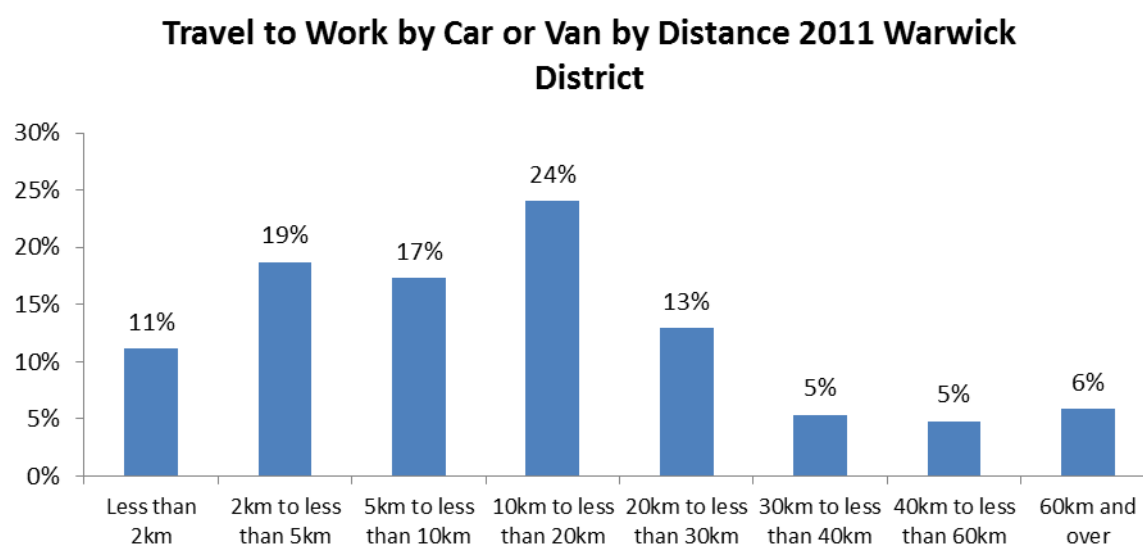


Source – Census 2011

⁵ DfT; Use of the Strategic Road Network (2014)

- 4.3.26 The majority of Coventry residents traveling to work by car or van are journeys that are 2 – 5km (27% of journeys), followed by journeys that are 5 – 10km (23% of journeys). Over 60% of journeys to work by car or van are less than 10km in distance.
- 4.3.27 This information suggests that schemes that provide additional capacity for short distance trips will deliver the greatest benefit. This could be achieved by providing, for example, additional capacity on local roads, a strategic bypass to remove longer distance trips from the local road network or by providing a sustainable mode alternative to the car.
- 4.3.28 Data presented Figure 4-8 shows the percentage split of the distance travelled by residents in the Warwick District who travel to work by car or van taken from the 2011 Census.

Figure 4-8 2011 Census Travel to Work by Car or Van by Distance Warwick District



Source – Census 2011

- 4.3.29 The most common distance travelled to work by car or van by Warwick District residents is between 10km and 20km (24% of journeys). This is followed by 19% of journeys between 2km and 5km. Overall 47% of journeys to work by car or van are less than 10km in distance.
- 4.3.30 Of these trips, it's those that are greater than 10km that are worth considering in this study of possibly South Coventry interventions, as this is the minimum distance between the closest major Warwickshire population centre (Kenilworth) and Coventry and therefore these are the most likely trips to benefit from interventions in the City. However, only a portion of these trips will be to Coventry, with the majority of longer-distance car and van trips in the region reflecting the more dispersed and rural nature of employment in the wider county.

TRAFFIC CONGESTION AND DELAY

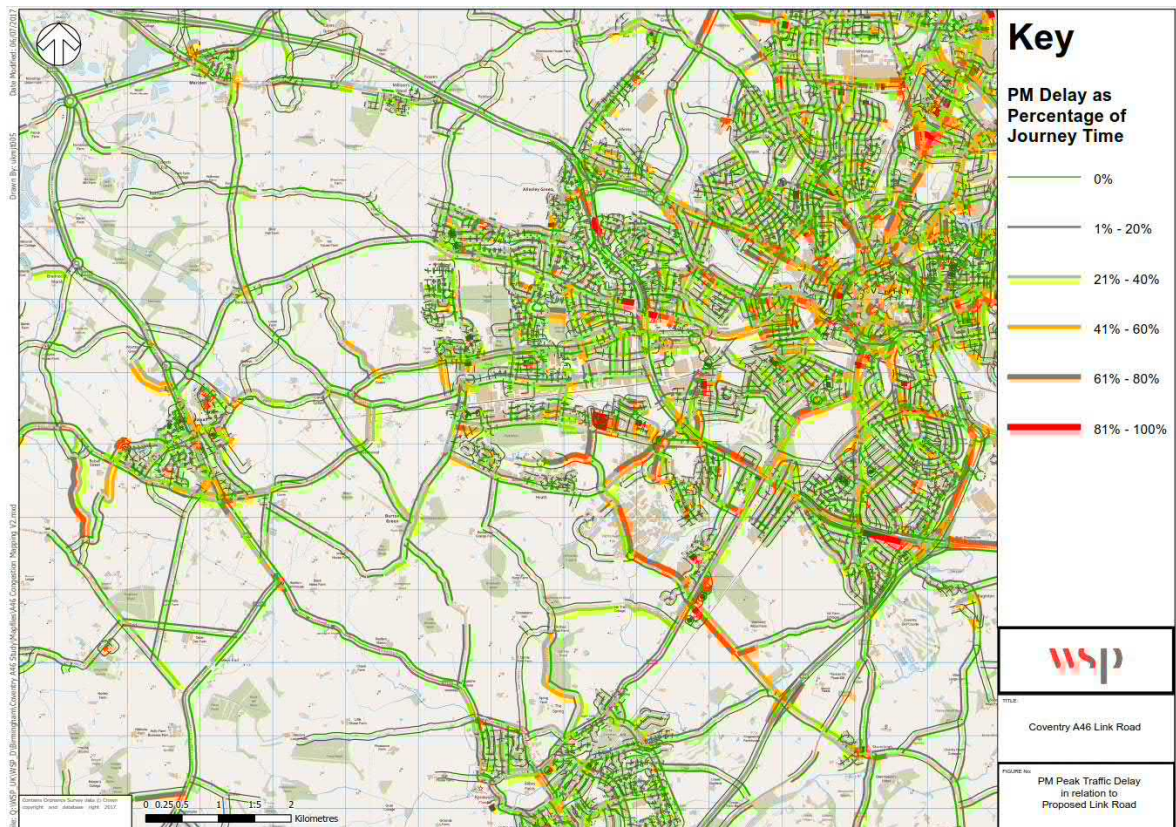
- 4.3.31 Data in Figure 4-9 shows the AM peak delay (07:00 – 09:00) as a percentage of journey time in the South Coventry / Warwickshire area using the latest available Trafficmaster data from 2013 to 2014.

Figure 4-9 AM Peak Delay South Coventry / Warwickshire 2013 - 2014



- 4.3.32 Congestion of 60-80% of journey time can be observed in some locations, notably on Stoneleigh Road approaching Kenilworth from the south and travelling Westbound on the A45 approaching Sir Henry Parkes Road.
- 4.3.33 Delay issues at the A46 / Stoneleigh Road junction are the focus of the Phase 1 A46 Link Road Stoneleigh junction improvements; therefore the impact of this scheme on traffic is not reflected in the above. Neither is the A45 / A444 Stivichall Interchange junction improvement which have been completed since the time of the Trafficmaster study.
- 4.3.34 Data in Figure 4-10 shows the PM peak delay (16:00-18:00) as a percentage of journey time in the South Coventry / Warwickshire area using the latest available Trafficmaster data from 2013 to 2014.

Figure 4-10 PM Peak Delay South Coventry / Warwickshire 2013 - 2014



- 4.3.35 In this period there appears to be considerable congestion at junctions and routes off Kenilworth Road from the A46 / Stoneleigh Road junction in the south to the North West along Gibbet Hill Road, Kirby Corner Road and Mitchell Avenue (60-100% of journey time). These delays in the PM peak extend around the University of Warwick and Canley area, including on the A45.
- 4.3.36 Similar to the AM peak portrayed in Figure 4-9, since 2014, the A45 / A444 Stivichall Interchange junction improvements have been completed to support the mitigation of delay and congestion issues at this junction.
- 4.3.37 From this review of congestion data, the following five objectives have been identified which any intervention must resolve:

OBJECTIVE SETTING

- 4.3.38 Based upon the preceding review of trip patterns, journey lengths and congestions sites, the following objectives are proposed as outlined in Table 4-4.

Table 4-4 Proposed Objectives

ID	Key current or future problems	Draft objectives	Measures of success
1	<ul style="list-style-type: none"> - Traffic congestion, resulting in longer journey times on key roads including the A45, Cromwell Lane and Stoneleigh Road. - Restriction of expansion of local employment sites including JLR Whitley, Stoneleigh Park and the City Centre South Masterplan due to lack of network capacity. - Inability to unlock strategic housing sites because the existing transport network does not have capacity to meet projected travel demand. - Increased transport costs to local businesses. - South Coventry is currently not an attractive place to live or work due of traffic congestion. 	<p>Journey times and reliability To enable the delivery of future housing, employment and educational development whilst preventing journey times from increasing on the A45; Cromwell Lane and Stoneleigh Road.</p>	<ul style="list-style-type: none"> - Average Peak Hour Journey Times (mins) for traffic on the following routes: <ul style="list-style-type: none"> o A45 between Stonebridge Island and Festival Island; o Cromwell Lane to A45 at Pickford Green; and o Stoneleigh Road to Cromwell Lane. - Variation between free flow journey times and average peak hour journey times.

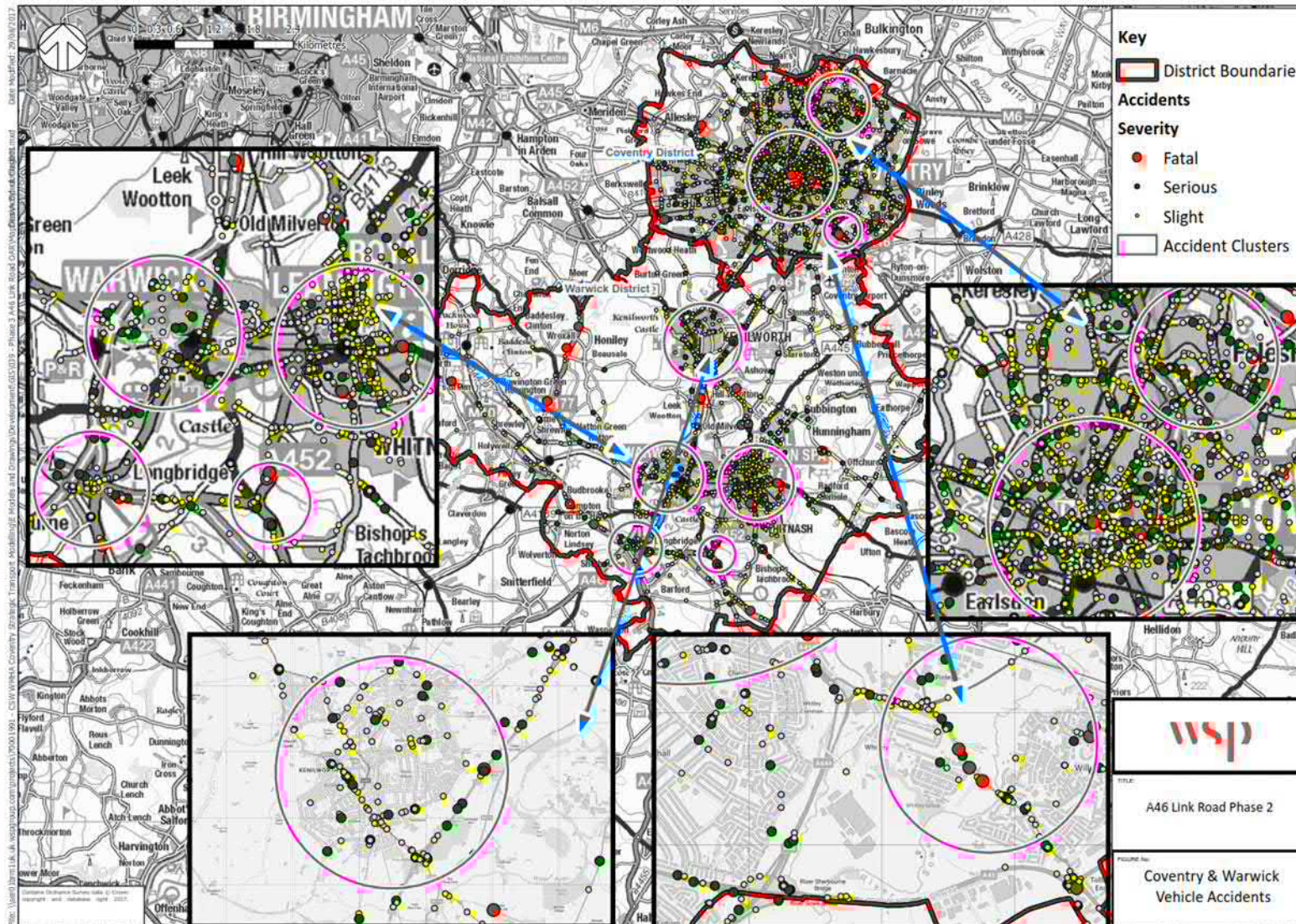
ID	Key current or future problems	Draft objectives	Measures of success
2	<ul style="list-style-type: none"> - Traffic congestion reduces accessibility to employment and educational opportunities. - Public transport journeys are adversely affected by traffic congestion on routes to / from the University of Warwick. 	Accessible economic development To deliver “desirable” average peak hour journey times close to those in the off peak to support accessibility to support future housing, employment and educational development sites in the local area.	<ul style="list-style-type: none"> - Average Peak Hour Journey Time (mins) by mode (Private Car; public transport; Cycling; Walking) on routes including A45, A46, and A429 Kenilworth Road for access to / from: <ul style="list-style-type: none"> o The new housing development sites at Kings Hill, Westwood Heath, Cromwell Lane and Eastern Green. - The new and growing employment sites at Eastern Green, Stoneleigh Park and Whitley South; as well as supporting access to sites in the wider strategic area including UK Central and HS2 Interchange.
3	<ul style="list-style-type: none"> - High volume of strategic trips on the A45 in South Coventry in the current situation which join / exit the A45 at Tile Hill Lane and Charter Avenue in the west, travelling to / from the Coventry Eastern Bypass north east towards - Lack of network resilience meaning planned maintenance or incidents result in long-diversions / delays for through traffic. 	Network resilience To ensure the transport network within Coventry and Warwickshire is resilient enough to provide a consistent and reliable level of service during (a) planned maintenance and (b) during incidents.	<ul style="list-style-type: none"> - Level of service and queue lengths for traffic on A45 between Stonebridge Island and Festival Island. - Total delay and total vehicle-kms with / without A45 (lower than current levels).
4	<ul style="list-style-type: none"> - Restriction of expansion to the University of Warwick due to lack of transport network capacity. - Existing high levels of sustainable travel by students to / from the University of Warwick need to be supported to continue and grow in the future situation. 	University of Warwick accessibility To support the delivery of future development at the University of Warwick and reduce journey times for those travelling to / from the site.	<ul style="list-style-type: none"> - Average Peak Hour Journey Time (mins) by mode (Private Car; Public Transport; Cycling; Walking) on routes including Cromwell Lane, Gibbet Hill Road, Stoneleigh Road and Charter Avenue. - Future university of Warwick Travel Surveys – mode split target for both staff and students

ID	Key current or future problems	Draft objectives	Measures of success
8	<ul style="list-style-type: none"> - Rat running on local roads around the University of Warwick and to the north of Kenilworth. 	Rat running To reduce vehicle flows on local roads including Crackley Lane and Hollis Lane.	<ul style="list-style-type: none"> - Change in vehicle flows on Crackley Lane and Hollis Lane.

ACCIDENTS

- 4.3.39** Data in Figure 4-11 shows the severity of accidents over the past five years in Coventry and Warwickshire, with an inset figure highlighting clusters of accidents around Coventry City Centre, the A45 and Kenilworth area.
- 4.3.40** In the Coventry LA and Warwick District area, there are a number of accidents on key arterial and radial routes into and around Coventry City Centre, as well as key strategic routes including the A452 and the A46. Most of accidents occur in local centres; including Coventry, Kenilworth, Leamington Spa and Warwick.
- 4.3.41** The inset figure shows that there have been two fatal accidents around the A45 / Charter Avenue / Kirby Corner Road junctions, as well as a cluster of severe accidents over the last five years. There have also been two fatal accidents on The Windmill Hill, as well as a number of fatal accidents in Coventry City Centre.
- 4.3.42** Additional clusters of severe accidents over the last five years have occurred around the A45 / A444 Stivichall junction which has since been improved, and around the Foleshill Road / A444 area in the north of the city.

Figure 4-11 Traffic Accident Data for the Last Five Years - Coventry and Warwickshire



OBJECTIVE SETTING

4.3.43 Based upon the accident data reviewed above, we developed the following objective as outlined in Table 4-5.

Table 4-5 Proposed Objective

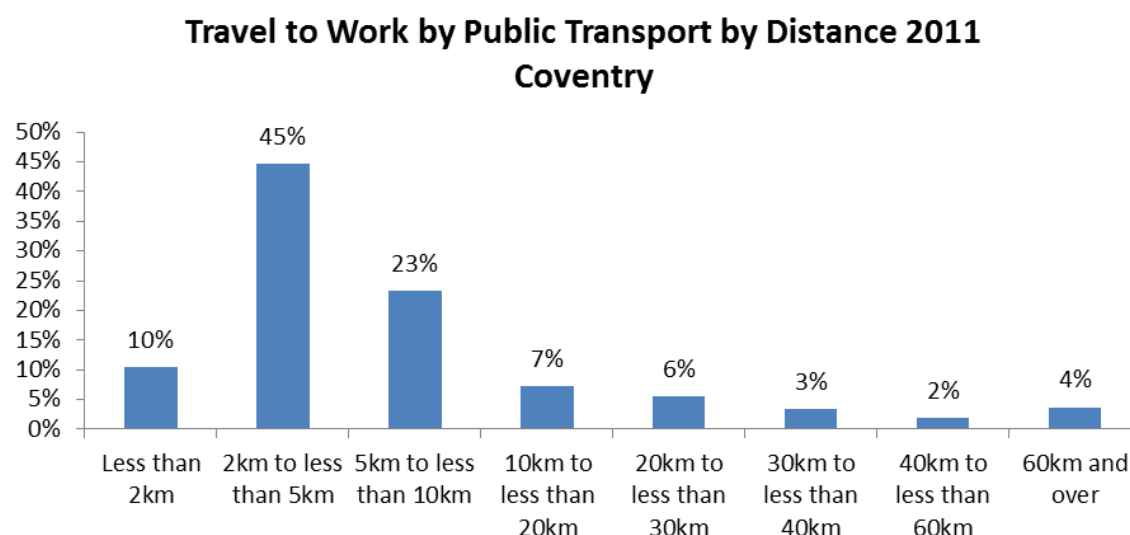
ID	Key current or future problems	Draft objectives	Measures of success
5	<ul style="list-style-type: none"> - Concentrations of casualties in the local area on the A45, Charter Avenue, A429, A46 and Westwood Road / Kirby Corner Road in the vicinity of the University of Warwick. - High concentrations of pedestrian and cyclist accidents on the A45, Charter Avenue and the A429. 	Road safety To reduce the number and severity of accidents on the A45, A429, Charter Avenue, and at the A46 Stoneleigh junction.	<ul style="list-style-type: none"> - Accident numbers on: <ul style="list-style-type: none"> The A45 between the A452 / A45 junction and the A45 / A46 / A444 junction (A46 Festival Island); Charter Avenue; The A429 between the A429 / A45 junction and the A429 / A45 junction; and The A46 Stoneleigh junction.

PUBLIC TRANSPORT NETWORK

4.3.44 The following provide details of the existing public transport network in the local area for bus and rail. As identified above, 12% of journeys to work in Coventry and 5% of journeys to work in Warwick were made by public transport based at the 2011 Census. Public transport for this data includes train, light rail, tram, bus, minibus or coach.

4.3.45 Data presented in Figure 4-12 shows the distance travelled on public transport journeys in Coventry based on Travel to Work data from the 2011 Census.

Figure 4-12 Travel to Work - Public Transport by Distance 2011 Coventry

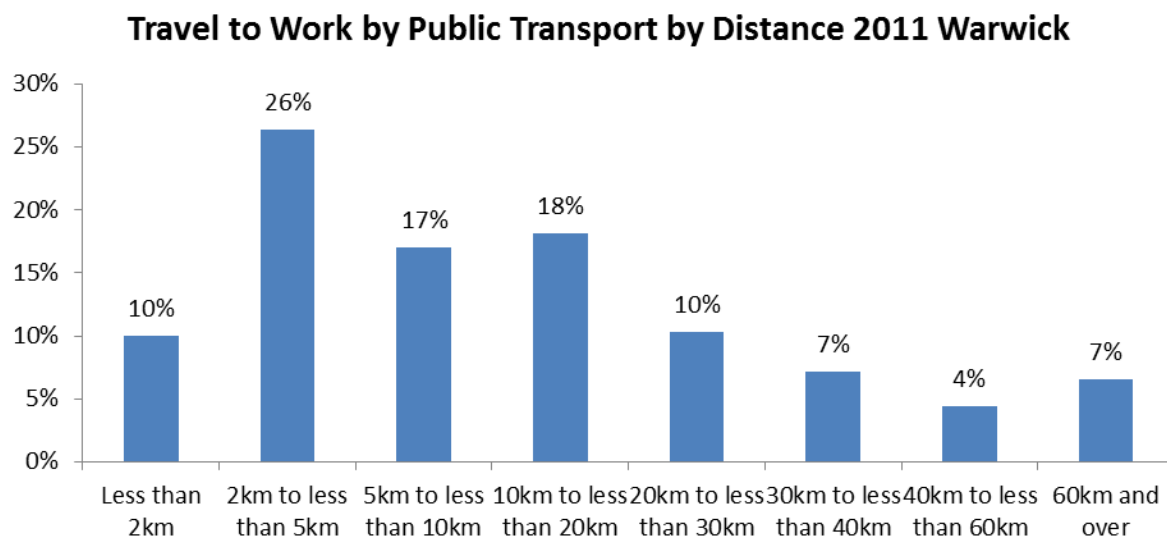


Source – Census 2011

4.3.46 The majority of public transport journeys to work are between 2km and 5km in distance, with a further 23% between 5km and 10km, and 10% less than 2km. A total of 78% of public transport journeys to work are 10km or less, and over half of public transport journeys are 5km or less.

4.3.47 Figure 4-13 shows the distance travelled for public transport journeys based on Travel to Work data from the 2011 Census.

Figure 4-13 Travel to Work - Public Transport by Distance 2011 Warwick



Source – Census 2011

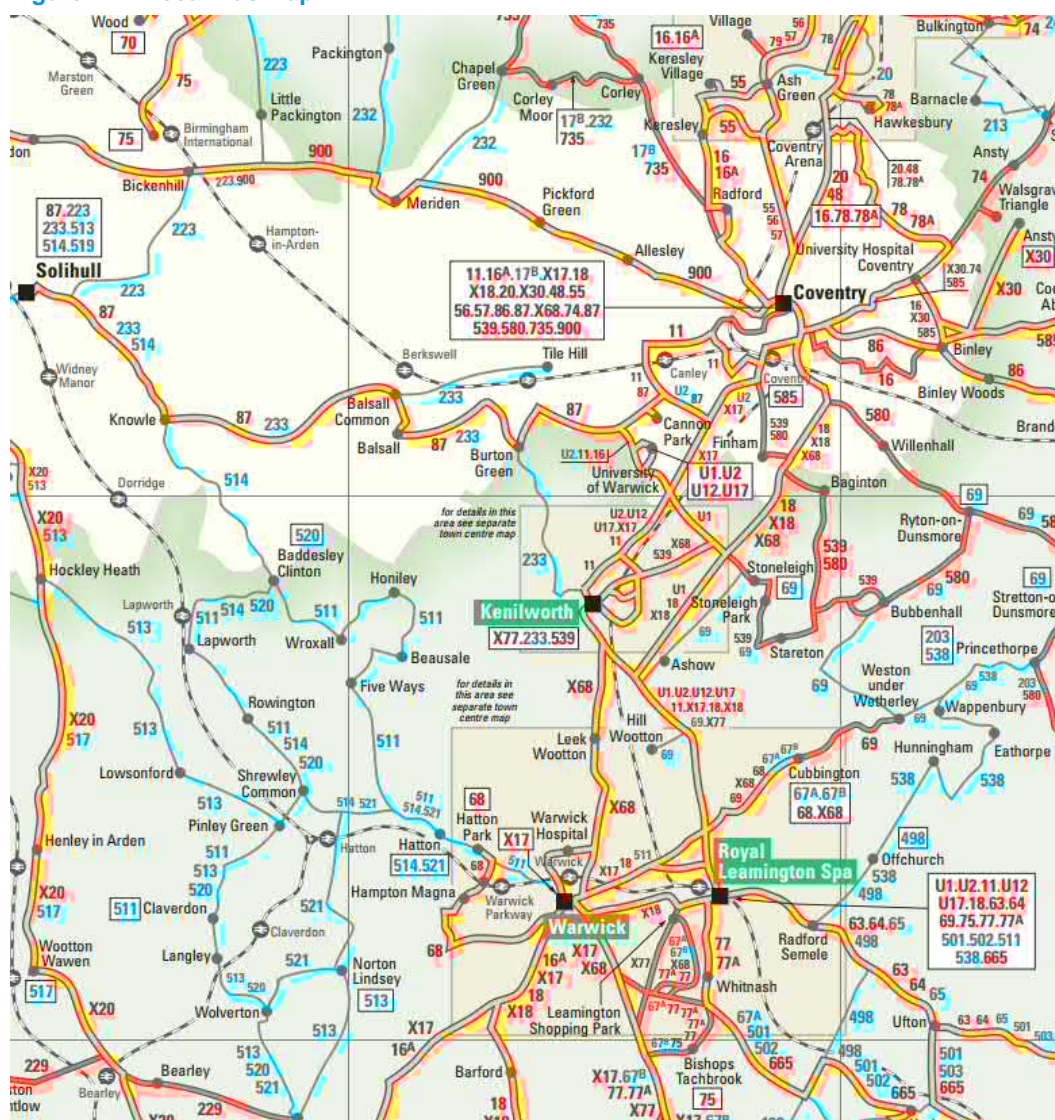
4.3.48 Fewer residents in Warwick District travel by public transport (only 8% of the total mode share); however those who travel by public transport in Warwick travel further than those in Coventry. Again, this reflects the more distributed nature of employment in Warwickshire or possibly residents of Warwick travelling to larger employment sites such as Coventry, Birmingham or even London (just over an hour away).

4.3.49 Just over one-third of respondents (36%) in Warwick traveling by public transport travel 5km or less, and over half of respondents (53%) travel 10km or less. However, a further 18% of respondents travelled by public transport travel between 10 and 20km, and over one-quarter (28%) of public transport journeys are 20km or more, extending to over 60km.

BUS

4.3.50 Local bus routes in Coventry and Warwickshire are shown in Figure 4-14. There is a good bus network in Coventry and between the towns of Warwickshire. The main bus operators in Coventry and Warwickshire include National Express Coventry, Stagecoach, Central Buses, Diamond Bus, Travel De Courcey and Johnsons.

Figure 4-14 Local Bus Map



Source – Warwickshire County Council

- 4.3.51 Key bus services that will provide connectivity between Coventry and Warwickshire are outlined in Table 4-6. These services provide a mixed coverage of frequencies, with most service provisions hourly or longer.

Table 4-6 Key Coventry and Warwickshire Bus Services

BUS NUMBER	ROUTE	OPERATOR	FREQUENCY
11	Leamington Spa, Kenilworth, University Of Warwick, Coventry via A429 and Gibbet Hill Road	National Express Coventry	Term Time Every 15 – 30 minutes Monday – Friday (06:30 – 00:41) Every 30 minutes Saturday(06:30 – 01:37) and Sunday (08:45 - 00:39)
X68	Cubbington, Hatton Park, Coventry via A46 and Warwick Road	Stagecoach	Every hour Monday to Friday (06:45 – 19:10) Every hour Saturdays (07:12 - 19:10)
87	Coventry, Cannon Park, Burton Green, Balsall Common, Knowle, Solihull via A429 and Kenilworth Road	Johnsons	Every hour Monday – Friday (07:20 – 18:55) Every hour Saturday (06:15 – 18:37)
539	Kenilworth, Stoneleigh, Baginton, Coventry via Dalehouse Lane / Stoneleigh Road and B4113	Johnsons	Approx. every two hours Monday to Saturday (08:20 – 18:10)

Source - Warwickshire County Council, 2016

- 4.3.76 Transport for West Midlands (TfWM) 2016 Travel Trends Report provides a summary of modal split data for the West Midlands metropolitan area using cordon counts carried out every two years during the inbound AM peak period (07:30 – 09:30) at centres in the region including Coventry City Centre. The following table shows the bus and rail counts in the Coventry City Centre cordon between 2011 and 2015.

Table 4-7 Coventry Cordon Counts for Bus and Rail – 2011 to 2015

MODE	COUNT YEAR		
	2011	2013	2015
Bus	7,617	7,194	6,955
Rail	1,963	2,300	2,287

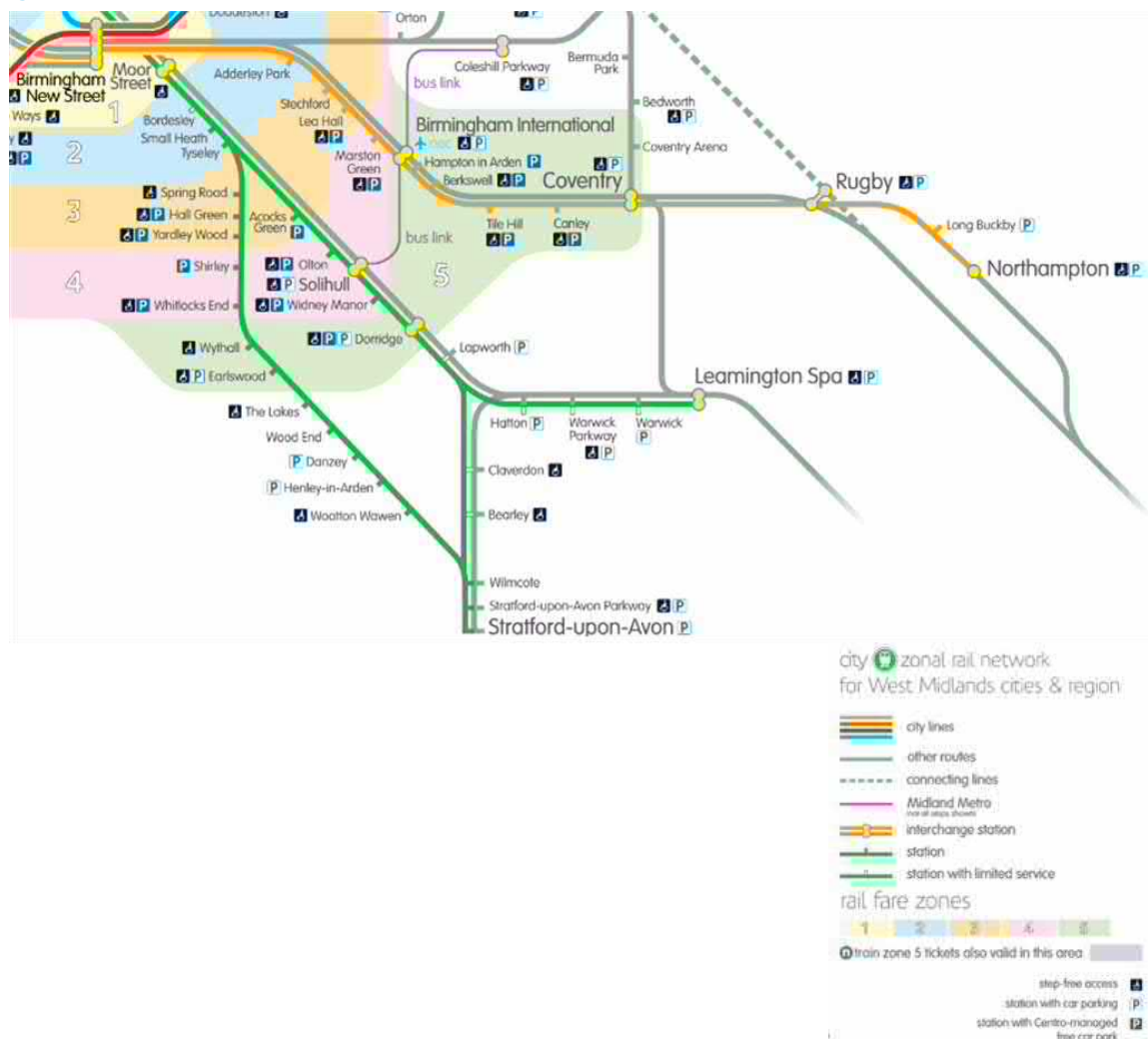
Source – West Midlands Cordon Count

- 4.3.77 The cordon counts show that there has been a 10% decrease in bus patronage into Coventry City Centre in the AM peak between 2011 and 2015 (7,617 inbound trips in 2011 to 6,955 trips in 2015). However, based on cordon data, public transport accounts for 22.7% of mode share across the cordon including 17.1% of the total mode share by bus. The mode share of rail is increasing but only accounts for 5.6% of the total mode share for the cordon area in 2015.

RAIL

- 4.3.78 There is good railway network connectivity serving Coventry and Warwickshire with 18 stations in the area. Figure 4-15 provides a plan of the local rail network in the Coventry and Warwickshire area, extracted from the wider West Midlands rail network.

Figure 4-15 Local Rail Network



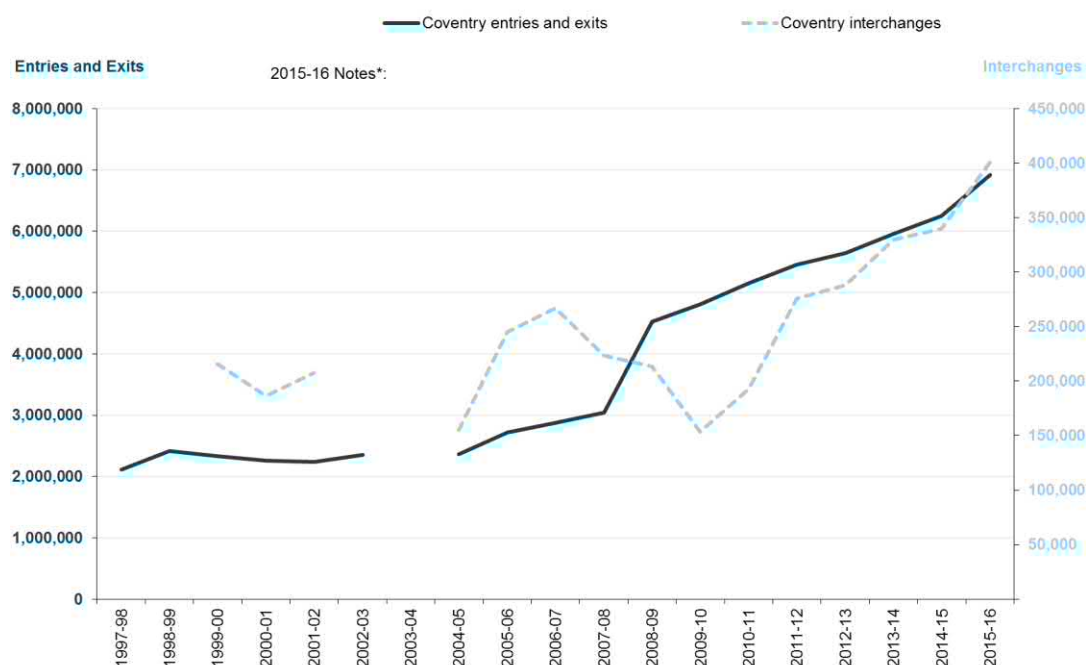
- 4.3.79 Included on the rail network above are two new railway stations at Coventry (Ricoh) Arena and Bermuda Park in Warwickshire as part of the Coventry to Nuneaton rail upgrade NUCKLE (Nuneaton – Coventry – Kenilworth – Leamington Spa project). In addition, platforms have also been extended at Bedworth Railway Station to facilitate longer trains.
- 4.3.80 Railway Stations with the greatest number of entries and exits per year in the Coventry and Warwickshire are outlined in Table 4-8.

Table 4-8 Top Five Railway Stations in Coventry and Warwickshire

STATION NAME	ROUTES	STATION FACILITY OWNER	1997-98 ESTIMATED TOTAL ENTRIES AND EXITS	2015-16 ESTIMATED TOTAL ENTRIES AND EXITS	RATE OF CHANGE
Coventry	WCML, London Midland local services, Cross County network.	Virgin Trains (West Coast)	2,110,537	6,921,432	2.28
Leamington Spa	Chiltern Line, London Midland local services, Cross County network.	Chiltern Railways	740,719	2,433,782	2.29
Rugby	WCML, London Midland local services.	Virgin Trains (West Coast)	777,598	2,281,588	1.93
Stratford-Upon-Avon	Chiltern Line, London Midland local services.	London Midland Trains	437,942	994,070	1.27
Nuneaton	WCML, London Midland local services, Cross County network.	London Midland Trains	472,186	1,236,492	1.62

- 4.3.81 The total entries and exits at Coventry, Leamington Spa and Rugby Railway Stations are estimated to have doubled between 1997/98 and 2015/16.
- 4.3.82 All the above railway stations have on-site parking. Therefore highway improvements on route to the stations will support greater journey time reliability for multi-modal journeys travelling to and from the park and ride sites.
- 4.3.83 Coventry Railway Station is served by frequent express services between London and Birmingham, some of which extend north to call at locations such as Wolverhampton, Shrewsbury, Manchester and Glasgow. There are also hourly cross-country services between Manchester Piccadilly and Bournemouth, calling at Leamington Spa and Banbury to the south and Birmingham, Wolverhampton, Stafford and Stoke on Trent in the north. An hourly local service is also available between Coventry and Nuneaton, serving the Ricoh Arena, Bedford and Bermuda Park business estate on route. There is ambition by local authorities and TfWM to double the frequency of this services to half-hourly in the near future, as well as to start a new local service between Coventry and Leamington Spa which would serve a new station at Kenilworth, the latter scheduled for opening in December of this year (2017).
- 4.3.84 Coventry Railway Station had an estimated 6.9 million entries and exits in between April 2015 – March 2016, the second highest figure in the West Midlands, following Birmingham New Street Railway Station⁶. Coventry Railway Station provides services on the West Coast Mainline (WCML), Cross Country network, as well as local London Midland services. The change in the estimated station usage at Coventry between 1997/8 and 2015/16 is shown in Figure 4-16. As a result of improvements made to the methodology, the estimates of station usage for 2003-04 were not produced.

Figure 4-16 Coventry Railway Station Usage between 1997/8 - 2015/16



Source – Office of Rail and Road

⁶ Office of Rail and Road, 2016

4.3.85 Usage at Coventry Railway Station has significantly increased over the past 20 years, both in terms of the number of entries and exits, and the number of interchange journeys via the station.

4.3.86 As the preceding data suggests, rail travel in Coventry and Warwick Districts have seen considerable growth over the recent period. Any future interventions should be designed in a fashion to complement and support growth by this sustainable mode, for example by providing better accessibility to Coventry Railway Station or Tile Hill Park and Ride.

AIR TRAVEL

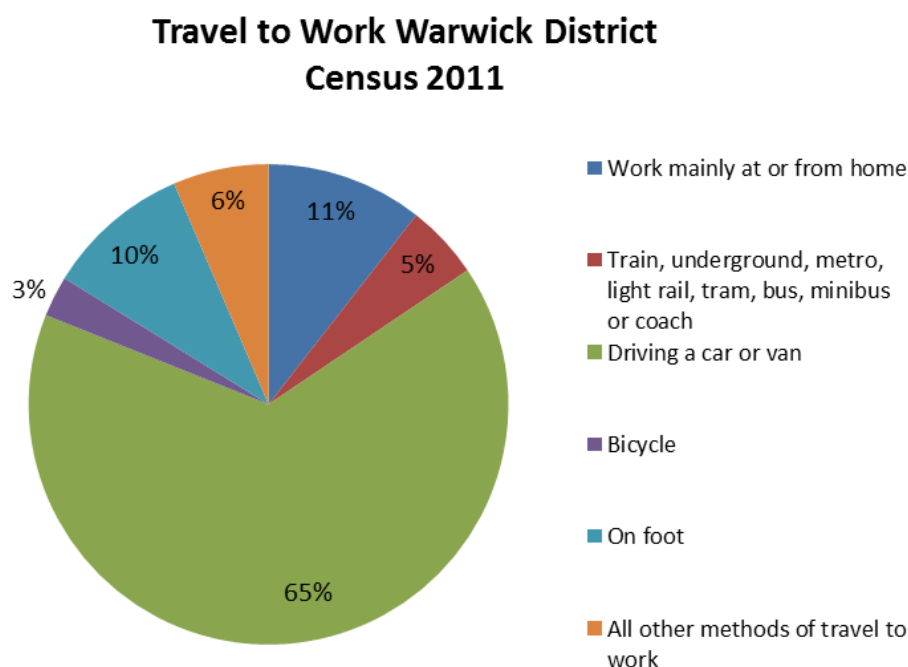
4.3.87 Coventry Airport mainly provides freight and cargo services and is approximately 7km south of Coventry City Centre, accessible via the A45 Tollbar End Roundabout. The nearest railway station to the airport is Coventry which is a 15 minute drive and is linked by the 539 bus service; regular bus services are available between the airport and Coventry City Centre on the 21 and 21W.

4.3.88 The biggest passenger airport in the West Midlands is Birmingham Airport with more than 11.6 million passengers in 2016, an increase of 14.2% compared to 2015. Birmingham Airport is approximately 16km west of Coventry City Centre via the A45, with connections also available from the A452, M42 and M6. The nearest railway station to the airport is Birmingham International which is on the West Coast Main Line and provides direct connections to Coventry Railway Station (10 minute journey) and Rugby Railway Station (approximately 25 minutes).

ACTIVE TRAVEL NETWORK

4.3.89 Based on data presented in Figure 4-1 and

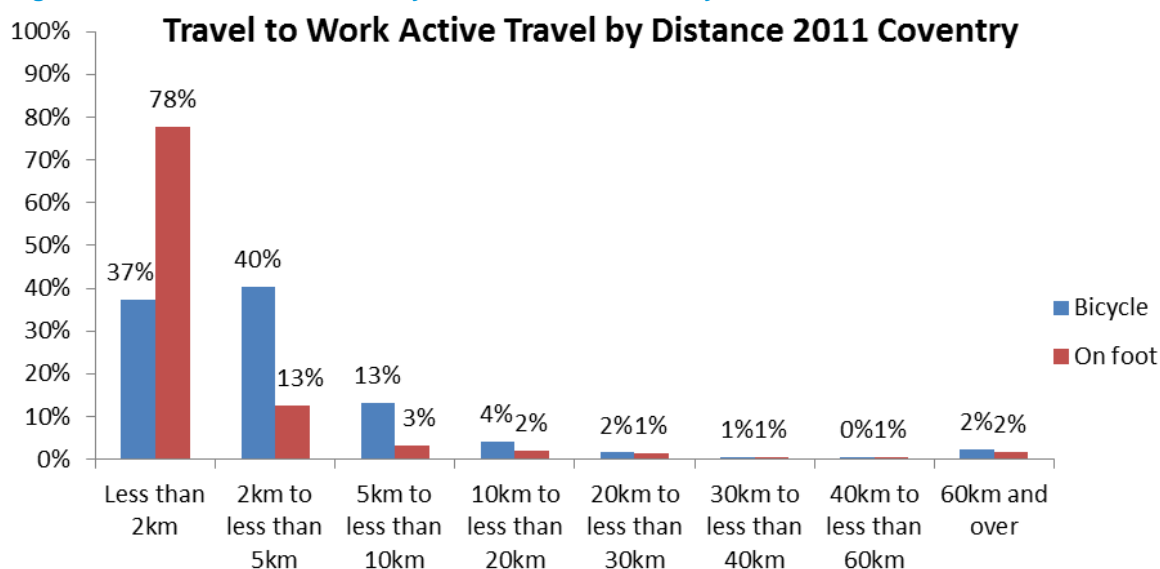
Figure 4-2 2011 Census Travel to Work Mode Share Warwick District



4.3.90 Source – Census 2011, 2% of journeys to work in Coventry and 13% of journeys to work in Warwick District are by active travel modes. In both areas, more than 90% of journeys to work on foot and by bicycle are 5km or less.

Data in Figure 4-17 shows the distance travelled to work by those respondents travelling by bicycle or on foot for the 2011 Census in Coventry.

Figure 4-17 Active Travel to Work by Distance 2011 - Coventry

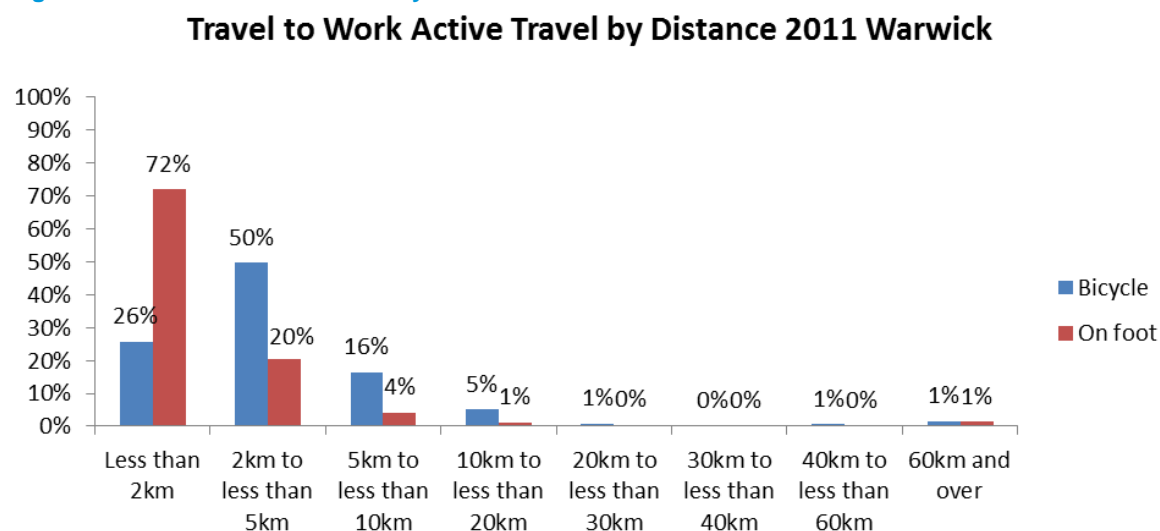


Source – Census 2011

4.3.91 More than three-quarters of journeys to work on foot (78%) are 2km or less, and a total of over 90% of journeys to work on foot are 5km or less. Whereas, for those cycling, more than one-third of journeys to work (37%) are 2km or less, and 40% of journeys are between 2km and 5km. Less than one-quarter of those cycling to work travel more than 5km. There is therefore potential to increase the percentage of those cycling longer distances (above 10km) through more active travel measures.

4.3.92 Data presented Figure 4-18 shows the distance travelled to work by those respondents travelling by bicycle or on foot for the 2011 Census in the District of Warwick.

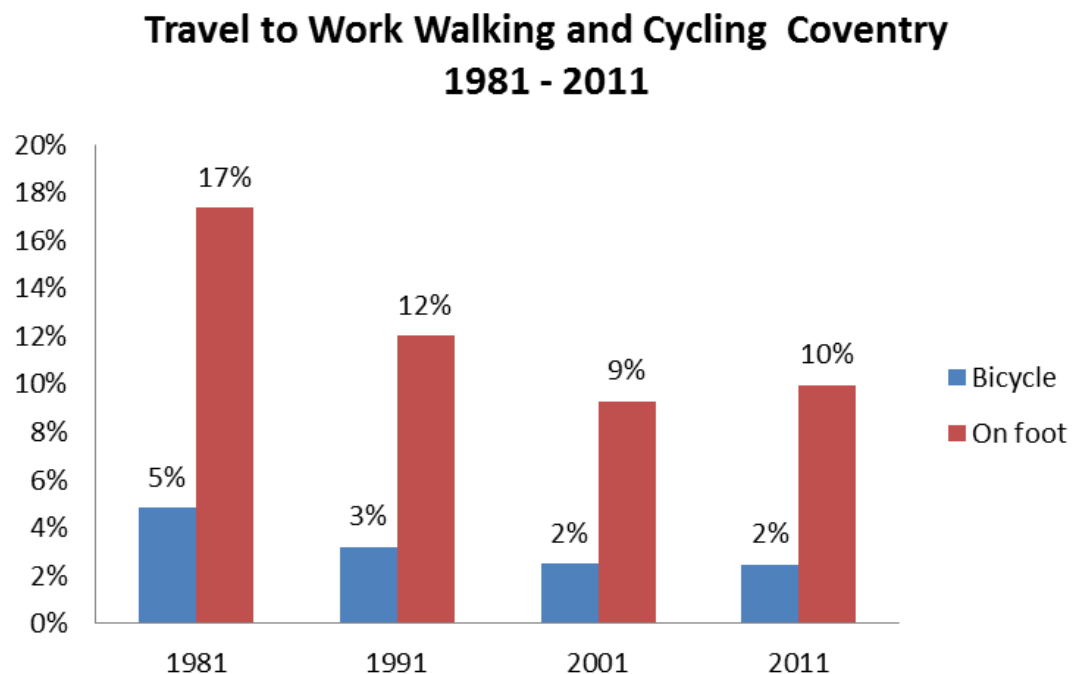
Figure 4-18 Active Travel to Work by Distance 2011 - Warwick



Source – Census 2011

- 4.3.93 Similar to the results for Coventry, almost three quarters of journeys to work on foot (72%) are 2km or less, and a total of 92% of journeys on foot at 5km or less. Of those cycling, over three-quarters of journeys are 5km or less, and a further 16% of those cycling travel between 5km and 10km.
- 4.3.94 Data presented Figure 4-19 shows the Travel to Work mode share for active travel (walking and cycling) by residents of Coventry using Census data between 1981 and 2011.

Figure 4-19 Travel to Work by Active Travel Coventry

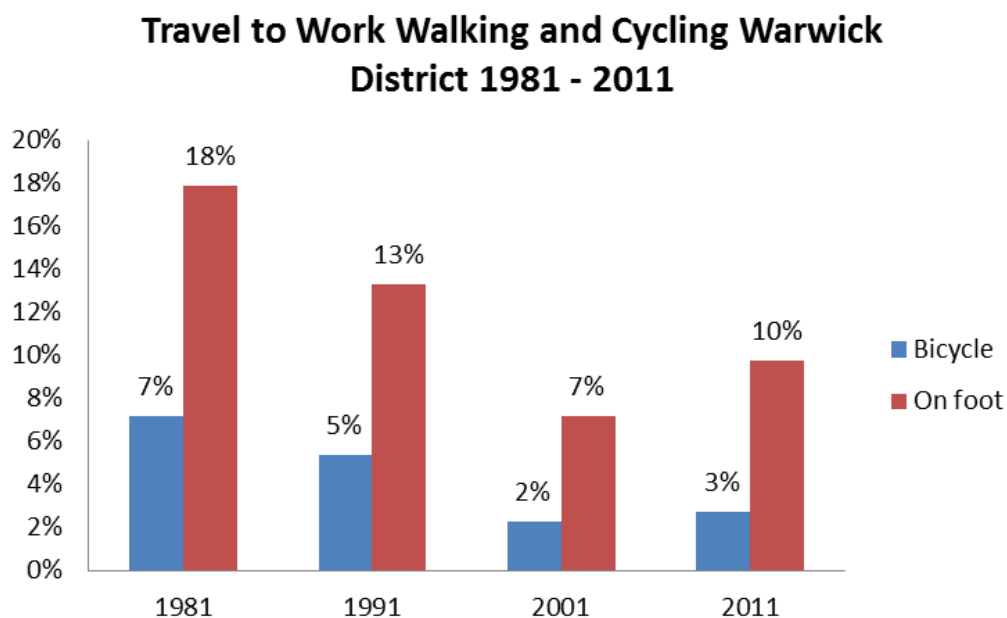


Source – Census 2011

4.3.95 There was a steady decline in the number of residents in Coventry walking and cycling to work between 1981 and 2001 but percentages for walking in 2011 have increased. Only approximately 2% of residents cycled to work in 2001 and 2011.

4.3.96 Data presented Figure 4-20 shows the Travel to Work mode share for active travel (walking and cycling) by residents of the Warwick District using Census data between 1981 and 2011.

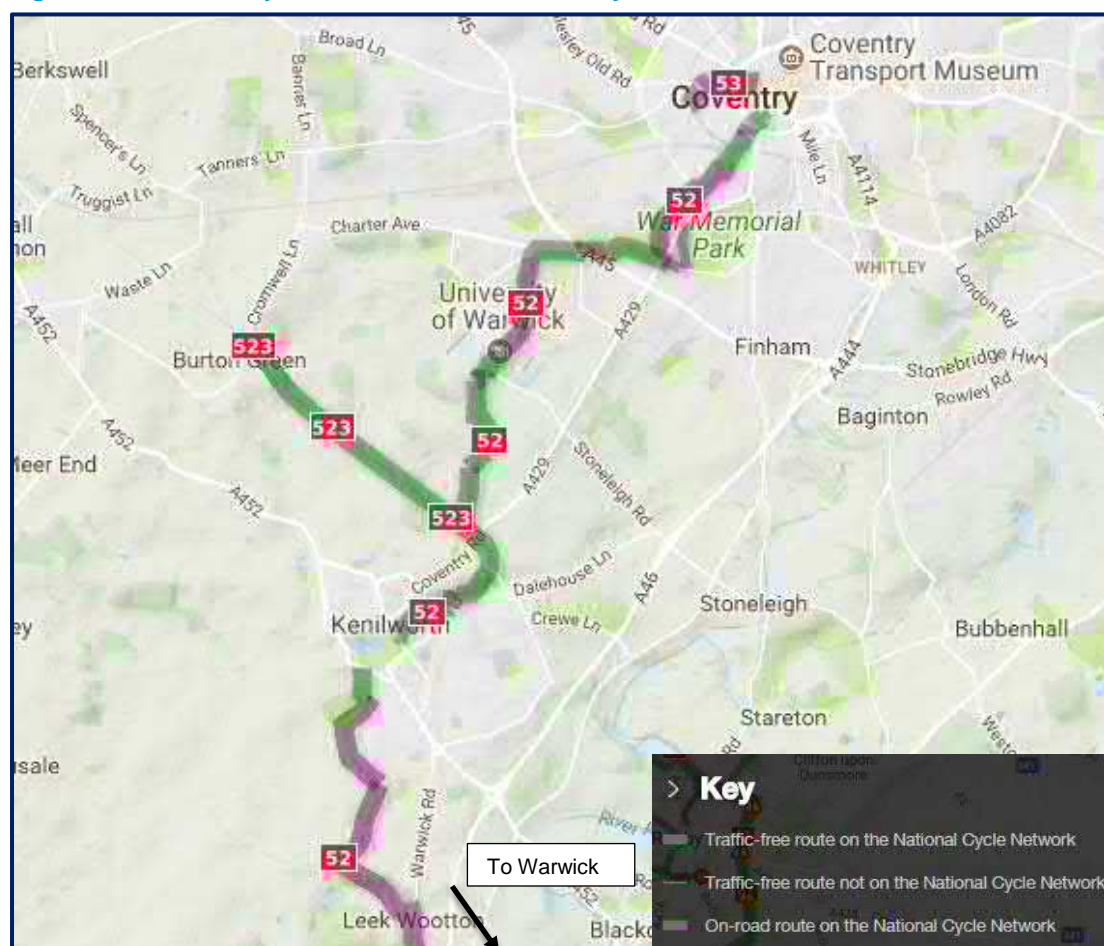
Figure 4-20 Travel to Work by Active Travel Warwick District



Source – Census 2011

- 4.3.97 The percentage change of Warwick residents walking and cycling to work between 1981 and 2011 follows a similar trend to that of the residents of Coventry shown in Figure 4-19. There was a steady decline in the percentage of residents walking and cycling to work between 1981 and 2001 however in 2011 walking has increased to almost 10% of journeys and cycling to 3% of journeys.
- 4.3.98 Based on data from the 2012 University of Warwick Travel Survey, the share of active travel modes for staff and student travel at the University of Warwick is significantly higher than for Travel to Work data.
- CYCLING**
- 4.3.99 As shown in Figure 4-3 a similar proportion of staff and students cycle to the University with 9% of staff, 10% of undergraduate students and 9% of postgraduate students cycling to the University. 4% of staff, 36% of undergraduate and 39% of postgraduate students walk to the University.
- 4.3.100 Information in Figure 4-21 shows the National Cycle Network (NCN) routes in Coventry and Warwickshire which include Routes 41, 52, 53 and 523. These routes are generally to the south-west of Coventry and the north of Warwick, with the exception of Route 41 which runs south-west and east between Rugby and Warwick, continuing south to Stratford-upon-Avon.
- 4.3.101 Route 523 is a traffic-free route, but the remaining NCN routes are partially traffic-free and on-road.

Figure 4-21 National Cycle Network Routes - Coventry and Warwickshire



Source - Sustrans

4.3.102 Figure 4-22 shows the cycle routes from Coventry City Centre heading south from the city. Routes include:

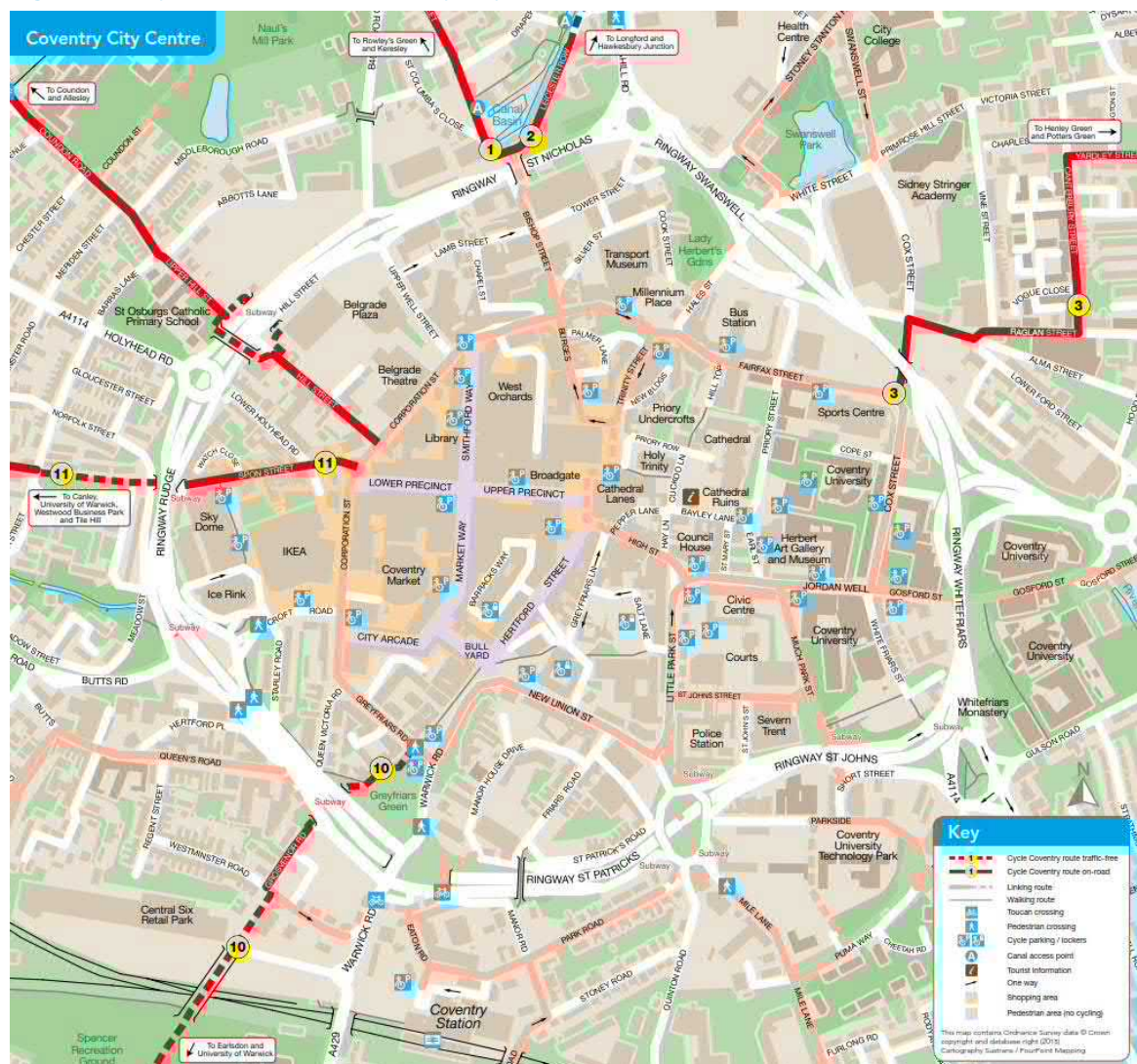
- Route 1 – To Rowley's Green and Keresley;
- Route 2 – To Longford and Hawkesbury Junction;
- Route 3 – To Henley Green and Potters Green (see Figure 4-23);
- Route 10 – To Earlsdon and University of Warwick (see Figure 4-25); and
- Route 11 – To Canley, University of Warwick, Westwood Business Park and Tile Hill (see Figure 4-25).

4.3.103 Additional cycle routes in Coventry include:

- Route 12 – Via Route 11 to Westwood Business Park and Tile Hill Railway Station (see Figure 4-25);
- Route 13 – Via Route 11 to Tile Hill and Bannerbrook Park (see Figure 4-25); and
- Sowe Valley Route, a mainly traffic free route to the north-east of the City.

- 4.3.104 Cycle routes out of Coventry City Centre are a combination of on-road and traffic-free routes.
- 4.3.105 There is a lack of cycle infrastructure to the south-east of Coventry, with most routes in the north and south-west of the City.

Figure 4-22 Cycle Routes from Coventry City Centre



Source – Coventry City Council

Figure 4-23 Cycle Coventry Route 3



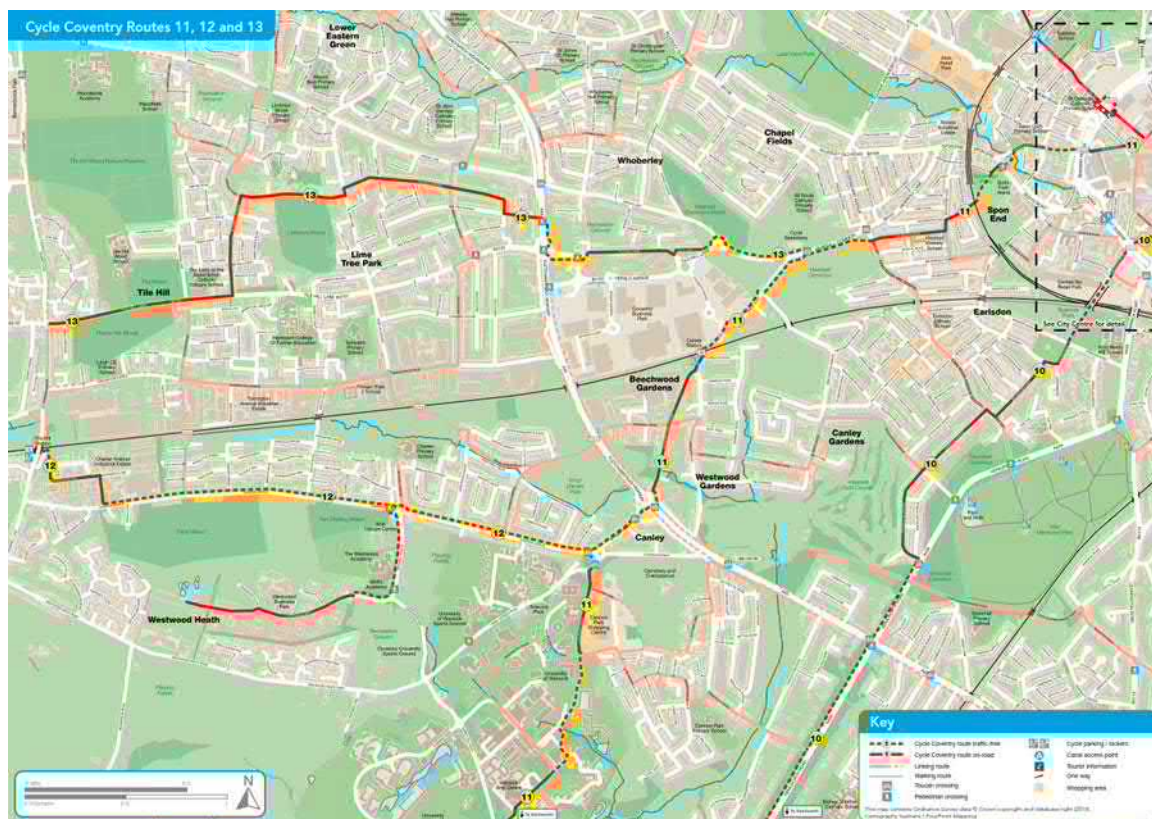
Source – Coventry City Council

Figure 4-24 Cycle Coventry Route 10 and 11



Source – Coventry City Council

Figure 4-25 Cycle Coventry Routes 11, 12 and 13



Source – Coventry City Council

- 4.3.106 Based on the preceding sections it is important that any intervention proposed is considered for its impact on walking and cycling and should be designed in such a way as to not create adverse severance issues for sustainable modes.

CAR SHARING

- 4.3.107 Coventry City Council and Warwickshire County Council currently support the Liftshare car sharing scheme across the region which is supported by local employers including Jaguar Land Rover (JLR). The car scheme has been in operation in Warwickshire since June 2014 and has since experienced success by becoming one of the biggest Liftshare networks in the country, with more than 5,000 registered members⁷.

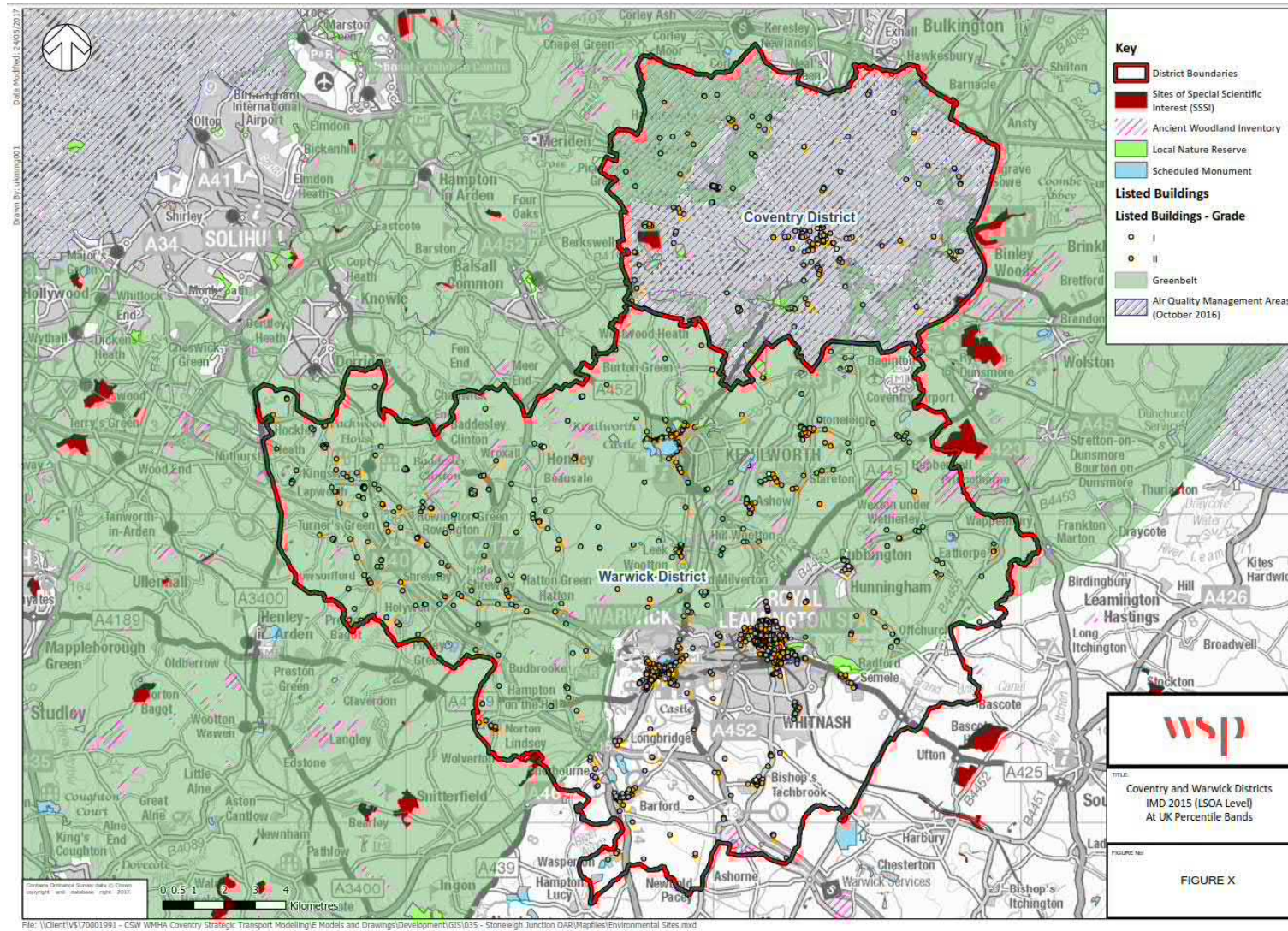
ENVIRONMENTAL LAND USE

- 4.3.108 There are a significant number of environmental constraints in the study area. Figure 4-26 provides details of the existing environmental land use in the area. Important features from the map include:
- There are a significant number of listed buildings in some of the key centres in the area including Coventry, Leamington Spa and Warwick.

⁷ News.warwickshire.gov.uk; March 2016

- A significant proportion of land in Coventry and Warwickshire is in the West Midlands Green Belt area. As of 31st March 3,030 hectares was declared designated Green Belt land in Coventry and 20,559 hectares within Warwick.
- The City of Coventry has been declared an Air Quality Management Area, based on exceedance of Nitrogen Dioxide emissions limits.

Figure 4-26 Environmental Land Use - Coventry and Warwickshire

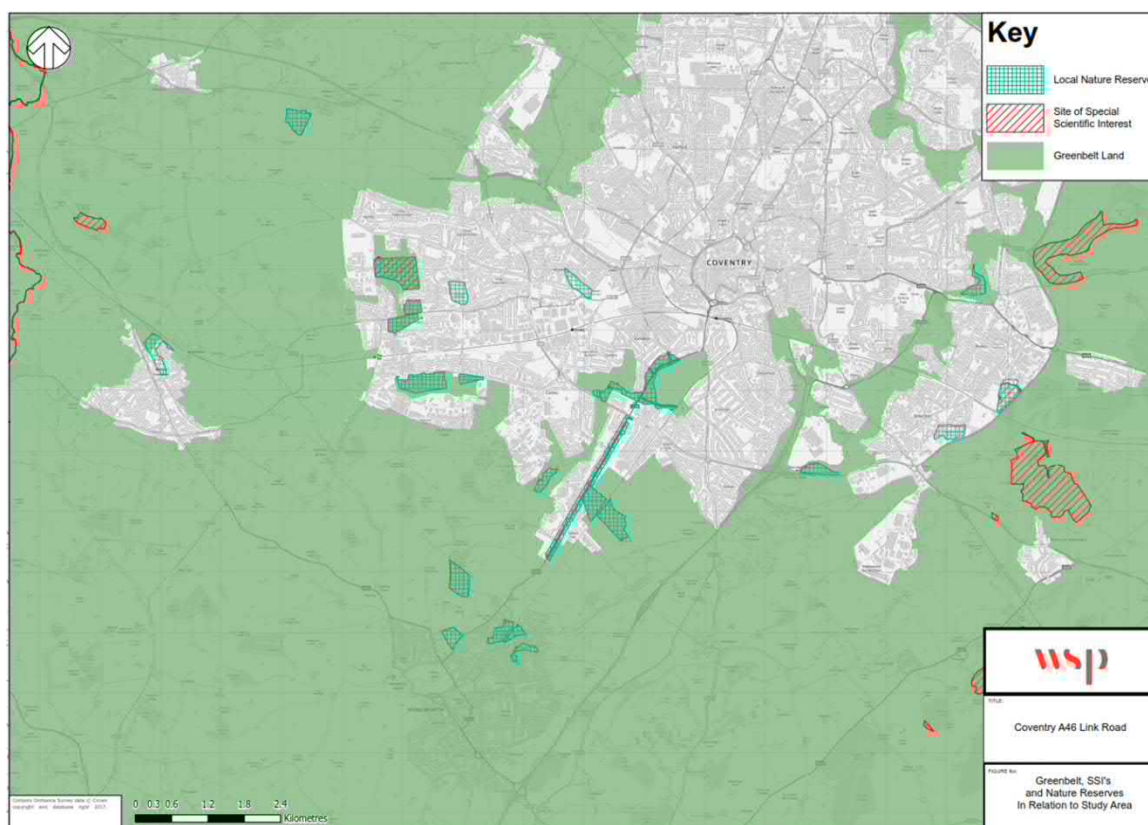


4.4 ENVIRONMENTAL LAND USE

GREEN BELT

- 4.4.1 Figure 4-27 shows the presence of Green Belt, Local Nature Reserves and Sites of Scientific Interest in the study area.

Figure 4-27 Greenbelt, SSIs and Nature Reserves in Study Area



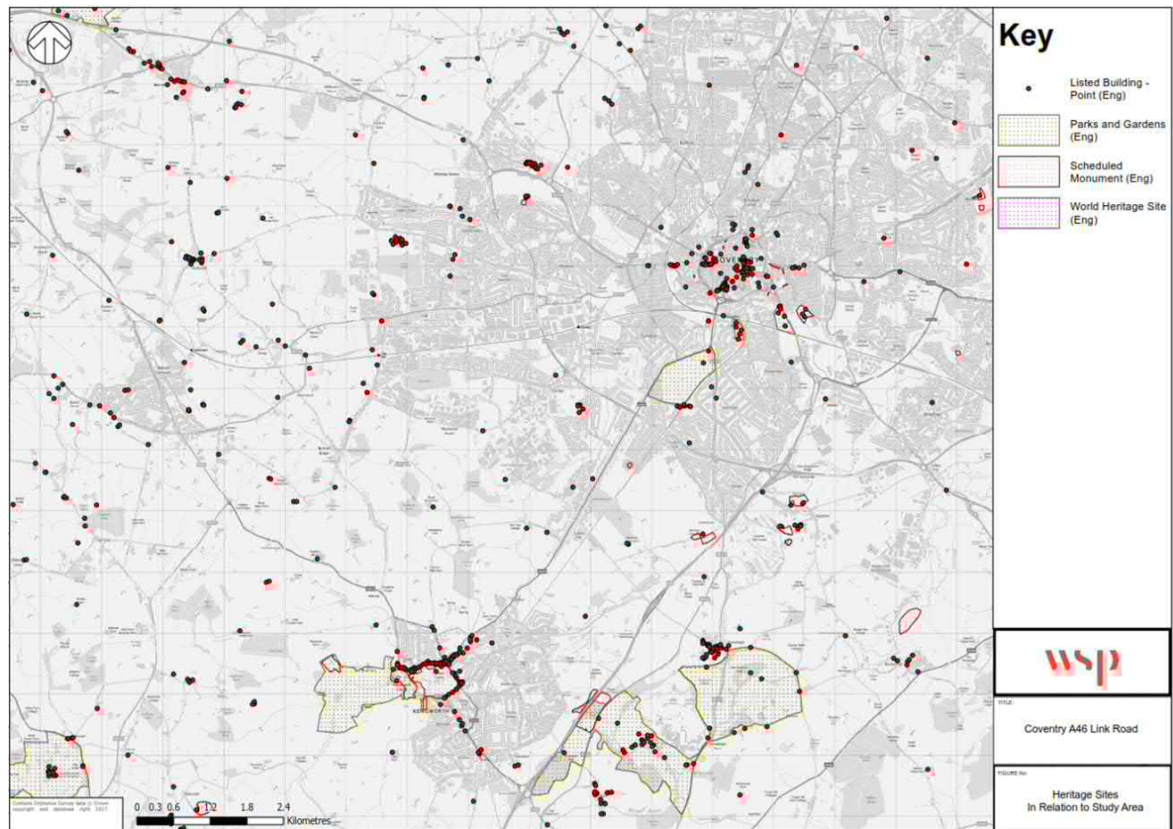
- 4.4.2 Green Belt Land is land set aside for preventing urban sprawl by keeping land permanently open and preventing cities from merging into each other. National Planning Policy Framework guidelines sets out that - Local Planning Authority should regard the construction of new buildings as inappropriate in Green Belt however exceptions can be provided for - local transport infrastructure which can demonstrate a requirement for a Green Belt location. Any infrastructure interventions in the study are likely to be located almost entirely within Coventry's Green belt, and therefore must meet the second clause before it will pass the planning commission.
- 4.4.3 Local Nature Reserves are established by local authorities with the permission of the district councils. They are intended to establish a formal regime for maintenance of a site which is locally important for wildlife, geology, education or enjoyment (which doesn't harm the fauna or flora). Once identified, the sites can be protected under locally set by-laws. Whilst these sites can be 'de-declared' through arrangement with Natural England who're responsible for monitoring the sites, the Link Road would be best delivered in a fashion avoiding impacting upon these sites if possible.

- 4.4.4 Sites of Special Scientific Interest (SSSI) “are protected by law to conserve their wildlife or geology.” Identified by Natural England.⁸ Any such transport interventions should be designed to avoid impacting on (SSSI) as far as possible, to avoid the need to enter in discussion with Natural England to obtain permission to act.

HERITAGE SITES

- 4.4.5 Figure 4-28 shows the location of listed buildings, designated parks and gardens, designated scheduled monument and designated world heritage site in the study area.

Figure 4-28 Heritage Sites in Study Area



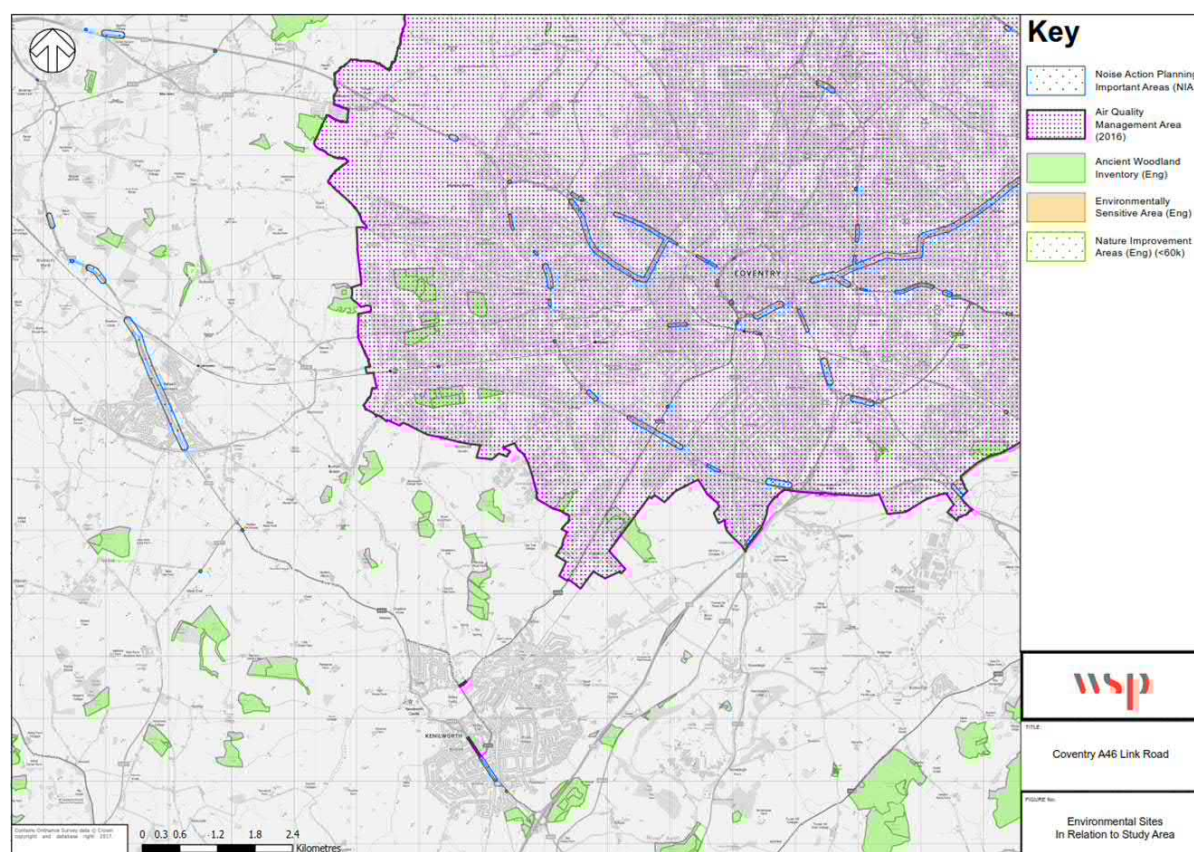
- 4.4.6 The study area has a considerable number of listed buildings. These are monitored by Historic England on the basis of having special architectural and / or historic interest. In order to adjust these buildings, permission would need to be obtained from the relevant local authority.
- 4.4.7 There is also a Historic England listed Parks and Garden location to the east of the study area. The list is designed to celebrate landscapes of note and promote their value. As such, the site is a 'material consideration' in the planning process, meaning that planning authorities must consider the impact of any proposed development on the landscapes' special character.

⁸ <https://www.gov.uk/guidance/protected-areas-sites-of-special-scientific-interest>

ENVIRONMENTAL SITES

4.4.8 Figure 4-29 shows the areas of environmental consideration in the study area.

Figure 4-29 Environmental Sites in Study Area



4.4.9 Figure 4-29 partially shows the Noise Action Planning Areas. In these areas, a framework is in place to manage environmental noise and its effects. These action plans are established by the local authority and registered with Defra, who provide oversight and monitoring. Noise Action Plans cover much of the A45 within Coventry, as well as the A452 through both Kenilworth and Balsall Common. An intervention in this area, between the A45 South of Coventry and the A46 to the West of Coventry, has the potential to aid in the solution of both of these groups of issues by relieving traffic from these roads.

4.4.10 The map also shows the extent of Air Quality Management Areas (AQMA) in the study area. One covers the entirety of Coventry, whilst the others cover sections of the A452 through Kenilworth. These areas will have been identified by the local authorities as breaching the National Air Quality Objectives for certain forms of pollution, predominantly NO₂ emissions from transport vehicles. In these areas, the local authority is responsible for putting in place a Local Air Quality Action Plan which will bring the level of pollution present to within the guidelines.

4.4.11 Information in Figure 4-29 illustrates the Ancient Woodlands registered within the study area. These broadly align with the Deciduous Woodland identified within the Priority Habitats Inventory. Ancient woodland is monitored by the Woodland's Trust on the basis of the irreplaceable nature of the habitat which it provides. As such, Ancient Woodland is protected within National Planning Policy Guidance under paragraph 118:

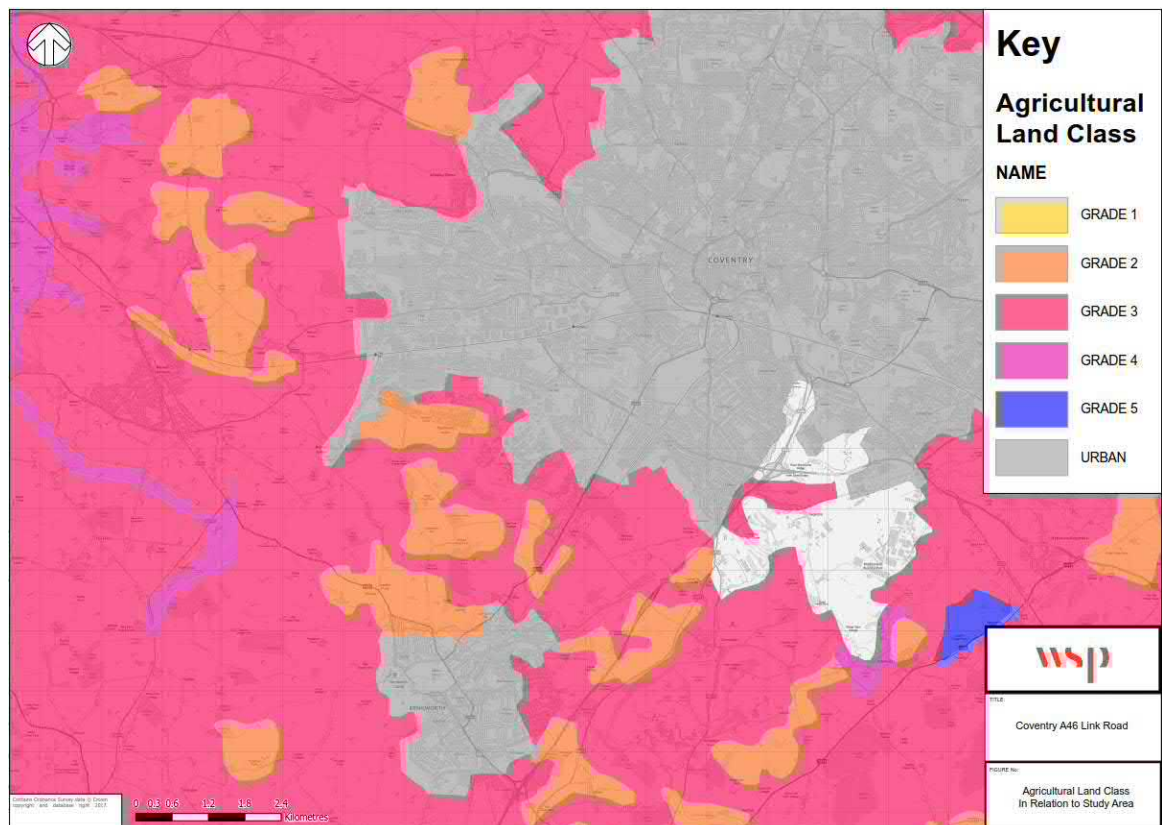
“planning permission should be refused for development resulting in the loss or deterioration of irreplaceable habitats, including ancient woodland and the loss of aged or veteran trees found outside ancient woodland, unless the need for, and benefits of, the development in that location clearly outweigh the loss.”

- 4.4.12 On this basis an intervention in the study area must be designed in a fashion that minimises the risk of harm to these habitats without strong justification.

AGRICULTURAL LAND

- 4.4.13 Figure 4-30 shows the agricultural land class by grade in the study area.

Figure 4-30 Agricultural Land Class in Study Area



4.4.14 Agricultural Land Classification refers to the quality of the land in relation to its ability to support crop growth and is ranked from Grade 1 “Best and Most Versatile Land” to Grade 5 “Very Poor Quality”. Under the National Planning Policy Framework it is advised that proposed developments on agricultural land should be designed to impact on the low grades of land before higher quality land is considered for use.⁹ Natural England should be consulted by the planning authority responsible before development on agricultural land, particularly that which is in tiers 1, 2 and 3a that are the most productive. The majority of the land within the study area to the South West of Coventry is of Grade 3 quality, with a considerable amount of Grade 2 also present.

4.4.15 An intervention will need, therefore, to be designed to have minimal impact on the usability of this land as far as possible in order to support the long term sustainability of food production in the area.

HABITATS

4.4.16 Information in Figure 4-31 shows priority habits in relation to the study area.

Figure 4-31 Priority Habitats in the Study Area



⁹ Sourced from <http://publications.naturalengland.org.uk/file/4424325>

- 4.4.17 Priority habitats are defined as the most threatened, requiring conservation action under the Great Britain “Biodiversity 2020¹⁰” document that replaced the UK Biodiversity Action Plan (UK BAP) in 2013.
- 4.4.18 Information in Figure 4-31 shows that the study area has a high number of deciduous woodland habitats, as well as several mudflats and a range of ‘multiple habitats’ areas. Much of this deciduous woodland is classified as Ancient Woodland by Natural England.
- 4.4.19 Under the Biodiversity 2020 guidelines, the design of an intervention will have to take careful consideration to minimise damage or disruption to these areas if possible, in order to assist in meeting the report’s targets of “90% of priority habitats in favourable or recovering condition”

INDEX OF MULTIPLE DEPRIVATION (IMD)

Indices of Multiple Deprivation (IMD) data provides a measure of deprivation of areas across the UK, based upon a range of indicators including:

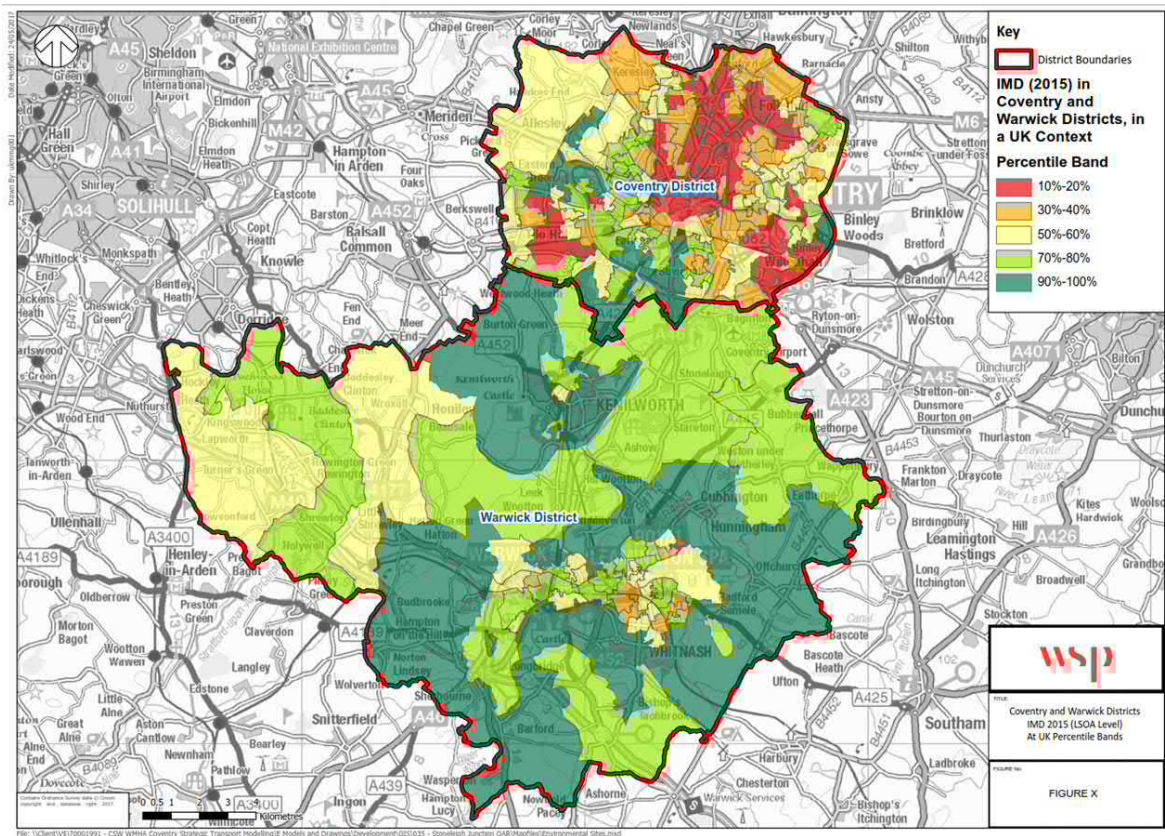
- Income;
- Employment;
- Health;
- Education;
- Crime;
- Access to Services; and
- Living Environment.

¹⁰ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/225300/pb14009-biodiversity2020-progress-guide-20130730.pdf

4.4.20

Data presented in Figure 4-32 shows the IMD data for LSOAs (Lower Super Output Areas) in Coventry and Warwickshire in a UK context.

Figure 4-32 Index of Multiple Deprivation (2015) Coventry and Warwickshire



- 4.4.21 A large proportion of areas in Coventry are categorised within the top 10 – 20% most deprived in the UK, despite being home to nationally significant employers and businesses. There is a significant difference in the level of deprivation in the district of Warwick, with only one LSOA within the top 10 – 20% most deprived areas in the UK. Large areas of the west of the District of Warwick are within the 50 – 60% percentile band of IMD in a UK context.
- 4.4.22 Transport and connectivity is crucial in enabling residents to access opportunities of education, training and skills development, to reduce severance and prevent the segregation of communities.
- 4.4.23 Coventry has a high proportion of work age population who have no formal qualifications (15% of working age population), above the national average (8% of working age population)¹¹. Therefore there is a potential opportunity to improve connections to key employment and educational establishments in the region to help create a positive economic impact in the area and to reduce deprivation.

OBJECTIVE SETTING

- 4.4.24 In order to tackle the risk of severance set out above, we identified the following objective which will also benefit and encourage additional use of walking and cycling as travel modes as outlined in Table 4-9.

Table 4-9 Proposed Objective

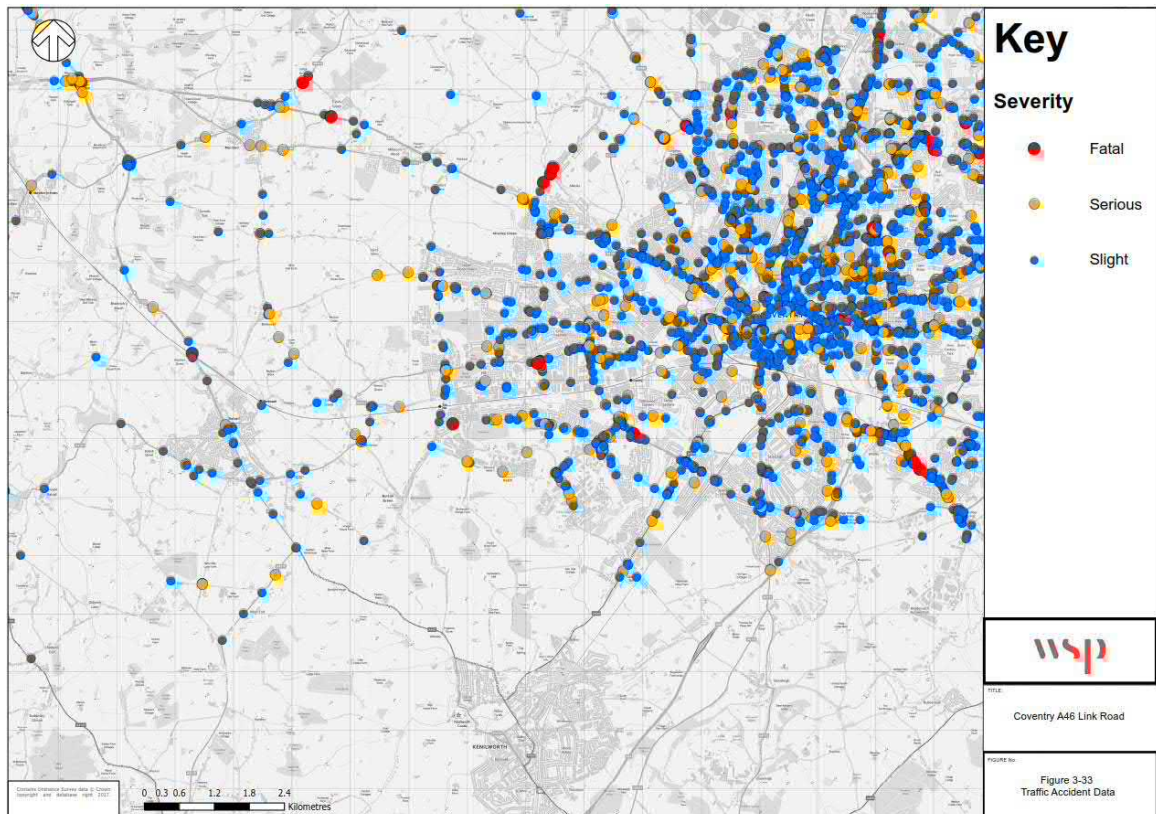
ID	Key current or future problems	Draft objectives	Measures of success
7	- Severance caused by high levels of traffic on the A45.	Severance To reduce vehicle flows on the A45, Stoneleigh Road and Gibbet Hill Road, and enable improved pedestrian and cycle crossing facilities and routes on the A45.	- Change in vehicle flows on the A45, Stoneleigh Road and Gibbet Hill Road.

¹¹ Insight, Coventry Economic Review 2016 (January 2017)

4.5 ACCIDENTS

4.5.1 Data in Figure 4-33 shows the location of traffic accidents by severity in the study area within the last five years.

Figure 4-33 Traffic Accident Data in Study Area



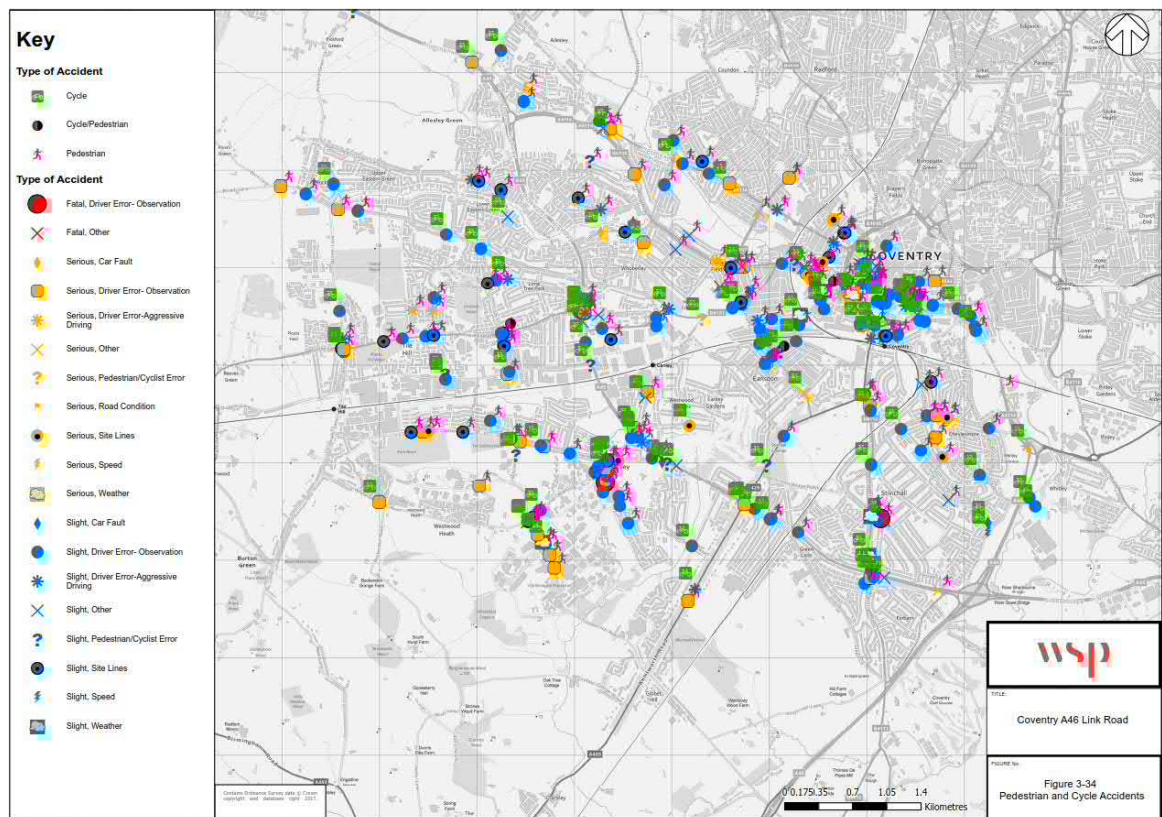
4.5.2

It can be observed that in the existing situation, a significant number of accidents have been recorded in the area. In particular, there are a range of serious accidents on the A429, Tile Hill area, and around the Kirby Corner Road / Charter Avenue / A45 junction including a fatality at this location within the last five years.

4.5.3

Data in Figure 4-34 shows accidents involving cyclists or pedestrians which have occurred in south west Coventry over the last five years.

Figure 4-34 Pedestrian and Cyclist Accident Data in Study Area



- 4.5.4 It can be observed that the majority of these accidents are caused by drivers failing to make comprehensive observations when approaching junctions or passing through areas with high levels of pedestrian and / or cycle traffic. In some instances, this is due to the area having poor site lines due to the horizontal curvature of the road approaching the junction.
- 4.5.5 In relation to the link road, there are several clusters of accidents which the road might help reduce. The first of these are Gibbet Hill Road and Kirby Corner Road, both of which pass through the University of Warwick Campus and show several pedestrian accidents, particularly on the latter. It can be noted between Figure 4-33 and Figure 4-34 that there is correlation in the location of traffic accidents and pedestrian and cyclist accidents.
- 4.5.6 There are a considerable number of cyclist and pedestrian accidents along the Fletchamstead Highway.

4.6 SUMMARY

- 4.6.1 Considering the data above, it is apparent that Coventry and Warwickshire currently have considerable issues with road capacity and network congestion, most likely driven by the high (60%) car and van travel to work mode share in the region, and the location of the area at the heart of the UK's strategic road network. This subsequently results in poor air quality and high numbers of accidents. Therefore, any intervention which could redistribute or reduce the demand on the network would be beneficial, as set out in the objectives identified.
- 4.6.2 Bus, walking and cycling trips have all seen a decline in recent years, despite the region possessing substantial network coverage and several long-distance off road cycle routes. This suggests that there is untapped potential for modal shift that would help reduce the aforementioned issues with large numbers of cars and vans on the roads.
- 4.6.3 As opposed to the other sustainable modes, rail is enjoying something of a renaissance over the past decade and demand is increasing rapidly, supported by plans for investment in new and increased facilities, such as the reopening of Kenilworth Station and the expansion of Coventry Station. Any intervention should support the continued development of this sustainable mode, possibly by making access to stations easier.
- 4.6.4 With regard to the environmental perspective, a significant proportion of land in Coventry and Warwickshire is in the West Midlands Green Belt area. As such, interventions should be designed and present in a fashion which minimises the impact of the natural amenities the area contains.
- 4.6.5 Finally, the collision data collected over the last five year period present a significant number of accidents within the study area; a relevant number of these accidents involve pedestrians and/or cyclists.

5 UNDERSTANDING THE FUTURE SITUATION

5.1 INTRODUCTION

5.1.1 This chapter provides a review of the future situation in Coventry and Warwickshire to inform the need for an intervention going forward.

5.2 FUTURE PLANNED CHANGES TO LAND USE

5.2.1 There are a number of developments that will be delivered over the next 25 years within the study area that could have a noticeable impact upon the local highway network in terms of increased travel traffic volume and direction of flows.

5.2.2 Information in Table 5-1 sets out employment development planned within Coventry, Warwickshire and the surrounding area up to 2030, which employment will put increased demand on the transport network.

Table 5-1 Employment Development at Key Strategic Land Use Sites

KEY STRATEGIC SITE	LOCATION	DESCRIPTION OF DEVELOPMENT	QUANTUM	DELIVERY TIMESCALE
Whitley Business Park	Coventry	Office, industrial and distribution development at the existing Whitley Business Park including JLR.	3,800 jobs ¹²	2021
Baginton Fields	Coventry	25ha employment land east of Whitley site.	1,200 jobs ¹²	2030
Whitley South	Coventry	60 acre engineering technology hub with B1 development, with JLR as the lead tenant and space for wider businesses including key Jaguar Land Rover suppliers. ¹³	Potential for 3,000 - 4,000 jobs ¹⁴	2041
Coventry and Warwickshire Gateway	Coventry	Two plots south east of the A45 / A46. Southern plot is 200 acres capable of providing 3.6 million sq. ft. of B2/B8 warehousing use. Northern plot is 60 acres for B1 (a), (b) and (c) use as well as a hotel and wider ancillary retail use.	10,000 jobs ¹²	2021
Eastern Green	Coventry	15ha of retail employment land adjacent to the A45 including a large superstore and local provisions.	2,500 jobs ¹²	2031

¹² Coventry Local Plan Modelling Report, December 2015

¹³ <http://www.whitleysouth.co.uk/>

¹⁴ <http://www.whitleysouth.co.uk/downloads/ConsultationBoards.pdf>

KEY STRATEGIC SITE	LOCATION	DESCRIPTION OF DEVELOPMENT	QUANTUM	DELIVERY TIMESCALE
Stoneleigh Park	Warwickshire	Science and technology Agro-tech park focused on innovation, sustainability, the environment, agriculture, rural businesses and research activities including the National Low Carbon Centre (NLCC) for the development and delivery of low carbon projects. A new masterplan is expected for Stoneleigh Park which will increase these figures.	3,000 jobs ¹⁵	2030
University of Warwick Masterplan	Coventry	University of Warwick Masterplan including research, teaching, a state-of-the art automotive research campus and commercial development, as well as appropriate levels of residential accommodation and support facilities.	5,762 jobs (West Midlands wide)	2018
UK Central Hub	Solihull	Compromising Birmingham Airport, National Exhibition Centre, Jaguar Land Rover, Birmingham and Blythe Valley Business Parks.	Up to 77,500 FTE jobs ¹⁶	2026
City Centre South Masterplan	Coventry	£300 million plan to regenerate City Centre South providing enhancements to retail and leisure.	3,600 jobs ¹²	2030
Friargate	Coventry	Major regeneration project around Coventry Railway Station.	15,000 jobs ¹²	2030
Ansty Park	Coventry	Expansion of the existing Ansty Park site, permitting up to 1.5 million sq. ft. of B1 and B2 development. ¹⁷	TBC	TBC

5.2.3 Most proposed development is for B1 and B2 land uses (business and general industrial use) which will support employment growth in Coventry and Warwickshire.

5.2.4 There is a significant provision of new housing planned in the local area, with a total of almost 38,000 new dwellings proposed for the development in the areas of Warwick and Coventry up to 2031 as summarised in Table 5-2. This includes approximately 4,000 homes on the Warwick / Coventry border at Cromwell Lane, Kings Hill and Westwood Heath.

Table 5-2 Proposed Housing Growth for Local Areas

LOCATION	DOCUMENT SOURCE	QUANTUM	DELIVERY TIMESCALE
Warwick	2016 Warwick District Local Plan	28,676 dwellings.	2011-2029 11,900 dwellings by 2026 from Local Plan allocations. Remaining 16,776 dwellings in the Local Plan delivered up to 2029.

¹⁵ Warwick District Council, 2017

¹⁶ The UK Central Hub Growth & Infrastructure Plan, March 2017

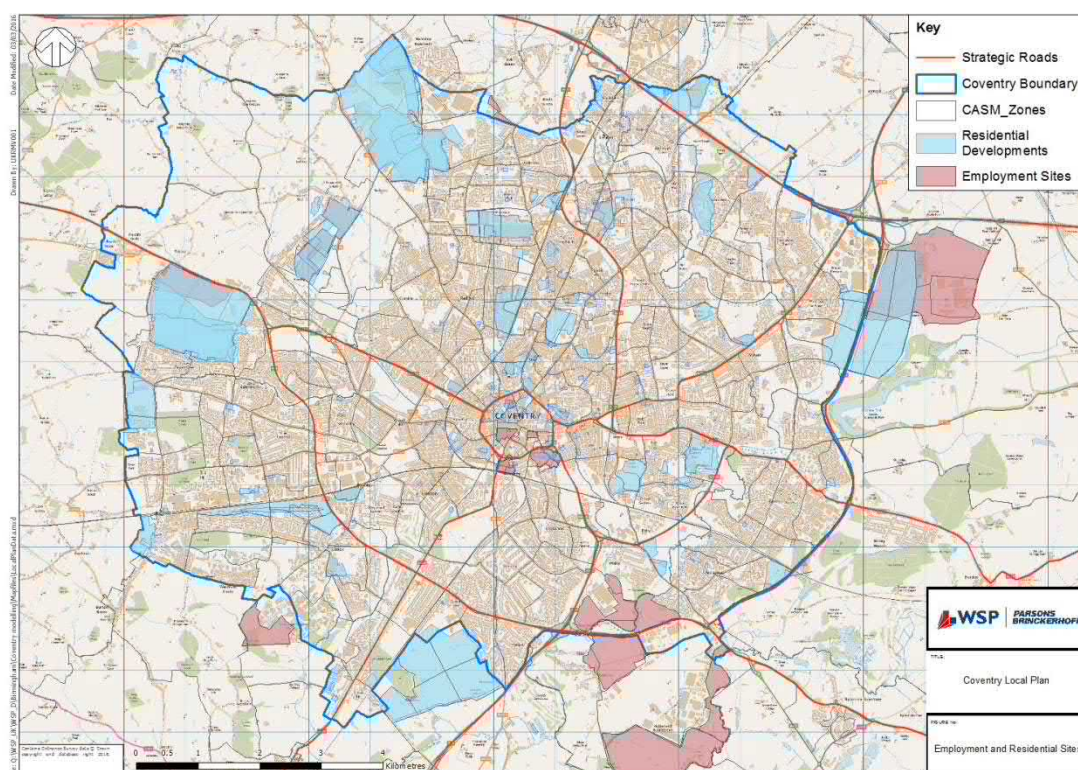
¹⁷ Coventry City Council, https://www.coventry.gov.uk/directory_record/25173/ansty_park

LOCATION	DOCUMENT SOURCE	QUANTUM	DELIVERY TIMESCALE
Coventry	2016 Coventry Draft Local Plan	Minimum of 24,600 dwellings	2011-2031 5,565 completed between 2011 – 2016, leaving 19,035 to develop from April 2016 – 2031
University of Warwick	University of Warwick Masterplan	Minimum of 2,000 additional student bedrooms on campus	2018

TRAVEL DEMAND IMPACT

- 5.2.5 The future development situation is likely to have an impact on travel patterns within the study area. Figures 5-1 and 5-2 show the employment and residential sites from the Coventry Local plan within the city.

Figure 5-1: Residential and Employment Sites



- 5.2.6 From this it can be identified that the majority of the larger residential schemes are situated on the outskirts of the city, and at the edge of the public transport links. It is therefore likely that more people will commute to employment sites utilising the strategic road network upon which many will be situated; this is therefore likely to increase traffic volume upon the road network within the city.
- 5.2.7 Whilst the current bus network services a variety of areas across the study area, frequency improvements may be required in order to encourage modal shift from car to bus. As outlined within Table 4-6, many of the current bus services operate an hourly service; however, this may not be enough to cope with future demand for those commuting from new and existing residential sites to existing and proposed employment sites.
- 5.2.8 There is potential for an increase in traffic volume from the south from areas within the Warwick District to new developments within Coventry. This is likely to increase pressure on strategic roads to the south of Coventry including the A46, A423, and A452.

5.3 FUTURE CHANGES TO THE TRANSPORT SYSTEM

- 5.3.1 As well as a number of developments taking place within the area, there are also some key transport initiatives to help mitigate traffic impacts of these future developments.
- 5.3.2 Data presented in Table 5-3 provides details of the key current and proposed changes to the local transport network.

Table 5-3 Surrounding Key Existing and Proposed Schemes

SCHEME NAME	OUTLINE	PROPOSED COMPLETION	COST
HS2 (London – West Midlands)	Proposed HS2 route from London to the West Midlands, including Birmingham Interchange Station in UK Central including location of construction compound in the vicinity of the A46 Stoneleigh Junction.	2026	£19.39 billion (estimated 2013) ¹⁸
NUCKLE	Large rail project including the development of new stations at Coventry Area and Bermuda Park (Phase 1) and Kenilworth (Phase 2); as well as a new platform at Coventry Railway Station, track and signal work.	2019	£23 million ¹⁹
New Kenilworth Railway Station	Part of the wider NUCKLE project involving the development of a new railway station in Kenilworth including an accessible footbridge with lifts, 90 space car park, 36 cycle stands and a stand for two buses.	2017	£12.1 million ²⁰
Coventry Railway Station Masterplan	Development of new infrastructure including a second footbridge and station entrance, 644 space multi-storey car park, bus interchange, bay platform and highway improvements.	2020 2021	/ £82.4 million ²¹
A46 Coventry Corridor Improvements	As part of the Coventry South Package, junction upgrades are required to designate the A46 as an “Expressway” so that A46 movements will not be required to give way to the A428 and B4082 respectively.	2022	£120 million ²²
Tile Hill Railway Station Car Park Improvements	As part of the Coventry South Package and as a result of substantial passenger growth at the station, car park capacity enhancements are proposed at the existing Tile Hill Railway Station which currently has 129 spaces ²³ by building a deck over the existing car park.	Start 2018/19	£8 million ²⁴
Coventry South Strategic Park and Ride	A new strategic Park & Ride railway station / transport interchange in South Coventry located on the north-south NUCKLE line. The station would be serviced by heavy rail, very light rail and bus to provide a range of modes to access employment sites.	Start post 2024	£20 million ²⁵

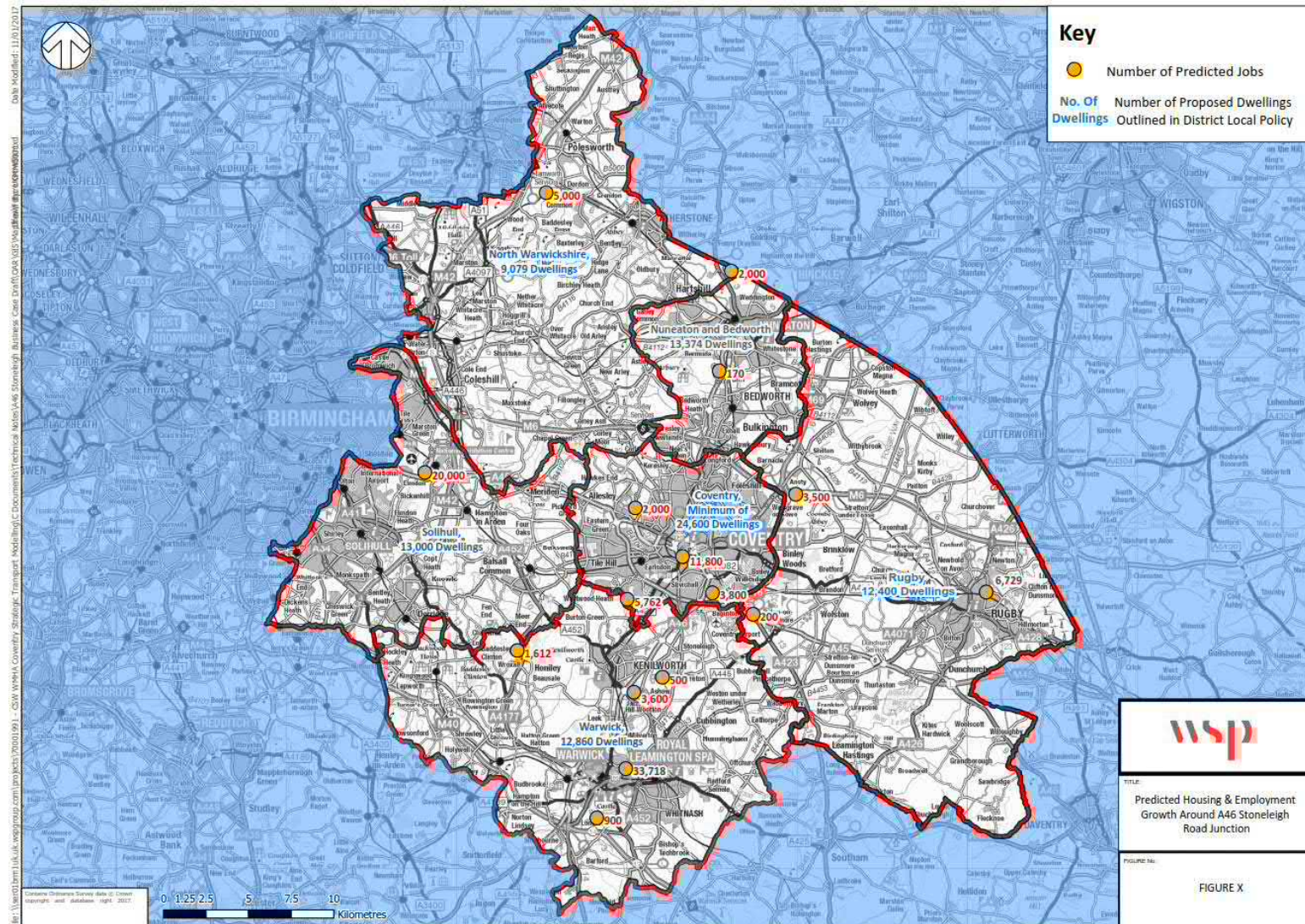
¹⁸ GOV.UK; HS2 Phase 1 Estimate of Expense (November 2013)¹⁹ SLC Rail, Coventry to Nuneaton Upgrade²⁰ CWLEP (2016); <https://www.cwlep.com/project/kenilworth-station>²¹ Coventry City Council; Rail Station Masterplan Update (January 2017)²² Coventry South Package Strategic Outline Business Case (April 2017)²³ National Rail Enquires²⁴ Coventry South Package Strategic Outline Business Case, April 2017²⁵ Coventry South Package Strategic Outline Business Case, April 2017

SCHEME NAME	OUTLINE	PROPOSED COMPLETION	COST
Whitley South	Installation of a bridge over the A45, the construction of new roads to serve the Whitley South site itself, and improvements to Stonebridge (Festival) Island, the A46 Stoneleigh Road junction and to the A444 Whitley roundabout.	2026	TBC
Stanks Island and Birmingham Road Improvement	<p>Signalisation of the A46 / Birmingham Road junction and widening of all approaches to the Stanks roundabout, including provision of pedestrian and cycle facilities and crossing points.</p> <p>Signalisation of Haywood Road Junction and signalised access to properties on Birmingham Road, including provision of pedestrian and cycle facilities and crossing points.</p> <p>Conversion of Wedgnock Lane to signalised T junction and provision of pedestrian and cycle facilities and crossing points.</p> <p>Application of controls that link signals on Birmingham Road together to maximise capacity and minimise delay, and reduction of speed limit on Birmingham Road from Stanks Island towards Warwick to 30mph.</p>	2022	£6 million ²⁶

- 5.3.37 All of the above schemes will aim to work in synergy to provide an overall more integrated transport network. The schemes will provide greater capacity, choice and accessibility within Coventry, Warwickshire and the wider area to support future growth.
- 5.3.38 Any option developed will take into consideration the above schemes. It should be envisaged that these schemes will work in favour of and compliment any option development and future appraisal work.
- 5.3.39 Key projects and packages include the delivery of HS2 Phase 1 which now has Royal Assent; the Coventry South Package which provides a strategic programme of investment within which the A46 Link Road will sit; and NUCKLE the Nuneaton to Coventry Rail Line upgrade including a number of improvements and new stations on the line.
- 5.3.40 HE's Road Investment Strategy (RIS) (2015/16 – 2019/20) includes a commitment to upgrade the trunk road sections of the A45 and A46 between the M6 and M40 to full Expressway standard. Active engagement has taken place to ensure that options for an intervention in relation to the A46 are developed to comply with expressway standards.
- 5.3.41 Information in Figure 5-2: overleaf provides a plan of the proposed future growth sites in the strategic area.

²⁶ Warwick District Infrastructure Delivery Plan, April 2017

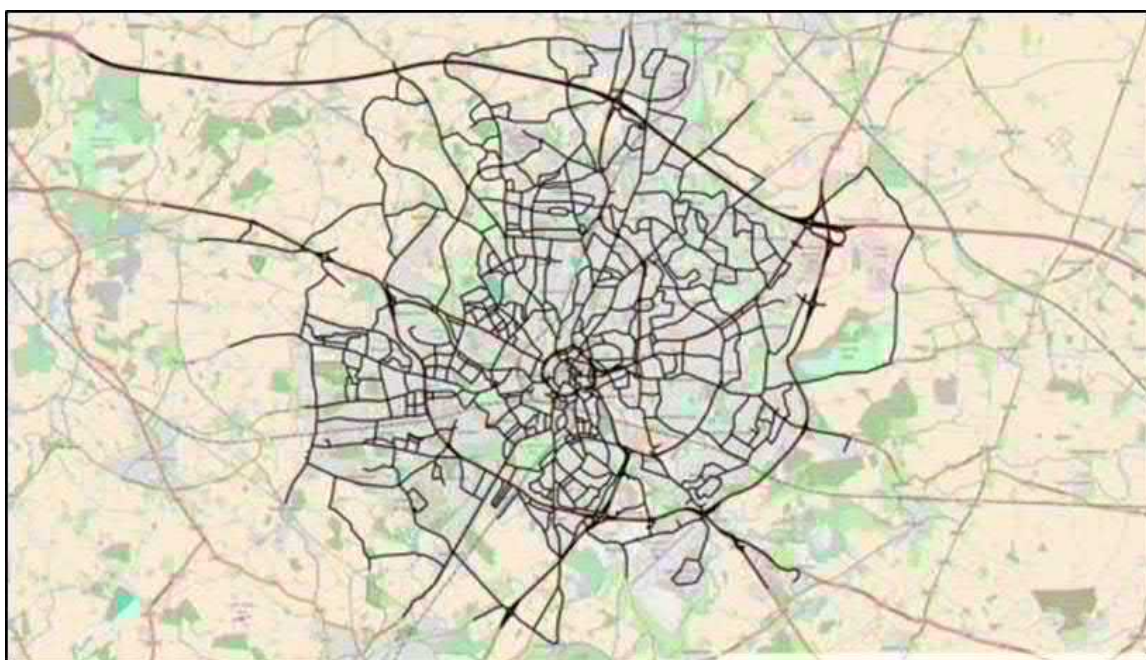
Figure 5-2: Proposed Future Growth Sites



FUTURE HIGHWAY NETWORK PERFORMANCE WITHOUT INTERVENTION

- 5.3.42 Data extracted from the CASH Highway Assignment Model (HAM) 2019 to highlight junctions where delay is greater in the 2019 and 2034 HE DoSomething (DS) scenario in comparison to the 2013 Base Year models.
- 5.3.43 The Do Minimum models include population and employment growth constrained to the National Trip End Model (NTEM) version 6.2 and Local Plan developments which have been identified in the uncertainty logs as 'More Than Likely' or 'Near Certain'. The Do Something models also include the M6 Junctions 2 to 4 Smart Motorway Improvement scheme.
- 5.3.44 The area from which this forecast data has been extracted for Coventry Local Authority Area is shown in Figure 5-3.

Figure 5-3 Coventry Local Authority Area Highway Network Statistics Area of Coverage



- 5.3.45 *Source - WSP*
- 5.3.46 Data in Table 5-4 and Table 5-5 shows the forecast network performance in the AM and PM peak hour in 2013, 2019 and 2034 for the Coventry Local Authority Area as extracted from CASH. Peak hours include:
- AM Peak – 08:00 – 09:00; and
 - PM Peak – 17:00 – 18:00.

AM PEAK

Data presented Table 5-4 shows the forecast highway network performance for the Coventry LA Area in the AM Peak in 2013, 2019 and 2034.

Table 5-4 AM Peak Highway Network Statistics - Coventry Local Authority Area

METRIC	AM PEAK						
	2013 Base Year	2019 CASM HE DS	2034 CASM HE DS	2019 - 2013	2034 - 2013	2019 - 2013 %	2034 - 2013 %
Link Cruise Time (Veh/Hrs)	8,589	9,625	11,130	1,036	2,541	12%	30%
Total Travel Time (Veh/Hrs)	10,202	11,484	14,198	1,281	3,996	13%	39%
Total Network Delay (Veh/Hrs)	2,001	2,305	3,536	304	1,535	15%	77%
Total Travel Distance (Veh/kms)	598,062	683,804	788,065	85,742	190,003	14%	32%
Average Speed (Km/H)	58.6	59.5	55.5	1	-3	2%	-5%

- 5.3.47 Forecast growth in traffic demand between 2013 and 2034 is expected to increase total travel distance, total travel time and total network delay in the AM peak. Highway network delay is expected to increase by 77% per annum between 2013 and 2034. Furthermore the increase in traffic demand on the network is expected to result in a decrease in average speed of up to 3kph in the Coventry LA area.
- 5.3.48 In the 2019 Do Something, although journey time is higher than in 2013, there are more trips which are re-routing to take more indirect journeys on high capacity roads to avoid delays, which is what leads to higher speeds. By 2034 this re-routing is no longer sufficient to maintain lower journey times.
- 5.3.49 The 'More than likely' or 'near certain' network improvements from local plans which have been applied to both the Do Minimum and Do Something models will cover only the relative short term. Population and employment growth forecasts from NTEM on the other hand, cover the longer term and are based on the assumption that appropriate ongoing transport improvements will be made, at a local level, to support this level of growth.
- 5.3.50 In turn, this will lead to the 20134 model assuming that while trip numbers continue to increase, no further transport improvements have been applied beyond a certain date, It therefore emphasises the importance of continued investment.
- 5.3.51 In addition, the impact of not providing network improvements would not only mean reduced traffic speeds, as indicated by these tables, but also reduced levels of development, as some developers might scale back existing plans or relocate to other regions which has invested in infrastructure.

PM PEAK

- 5.3.52 Data presented Table 5-5 shows the forecast highway network performance for the Coventry LA Area in the PM Peak in 2013, 2019 and 2034.

Table 5-5 PM Peak Highway Network Statistics - Coventry Local Authority Area

METRIC	PM PEAK						
	2013 BASE YEAR	2019 CASM HE DS	2034 CASM HE DS	2019 - 2013	2034 - 2013	2019 - 2013 %	2034 - 2013 %
Link Cruise Time (Veh/Hrs)	9,033	9,964	11,457	930	2,423	10%	27%
Total Travel Time (Veh/Hrs)	10,713	11,852	14,245	1,139	3,532	11%	33%
Total Network Delay (Veh/Hrs)	2,090	2,347	3,336	257	1,246	12%	60%

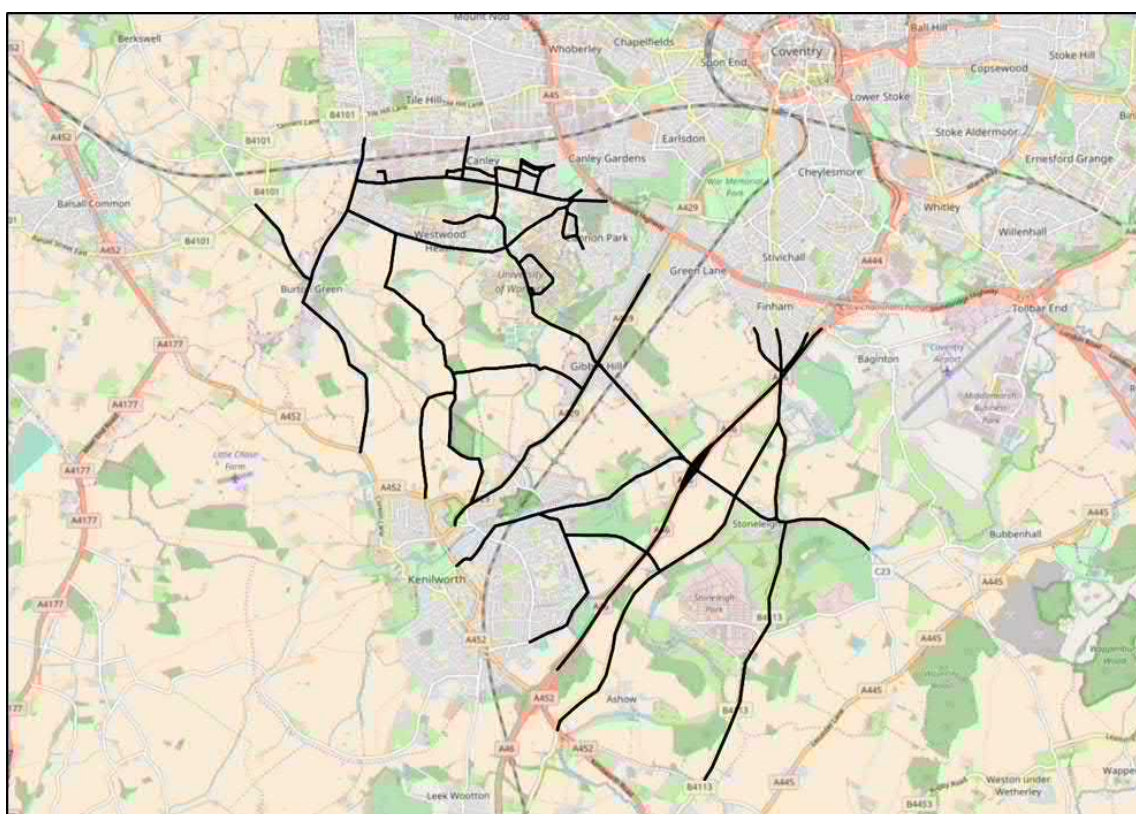
METRIC	PM PEAK						
	2013 BASE YEAR	2019 CASM HE DS	2034 CASM HE DS	2019 -2013	2034 -2013	2019 -2013 %	2034 -2013 %
Total Travel Distance (Veh/kms)	628,224	708,154	811,876	79,930	183,651	13%	29%
Average Speed (Km/H)	58.6	59.7	57.0	1	-2	2%	-3%

- 5.3.53 Forecast growth in traffic demand between 2013 and 2034 is expected to increase total travel distance, total travel time and total network delay in the PM peak. Highway network delay in particular is expected to increase by 60% in the PM peak between 2013 and 2034. Furthermore the increase in traffic demand on the network is expected to result in a decrease in average speed of up to 2 kph across the Coventry LA area.

CURRENT AND FUTURE HIGHWAY NETWORK PERFORMANCE

- 5.3.54 Data relating to the future highway network performance has been extracted from the AM and PM peak hour 2019, 2034 HE DS and 2013 Base Year CASM HAMs for the South Coventry and Warwickshire area around the geographic area of scope. This area is shown in Figure 5-4.

Figure 5-4 Geographic Scope Highway Network Area Coverage



Source - WSP

- 5.3.55 Analysis of a number of performance metrics has been undertaken for the highway network in the study area. These metrics include:
- Link Cruise Time (Veh/Hrs): Total Veh/Hrs travelled on the links in the network's unloaded state (does not consider delay);
 - Total Travel Time (Veh/Hrs): Total Veh/Hrs travelled on the links in the network's loaded state (takes delay into consideration);

- Total Network Delay (Veh/Hrs): Total delay experienced across the links in the network;
- Total Travel Distance (Veh/kms): Total distance travelled across the links in the network; and
- Average Speed (Km/H): Total travel distance divided by total travel time.

5.3.56 The following tables provide the modelled outputs of these metrics for the study area for the 2013 base year, and two future forecast years in 2019 and 2034 for the AM and PM peak periods.

HIGHWAY NETWORK PERFORMANCE – AM PEAK

5.3.57 Data presented in Table 5-6 displays AM peak highway network statistics for the study area. This shows the base year statistics for 2013, as well as future year estimates for 2019 and 2034, and the percentage change between these periods.

Table 5-6 AM Peak Highway Network Statistics – Study Area

METRIC	AM PEAK						
	2013 Base Year	2019 CASH HE DS	2034 CASH HE DS	2019 - 2013	2034 - 2013	2019 - 2013 %	2034 - 2013 %
Link Cruise Time (Veh/Hrs)	1,009	1,209	1,381	200	372	20%	37%
Total Travel Time (Veh/Hrs)	1,112	1,388	1,707	276	595	25%	53%
Total Network Delay (Veh/Hrs)	120	203	352	84	232	70%	194%
Total Travel Distance (Veh/kms)	80,227	97,002	111,620	16,776	31,393	21%	39%
Average Speed (Km/H)	72.1	69.9	65.4	-2	-7	-3%	-9%

5.3.58 The growth in traffic demand from 2013 to 2034 leads to increases in the total travel distance, total travel time and total network delay during the AM peak hour. Highway network delay in particular increases by 194% between 2013 and 2034 in the AM peak. The increase in traffic demand on the highway network results in a decrease in the average speed across the study area, of up to 7 kph.

5.3.59 Data in Table 5-7 summarises the percentage change between the Coventry Local Authority area (see Table 5-4) and the study area.

Table 5-7 AM Peak Percentage Increase in Network Statistics between the Coventry LA and Study Area

METRIC	AM PEAK 2013-2019		AM PEAK 2013-2034	
	Coventry Local Authority	Study Area	Coventry Local Authority	Study Area
Link Cruise Time (Veh/Hrs)	12%	20%	30%	37%
Total Travel Time (Veh/Hrs)	13%	25%	39%	53%
Total Network Delay (Veh/Hrs)	15%	70%	77%	194%
Total Travel Distance (Veh/kms)	14%	21%	32%	39%
Average Speed (Km/H)	2%	-3%	-5%	-9%

5.3.60 Table 5-7 shows that the percentage increases in network statistics are significantly greater in the study area compared to overall impacts across the Coventry Local Authority area.

HIGHWAY NETWORK PERFORMANCE – PM PEAK

5.3.61

Data presented in Table 5-8 displays PM peak highway network statistics for the study area. This shows the base year statistics for 2013, as well as future year estimates for 2019 and 2034, and the percentage change between these periods.

Table 5-8 PM Peak Highway Network Statistics – Study Area

METRIC	PM PEAK						
	2013 Base Year	2019 CASH HE DS	2034 CASH HE DS	2019 - 2013	2034 - 2013	2019 - 2013 %	2034 - 2013 %
Link Cruise Time (Veh/Hrs)	982	1,120	1,272	138	289	14%	29%
Total Travel Time (Veh/Hrs)	1,080	1,295	1,534	216	454	20%	42%
Total Network Delay (Veh/Hrs)	115	208	289	92	174	80%	151%
Total Travel Distance (Veh/kms)	78,314	89,573	102,715	11,259	24,401	14%	31%
Average Speed (Km/H)	72.5	69.2	67.0	-3	-6	-5%	-8%

5.3.62

The growth in traffic demand from 2013 to 2034 leads to increases in the total travel distance, total travel time and total network delay during the PM peak hour. Highway network delay in particular increases by 151% during the PM peak hour. The increase in traffic demand on the highway network results in a decrease in the average speed across the study area, of up to 6 kph.

5.3.63

Data in Table 5-9 summarises the percentage change between the Coventry Local Authority area (see Table 5-5) and the study area.

Table 5-9 PM Peak Percentage Increase in Network Statistics between the Coventry LA and Study Area

METRIC	PM PEAK 2013-2019		PM PEAK 2013-2034	
	Coventry Local Authority	Study Area	Coventry Local Authority	Study Area
Link Cruise Time (Veh/Hrs)	10%	14%	27%	29%
Total Travel Time (Veh/Hrs)	11%	20%	33%	42%
Total Network Delay (Veh/Hrs)	12%	80%	60%	151%
Total Travel Distance (Veh/kms)	13%	14%	29%	31%
Average Speed (Km/H)	2%	-5%	-3%	-8%

- 5.3.64 Table 5-9 shows that the percentage increases in network statistics are significantly greater in the study area compared to overall impacts across the Coventry Local Authority area.

5.4 SUMMARY

- 5.4.1 An analysis of the future situation in Coventry and Warwickshire has been undertaken to review planned development in the area up to 2031.
- 5.4.2 The majority of the proposed land use development is for B1 and B2 land uses (business and general industrial use) which will support employment growth in Coventry and Warwickshire. The most significant developments are the Coventry and Warwickshire Gateway which could see the development of up to 10,000 jobs, and UK Central which could see up to 77,000 jobs by 2031. Other significant developments in the area include Stoneleigh Park (3,000 jobs) and the University of Warwick Masterplan (5,762 jobs).
- 5.4.3 There is a significant provision of new housing planned in the local area, with a total of almost 38,000 new dwellings allocated in the Local Plan. This includes approximately 4,000 homes on the Warwick / Coventry border at Cromwell Lane, Kings Hill and Westwood Heath proposed for the development in the areas of Warwick and Coventry up to 2031.
- 5.4.4 There is a range of key current and proposed changes to the local transport network. The most iconic of these will be the development of HS2 Phase 1 through Coventry and Warwickshire towards Birmingham Interchange Station. There are a number of local public transport interventions in development including Tile Hill Railway Station Car Park Improvements, the new Kenilworth Railway Station and the Coventry Railway Station Masterplan. There are also a number of highways scheme proposed including Whitley South and the A46 Coventry Corridor Improvements. Furthermore, Highways England's Road Investment Strategy (RIS) (2015/16 – 2019/20) includes a commitment to upgrade the trunk road sections of the A45 and A46 between the M6 and M40 to full Expressway standard.

6 ESTABLISHING THE NEED FOR INTERVENTION

6.1 INTRODUCTION

6.1.1 Using the data and analysis of the current and future network undertaken in the earlier chapters of this report, the next stage is to develop the case for a local intervention. The transport related opportunities and constraints within the existing and future network will be gathered based on the earlier stages of this report and the underlying causes of these problems will be investigated.

6.1.2 Opportunities and constraints will include both transport-related problems and opportunities such as supporting housing and population growth.

6.2 CURRENT TRANSPORT-RELATED OPPORTUNITIES AND CONSTRAINTS

6.2.1 In evaluating the basis for intervention, analysis of the existing and predicted transport issues in addition to their underlying causes has been carried out.

6.2.2 Evidence given in Chapter 4 of this OAR outlines the framework for understanding the existing network using data that outlines the opportunities and constraints in the area.

6.2.3 The emerging themes from the local, regional and national transport strategy and policy include to:

- Facilitate business, investment and productivity growth;
- Support housing growth;
- Support access to education, skills and employment opportunities;
- Improve connectivity and reduce congestion;
- Create a fully integrated transport network by unlocking the benefits and capacity of transport schemes; and
- Improve health and safety of communities.

The following SWOT analysis in Table 6-1 has been developed to extract the opportunities and constraints understood from this study so far based on the current situation analysis undertaken in Chapter 4.

Table 6-1 SWOT Analysis – Opportunities and Constraints

OPPORTUNITIES	CONSTRAINTS
<ul style="list-style-type: none"> → To support local policy objectives and strategy. → Support access to existing and proposed employment sites to increase jobs and economic growth and equal opportunities. → Support the development of new housing sites to meet housing growth targets in Coventry, Warwickshire and the University of Warwick. → Support wider existing and proposed transport schemes in Coventry and Warwickshire to develop and sustain a fully integrated, well connected network. 	<ul style="list-style-type: none"> → A new railway station at Kenilworth is currently under construction which will create additional trips on this part of the network. → Coventry Railway Station had an estimated 6.9 million entries and exits in between April 2015 – March 2016, the second highest figure in the West Midlands. → Going forward, Coventry Railway Station is proposed to undergo a Master Plan for the regeneration and increased capacity of the station and surrounding area including interfacing projects such as Friargate. This will create

OPPORTUNITIES	CONSTRAINTS
<ul style="list-style-type: none"> → Coventry City Council and Warwickshire County Council currently support the Liftshare car sharing scheme across the region which is supported by local employers including JLR. → Coventry Railway Station provides services on the West Coast Mainline (WCML), Cross Country network, as well as local London Midland services. → Coventry and Warwickshire are strategically positioned on the highway network, with a number of key routes providing national and regionally connectivity. → The development of HS2 Phase 1 will route through Coventry and Warwickshire towards Birmingham Interchange Station. There is opportunity to support access to HS2 through wider connections in the local area. → The Coventry and Warwickshire LEP area forms part of the 'golden triangle' which supports logistics access and sector growth in the Midlands, with over 90% of the UK population within a four hour drive of the Midlands. → The A46 in the local area provides connectivity through some of the most affluent areas in the district of Warwick to the south to some of the most deprived areas in the north of Coventry. → A high proportion of students at the University of Warwick travel by sustainable modes to the university. → There are a number of National Cycle Network routes which provide a combination of on-road and traffic-free cycle ways. → The City of Coventry has been declared an Air Quality Management Area, based on exceedance of Nitrogen Dioxide emissions limits. → A significantly proportion of Coventry is categorised within the top 10 – 20% most deprived in the UK, despite holding location to nationally significant employers and businesses. 	<ul style="list-style-type: none"> additional jobs and trips in the area. → The most significant delays in peak periods as a percentage of journey time occur between the A46 and the University of Warwick and Canley area, including the A45 between Coventry and Canley. → 60% of journeys to work made by residents in Coventry are by car or van and 65% in Warwick (Census, 2011). Car mode share for both areas is significant and requires the necessary highway capacity to cope with demand. → Over 60% of journeys to work by car or van by residents in Coventry and 47% by residents in Warwick are less than 10km in distance. → Bus services between Coventry and Warwickshire are generally every hour or longer with the exception of the Number 11 (Leamington Spa – Coventry via University of Warwick which operates during term time. → Consideration of the construction and route of HS2 Phase 1 through the local area. → More than three-quarters of journeys to work on foot (78%) are 2km or less in Coventry. More than 90% of journeys to work on foot are 5km or less in Coventry and Warwick. → A significant proportion of land in Coventry and Warwickshire is in the West Midlands Green Belt area.

6.2.4 The SWOT analysis indicates that there are a greater number of opportunities than constraints in Coventry and Warwickshire; enough to make a profound impact on improving the current transport network.

6.2.5 Table 6-2 categorises the above opportunities and constraints within the context of the national and local policy themes identified in Section 4.2. Some opportunities and constraints have been replicated across the different themes where they strategically fit.

Table 6-2 Current Opportunities and Constraints against Strategic Themes

STRATEGIC THEMES	OPPORTUNITIES AND CONSTRAINTS
Support access to education, skills and employment opportunities; housing growth and facilitate business, investment and productivity growth.	<ul style="list-style-type: none"> → To support local policy objectives and strategy. → Support access to existing and proposed employment sites to increase jobs and economic growth and equal opportunities. → Support the development of new housing sites to meet housing growth targets in Coventry, Warwickshire and the University of Warwick. → Coventry City Council and Warwickshire County Council currently support the Liftshare car sharing scheme across the region which is supported by local employers including JLR. → A high proportion of students at the University of Warwick travel by sustainable modes to the university → A significantly proportion of Coventry is categorised within the top 10 – 20% most deprived in the UK, despite holding location to nationally significant employers and businesses. → Going forward, Coventry Railway Station is proposed to undergo a Master Plan for the regeneration and increased capacity of the station and surrounding area including interfacing projects such as Friargate. This will create additional jobs and trips in the area.
Improve connectivity and reduce congestion	<ul style="list-style-type: none"> → To support local policy objectives and strategy. → The most significant delays in peak periods as a percentage of journey time occur between the A46 and the University of Warwick and Canley area, including the A45 between Coventry and Canley. → 60% of journeys to work made by residents in Coventry are by car or van and 65% in Warwick (Census, 2011). → Over 60% of journeys to work by car or van by residents in Coventry and 47% by residents in Warwick are less than 10km in distance.

STRATEGIC THEMES	OPPORTUNITIES AND CONSTRAINTS
Create a fully integrated transport network by unlocking the benefits and capacity of transport schemes	<ul style="list-style-type: none"> → To support local policy objectives and strategy. → Support wider existing and proposed transport schemes in Coventry and Warwickshire to develop and sustain a fully integrated, well connected network. → Coventry Railway Station provides services on the West Coast Mainline (WCML), Cross Country network, as well as local London Midland services. → Coventry and Warwickshire are strategically positioned on the highway network, with a number of key routes providing national and regionally connectivity → The Coventry and Warwickshire LEP area forms part of the 'golden triangle' which supports logistics access and sector growth in the Midlands, with over 90% of the UK population within a four hour drive of the Midlands. → There are a number of National Cycle Network routes which provide a combination of on-road and traffic-free cycle ways → A new railway station at Kenilworth is currently under construction which will create additional trips on this part of the network. → Coventry Railway Station had an estimated 6.9 million entries and exits in between April 2015. → Bus services between Coventry and Warwickshire are generally every hour or longer with the exception of the Number 11 (Leamington Spa – Coventry via University of Warwick which operates during term time).
Improve health and safety of communities	<ul style="list-style-type: none"> → To support local policy objectives and strategy. → A high proportion of students at the University of Warwick travel by sustainable modes to the university → There are a number of National Cycle Network routes which provide a combination of on-road and traffic-free cycle ways → The City of Coventry has been declared an Air Quality Management Area, based on exceedance of Nitrogen Dioxide emissions limits. → A significant proportion of land in Coventry and Warwickshire is in the West Midlands Green Belt area → 60% of journeys to work made by residents in Coventry are by car or van and 65% in Warwick. → Over 60% of journeys to work by car or van by residents in Coventry and 47% by residents in Warwick are less than 10km in distance. → More than three-quarters of journeys to work on foot (78%) are 2km or less in Coventry. More than 90% of journeys to work on foot are 5km or less in Coventry and Warwick.

6.2.8 By associating the existing opportunities and constraints with the key themes of national and local policy and strategy, the barriers that the existing situation is causing (see section 4.5) to meeting these aims and objectives can be understood. Therefore it is evident that additional interventions are required to remove these barriers to growth and support opportunities and planned interventions to maximise their economic, social and environmental benefits.

6.2.9 The existing constraints are only to become more significant in the future without the necessary interventions to prevent this from being the case. The following section outlines the impact of this future situation on the highway network of which over 60% of Coventry and Warwickshire residents travel to work on if an intervention is not implemented.

6.3 SUMMARY

6.3.1 Evidence in Chapter 4, 5 and 6 provide the basis to support the need for an intervention within areas across the Coventry and Warwickshire transport network. A wide range of opportunities and constraints have been identified on the network as outlined in Table 6-1 which have been aligned to the strategic themes of the national and local policy and strategy in Table 6-2.

6.3.2 Following this analysis of the current and future network undertaken in the above chapters, a transport intervention is necessary in order to:

- Increase the networks capacity in order to successfully support future developments and employment growth;
- Unlock public transport and active travel opportunities as part of a whole corridor approach to reduce demand on the existing network; and
- Downgrade vehicle capacity on the A45, but facilitate demand which is expected to increase in the future.

7 SCHEME OBJECTIVES

7.1 OBJECTIVES OVERVIEW

7.1.1 The intervention will align with the strategic objectives of policy and guidance at the regional and local level. In line with these objectives and the need for an intervention, a number of specific objectives are being developed to form the focus of the desired outcomes and outputs of the intervention.

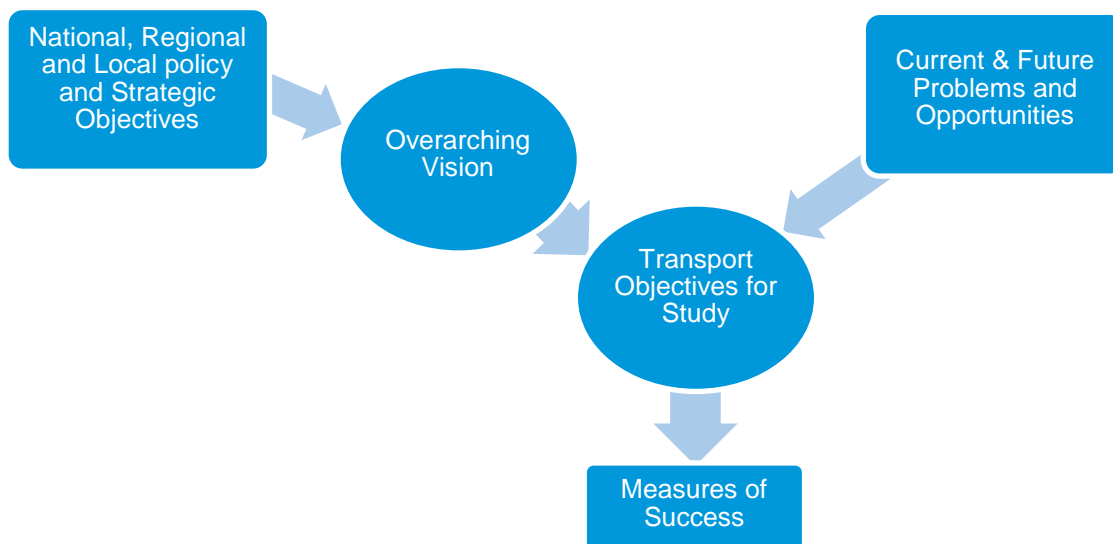
7.1.2 The scheme objectives are being informed by stakeholder engagement as well as an understanding of the issues and opportunities for the need for an intervention as identified in the earlier stages of this report.

7.2 LOGIC PROCESS

7.2.1 A set of scheme-specific objectives are being developed which are tailored to the specific need for the intervention, to support opportunities and mitigate problems identified in this report. The objectives will not only provide focus for the study, but they can provide clarity to all stakeholders on what is trying to be accomplished

7.2.2 The scheme objectives will be developed on the basis of the need for the intervention based on the overarching vision, current and future opportunities and constraints. This process is outlined in chapters 4, 5 and 6 and the overarching process shown in Figure 7-1.

Figure 7-1 Scheme Specific Objectives Process



7.2.3 In order to ensure that the success of the objectives is measurable, they will be developed into SMART objectives, that is:

- *Specific* - say in precise terms what is sought;
- *Measurable* – the means by which satisfaction whether or not the objective has been achieved can be assessed;
- *Attainable* - general agreement that the objective set can be reached;
- *Relevant* - the objective is a sensible indicator or proxy for the change which is sought; and

- *Timed* - the objective will be associated with an agreed future point by which it will have been met.

7.2.4 Developing the objectives in such a way provides a definitive way to constitute what would a successful outcome be in terms of a measurable output.

7.3 STRATEGIC OBJECTIVES

7.3.1 In line with the development of the vision for the intervention, in ascertaining the strategic objectives for the intervention to support, whilst there are a suite of documents at national, regional and local level as outlined in Chapter 2, it is considered that the following are key for supporting the development of the scheme specific objectives:

- Coventry Local Plan Publication Draft 2016 (March 2017);
- Warwick District Draft Local Plan 2011 - 2029 (Publication draft) (April 2014);
- Warwickshire Local Transport Plan 2011-2026;
- West Midlands Strategic Transport Plan 'Movement for Growth';
- Midlands Connect Strategy; and
- The Midlands HS2 Growth Strategy.

7.3.2 In addition to the above, the objectives of the Coventry South Package have also been considered in the development of the scheme specific objectives. The objectives for each of the above documents are provided in Chapter 2 as part of the development of the Vision.

COVENTRY SOUTH PACKAGE OBJECTIVES

7.3.3 Furthermore, the intervention will form part of the wider Coventry South Package, which has a number of its own objectives that the intervention must align to. These objectives include:

- To mitigate and support the housing and employment proposals contained within the Local Plans for Warwick District, Rugby Borough, Coventry City and Solihull.
- To support the growth aspirations of the University of Warwick and key existing and proposed employment sites within the immediate area and wider A46 corridor.
- To ensure the Coventry and Warwickshire is well connected to the economic opportunities in Solihull, which will arise as a result of the opening of HS2 in 2026 and the UK Central proposals.
- To help reduce congestion in the A45 corridor which will enable further housing growth to come forward in Coventry, Warwickshire and Solihull.
- To improve the public transport network by providing a new station at the University of Warwick, improving the Tile Hill Stations ability to deal with demand and by paving the way for a future Very Light Rail scheme to connect key employment sites.
- To provide additional resilience to the Strategic Road Network (specifically the M6, M40 and M42) through the delivery of a new high quality east-west highway link.
- To complement the proposal by Highways England for the A46 between the M6 and M40 to become an "Expressway".

- 7.3.4 In order to support the Coventry South Package Objectives, the objectives for the intervention will need to support future housing and employment growth, in particular, for the University of Warwick and surrounding area. This includes improving the public transport network and providing additional resilience on the strategic road network.

7.4 VISION

- 7.4.1 The scheme objectives have also been developed in line with the vision for the intervention, as well as the wider visions and objectives of local and regional policy and strategy.

- 7.4.2 The vision for the intervention is:

TO SUPPORT PLANNED SUB-REGIONAL HOUSING AND EMPLOYMENT GROWTH WITHIN WARWICK DISTRICT, COVENTRY CITY AND THE WIDER A46 CORRIDOR AS PART OF THE COVENTRY SOUTH PACKAGE, INCLUDING THE UNIVERSITY OF WARWICK'S EMERGING MASTERPLAN. AS WELL AS TO REDUCE THE INAPPROPRIATE USE OF MINOR RESIDENTIAL ROADS FOR TRAFFIC ACCESSING THE UNIVERSITY AND SURROUNDING AREA.

- 7.4.3 This vision is aligned to the vision of the Coventry South Package, and will shape the identification of the scheme specific objectives.

7.5 CURRENT AND FUTURE PROBLEMS AND OPPORTUNITIES

In line with the earlier chapters of this report, the current and future problems and opportunities in Coventry and Warwickshire include:

- Delay and volume capacity constraints on key routes including the A45, Cromwell Lane and Stoneleigh Road.
- Restriction of expansion of local employment sites including JLR Whitley, Stoneleigh Park and the University of Warwick due to lack of capacity.
- Opportunity to ensure new development is accessible by all modes.
- High volume of strategic trips on the A45 in the local area in the current situation.
- Poor network resilience meaning planned maintenance or incidents result in long-diversions / delays for through traffic.
- Restriction of expansion to the University of Warwick due to lack of capacity in the current situation.
- High levels of sustainable travel by students to / from the University of Warwick need to be supported to continue and grow in the future situation.
- High concentrations of collisions in the local area on the A45, Charter Avenue, A429, A46, Westwood Road / Kirby Corner Road in the vicinity of the University of Warwick.
- High concentrations of pedestrian and cyclist accidents on the A45, Charter Avenue and the A429.
- Poor Air Quality within the City of Coventry requiring an Air Quality Management Area, based on exceedance of Nitrogen Dioxide emissions limits.

7.6 STAKEHOLDER ENGAGEMENT

7.6.1 As part of the understanding for the need for an intervention, the ongoing process of stakeholder engagement with all interested parties has started to take place between Coventry City Council and Warwickshire County Council and the following as a minimum:

- University of Warwick;
- Commercial Estates Group (CEG);
- Crest Nicholson;
- Highways England;
- Warwick District Council;
- West Midlands Combined Authority (WMCA);
- Department for Transport;
- Arup as primary designers for the King's Hill development;
- Solihull Metropolitan Borough Council (SMBC); and
- HS2 Ltd.

7.6.2 Wider consultation is to take place with stakeholders including Stoneleigh Park and Network Rail.

7.6.3 Every effort has (to date) and will (in the future) be made to assimilate phasing and construction activities with HS2 Ltd and local developers to the mutual benefit of all parties in relation to commercial, sustainable, environmental and external stakeholder interfaces. Furthermore, the intervention will aim to minimise potential stakeholder objection whilst balancing impacts and potential user delays.

7.6.4 As part of the ongoing stakeholder engagement process, it was recognised that Midlands Connect and the West Midlands Combined Authority need to be consulted with on the basis of their high level strategy documents which have been included as part of the policy and strategy review in Chapter 3 of this report and feeds into the scheme specific objectives development in this chapter.

7.6.5 Going forward, an issues and options consultation for the intervention is planned to take place in Autumn 2017 which will be supported by the outputs of this OAR including challenges identified in this work, particularly around Westwood Heath and HS2. Further to this scheme options consultation is proposed to take place in Spring 2018 which will feed into the Outline Business Case.

7.7 SCHEME SPECIFIC OBJECTIVES

7.7.1 Information in the earlier chapters of this report has shaped the process taken to develop the scheme-specific objectives including the key current and future problems, objectives and their measures of success.

7.7.2 Table 7-1 outlines the scheme objectives for the intervention, including the key current and future problem that the objective will address and how the success of the objective will be measured.

Table 7-1 Scheme Objectives

	Key current or future problems	Draft objectives	Measures of success	Note
1	<ul style="list-style-type: none"> - Traffic congestion, resulting in longer journey times, on key routes including the A45, Cromwell Lane and Stoneleigh Road. - Restriction of expansion of local employment sites including JLR Whitley, Stoneleigh Park and the City Centre South Masterplan due to lack of capacity. - Inability to unlock strategic housing sites because the existing transport network does not have capacity to meet projected travel demand. - Increased transport costs to local businesses. - 	<p>Maintain journey times following development</p> <p>To enable the delivery of future housing, employment and educational development whilst maintaining journey times on the local network including on the A45; Cromwell Lane and Stoneleigh Road.</p>	<ul style="list-style-type: none"> - Average Peak Hour Journey Times (mins) for traffic on the following routes: <ul style="list-style-type: none"> o A45 between Stonebridge Island and Festival Island; o Cromwell Lane to A45 at Pickford Green; and o Stoneleigh Road to Cromwell Lane. - Variation between free flow journey times and average peak hour journey times. 	-
2	<ul style="list-style-type: none"> - Traffic congestion reduces accessibility to employment and educational opportunities. - Public transport journeys are adversely affected by traffic congestion on routes to / from the University of Warwick. 	<p>Provide accessible economic development</p> <p>To deliver “desirable” average peak hour journey times close to those in the off peak to support accessibility to support future housing, employment and educational development sites in the local area.</p>	<ul style="list-style-type: none"> - Average Peak Hour Journey Time (mins) by mode (Private Car; public transport; Cycling; Walking) on routes including A45, A46, and A429 Kenilworth Road for access to / from: <ul style="list-style-type: none"> o The new housing development sites at Kings Hill, Westwood Heath, Cromwell Lane and Eastern Green. o The new and growing employment sites at Eastern Green, Stoneleigh Park and Whitley South; as well as supporting access to sites in the wider strategic area including UK Central and HS2 Interchange. 	<ul style="list-style-type: none"> - Could be tied more to population within x minutes / journey time of key employment locations.

Key current or future problems	Draft objectives	Measures of success	Note
<p>3</p> <ul style="list-style-type: none"> - High volume of strategic trips on the A45 in South Coventry in the current situation which join / exit the A45 at Tile Hill Lane and Charter Avenue in the west, travelling to / from the Coventry Eastern Bypass north east towards - Lack of network resilience meaning planned maintenance or incidents result in long-diversions / delays for through traffic. 	<p>Improve network resilience</p> <p>To ensure the transport network within Coventry and Warwickshire is resilient enough to provide a consistent and reliable level of service during (a) planned maintenance and (b) during incidents.</p>	<ul style="list-style-type: none"> - Level of service and queue lengths for traffic on A45 between Stonebridge Island and Festival Island. - Total delay and total vehicle-kms with / without A45 (lower than current levels). 	<ul style="list-style-type: none"> - The resilience objective could address frequency in addition to severity of incident delays; with frequency likely to be a qualitative assessment in relation to ability of infrastructure to deal with climate events (incidents being dealt with under safety objective).
<p>4</p> <ul style="list-style-type: none"> - Restriction of expansion to the University of Warwick due to lack of transport network capacity. - High levels of sustainable travel by students to / from the University of Warwick need to be supported to continue and grow in the future situation. 	<p>Improve University of Warwick accessibility</p> <p>To support the delivery of future development at the University of Warwick and reduce journey times for those travelling to / from the site.</p>	<ul style="list-style-type: none"> - Average Peak Hour Journey Time (mins) by mode (Private Car; Public Transport; Cycling; Walking) on routes including Cromwell Lane, Gibbet Hill Road, Stoneleigh Road and Charter Avenue. - Future university of Warwick Travel Surveys – mode split target for both staff and students 	
<p>5</p> <ul style="list-style-type: none"> - The greatest concentrations of casualties in the local area are on the A45, Charter Avenue, A429, A46, Westwood Road / Kirby Corner Road in the vicinity of the University of Warwick. - High concentrations of pedestrian and cyclist accidents on the A45, Charter Avenue and the A429. 	<p>Improve road safety</p> <p>To reduce the number and severity of accidents on the A45, A429, Charter Avenue, and at the A46 Stoneleigh junction.</p>	<ul style="list-style-type: none"> - Accident numbers on: <ul style="list-style-type: none"> o The A45 between the A452 / A45 junction and the A45 / A46 / A444 junction (A46 Festival Island); o Charter Avenue; o The A429 between the A429 / A45 junction and the A429 / A45 junction; and <p>The A46 Stoneleigh junction.</p>	<ul style="list-style-type: none"> - The economic appraisal of the scheme will use COBALT (COst and Benefit to Accidents - Light Touch) for the impact on accidents.

Key current or future problems		Draft objectives	Measures of success	Note
6	<ul style="list-style-type: none"> Poor Air Quality within the City of Coventry resulting in designation as an AQMA. 	Improve air quality To reduce the impact of transport on air quality within the City of Coventry to achieve levels below accepted thresholds for NO ₂ .	<ul style="list-style-type: none"> NO₂ Levels at key receptors within Coventry City AQMA. 	<ul style="list-style-type: none"> Appraisal will consider environmental impact and mitigation of proposed interventions. Objective aimed at addressing opportunity for the options to make improvements to air quality in the City of Coventry.
7	<ul style="list-style-type: none"> Severance caused by high levels of traffic on the A45. 	Reduce severance To reduce vehicle flows on the A45, Stoneleigh Road and Gibbet Hill Road, and enable improved pedestrian and cycle crossing facilities and routes on the A45.	<ul style="list-style-type: none"> Change in vehicle flows on the A45, Stoneleigh Road and Gibbet Hill Road. 	<ul style="list-style-type: none"> The economic appraisal of the scheme will assess the impact of severance, especially in relation to impact on active modes such as cycling and walking.
8	<ul style="list-style-type: none"> Rat running on local roads around the University of Warwick and to the north of Kenilworth. Capacity constraints due to rat running leading to congestion on the local network. 	Reduce rat running To reduce vehicle flows on local roads including Crackley Lane and Hollis Lane in order to relieve capacity on the local network.	<ul style="list-style-type: none"> Change in vehicle flows on Crackley Lane and Hollis Lane. 	<ul style="list-style-type: none"> -

7.8 SUMMARY

7.8.1

In alignment with the strategic objectives as identified in local strategic planning documentation for Coventry and Warwickshire, as well as taking consideration of the need for intervention based on analysis of the current and future network, future growth and development proposals, and stakeholder engagement, the following scheme-specific objectives have been identified:

Scheme Specific Objectives

Maintain journey times following development

To enable the delivery of future housing, employment and educational development whilst maintaining journey times on the local network including on the A45; Cromwell Lane and Stoneleigh Road

Provide accessible economic development

To deliver “desirable” average peak hour journey times close to those in the off peak to support accessibility to support future housing, employment and educational development sites in the local area.

Improve network resilience

To ensure the transport network within Coventry and Warwickshire is resilient enough to provide a consistent and reliable level of service during (a) planned maintenance and (b) during incidents.

Improve University of Warwick accessibility

To support the delivery of future development at the University of Warwick and reduce journey times for those travelling to / from the site.

Improve road safety

To reduce the number and severity of accidents on the A45, A429, Charter Avenue, and at the A46 Stoneleigh junction.

Improve air quality

To reduce the impact of transport on air quality within the City of Coventry to achieve levels below accepted thresholds for NO₂.

Reduce severance

To reduce vehicle flows on the A45, Stoneleigh Road and Gibbet Hill Road, and enable improved pedestrian and cycle crossing facilities and routes on the A45.

Reduce rat running

To reduce vehicle flows on local roads including Crackley Lane and Hollis Lane in order to relieve capacity on the local network.

8

GEOGRAPHIC AREA OF SCOPE

8.1 DEFINING THE GEOGRAPHIC SCOPE

8.1.1 The geographical area of impact has been defined in terms of the area to be addressed by the intervention. This draws upon the geographical scope of the key origins, destinations and economic growth sites in the area; as well as analysis of the current and future transport demand. Based on the results of the analysis undertaken in the above chapters of the report, the key area of focus for the opportunities and constraints in Coventry and Warwickshire is in South Coventry and the northern extent of Warwick District.

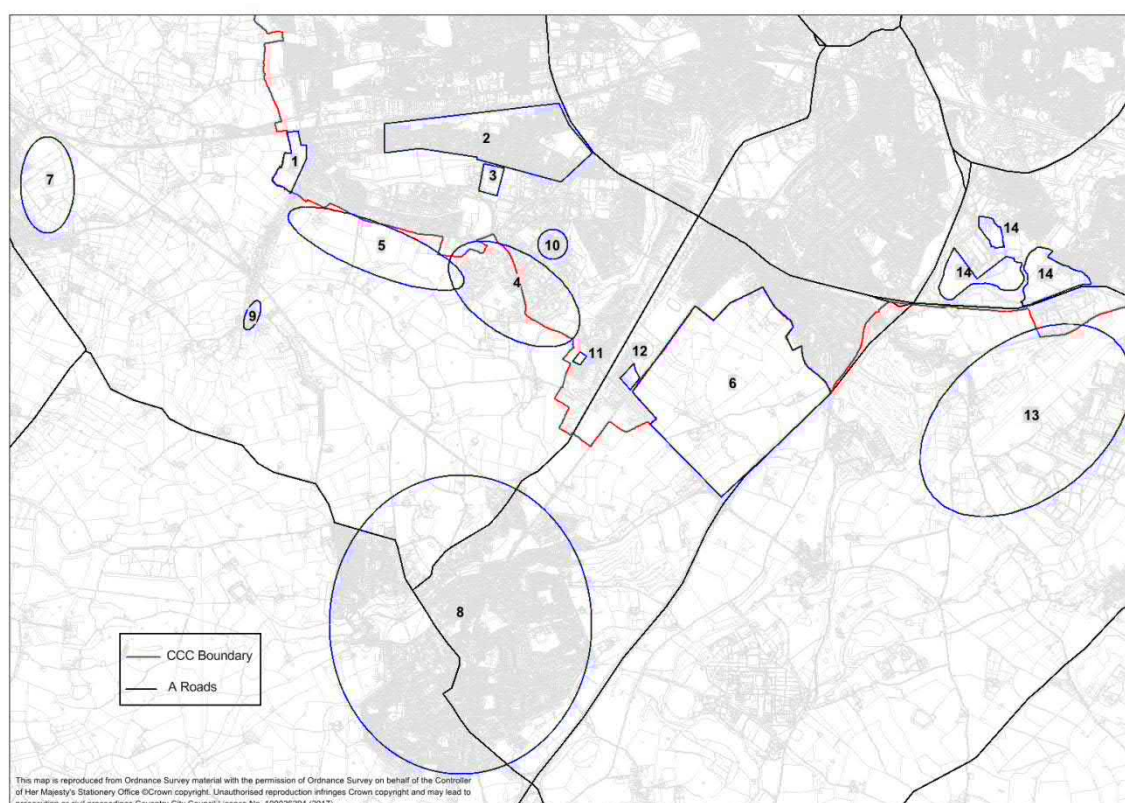
8.1.2 The evidence to take the process of defining this geographic scope to the next stage is based on an analysis of the geographical extent of the current and future transport problems and underlying drivers in this chapter.

8.1.3 Defining the area of impact at this stage is necessary to influence the scope of the options generation in Chapter 9.

8.2 FUTURE DEVELOPMENT

8.2.1 Information in Figure 8-1 shows the locations of future planned development in South Coventry and the North/North East extent of Warwick District for the period up to 2031.

Figure 8-1 Future Development in South Coventry



Source: Coventry City Council, 2017

8.2.2

There is a significant range of development proposed in the South Coventry and North/North East extent of the Warwick District area. The development sites references in the figure above are referenced as follows:

1. Cromwell Lane;
2. Canley Regen;
3. Mitchell Avenue;
4. University of Warwick;
5. Westwood Heath;
6. Kings Hill;
7. Balsall Common;
8. Kenilworth;
9. Burton Green;
10. Cannon Park;
11. Cryfield Grange;
12. Stoneleigh Rd;
13. Coventry and Warwickshire Gateway; and
14. Whitley / Baginton Fields

- 8.2.3** As part the developments shown in Figure 8-1, the construction of approximately 4,000 homes on the Warwick / Coventry border are proposed in the area of Cromwell Lane, Kings Hill and Westwood Heath. In addition to this, as part of the University of Warwick Masterplan a minimum of 2,000 additional student bedrooms are proposed for development on campus.
- 8.2.4** Furthermore, the development of Coventry and Warwickshire Gateway proposed development on two plots south east of the A45 / A46 with the potential to provide up to 10,000 jobs. The Southern plot is 200 acres, and could provide up to 3.6 million sq. ft. of B2/B8 warehousing use, and the Northern plot is 60 acres for B1 (a), (b) and (c) use as well as a hotel and wider ancillary retail use.
- 8.2.5** Further office, industrial and distribution development is proposed at the existing Whitley Business Park including at the Whitley Jaguar Land Rover site, which will see an additional 3,800 jobs with the development to be completed by 2021. At Baginton Fields, east of the Whitley site, 25ha of employment land is proposed to provide up to 1,200 jobs by 2030.
- 8.2.6** A number of transport schemes are also proposed in the local area, the most significant to be HS2 which will travel through the study area, with HS2 Phase 1 from London to Birmingham to be completed by 2026. On a more local scale, the construction of the new Kenilworth Railway Station is due for completion at the end of 2017 which will see addition trips on the local network for multi-modal journeys to and from the station. The Whitley South scheme will also see the installation of a bridge over the A45, the construction of new roads to serve the Whitley South site itself, and improvements to Stivichall (Festival) Island, and to the A444 Whitley roundabout.

8.3 SUMMARY

- 8.3.1** Based on the results of the analysis undertaken in the above chapters of the report, the key area of focus for the opportunities and constraints in Coventry and Warwickshire is in South Coventry and towards the North/North Eastern extent of Warwick District. The study area experiences and is forecast to experience further significant delays and reduced average speeds in the AM and PM peak.
- 8.3.2** There is significant housing, employment and transport development proposed in the study area until 2031, which needs to be supported by a robust and resilient transport network.

9

GENERATING OPTIONS

9.1 INTRODUCTION

9.1.1 Following the definition of the area of impact, the next stage is to develop a range of potential interventions.

9.1.2 The process started with the understanding of the current issues in the area and the need for the intervention including the future context and conditions. Furthermore, the intervention needs to support the overarching national, local and scheme-specific objectives including input from stakeholder engagement.

9.2 METHODOLOGY FOR GENERATION OF OPTIONS

9.2.1 In line with WebTAG guidance a broad range of alternative options that provide the potential to mitigate the problems and achieve the scheme objectives (Chapter 4) have been developed. These options have been developed with consideration as to what extent they can support the vision for intervention mentioned in section above.

9.2.2 The options feature a wide a range of modes, infrastructure, costs, influencing of travel behaviour and need to travel, revenue and capital spend, land use requirements as possible in the generation of the options including:

- Travel planning;
- Public transport provisions; and
- Highways infrastructure.

9.2.3 These options have been assessed against a do minimum scenario in the context of the intervention not going ahead, and to understand the relative performance of this range of options in addressing problems and meeting the scheme objectives. The process of the options generation involves analysis of the following:

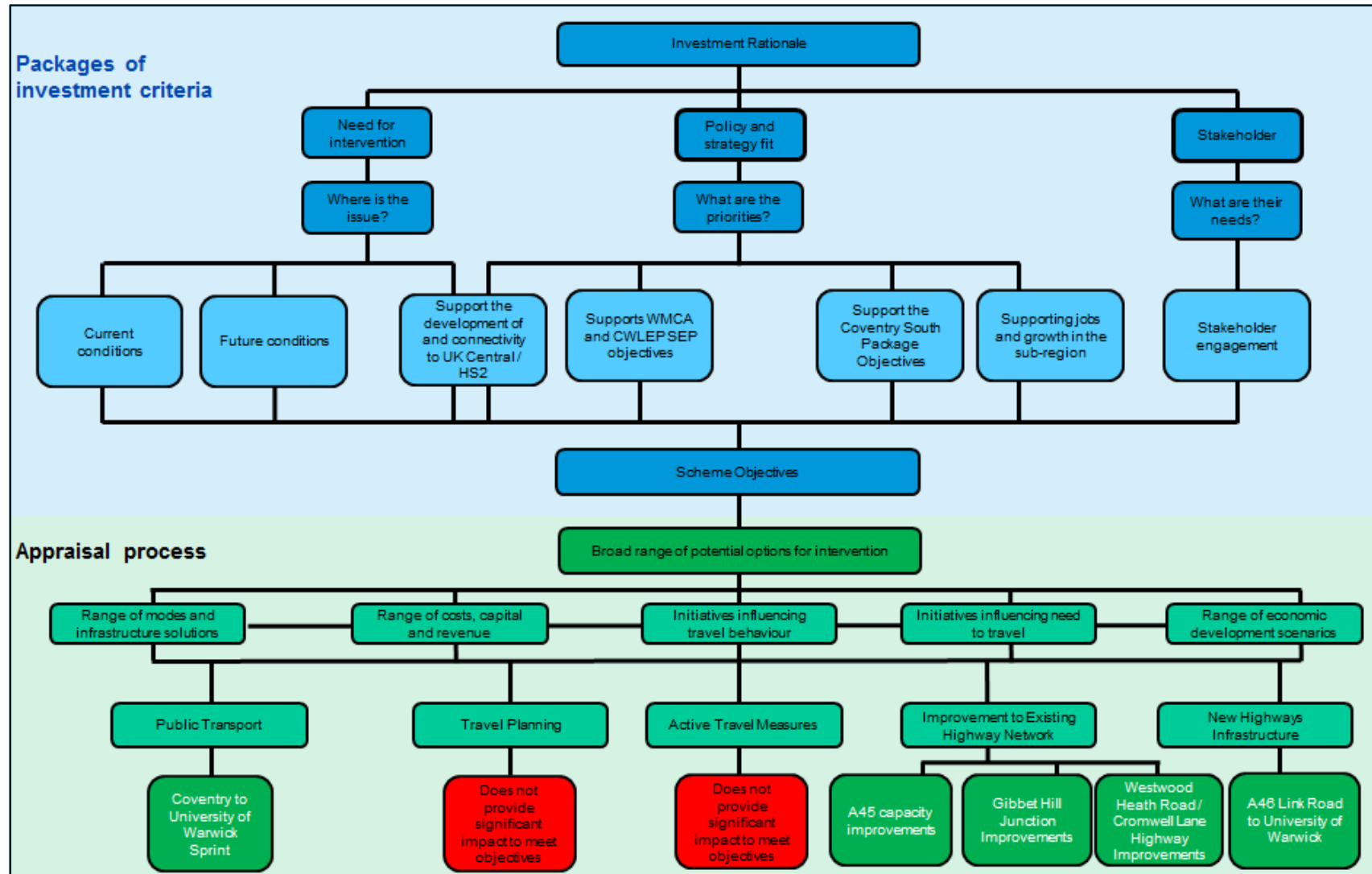
- Current conditions on the network;
- Future conditions on the network;
- Supporting existing policy and strategy; and
- Stakeholder engagement including consistent engagement with HE to ensure that options do not interfere with but complements their wider programme of works.

9.2.4 Consideration has been given to the end-to-end journey experience in the generation of interventions, however not all options provide a solution to this end. Similarly, not all options comply to support all of the scheme-specific objectives, but all contribute to at least some objectives as a minimum.

9.3 OPTIONS GENERATED

9.3.1 Figure 9-1 provides an overview of the options generation process from understanding the need for intervention as identified in the earlier stages of this report, which informed the development of the scheme objectives. Following this, a broad range of potential options have been identified to address the problems and meet the needs of the scheme objectives. These options include a range of modes and solutions, as well as range of costs and implementation timescales.

Figure 9-1 Options Generation Process



9.4 VALIDATION OF INITIAL OPTIONS AGAINST THE OBJECTIVES

9.4.1 The options brought forward for the next stage of the options assessment process include:

PUBLIC TRANSPORT PROVISIONS:

- Coventry to University of Warwick Sprint, a Bus Rapid Transit (BRT) route between Coventry & the University of Warwick (as outlined in Section 1.6);

HIGHWAYS INFRASTRUCTURE:

- A45 capacity improvements in the form of an underpass at the A429/A45 junction;
- Gibbet Hill Junction Improvements in the form of junction improvements at Gibbet Hill Road / A429/ Stoneleigh Road.
- Westwood Heath Road / Cromwell Lane Highway Improvements in the form of capacity improvements on Cromwell Lane and signalisation of junction with Westwood Heath Road; and
- A46 Link Road to University of Warwick, the development of a new link road from the A46 / Stoneleigh Road junction.

9.4.2 An initial validation of these options to assess the suitability of them has been undertaken against the scheme specific objectives as outlined in Table 9-1.

Table 9-1 Validation of Initial Options against Objectives

DESCRIPTION	JOURNEY TIMES AND RELIABILITY	ACCESSIBLE ECONOMIC DEVELOPMENT	NETWORK RESILIENCE	UNIVERSITY OF WARWICK ACCESSIBILITY	ROAD SAFETY	AIR QUALITY	SEVERANCE	RAT RUNNING
Measure of success	Average Peak Hour Journey Times	Average Peak Hour Journey Times	Peak Hour Journey Time Reliability	Average Peak Hour Journey Time / Mode Share Data	Accident Rates	NO2 Levels at key receptors	Change in Journey Time and distance	Change in vehicle flows
Coventry to University of Warwick Sprint bus route	✓	✓	✓	✓	✓	✓	✓	✗
A45 capacity improvements	✓	✓	✓	✓	✓	✗	✓	✓
Gibbet Hill Junction Improvements	✓	✓	✓	✓	✓	✗	✓	✓
Westwood Heath Road / Cromwell Lane Highway Improvements	✓	✓	✓	✓	✓	✗	✓	✗
A46 Link Road to University of Warwick	✓	✓	✓	✓	✓	✓	✓	✓

9.5 SUMMARY

9.5.1

Following the definition of the area of impact, a range of potential interventions have been generated for implementation in the study area to address the identified problems and meet the needs of the scheme objectives. The options discussed feature a wide a range of modes, infrastructure, costs, influencing of travel behaviour and need to travel, revenue and capital spend and land use requirements.

9.5.2 The options brought forward from a variety of sources for the next stage of the options assessment process include:

- Coventry to University of Warwick Sprint
- A45 capacity improvements
- Gibbet Hill Junction Improvements
- Westwood Heath Road / Cromwell Lane Highway Improvements
- A46 Link Road to University of Warwick

9.5.3 Travel planning and active travel measures were also considered as part of the options generation process. As identified within Figure 4-17 and Figure 4-18 of this report, active travel mode share trends obtained from 2011 census data outline that the majority of active travel undertaken is less than distances of 5km. Therefore these options were not brought forward as they do not warrant a significant impact to support the scheme objectives.

10 INITIAL SIFTING

10.1 INITIAL SIFTING METHODOLOGY

- 10.1.1 The scheme-specific objectives have been identified to align against:
- The strategic objectives of policy and guidance at the local and regional level where relevant;
 - The need for the intervention whereby the specific objectives are being developed to focus the desired outcomes and outputs of an intervention; and
 - Information from stakeholder engagement.
- 10.1.2 As well as working to support the generation of the long list of options, this will also inform the initial sifting process to identifying any options which, as outlined in The Transport Appraisal Process WebTAG guidance, do not:
- Meet all the key objectives for the intervention;
 - Fit with existing local, regional and national programmes and strategies, as well as wider government priorities; and
 - Meet the needs of the stakeholders, affordability and deliverability.

10.2 INITIAL SIFTING

- 10.2.1 In order to undertake the initial sifting process, the DfT's supported Early Appraisal Sifting Tool (EAST) was used with modifications to reflect the nature of the intervention (and potential model outputs) which is able to inform the later stages of the options appraisal going forward.
- 10.2.2 EAST has been produced by the DfT to provide an approach to the assessment of a range of options which are seeking to address a known problem or meet an agreed set of objectives, and presents the analysis consistent with the five case business case model (Strategic, Economic, Management, Financial and Commercial).
- 10.2.3 This tool has been established by DfT as a simple and consistent means of:
- Comparing options based on an agreed set of criteria,
 - Allowing the number of options to be filtered based on performance against criteria,
 - Identifying potential packaging and enhancements across options, and
 - Identifying major uncertainties at the early stage of project development, which can be addressed at later stages of appraisal.
- 10.2.4 The benefits of using EAST include the ability to filter the number of options based on performance against criteria and to quickly dismiss 'non-runners' early into the appraisal process.
- 10.2.5 Where relevant, any quantified impacts and evidence from previous studies have been included to inform the appraisal process.
- 10.2.6 As part of the process of the methodology of developing the EAST for this options assessment report, the EAST criteria were reviewed under each heading to identify potential areas where more relevant criteria could be used to replace or supplement the existing attributes. Those attributes that were revised are presented in

Table 10-10-1 Appraisal Criteria

CASE	STANDARD EAST CRITERIA	PROPOSED REVISED EAST CRITERIA	COMMENT / JUSTIFICATION
Overall	Name/No.	Name/No.	
	Date	Date	
	Description	Description	
Strategic	Identified problems and objectives of the option	Identified problems and objectives of the option	
	Scale of impact	Scale of impact	
	Scale of impact - Comments	Scale of impact - Comments	
	Fit with wider transport and government objectives	Fit with wider transport and government objectives	
	Wider transport and government objectives - Comments	Wider transport and government objectives - Comments	
	Fit with other objectives	Fit with WMCA and CWLEP SEP objectives	To provide an understanding of fit/agreement with agreed local objectives more specifically.
	Fit with other objectives - Comments	Fit with WMCA and CWLEP SEP objectives - Comments	
		Key opportunities	To support the options appraisal process as outlined in WebTAG Guidance for the individual options.
	Key uncertainties	Key uncertainties	
	Degree of consensus over outcomes?	Degree of consensus over outcomes?	
	Degree of consensus over outcomes? - Comments	Degree of consensus over outcomes? - Comments	
Economic	Economic Growth	Economic Growth	
	Economic growth - Comments	Economic growth - Comments	
	Carbon emissions	Air Quality	Relates directly to supporting the Air Quality Management Area in Coventry.
	Carbon emissions - Comments	Air Quality - Comments	
	Socio-distributional impacts and the regions	Socio-distributional impacts within C&W Area	Making it more locally specific
	Socio-distributional impacts and the regions - Comments	Socio-distributional impacts within C&W Area - Comments	
	Local environment	Local environment	
	Local environment - Comments	Local environment - Comments	

CASE	STANDARD EAST CRITERIA	PROPOSED REVISED EAST CRITERIA	COMMENT / JUSTIFICATION
	Well being	Well being	Outline at this early stage.
	Wellbeing - Comments	Wellbeing - Comments	
	Expected VfM Category	Outline VfM Category	
	Expected VfM Category - Comments	Outline VfM Category - Comments	
Managerial	Implementation timetable	Implementation timetable	
	Implementation timetable - Comments	Implementation timetable - Comments	
	Public acceptability	Public acceptability	
	Public acceptability - Comments	Public acceptability - Comments	
	Practical feasibility	Practical feasibility	
	Practical feasibility - Comments	Practical feasibility - Comments	
	What is the quality of the supporting evidence?	What is the quality of the supporting evidence?	
	What is the quality of the supporting evidence? - Comments	What is the quality of the supporting evidence? - Comments	
Financial	Key risks	Key risks	
	Affordability	Affordability	
	Affordability - Comments	Affordability - Comments	
	Capital Cost (£m)?	Capital Cost (£m)?	
	Capital Cost (£m)? - Comments	Capital Cost (£m)? - Comments	
	Revenue Costs (£m)?	Revenue Costs (£m)?	
	Revenue Costs (£m)? - Details	Revenue Costs (£m)? - Details	
	Cost Profile	Cost Profile	
	Overall cost risk	Overall cost risk	
Commercial	Other costs	Other costs	
	Flexibility of option	Flexibility of option	
	Flexibility of option - Comments	Flexibility of option - Comments	
	Where is funding coming from?	Where is funding coming from?	
	Any income generated? (Y/N)	Outline value of income generated	
	If yes, how much income generated (£m)?		Outline at this early stage.

- 10.2.7 The revised EAST criteria provides a more tailored approach to the initial appraisal of the options, with greater focus on the specific needs of the intervention in comparison to DfT's standard EAST criteria in order to ensure that the right options are scoring the highest in the appraisal process.
- 10.2.8 There are additional criteria which have been added to encompass those which do not fit with the standard assessment, including identifying the key opportunities that the option provides in line with WebTAG Transport Appraisal Guidance around the opportunities that interventions should support.
- 10.2.9 Where quantitative evidence is available based on existing reporting, this information has been made use of. Where quantitative evidence is not available, appraisal is based on a range of other sources including qualitative evidence from existing reporting, stakeholder engagement, anecdotal evidence and understanding from similar options implemented elsewhere where applicable. Most of the criteria are given a Red/Amber/Green (RAG) rating which provides a visual guide to the respondent as to the option's impact. Other criteria provide a description which in some cases provides a comment associated the criteria.
- 10.2.10 The scoring of the criteria has been undertaken as outlined in the DfT's EAST guidance note. On the basis of the evidence from previous studies and policies, along with the technical evidence presented in this OAR, a quantitative assessment of the impact of each option against the criteria, as to the greater impact has been conducted, taking into account location specific factors for the intervention.
- 10.2.11 Following the high level appraisal of each option against the criteria, the options were ranked with the preferred option scoring the highest across the criteria.
- 10.2.12 The EAST sifting process provided the results with regard to the criteria in relation to each of the five business cases:
- Strategic;
 - Economic;
 - Management;
 - Financial; and
 - Commercial.

10.3 EVALUATION OF INITIAL SIFTING

- 10.3.1 The following section provides a summary of the results of the EAST for the long list of options. The full EAST is available in Appendix A. As per the EAST appraisal template, each element has been assessed on a five point scale which is not weighted.
- 10.3.2 Information in Table 10-2 to Table 10-6 provides the results of the EAST assessment for the options, with each table providing the results of the criteria for each of the five business cases:
- Strategic (Table 10-2);
 - Economic (Table 10-3);
 - Management (Table 10-4);
 - Financial (Table 10-5); and
 - Commercial (Table 10-6).

Table 10-2 EAST Strategic Case Criteria Appraisal

Name/No.	Scale of impact ²⁷	Fit with wider transport and government objectives	Fit with WMCA and CWLEP SEP objectives	Key Opportunities	Key Uncertainties	Degree of consensus over outcomes?
Coventry to University of Warwick Sprint	Minor Impact	Reasonable fit	Reasonable fit	Provides an opportunity to provide a rapid transit link between two strategic centres	Affordability of high quality vehicles and maintenance. Route alignment for Sprint services in line with proposals for the A46 to be upgraded to Expressway and competing requirements of Sprint Standards.	Poor/Weak Consensus
A45 capacity improvements	Significant Impact	Good fit	Excellent fit	To provide increased capacity and reduce the levels of congestion; on a strategic highway between Coventry and the rest of the West Midlands Metropolitan Area including	Ensuring that this intervention is focused at the most appropriate junction on the A45 to ensure maximum benefit.	Poor/Weak Consensus
Gibbet Hill Junction Improvements	Significant Impact	Good fit	Reasonable fit	To provide essential capacity improvements and congestion reduction required to access the Strategic Road Network	Ensuring the intervention is focused at the most appropriate location to ensure maximum benefit.	Reasonable Consensus
Westwood Heath Road / Cromwell Lane Highway Improvements	Significant Impact	Good fit	Good fit	To provide extra capacity on the network to support development proposals	Ensuring the intervention is focused at the most appropriate location to ensure maximum benefit.	Reasonable Consensus

²⁷ Scale of Impact refers to what extent does the option alleviate the key current or future problems.

A46 Link Road to University of Warwick	Fully Addresses the identified problem	Excellent fit	Excellent fit	<p>To provide extra capacity on the network to support development proposals, whilst improving peak hour journey times to and from the University of Warwick; this additional capacity has the opportunity to also relieve "Rat Running" on local roads around the University of Warwick and to the north of Kenilworth.</p> <p>Supports local and regional economic growth for Coventry, Warwickshire and the wider West Midlands Metropolitan Area; in line with planned development growth.</p>	Public Consultation, Environmental Uncertainties, exact routing of link road.	Good Consensus
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Table 10-3 EAST Economic Case Criteria Appraisal

Name/No.	Economic Growth	Air Quality	Socio-distributional impacts within C&W Area	Local environment	Well being	Outline VfM Category
Coventry to University of Warwick Sprint	Positive Economic Growth	Minor Negative Impact	High Positive Impact	Neutral Impact	Minor Positive Impact	Low VfM
A45 capacity improvements	Weak Economic Growth	Neutral Impact	Minor Positive Impact	Neutral Impact	Neutral Impact	Low VfM
Gibbet Hill Junction Improvements	Weak Economic Growth	Neutral Impact	Minor Positive Impact	Neutral Impact	Neutral Impact	Low VfM
Westwood Heath Road / Cromwell Lane Highway Improvements	Weak Economic Growth	Neutral Impact	Minor Negative Impact	Neutral Impact	Neutral Impact	Medium VfM
A46 Link Road to University of Warwick	Positive Economic Growth	Minor Positive Impact	Minor Positive Impact	Negative Impact	Neutral Impact	High VfM

Table 10-4 EAST Management Case Criteria Appraisal

Name/No.	Implementation timetable	Public acceptability	Practical feasibility	What is the quality of the supporting evidence?	Key risks
Coventry to University of Warwick Sprint	Medium Term	Minor Positive Response	Some Barriers	Poor Quality Evidence	Necessary demand for the option to be feasible. Ensuring that the most beneficial and feasible route is targeted. Public and political acceptance.
A45 capacity improvements	Medium Term	Neutral Response	Some Barriers	Poor Quality Evidence	Land take requirements, environmental constraints, the improvements generate significant increase in strategic trips to support BCR.
Gibbet Hill Junction Improvements	Medium Term	Neutral Response	Minor Barriers	Reasonable Quality Evidence	Land take requirements, environmental constraints, the improvements generate significant journey time savings
Westwood Heath Road / Cromwell Lane Highway Improvements	Medium Term	Minor Positive Response	Some Barriers	Reasonable Quality Evidence	Land take requirements, environmental constraints, the improvements generate reasonable journey time savings.
A46 Link Road to University of Warwick	Medium Term	Minor Positive Response	Minor Barriers	Good Quality Evidence	Public acceptability, land take requirements, environmental constraints.

Table 10-5 EAST Financial Case Criteria Appraisal

Name/No.	Affordability	Capital Cost (£m)?	Revenue Costs (£m)?	Cost Profile	Overall cost risk	Other Costs
Coventry to University of Warwick Sprint	Average Affordability	Not known at this stage	Not known at this stage	Not known at this stage	Not known at this stage	Sprint vehicle fleet maintenance would be required, as well as maintenance of road markings, shelters, signage, etc. Ticketing and operating costs.
A45 capacity improvements	Average Affordability	Not known at this stage	N/A	Not known at this stage	Not known at this stage	Not known at this stage
Gibbet Hill Junction Improvements	Average Affordability	Not known at this stage	N/A	Not known at this stage	Not known at this stage	Not known at this stage
Westwood Heath Road / Cromwell Lane Highway Improvements	Below Average Affordability	Not known at this stage	N/A	Not known at this stage	Not known at this stage	Not known at this stage
A46 Link Road to University of Warwick	Below Average Affordability	Not known at this stage	N/A	Not known at this stage	Not known at this stage	Land requirements, etc.

Table 10-6 EAST Commercial Case Criteria Appraisal

Name/No.	Flexibility of option	Where is funding coming from?	Any income generated?	Outline Value of Income Generated
Coventry to University of Warwick Sprint	Very Flexible	Not known at this stage	Yes but unknown at this stage.	Not known at this stage
A45 capacity improvements	Very Inflexible	Not known at this stage	None	None
Gibbet Hill Junction Improvements	Very Inflexible	Not known at this stage	None	None
Westwood Heath Road / Cromwell Lane Highway Improvements	Very Inflexible	Not known at this stage	None	None
A46 Link Road to University of Warwick	Slightly Inflexible	Development funding in 2017/18 by the Department for Transport under the Large Local Major Scheme (LLMS) programme	None	None

- 10.3.3 The following sections provide a summary of the results of the EAST for each of the five cases.

STRATEGIC CASE

- 10.3.4 As shown in the Strategic Case EAST criteria results in Table 10-2, the option with the greatest strategic fit is the A46 Link Road to the University of Warwick. It has been well demonstrated through the evidence presented in this OAR that the link road will provide the strategic transport capacity to enable the growth planned by the CSW LEP and both Coventry and Warwickshire local authorities. The consensus of views to support this option has been captured through the review of plans and policies in the region. The link road is the only option which provides the opportunity to maximise the efficiency of the wider network, by relieving congestion on other key routes such as the A45. This option has a strong fit with the strategic objectives of local policy and strategy, and provides an intervention that will support a wide range of key opportunities.
- 10.3.5 The highways improvement interventions on the A45, Gibbet Hill and Westwood Heath Road have potential to reduce congestion and increase capacity within their geographic setting, however they do not create a step change in the network to reduce congestion on the existing network to free access for public transport connectivity and wider scheme objectives.

ECONOMIC CASE

- 10.3.6 As shown in the Economic Case EAST criteria results in Table 10-3, the options with the greatest economic growth impacts are the Coventry to University of Warwick Sprint and the A46 Link Road to the University of Warwick. The option with the greatest air quality impact is the A46 Link Road as the development of the new road will reduce congestion and remove trips from some parts of the AQMAs in the study area. The greatest socio-economic impact is with the Coventry to University of Warwick Sprint as this intervention will support access for non-car households, providing more equal access to opportunities. Furthermore, this option also provides the greatest benefit to wellbeing, encouraging and providing greater opportunity for more efficient, reliable and sustainable travel.
- 10.3.7 The option with the greatest negative impact on the local environment is the A46 Link Road; this option is proposed for construction through existing green belt land. Despite this, this option is likely to provide the greatest value for money in line with the significant range of benefits that it will provide to the local and regional area, and the support that it will provide to access to proposed housing and employment sites.

MANAGEMENT CASE

- 10.3.8 As shown in the Management Case EAST criteria results in Table 10-4, all options should be implemented in the medium term. The Coventry to University of Warwick Sprint has a number of key risks including the level of demand for the service, and the public and political acceptability of the option. All of the remaining options will require some land take and have a number of environmental risks associated with this, in particular the A46 Link Road due to the scale of land take. A key risk for the highway improvements options is ensuring that the options generate a significant increase in journey time savings, in particular following housing and employment developments.

FINANCIAL CASE

- 10.3.9 As shown in the Financial Case EAST criteria results in Table 10-5, the most affordable options are the Coventry and University of Warwick Sprint, A45 capacity improvements and Gibbet Hill Junction Improvements. The detailed costs of the options are not yet known at this stage; further development of the capital cost and cost risks of the options will be developed at the next stage of the appraisal.

COMMERCIAL CASE

- 10.3.10 No capital funding is committed to this or any of the other options at this stage. As a public transport scheme, the Coventry to University of Warwick Sprint would generate income through revenue and ticketing, however the details of this income are not known at this stage, and this would be subject to a commercial contract between the transport authority (TfWM) and the bus operator (s) contracted to run any new service.

10.4 SUMMARY

- 10.4.1 Following the initial sifting of the generated options for an intervention, the preferred option to be taken forward for the next stage of the options development process is the development of the A46 Link Road.

11

PREFERRED OPTION

11.1 PHASE 2 A46 LINK ROAD

11.1.1 As identified in Chapter 9, the preferred option for an intervention is the A46 Link Road to the University of Warwick. The link road will run east to west, from the A46 / Stoneleigh Road junction, approximately 5km to Kirby Corner / Westwood Heath Road / Cromwell Lane in Westwood Heath. The route will run adjacent to the west of University of Warwick central campus where significant housing development is proposed as part of the University's Masterplan. The new link road will support wider housing and employment policies in the area, including development as Westwood Heath and Kings Hill, increasing resilience on this part of the network and freeing up capacity on the A45. It is hoped that in the future this could support the route becoming a greater public transport corridor for connectivity to the wider West Midlands, including Birmingham, Solihull and UK Central.

11.2 PHASE 2 A46 LINK ROAD IN FUTURE LOCAL DEVELOPMENT CONTEXT

11.2.1 The proposed route location and study area for the A46 Link Road is shown overleaf in Figure 11-1. The map shows the relationship between the proposed Link Road and development sites in Solihull Local Development Plan, Coventry Local Development Plan and Warwickshire Local Development Plan. The scheme location is shown in context of the surrounding infrastructure including:

- Railway routes / stations including the proposed HS2 route / station;
- Key road network including surrounding A and B roads and motorways; and
- Urban areas.

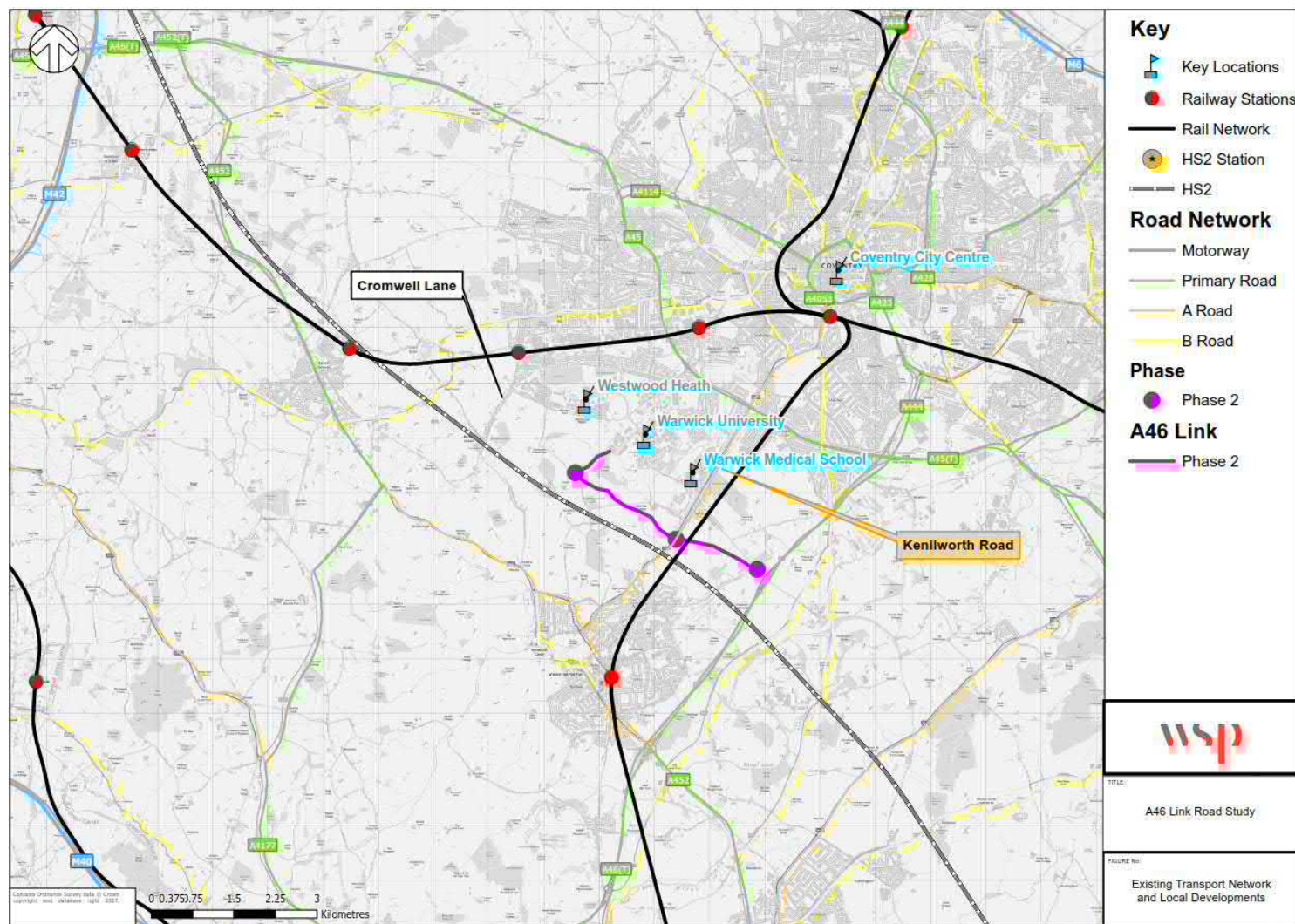
- 11.2.2** Immediately accessible by the link road are development sites at the University of Warwick and the Westwood Heath development adjacent to Cromwell Lane. The former will see considerable expansion of the university in terms of staff employment and additional students provided for, as well as other supporting functions such as a new nursery / day care facility. The latter is a proposal for 240 residential dwellings. The proximity of the development to the link road means that it will be significant in providing access to the wider area.
- 11.2.3** There are several developments in the wider area to which the link road will enable increased access. At the Eastern end, the Link Road will provide access from the west to the new employment site at Coventry Gateway and the forthcoming expansions in employment at the National Agricultural Centre / Showground and Abbey Park.
- 11.2.4** Figure 11-1 shows that there is a strong railway network in the study area, which should be supported by a robust road network to support journey time reliability for door-to-door connections, in particular to support access to Tile Hill Railway Station and car park enhancements outlined in the Coventry South Package. In addition, the option will support access to railway stations with the A46 Link Road providing an alternative to the A45. This in turn, will have a positive impact on the A45, both in terms of economic and social benefits of greater journey time reliability for business users and public transport users on this route.
- 11.2.5** The A46 Link Road route largely runs parallel to the HS2 route in the study area, and will improve connectivity northbound towards UK Central for links to the A45 towards the HS2 Interchange Station. In supporting access to the A45, the Link Road will improve accessibility to the wider Greater Birmingham and Solihull LEP area including Jaguar Land Rover's (JLR) Solihull Plant.
- 11.2.6** As shown in Figure 11-1 the A46 Link Road will provide connectivity for the proposed Westwood Heath Sustainable Urban Extension (SUE) to the east of the northern end of the proposed Link Road which will see the construction of approximately than 4,000 homes on the Warwick / Coventry border at Cromwell Lane, Kings Hill and Westwood Heath. The new road will support network resilience in line with population growth in the local area following this development. The road would support additional vehicular demand generated by the developments, due to the increased capacity available; thus reducing the demand on current local routes and providing alternative routes in case of disruptions.

11.3 A46 LINK ROAD SUPPORT TO STRATEGIC HIGHWAY CONNECTIVITY

- 11.3.1** The proposed link road will provide a connection between the A46 south of Coventry and the University of Warwick, providing an alternative route from major routes such as Stoneleigh Road, and A429 approaching east of the University of Warwick, and more local roads including Crackley Lane and Hollis Lane approaching from Kenilworth towards the University of Warwick. The link road will provide an alternative route to the A45 and A46, the A46 Link road would act as a relief road for these routes, in particular the A45, diverting trips which would otherwise have to travel into Coventry's suburbs to travel west.
- 11.3.2** The impact of the link road will support network resilience in the local area, where road closures occur on surrounding route to ensure that traffic can continue to operate via an alternative route. These routes include Stoneleigh Road and the A429.
- 11.3.3** The implementation of the A46 link road scheme will provide significant improvement in connectivity to the following:
- The A46 Link Road to the University of Warwick will provide onwards connections from several existing routes radiating from Coventry including the: The B4101 connects to Balsall Common, meeting the north-south A452 in the centre of the town. The A452 itself forms a north west to south east corridor between an interchange with the A46 west of Warwick and an interchange with the M42 north of the NEC.

- In terms of onward connections, the A45 connects Birmingham with Northampton via Coventry and Daventry. To the east, it also offers connections to the M45 and thence to the north-south M1 motorway; as well as connections with the A4071 to Rugby. To the west, it connects with the north-south M42 close to the NEC, one of the region's key employment sites.
- Improved access and capacity on the A46 will improve highway connectivity to Coventry, and strategic access to the M5 motorway via Ashchurch. The A46 also passes through Evesham and provides connections, via other roads, to the key local centres in Warwickshire including Kenilworth, Warwick and Stratford-Upon-Avon.
- The A46 Link Road will support wider strategic connections to the M42, by freeing capacity on the A45 for connections on to the motorway. The m42 acts as a strategic artery connecting other routes including the M5, M40 and M1. The M1 itself forms the primary national north-south artery connecting London in the south with Leeds, connecting the principal East Midlands towns of Leicester, Derby, Nottingham and Sheffield.
- As well as highway connections, the proposed link road will also provide access from locations south of Coventry to the extensive Park and Ride facility at Tile Hill railway station as part of the Coventry South Package. The station provides services on a 20 minute frequency between Birmingham and London Euston for much of the day. En route, the trains call at Birmingham International for access to UK Central and in the future connections to the HS2 Interchange Station. As well as London Euston, Tile Hill provides direct services southbound to Milton Keynes and Northampton.

Figure 11-1 A46 Link Road Study Area and Key Developments

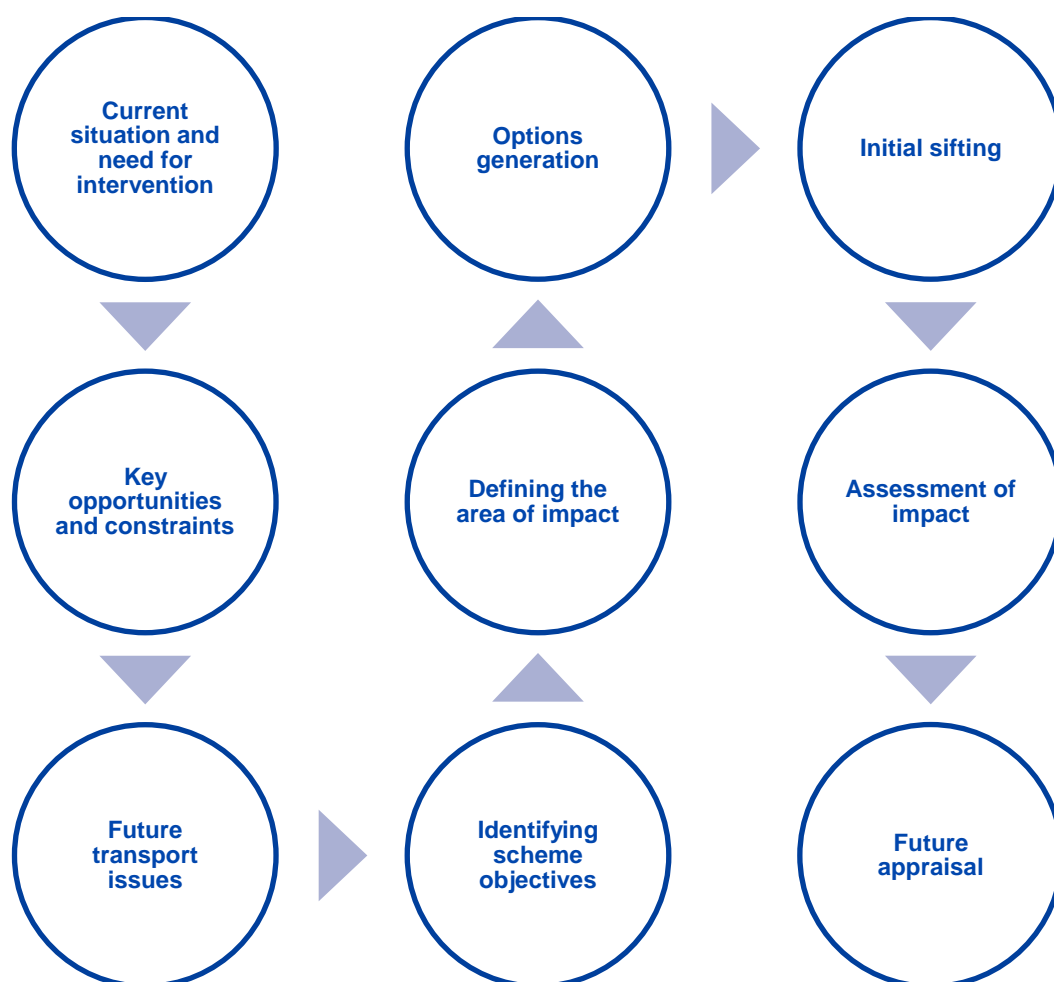


12 SUMMARY

12.1 OVERVIEW

12.1.1 Following this Stage 1 Options Development process, as outlined in WebTAG guidance, further appraisal be undertaken for the appraisal of individual schemes.

12.1.2 The following diagram outlines the process that has been taken to create and define the first stage of the options assessment process for the scheme as set out in this report:



12.1.3 This process has established a thorough assessment of the most appropriate and effective, options to be taken forward for future appraisal in the business case. Based on this appraisal the preferred option to be taken forward is the A46 Link Road to University of Warwick.

12.1.4 Further development of the detailed design and preferred layout of the A46 Link Road between the A46 Stoneleigh Junction and the University of Warwick are to be undertaken as the next stage of the development of the intervention, and to form part of the Outline Business Case for the scheme going forward.