

A27 CORRIDOR FEASIBILITY STUDY
REPORT 1 OF 3: EVIDENCE REPORT

Highways Agency

[Job number: 3511134AFJ]

A27 Corridor Feasibility Study

Report 1 of 3: Evidence Report

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1 EXECUTIVE SUMMARY

1.1 Introduction and Purpose

1.1.1 The A27 corridor feasibility study is one of six studies undertaken by the Department for Transport (DfT) to investigate problems and identify potential solutions to tackle some of the most notorious and long-standing road ‘hot spots’ in the country.

1.1.2 This report summarises the evidence gathering phase (Study Stage 1) of the A27 Feasibility Study. It sets out the evidence describing the current and future situations, identifies problems from the evidence, and – against the policy context – identifies the need for intervention. The evidence assessment was used to identify intervention specific objectives and to refine the geographic area of interest.

1.1.3 The prioritised problem areas (where need for intervention have been identified) form the basis for Study Stages 2 and 3 and are identified from Study Stage 1 as follows:

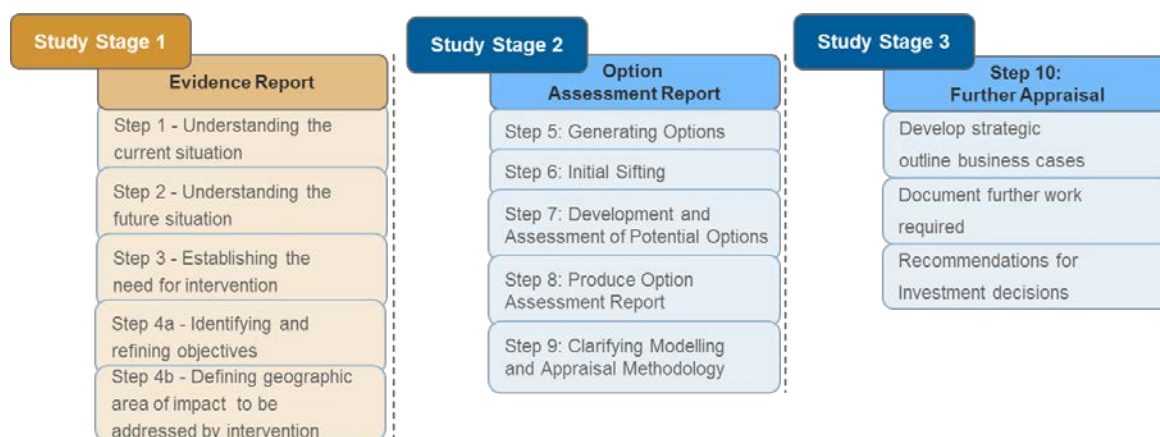
- Arundel;
- Worthing and Lancing; and
- East of Lewes - specifically the stretch of road between Lewes and Polegate.

1.2 Overview of A27 Corridor Feasibility Study

1.2.1 Parsons Brinckerhoff (PB) was commissioned by the Highways Agency (HA) to undertake a feasibility study on the A27 Corridor on behalf of the DfT in November 2013.

1.2.2 The purpose, scope and approach used for the A27 Corridor Feasibility Study are set out in a Scope Document issued by the DfT and HA¹. This required the study to take a proportionate approach and to be completed in accordance with DfT’s Transport Analysis Guidance (January 2014) and in three stages which are set out below.

1.2.3 This report is the first of three reports covering the Study Stages, as follows:



¹ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/345568/a27-feasibility-study-scope.pdf

1.3 Background

- 1.3.1 The A27 is the only east-west trunk road south of the M25. It links various cities and towns along the south coast, accommodating over three quarters of a million people, including Portsmouth, Havant, Chichester, Arundel, Worthing and Lancing, Brighton and Hove, Lewes and Eastbourne. The A27 also provides access to Hayling Island, the Manhood Peninsula, Bognor Regis, Littlehampton and the ports of Portsmouth, Shoreham, and Newhaven, and provides businesses and residents in this corridor with access to the rest of the strategic road network (SRN). The A27 is located in the southern part of the sub-regional economic area referred to as the Gatwick Diamond.
- 1.3.2 The local economy has strengths in advanced engineering, tourism and other sectors and has accommodated substantial population and household growth over the past decade, particularly in the urban areas. The A27 corridor runs alongside and across the South Downs National Park (SDNP) and the corridor is constrained by the urban areas along the route and the sea to the south.
- 1.3.3 There have been long-standing calls to improve the A27 corridor. Infrastructure enhancements along the A27 and beyond were previously considered as part of the South Coast Multi Modal Study (SoCoMMS) which reported in 2002. The study concluded that there was little justification for a long distance strategic south coast route between Southampton and Margate. It did, however, identify the need for a number of investments along the A27. Only some of these were progressed at the time owing to concern about potential difficulties of delivering major road schemes in environmentally sensitive locations.
- 1.3.4 Further studies have since been undertaken by the Highways Agency and local authorities respectively. Highway improvements have been undertaken by the Highways Agency (for example, at Beddingham and Southerham) and by East Sussex County Council in the form of the Bexhill to Hastings link road.
- 1.3.5 As part of the outcomes of the 2013 Spending Review, Government committed to investment for major improvements to the A27 Chichester bypass as part of its pipeline of future major road schemes, subject to value for money (VfM) and deliverability.

1.4 Overview of Current situation

- 1.4.1 This stage of the A27 Corridor Feasibility Study reviewed the current situation along the A27, and identified problems along the route.

Travel Demand

- 1.4.2 Analysis of Census Journey to Work and historic roadside interview data shows the following:
- There are a variety of short and long distance trips made across the districts along the A27, with little change in travel patterns between 2001 and 2011:
 - Over 60% of trips along the coastal area were estimated to be journeys made entirely within the respective counties of West and East Sussex;
 - Between 1.5 and 2% of commuter journeys in Arun, Worthing and Wealden are made using bus, and between 3 and 4% using rail.
 - A high proportion of work-related journeys in the coastal area are made by road.

- Goods vehicles represent more than 15% of the daily traffic volumes along A27 and a third of this is heavy goods traffic.

Transport Provision

- 1.4.3 **Rail Provision:** The coastal area is served by a number of rail routes, including the west and east Main Line routes and the west and east Coastway routes. These routes run parallel to the A27, and could provide an alternative to journeys along the A27. However, these routes are mostly focussed on access between the south coast and London. These provide en route a good service between some locations within the study area but in respect of purely Coastway services these cater primarily for local stopping stations, providing good rail accessibility for shorter journeys but lengthy journey times for longer distance journeys. Consultation with Network Rail has found that the rail network is close to capacity with no significant improvements planned.
- 1.4.4 **Bus Provision:** There are various bus routes serving the communities within the A27 corridor. Consultation with the various Local Authorities along the corridor indicates that no major road-based public transport investment is anticipated.
- 1.4.5 **Highway Provision:** For most of its 67 mile length the A27 is dual carriageway. Four stretches of road remain single carriageway, namely at Arundel, Worthing, and along two stretches to the east of Lewes. Such sections of road tend to experience peak hour congestion and poor time reliability.
- 1.4.6 Issues identified and performance along the Highway Network are as follows:
- **Capacity:** Annual average daily traffic volumes (AADT) on specific single carriageway links were close to or above the theoretical capacity of the road at Arundel, Worthing and on the stretch between Lewes and Polegate. AADT volumes on most sections of the dual carriageway along the A27 are within the theoretical road capacity.
 - **Reliability:** sections of single carriageway and at-grade junctions result in congestion and delays which impact on the efficient and safe movement of people and goods. Congestion is a problem at a number of locations including Chichester, Arundel, Worthing and between Lewes and Polegate.
 - **Severance:** The route runs through and close to settlements causing severance issues at Arundel, Worthing and Lancing and villages east of Lewes.
 - **Air Quality:** Traffic and congestion affect air quality, in particular at locations such as Worthing and Storrington where AQMA's have been declared due to high volumes of traffic.
 - **Road Safety:** Accidents are a significant challenge along certain links, with incidents leading to further impacts on journey-time reliability.

Environmental Constraints

- 1.4.7 The study identified a range of environmental constraints, most significantly the SDNP alongside and through which the A27 is aligned. Various other locations protected by environmental designations have been identified, as well as the coastal floodplains of the River Arun and River Adur.

1.5 Future Situation

- 1.5.1 The area is planning for significant growth. Over 60,000 new homes and substantial employment development are expected within the coastal study area (West and East Sussex).
- 1.5.2 The ability of the transport system to support such growth will, however, be constrained by:
- the capacity of the A27, the capacity of the local road network and the junctions linking the routes; and
 - limitations on rail and other public transport modes to significantly improve their offer of an alternative choice of travel, other than in the larger urban areas.
- 1.5.3 High level traffic modelling undertaken as part of this study indicates that congestion is expected to worsen in future, particularly along the single carriageway and narrow lane sections with reduced capacity.

1.6 The Need for Intervention

- 1.6.1 The evidence demonstrates that whilst bus/rail network or alternative methods such as Light Rail and demand management measures may provide opportunities for modal transfer, these measures are unlikely to be able to adequately address the study objectives of reducing travel time, improving journey time reliability and enabling local planning authorities to manage the impact of planned growth.
- 1.6.2 Government's policy on the SRN is to ensure that it operates effectively and efficiently, and that it supports and facilitates economic growth. A more efficient network would enable firms reliant on the A27 for access to operate more efficiently, and encourage investment in existing and new businesses. With greater certainty over journey times, businesses would be better positioned to compete internationally.
- 1.6.3 In light of the current problems of constrained capacity, planned growth in housing and employment is likely to result in the worsening of congestion and delays. There are clear limitations to alternative public transport solutions, and hence **there is a need to invest in road-based solutions.**

1.7 Geographic Area of Interest for A27 Corridor Feasibility Study

- 1.7.1 The analysis within this report determined three priority locations or 'hotspot areas' for targeting interventions:
- Arundel
 - Worthing and Lancing, and
 - East of Lewes - specifically the stretch of road between Lewes and Polegate.

1.8 Intervention Specific Objectives

- 1.8.1 Based on the analysis of available evidence and discussion with the Study Stakeholder Reference Group (SSRG), the study team defined a number of intervention specific objectives:
- Reducing travel time and improving journey time reliability in the key hotspot areas;
 - Reducing severance and pollution impacts;
 - Enabling local planning authorities to manage the impact of planned growth and in doing so support the wider economy;

- Providing safer roads which are resilient to delay and which are able to adequately cater for the impacts of adverse weather;
- Minimising impacts on the natural environment and optimising environmental opportunities and mitigation; and
- Providing opportunities for improved accessibility for all users.

2 INTRODUCTION

This chapter provides an introduction to the A27 Corridor Feasibility Study including the background to the study, the scope of the study and the methodology applied. The reports developed as part of the study stages are described, and an overview of the stakeholder engagement undertaken during the study.

2.1 Background

2.1.1 Following the 2013 Spending Review, the Government announced its plans for the biggest ever upgrade of the Strategic Road Network (SRN). The HM Treasury document, Investing in Britain's Future (July 2013), set out details of the programmes of infrastructure investment. As part of that investment programme, the Government announced a series of feasibility studies to look at problems and identify potential solutions to tackle some of the most notorious and long-standing road hot spots in the country. The 6 locations identified included the A27 corridor.

2.1.2 The feasibility studies were progressed alongside the Highways Agency's Route Strategies programme which is considering the current and future performance of the entire network as a series of routes, in order to inform investment decision-making over the next 5 year investment period. The A27 falls within the following routes of the Route Strategy programme:

- 'South Coast Central';
- 'M25 to Solent'; and
- 'Solent to Midlands' route.

2.1.3 The A27 is the only east-west trunk road south of the M25. It links various cities and towns along the south coast, accommodating over three quarters of a million people, including Portsmouth, Havant, Chichester, Arundel, Worthing/Lancing, Brighton and Hove, Lewes and Eastbourne. The A27 provides access to Hayling Island, the Manhood Peninsula, Bognor Regis and the ports of Portsmouth, Shoreham, and Newhaven, and provides businesses and residents in this corridor with access to the rest of the SRN.

2.1.4 The A27 corridor, between Portsmouth and Brighton is constrained to the north by the South Downs National Park and various towns and the sea to the south. It is predominantly of a dual carriageway standard route across this section, with notable exceptions at Arundel and Worthing where it reduces to single carriageway. These sections of the corridor in particular experience considerable peak hour congestion and suffer from having a number of local access points which mean that they attract peak time local access movements which impact adversely on the strategic road function. To the east of Brighton the A27 corridor passes through the South Downs and ends at Pevensey, linking to the A259. Along this section of the route the road is a mixture of single and dual carriageway.

2.1.5 The local economy has strengths in advanced engineering, tourism and other sectors and has accommodated substantial population and household growth over the past decade, particularly in the urban areas. The A27 corridor runs alongside and across the South Downs National Park and is constrained also by the urban areas along the route and the sea to the south.

2.1.6 There have been long-standing calls to improve the A27 corridor. Infrastructure enhancements along the A27 and beyond were previously considered as part of the

South Coast Multi Modal Study (SoCoMMS) which reported in 2002. The study concluded that there was little justification for a long distance strategic south coast route between Southampton and Margate. It did, however, identify the need for a number of investments along the A27. Only some of these were progressed at the time owing to concern about potential difficulties of delivering major road schemes in environmentally sensitive locations.

2.1.7 Further studies have since been undertaken by the Highways Agency and local authorities respectively. Transport improvements have been developed by the Highways Agency (for example, at Beddingham and Southerham), and by East Sussex County Council in the form of the Bexhill to Hastings link road.

2.1.8 As part of the outcomes of the 2013 Spending Review, Government committed to investment for major improvements to the A27 Chichester bypass as part of its pipeline of future major road schemes, subject to value for money and deliverability

2.2 Overview of A27 Corridor Feasibility Study

2.2.1 Parsons Brinckerhoff (PB) was commissioned by the Highways Agency (HA) to undertake a feasibility study on the A27 Corridor on behalf of the Department for Transport (DfT) in November 2013.

2.2.2 The purpose, scope and approach used for the A27 Corridor Feasibility Study are set out in a Scope Document issued by the Department of Transport and the Highways Agency². This required the study to take a proportionate approach and to be completed in accordance with DfT's Transport Analysis Guidance (January 2014).

2.2.3 The Scope Document³ sets out the aim for this study, namely to identify *"the opportunities and understand the case for future investment solutions within the A27 corridor, particularly at Arundel and Worthing, which are deliverable, affordable and offer value for money."*

2.2.4 In particular, the study was required to:

- Identify and assess the case, deliverability and timing of specific infrastructure investments that best address existing and future priority problems on the A27 corridor;
- Understand the balance of benefits and impacts from potential individual investment proposals and any additional benefits or impacts from potential packages of investment in the national and local transport networks; and
- Evidence, where possible, the wider economic impacts from the transport investment in the corridor.

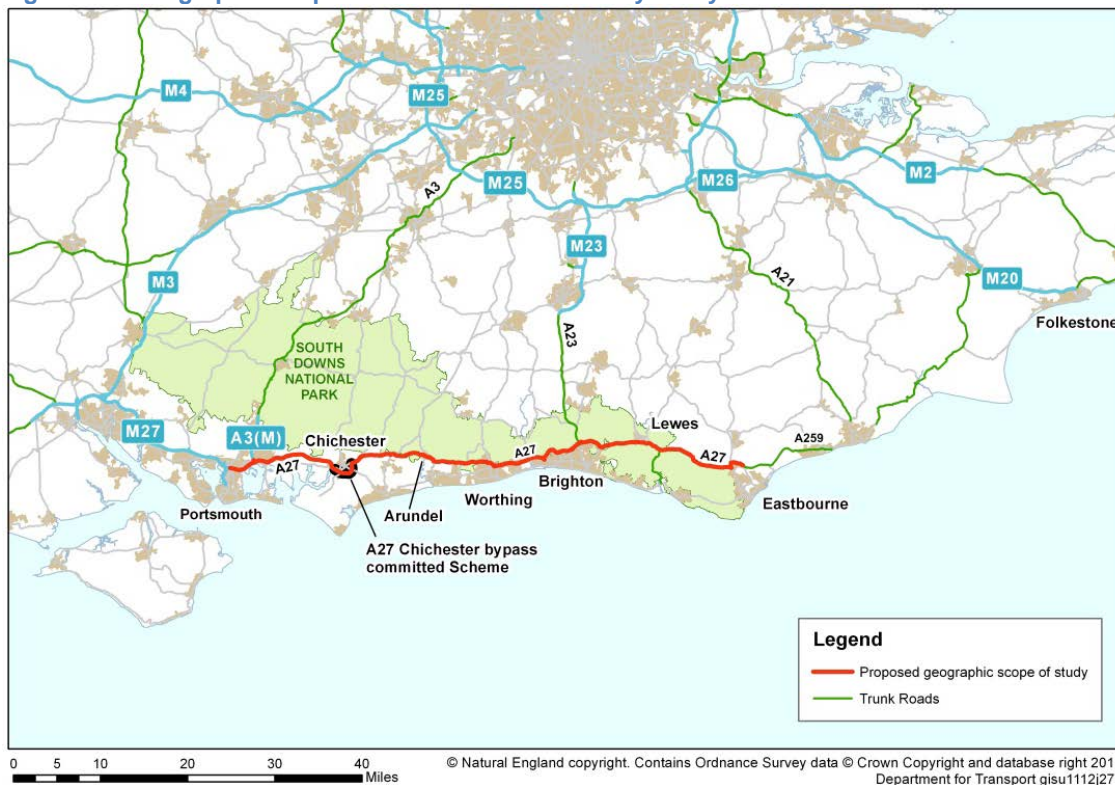
2.2.5 This study draws heavily on inputs from the South Coast Central Route Strategy as a basis for evidence collation, but has sourced information directly from other studies and projects that have been undertaken of the corridor, and the recent evidence provided by Local Authorities within the Local Economic Partnerships (LEPs) Strategic Economic Plans (SEPs).

²A27 Corridor Feasibility Study Scope Document, DfT, 23 April 2014.

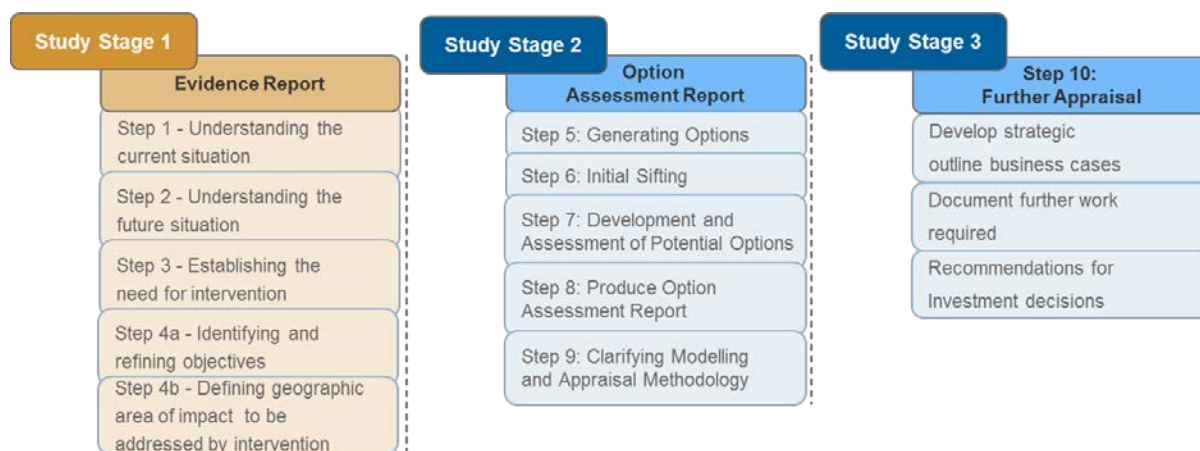
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/345568/a27-feasibility-study-scope.pdf

- 2.2.6 The purpose of the study was to inform investment planning in the SRN, and focussed on road-based solutions. However, in arriving at those solutions the analysis considered transport demand and capacity provision in the round, investigating alternative non-car-based modes.
- 2.2.7 Discussions have been held with Network Rail regarding their plans for the South Coast Rail infrastructure and with Southern (the Rail Services provider) regarding the potential for improvement to Coastway and other services between the Coast and London. In broad terms the potential impact of improved public transport and travel planning initiatives on A27 traffic demand was considered. However, specific issues or proposals in relation to other parts of the motorway or trunk road network in the immediate vicinity have not been considered. Instead, they are being considered as part of the Highways Agency's South Coast Central, M25 to Solent and Solent to Midlands Route Strategies.
- 2.2.8 The study considered the length of the A27, from its junction with the M27 in the west (between Cosham and Portsmouth), and its junction with the A259 at Pevensey in the east. A map of the geographical scope of the study is included at Figure 2-1.

Figure 2-1: Geographic scope of A27 Corridor Feasibility Study



2.2.9 This report is the first of three reports covering the Study Stages, as follows:



2.3 Stakeholder Engagement during Study

2.3.1 Stakeholder engagement has been a key aspect of the study process including for verifying the evidence base and for agreeing the intervention specific objectives. This engagement has been managed largely by means of a A27 SSRG. The main role of the Group has been to ensure stakeholders' views are captured and considered during the study process, particularly at key points in the study's work and at times of the development of key outputs. The establishment of the SSRG enabled the views of a wider community of stakeholder organisations to be considered and fed into the work of the A27 Corridor Feasibility study (in accordance with their Terms of Reference).

2.3.2 In total four separate Group meetings have been held throughout the duration of the study. Meetings have been held as detailed in Table 2-1.

Table 2-1: A27 Study Stakeholder Reference Group meetings

Meeting agenda	Date	Location
Detailing scope of study	Wednesday, 22nd January 2014	Brighton
Agreeing the intervention specific objectives	Tuesday, 3rd June 2014	Worthing
Initial sift of options	Wednesday, 27th August 2014	Eastbourne
Overview of emerging study outcomes	Tuesday, 4th February 2015	Brighton

2.3.3 In addition to the Group meetings, meetings were held with some individual members of the SSRG about information and tools (notably available modelling tools and data). Meetings were held with Network Rail and Southern Rail to discuss the current and planned rail network in the study area.

2.3.4 The study team have received a number of items of direct correspondence from stakeholders, amounting to approximately 150 separate pieces of communication received at the time of writing.

2.4 Purpose and Content of this Report

2.4.1 This report forms the first part of a suite of documents setting out the results of each stage of the A27 Corridor Feasibility Study:

• **Study Stage 1: Evidence Report, describing the review of evidence and identification of problems along the A27 corridor;**

• Study Stage 2: Option Assessment Report, describing work to finalise the range of infrastructure proposals that could address the problems along the corridor at the priority locations identified; and

• Study Stage 3: Investment Cases, describing the work to assess the affordability, value for money and deliverability of prioritised infrastructure proposals.

2.4.2 This report documents the evidence base relative to current and predicted future performance of the A27 corridor, taking account of planned developments and planned improvements to the surrounding transport networks.

2.4.3 The report then explains and documents the need for intervention and uses this information to refine the objectives and scope of the study work. The current and future issues identified have been used to define a series of intervention specific objectives which address reliability, environmental and economic concerns.

2.4.4 The technical content and conclusions set out in this report were completed prior to and formed part of the input to the Road Investment Strategy (RIS) announced in December 2014.

3 BACKGROUND AND HISTORICAL WORK

This chapter provides information on the A27 corridor, previous studies about the A27 corridor, and considers how they inform this A27 Corridor Feasibility Study. The chapter discusses the transport modelling tools available and their relevance for this study.

3.1 Overview of Previous Studies and Scheme Decisions

3.1.1 The study considered historical studies and reports along with Census data, recent reports and evidence gathered as part of the Route Strategy stakeholder liaison for the South Coast Central, M25 to Solent and Solent to Midlands areas.

3.1.2 The SoCoMMS (South Coast Multimodal Study) of 2001/2, one of the DfT's programme of multi-modal studies, has been a particularly relevant source for the study, providing a basis for an assessment of past travel demands and examining changes since then.

3.1.3 In addition, reflecting the HA and DfT's long term history of involvement in the A27 corridor, there have historically been a number of other relevant studies and schemes designed for proposals at Chichester, Worthing, Arundel and on the corridor to the east of Lewes.

3.1.4 Over the years a number of proposals have either been rejected or postponed due to funding constraints and / or because of the sensitivities associated with their delivery. For example, in 1985 the DfT/HA undertook analysis in support of an Arundel bypass. Formal public consultation for the bypass took place, and in July 1993 the DfT issued a Preferred Route Statement for a route popularly known as the 'Pink-Blue' route. It was confirmed, however, that the start of construction would depend on the completion of statutory procedures and the availability of funds. In December 1996 the Arundel Bypass project was included in the DfT's main roads programme, to be implemented when funding became available. However, following the change of Government in 1997, the scheme was removed from the programme and remitted for further review. Since then, whilst it has remained as a high priority District, County and Regional aspiration, it has never qualified for the allocation of the funds available for road transport improvements.

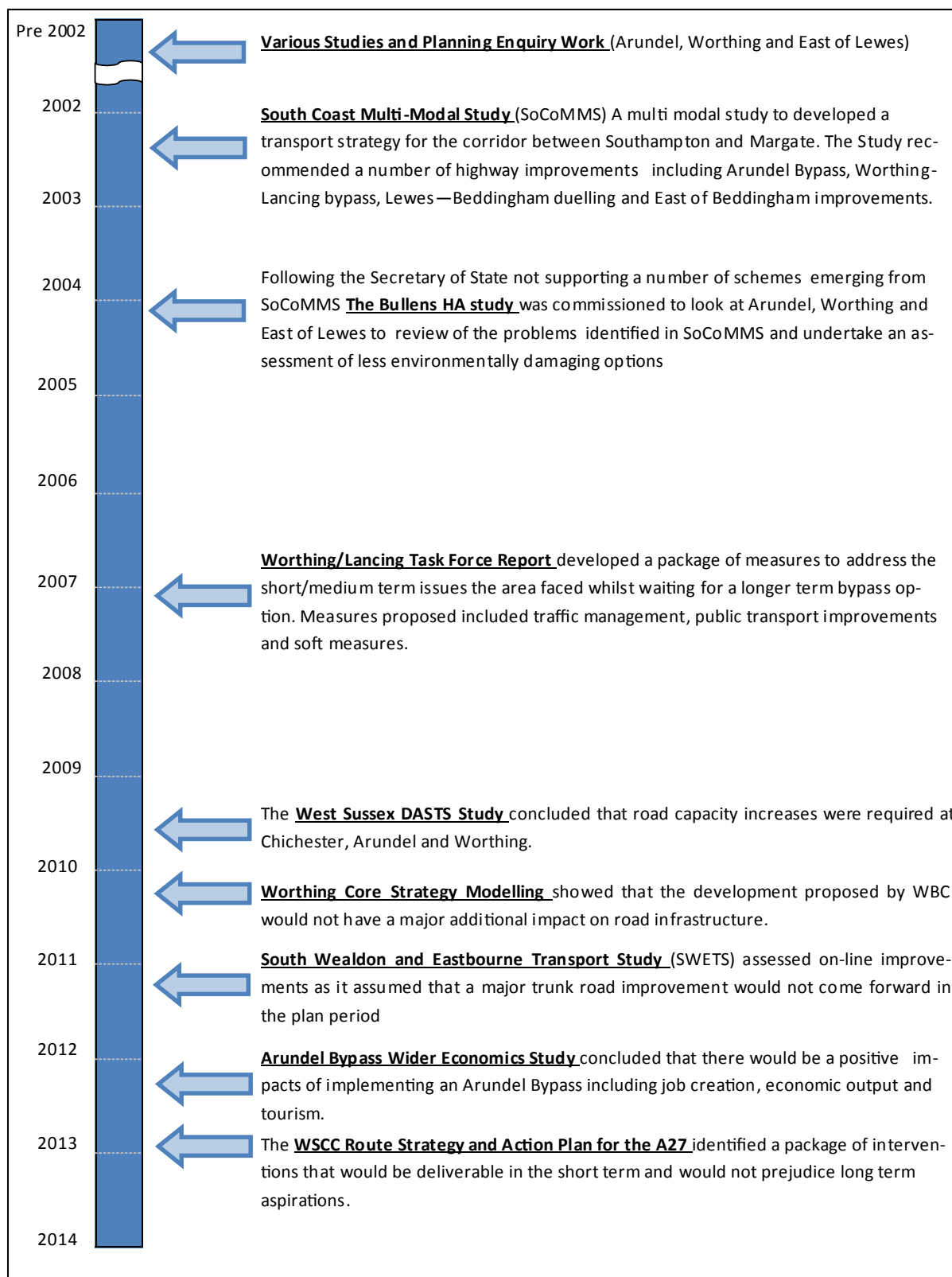
3.1.5 Similarly, previous schemes at a number of the priority locations identified for analysis in this study have reached various stages of development but not proceeded with.

3.1.6 The relevant timelines for the various studies which informed the analysis in this report are as outlined in Figure 3-1. Further information on the studies and their respective outcomes is provided in the sections that follow.

3.2 The South Coast Multi Modal Study (SoCoMMS)

3.2.1 The South Coast Multi Modal Study (SoCoMMS) formed a part of the DfT's programme of Multi Modal studies. These multi modal studies were undertaken as a part of the 'New Deal for Trunk Roads in England' White Paper (Department for the Environment, Transport and the Regions [DETR], July 1998). The SoCoMMS study was to develop a transport strategy to address congestion, safety and environmental problems and support regeneration and economic growth.

Figure 3-1: Timeline for past studies



- 3.2.2 The SoCoMMS recommendations included enhancements to the Strategic Road Network (SRN) to tackle congestion alongside measures to improve access to ports and airports, public transport, and to manage future growth in travel demand alongside balanced choices for transport users. SoCoMMS outputs provided a framework for considering future transport investment decisions in the study area.
- 3.2.3 Full details of the study and its recommendations can be found at <http://www.socomms.org.uk>.

Government response to SoComms - Supported Recommendations

- 3.2.4 In responding to the SoCoMMS recommendations the Secretary of State⁴ announced an intention to take forward a number of trunk road improvements. These included:
- M27 technology improvements;
 - Small scale improvements to the A27 between Worthing and Lancing; and
 - A21 Lamberhurst bypass.
- 3.2.5 He supported the inclusion of the A21 Tonbridge to Pembury scheme in the Targeted Programme of Improvement and confirmed support for the M27 widening between junctions 3 and 4, climbing lane between junctions 11 and 12, junction improvements and introduction of improved technology on this section of road.
- 3.2.6 The study recommended through-rail service improvements from Brighton to Ashford which were implemented, as was an improvement to track layout to allow passing trains at Barnham.

Outcomes from SoCoMMS – Unsupported Recommendations

- 3.2.7 Crucially, the Secretary of State did not support the following schemes on the A27:
- improvements through Worthing and Lancing in the form of a tunnel or tunnels;
 - a bypass of Arundel; and
 - bypasses of Selmeston and Wilmington.
- 3.2.8 It was noted that “*each of these schemes would have significant environmental impacts.*” Table 3-1 shows the specific issues raised:

Table 3-1: Environmental Concerns

SoCoMMS scheme proposal	Reason for rejection
Improvements through Worthing and Lancing in the form of a tunnel or tunnels	A tunnel at Worthing would impact on important groundwater sources and have a very high cost.
Chichester bypass improvements	Improvements to the Chichester bypass would impact on a number of aspects of the local environment.
Bypass of Arundel	A bypass of Arundel would have negative impacts on heritage and landscape as well as the water environment.
Bypasses of Selmeston and Wilmington	Bypasses at Selmeston and Wilmington were identified as adversely impacting on the Sussex Downs Area of Outstanding Natural Beauty and surrounding landscape and biodiversity.

⁴ SECRETARY OF STATE’S RESPONSE TO SOUTH COAST MULTIMODAL STUDY, 9 JULY 2003, DfT

3.2.9 The Secretary of State therefore asked the HA to work with local authorities and statutory environmental bodies to identify less damaging options, including management measures which reduce the need for major road construction, and to report back to him.

3.2.10 The HA was directed to review safety and other local issues along the corridor in the light of its South Coast Route Management Strategy, and, where necessary, bring forward appropriate remedial measures and to work with local authorities and statutory environmental bodies to identify less damaging options.

Further Outcomes from SoCoMMS

3.2.11 Other proposals for the A27 corridor that are not so reliant on major schemes were tested within SoCoMMS. These measures which had the potential to reduce the need for major road improvements included the following:

- **Tolling Motorways and Trunk Roads**, Localised road pricing / tolling on its own was rejected by SoCoMMS. Tolling was potentially seen as encouraging *“car users to use the non-motorway/ trunk road network as an alternative”* resulting in:
 - *“Congestion on the non-motorway/trunk road network*
 - *Increasing the overall number of road accidents, because more traffic will be using the unsuitable roads; and*
 - *Potentially creating air pollution and traffic noise impacts within sensitive urban areas and in tranquil rural areas.”*
- **Area wide road pricing** was also rejected in SoCoMMS because of the *“lack of alternative modes”* for the majority of trips. The approach was seen as also having implications for economic efficiency and wider regeneration benefits.
- **Improving Public Transport** on its own was rejected as an option. SoCoMMS noted that *“Whilst this approach can be successful in increasing the use of bus and rail services, it will have limited effect on the overall use of private vehicles within the corridor.”*
- **Soft Measures:** SoCoMMS also assessed the possible impact ‘soft measures’ including behavioural change and non-motorised transport modes might have on the corridor. For the A27, it found that unlike many of the other multi-modal studies, sections of the ‘strategic corridor’ (A27) pass through urban areas, and thus the impact of school travel plans and walking and cycling has the potential to be important for local journeys. The report noted some ‘soft measures’ which could have material effects on travel demand. These included; tele-working, videoconferencing, workplace travel plans, public transport fares and ticketing, individualised marketing campaigns, public transport fares and bus quality partnerships. Significantly, however, these interventions were all identified as not being sufficient to meet the demands for road based travel forecast in this corridor.

3.2.12 On their own, these options were not seen as having the potential to tackle many of the congestion ‘hot spots’.

Potential for modal transfer along the corridor

3.2.13 The SoCoMMS study identified that less than 12% of all motorised trips are by public transport with this identified as reflecting a steady decline over several decades fuelled by an increasingly dispersed land-use pattern, poor interchanges and a lack of modal integration. The study also found that there was limited scope for significant modal

transfer along the corridor and that improving public transport on its own; whilst it may successfully increase the use of bus and rail services, it will, however, have limited effect on the overall use of private vehicles within the corridor. Improving public transport, on its own, is not an effective approach to tackling many of the congestion 'hot spots'.

3.3 Further studies following SoCoMMS

HA / Bullen Studies

3.3.1 Following on from SoCoMMS, the HA commissioned Bullen Consultants to undertake a review of the problem areas identified in SoCoMMS, specifically at Arundel and Worthing/Lancing and Beddingham to Polegate. This work included an assessment of other less environmentally damaging options than those proposed by SoCoMMS. The review reported on the engineering, environmental, traffic and economic impacts of these options, and recommended the following options for further investigation:

Arundel Improvement Options:

- Bypass around Tortington Common and Lake Copse (offline dualling)
- Flyover Ford Road roundabout (online dualling)
- At grade junction at Ford Road roundabout (online dualling)
- 200m-300m tunnel west of Ford Road roundabout (online dualling)

Worthing Improvement Options:

- Salvington - Traffic Signal Junction with widened 2 lane approaches.
- Offington - Grade separation (flyover)
- Grove Lodge - Grade separation (underpass)
- Lyons Way - Improved signalisation and widened 3 lane approaches
- Bustical Lane - Improve signalisation and widened 3 lane approaches
- Manor Road - Signalisation of the nodes and widening of entries

Beddingham to Polegate Improvement Options:

- Northern bypass east of Middle Farm and/or Southern bypass of Selmeston
- Link from Cophall to A27 west of Folkington road, including grade separation at Cophall and roundabout where re-joining A27.
- Improvements to local access junctions between Beddingham and Polegate and minor widening.
- The report stated that a combination of the Selmeston Bypass, Folkington Link and minor widening/junction improvements provided a coherent strategy for the A27 between Beddingham and Polegate.

Worthing / Lancing Task Force Group (2007)

3.3.2 Following Bullen Consultants' work, Parsons Brinckerhoff was commissioned by the HA to take forward the Worthing and Adur Strategic Transport Model (WASTM) and strategy development study. This considered less environmentally damaging options for addressing identified problems whilst facilitating the required growth and development forecasts within the target areas..

3.3.3 The WASTM study set out a package of highway improvement measures that could be taken forward alongside public transport and travel demand management measures. The HA and WSCC did not, however, progress any of these measures following the study.

Worthing Core Strategy Modelling (2010)

- 3.3.4 Parsons Brinckerhoff were commissioned by Worthing Borough Council (WBC) to determine the broad highway impacts of their proposed 'Core Strategy'. This work showed that the development proposed in the Core Strategy (2011) would not have a major additional impact on the road infrastructure in Worthing and the surrounding area. The developments were considered to be of sufficiently small scale to the extent that their localised impacts could be addressed through the 'Transport Assessment' process and local road network improvements.

DaSTS Studies (2010)

- 3.3.5 A number of additional corridor-based studies have been undertaken in West Sussex. Most notable these include the Delivering a Sustainable Transport System (DaSTS) studies for West Sussex Coast and Gatwick Diamond.

- **West Sussex Coast DaSTS conclusions:** Option 4 (Low Infrastructure) identified as the preferred option out of 7 considered. This option includes integrated demand management measures and committed investment (Chichester package including A27 improvements, Coastal Transport System - Worthing to Brighton, Bognor Regis Relief Road) and combines these with targeted investment in the SRN to address specific bottlenecks. This included online improvements on the A27 at both Arundel and Worthing, localised road improvements at Littlehampton and Crossbush and an extension of the bus-based Coastal Transport System to Littlehampton, Bognor Regis and Chichester.
- **Gatwick Diamond DaSTS conclusions:** Four options identified and all four recommended for further study, which included non-transport measures, transport management & policy, investment in sustainable transport at regional hubs, improved cross-study road and PT links, and improved strategic links.

South Wealden and Eastbourne Transport Study (SWETS) (2010)

- 3.3.6 The South Wealden and Eastbourne Transport Study (SWETS)⁵, completed in 2010 to support the emerging Wealden Core Strategy, assessed online improvements under the assumption that a major trunk road improvement would not come forward during the plan period.

- 3.3.7 SWETS concluded that the following A27 junction improvements would be necessary:
- provision of a west to north filter lane at the A27/A22/A2270 signal junction and improvements to the geometry of the junction including the A27 approaches;
 - signalisation of the A22/A27 roundabout at Cophall and improvements to the geometry of the entry and exit roads;
 - improvements to the geometry of the entry and exit roads at the A27/A22 New Route roundabout; and
 - improvements to the geometry of the entry and exit roads at the A27/A259 roundabout.

⁵ Report by East Sussex County Council for Wealden District Council and Eastbourne Borough Council, based on technical reports by Transport Planning (International) Ltd. (November 2010)

- 3.3.8 The online improvements have since been developed and costed as part of the 2012/13 Polegate Movement and Access Strategy, undertaken for East Sussex County Council by Halcrow Group Ltd in November 2013.

Arundel Bypass Wider Economics Study (2013)

- 3.3.9 For Arundel a working group, comprising Arundel District Council, Horsham District Council and West Sussex County Council, commissioned Parsons Brinckerhoff to undertake a preliminary assessment of the wider economic impacts of building the Arundel Bypass in West Sussex. This work undertook the following:

- review of current or 'baseline' economic characteristics of the area;
- review of all previous 'transport economics' appraisals;
- 'business survey' of various local companies (330 responses received); and
- initial 'economic impact' analysis in terms of impacts on GVA, employment, tourism and employment-related financial benefits to Government.

WSCC Route Study and Action Plan for the A27 (2013)

- 3.3.10 A further A27 study has since been conducted by Atkins on behalf of WSCC. This work was required to identify packages of small-scale interventions that would be deliverable in the short term. The scope of work identified that these interventions should be affordable and achievable and should not prejudice longer term aspirations for the routes (considered at this stage to be the Chichester fly-overs, Arundel By-pass and Worthing by-pass). Schemes were therefore mainly focussed on online junction improvements.
- 3.3.11 WSCC did not progress the Action Plan as Government announced new plans to upgrade Chichester Bypass and complete an A27 corridor study in its June 2013 Spending Review.

3.4 Availability and Robustness of Transport Modelling

- 3.4.1 The available local and strategic transport models, available for use in the assessment of the A27 corridor by the HA and local highway authorities, were identified and reviewed for their suitability. There are a number of traffic models which have historically been used in support of core strategy / local plan development by local planning authorities along the corridor. Table 3-2 provides a summary of the main models and their relevance to the study.
- 3.4.2 The study team worked closely with key stakeholders at WSCC and ESCC in order to maximise the effectiveness of using existing models in support of the study. Available count data and/or origin-destination survey data from existing sources was identified for use where applicable in Study Stage 3.

Table 3-2: Summary of available transport models and their relevance

Model and Validation Year	Type	Extent	Relevance for use in assessing potential options as part of A27 Corridor Feasibility Study
SoCoMMs Strategic Model – year 2000 validation	EMM E/2	Corridor Wide	Provides a summary of basic demand data and allows an assessment of A27 corridor relative to wider demand considerations
SoCoMMS local Models – various assessment years -1999-2000	Mainly SATURN	Local models for Arundel, Worthing, Chichester, Hastings and East Of Lewes	Provide base models for re-creating scheme analysis. Historically used in Bullen's assessment work
West Sussex County Model (2009 validation with 2003 O-D data)	TRIPS – multi modal	County Wide	Potential basis for assessing A27 corridor as a whole while enabling a more detailed assessment of specific schemes and their interactions in the corridor
Chichester Area Transport Model (CATM) - 2009	SATURN / CUBE	Chichester and environs.	Enables a localised assessment around Chichester Arundel area
South Wealden and Eastbourne Transport Study (SWETS) - 2010	Multi-modal transport model, SATURN / CUBE	Wealden and Chichester Environs	A tool for assessing schemes in the eastern end of the corridor

4 STEP 1: UNDERSTANDING THE CURRENT SITUATION

This chapter of the report considers *Step 1 – Understanding the Current Situation* of DfT's Transport Analysis guidance and covers the following:

- Policy context;
- Current travel demand;
- Provision of public transport; and
- Route performance.

4.1 Relevant policies – National Policy

- 4.1.1 The national policy statements outlined below were the most relevant during the course of the A27 study. Some of the documents referred to in this stage of the study were superseded by the publication of the Road Investment Strategy⁶ and the finalised National Network National Policy Statement in December 2014.
- 4.1.2 **Action For Roads: A Network for the 21st Century (2013)**⁷ set out the priorities for the future on Britain's road network. Emphasis is placed in the document on providing a network which can support efficiency, innovation, inward investment, competition, accessibility to labour markets, and trade and agglomeration effects.
- 4.1.3 Paragraph 2.8 of the document states that *"Some strategic roads, including some of the most notorious hot-spots in the country, have long been recognised as being in need of a comprehensive solution. We will identify and fund feasibility studies looking at problems on the A303 to the South West, the A27 on the south coast, the A1 north of Newcastle, A1 Newcastle-Gateshead Western bypass and trans-Pennine routes between Sheffield and Manchester. These will spotlight these routes for the capital investment needed to fix longstanding problems."*
- 4.1.4 The **National Policy Statement for National Networks⁸ (NPS)** sets out the Government's vision and policy for the future development of nationally significant infrastructure projects on the national road and rail networks. Within the draft NPS the Government's vision and strategic objectives for the National Networks were set out as; *"The Government will deliver national networks that meet the country's long term needs; supporting a prosperous and competitive economy and improving overall quality of life as part of a wider transport system."*
- 4.1.5 The NPS included policies relevant to future development proposed within nationally designated areas, stating in paragraph 5.136 that *"Great weight should be given to conserving landscape and scenic beauty in nationally designated areas. National Parks, the Broads and Areas of Outstanding Natural Beauty have the highest status of protection in relation to landscape and scenic beauty."*

⁶ <https://www.gov.uk/government/collections/road-investment-strategy>

⁷ Action for Roads - A network for the 21st century, July 2013, Department for Transport
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/212590/action-for-roads.pdf

⁸ Department for Transport, National Policy Statement for National Networks (NPS), December 2013.
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/263720/consultation-document-draft-national-policy-statement.pdf

- 4.1.6 In addition the **National Planning Policy Framework⁹ (NPPF)** sets out government's planning policies for England and how these are expected to be applied. This states (paragraph 14) that *"At the heart of the National Planning Policy Framework is a presumption in favour of sustainable development, which should be seen as a golden thread running through both plan-making and decision-making."*

Consideration of such applications should include:

- an assessment of: the need for the development, including in terms of any national considerations, and the impact of permitting it, or refusing it, upon the local economy;
- the cost of, and scope for, developing elsewhere outside the designated area, or meeting the need for it in some other way;
- consideration of *"areas of special designation such as National Parks"*; and
- any detrimental effect on the environment, the landscape and recreational opportunities, and the extent to which that could be moderated.

- 4.1.7 The **SRN performance specification 2013-15¹⁰** outlined the high-level performance outcomes, outputs and specific requirements that the Government wanted to secure for the SRN and the HA, as network operator, by 2015. This document contained five outcomes under which were listed the key outputs and some specific requirements which the Government wanted the network operator to deliver in order to contribute towards achievement of those outcomes. The five outcomes were:

- A SRN which supports and facilitates economic growth;
- A SRN which is maintained to a safe and serviceable condition;
- An efficiently and effectively operated SRN;
- A SRN which minimises its negative impacts on users, local communities and the environment; and
- A SRN which balances the needs of individuals and businesses that use and rely on it.

4.2 Subnational Policy and Perspectives

- 4.2.1 An assessment of subnational policy is relevant and is focused primarily around a review of the recently submitted Local Enterprise Partnerships (LEPs) Strategic Economic Plans (SEPs).

- 4.2.2 The Coast to Capital Local Enterprise Partnership (C2CLEP) Strategic Economic Plan¹¹ SEP and the South East Local Enterprise Partnership (SELEP) Strategic Economic Plan SEP cover the majority of the A27 corridor. The Coast to Capital SEP covers the A27 to the west of the A23 and the South East SEP covers the A27 to the

⁹ Department for Communities and Local Government, National Planning Policy Framework (NPPF), March 2012. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/6077/2116950.pdf

¹⁰ Department for Transport, Strategic road network performance specification 2013-15, April 2013. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/185684/performance-specification-2013-15.pdf

¹¹ Coast to Capital (C2C) Local Enterprise Partnership, Strategic Economic Plan (SEP), March 2014. <http://www.coast2capital.org.uk/strategic-objectives/strategic-economic-plan>

east of the A23. Each SEP identifies the key objectives that transport interventions can help to achieve.

South East LEP Strategic Economic Plan

- 4.2.3 The SELEP SEP includes the information that “*Business has identified the A27 as a barrier to growth*” and “*upgrading the A27 between Eastbourne and Lewes to address these constraints is vitally important to improving connectivity to A23/M23, Gatwick Airport and London and supporting businesses and housing growth plans in the Eastbourne- South Wealden growth corridor.*”

The Coast to Capital Strategic Economic Plan

- 4.2.4 Within the C2C SEP further detail is provided on the ambition of investment potential of ‘The Coastal Corridor’. It states “*The Coastal Corridor is identified as having excellent development and regeneration opportunities that could transform the area’s economy and provide significant new jobs and homes. The largest of these are Shoreham Harbour and Enterprise Bognor Regis. Significant development opportunities exist in Worthing and Littlehampton.*”

- 4.2.5 With reference to the A27 the C2C SEP states “*Growth in the Coastal Corridor continues to be constrained by performance of the A27 which is the only major east-west road along the coast providing connections between a string of priority business locations in Brighton, Shoreham, Worthing, Littlehampton and Bognor Regis. Without fail, every consultation with businesses has brought up investment in A27 improvements as a top priority for growth.*”

- 4.2.6 Additionally issues cited by the C2CLEP Strategic Economic Plan SEP include:

- Peak hour congestion at bottlenecks at Chichester, Arundel, Worthing and Lancing;
- Unreliable journey times caused by congestion, poor resilience and very slow recovery from any incident;
- Inadequate capacity acts as a constraint to growth;
- Conflicts between strategic and local traffic movements making end to end journeys unattractive;
- Severance where the route bisects employment and housing areas; and
- Perceived and actual transport problems act as a deterrent to investment and creating issues for planning consents.

Impact on Business in the A27 Corridor

- 4.2.7 A survey of businesses in Arundel in 2012 revealed the following:

- 30% of firms said the A27 at Arundel was very important for their business, followed by 43% who said it was important;
- Journey time reliability was identified as a major problem by 60% of respondents, and a moderate problem by 35% of respondents. Journey times were less of a problem, although 51% still reported that they were a major problem, and 43% said they were a moderate problem. Only 5% of respondents said they did not have a problem with either journey time reliability or absolute journey times;

- 68% of business reported major disruption to business travel, followed by 63% who reported major disruption to both customer travel and staff travel;

4.2.8 A survey of Eastbourne Businesses on the suitability of the A27 in 2014 indicated that 62% of respondents said it increases business costs and 44% said they had lost customers as a result.

4.2.9 A survey of residents in Eastbourne undertaken at the same time found 61% of residents felt the existing A27 between Lewes and Eastbourne makes a significant negative impact on the prosperity of Eastbourne. Furthermore, 92% of residents felt the road was unsafe.

4.3 Policy Support for Behavioural Change Measures

4.3.1 It is worth noting that the LEPS and local authorities in the area are supportive of other initiatives, particularly behavioural change and sustainability. Behavioural change measures include providing improved information to the travelling public.

4.3.2 Both the West and East Sussex transport plans provide suggestions for behavioural change initiatives which aim to reduce the amount of car use.

4.3.3 Within the West Sussex Local Transport Plan 2011-2026 (LTP3)¹², a list of initiatives are suggested to encourage behavioural change:

- Using school travel planning to coordinate a range of behaviour change activities, skills training and investment priorities to encourage physically active travel behaviour in young people;
- Introducing or supporting innovative behaviour change initiatives such as Bikeit and Easit where there are clear benefits and funding is available; and
- Promoting walking and cycling through school and workplace travel plans and through promotion of national events, walking buses, bike week and Travelwise week.

4.3.4 Within the East Sussex Local Transport Plan 3 (2011-2026)¹³ the following initiatives are listed:

- Promoting our Travelchoice brand, the wider health benefits and CO₂ reduction benefits of walking, cycling, public transport and car sharing to change people's travel behaviour by:
 - Better travel information;
 - School travel planning;
 - Voluntary and development led workplace travel plans;
 - Travel awareness campaigns and promotions;
 - Car sharing, and
 - Car clubs.

¹²http://www.westsussex.gov.uk/your_council/plans_projects_reports_and/plans/west_sussex_transport_plan/5_provisio_nal_west_sussex.aspx#ltp3

¹³ <http://www.eastsussex.gov.uk/roadsandtransport/localtransportplan/default.htm>

- Deliver targeted behaviour change measures in communities to support the promotion of new sustainable transport schemes; and
- Consider how the introduction of transport schemes can support or 'nudge' communities into using more sustainable modes of travel.

4.4 Current Conditions along the A27 – Environmental Considerations

4.4.1 The study identified a range of environmental constraints. The route passes along and through the South Downs National Park and north of the coastal floodplains of the River Arun and River Adur. The following environmental designations within 500m of the alignment were identified:

- Air Quality – Air Quality Management Areas (AQMA)¹⁴.
- Water Environment – Flood risk areas, Source Protection Zones and aquifers.
- Cultural Heritage – World Heritage Sites, Listed Buildings, Scheduled Monuments and Historic Parks and Gardens.
- Geology and Soils – Underlying geology and Best and Most Versatile (BMV) agricultural land¹⁵.

4.4.2 Traffic and congestion have a direct effect upon air quality. There is currently an AQMA along the A27 in Worthing (centred on the Grove Lodge junction), and at Storrington along the A283, which is affected by traffic re-routing off the A27 in order to bypass Arundel and Worthing.

4.4.3 The following environmental designations within 1km of the alignment were identified:

- Ecology – Ramsar Sites, Special Areas of Conservation (SACs), Special Protection Areas (SPAs), Sites of Special Scientific Interest (SSSIs), National Nature Reserves (NNRs), and Local Nature Reserves (LNRs).
- Landscape – National Parks and Areas of Outstanding Natural Beauty.

4.5 Current Travel Conditions along the A27 – Travel Demand

Travel demand – Trip Distribution

4.5.1 The SoCoMMS and DaSTS studies had identified that a large proportion of trips made on the A27 are local trips, with two thirds of trips within the corridor being made entirely within a single county area (e.g. car journeys within West Sussex)..

4.5.2 As part of this study the distribution of journey to work trips from the 2001 and 2011 Census data was reviewed for Chichester, Arun, Adur, Worthing and Brighton and Hove, which found that the distribution of trips had not changed significantly between 2001 and 2011. In 2011, 72% of trips made had origins and destinations within these districts (i.e. within the A27 corridor), a decrease of 4% from 2001.

¹⁴ Local Authorities are required by law to designate Air Quality Management Areas (AQMAs) in locations where air pollution exceeds the air quality objectives.

¹⁵ The Agricultural Land Classification (ALC) system classifies agricultural land in five categories according to versatility and suitability for growing crops. The top three grades, Grade 1, 2 and 3a, are referred to as the 'Best and Most Versatile' (BMV) land. Grade 3a and 3b are not differentiated on the ALC maps, so only Grade 1 and 2 land has been considered to be BMV land.

4.5.3 The conclusion from this review was that the pattern of journeys to work has not significantly changed from 2001 to 2011, and that the findings as part of the SoCoMMS study were still applicable.

Travel demand – Mode Choice

4.5.4 An indicator of travel demands and patterns in travel for various modes can be accessed through Method of Travel to Work Census Data. A comparison was made between 2001 census data and 2011 census data for districts in both East Sussex and West Sussex. This data is displayed in Figure 4-2 and Figure 4-3.

Figure 4-1: Method of Travel to Work 2001 & 2011 Census % Comparison

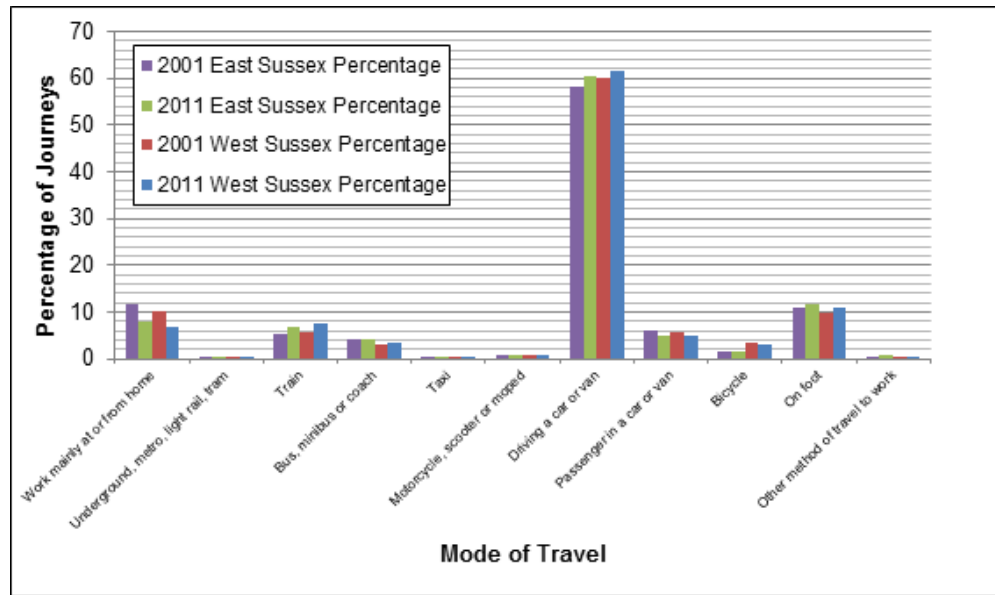
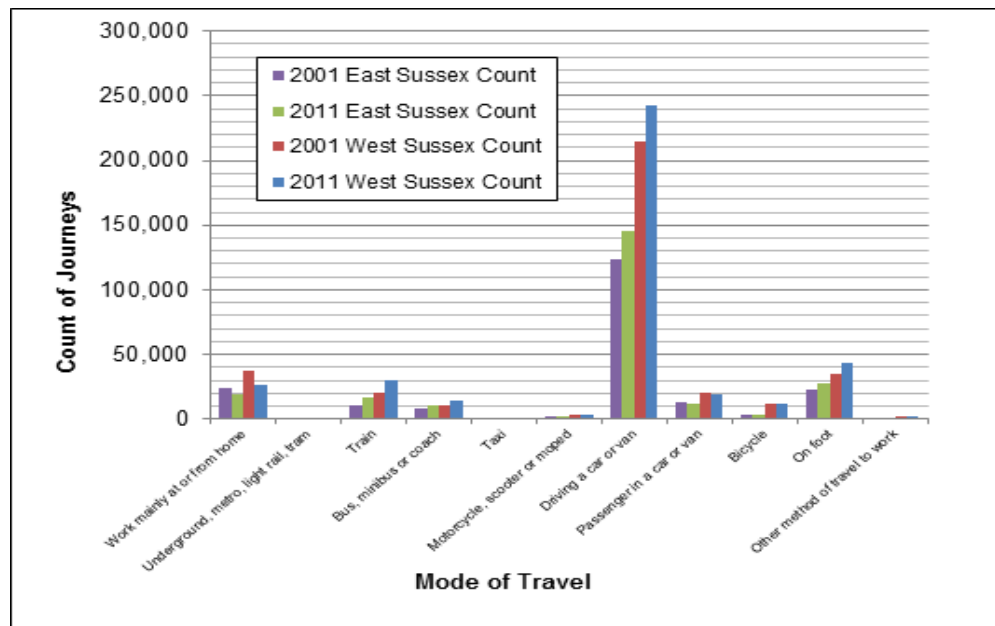


Figure 4-2: Method of Travel to Work 2001 & 2011 Census Comparison



- 4.5.5 The data shows that the proportion of journeys made by each mode have not changed significantly between 2001 and 2011. The highest proportion of journeys are made by car with a 60% average share across East and West Sussex. There has been an increase in journeys made between 2001 and 2011, with the largest increase in car use (a 2.3% increase in car use in East Sussex and a 1.5% increase in West Sussex).
- 4.5.6 The count of journeys made using public transport, and their mode share, have increased between 2001 and 2011. In East and West Sussex, bus use has grown by 7% and 24% respectively. However, in absolute terms, the number of journeys made using public transport remains low as a proportion of the total travel demand.
- 4.5.7 Train and bus mode share is less than 10% in East and West Sussex, with a larger proportion (10-15%) of journeys to work made by walking or cycling. There is a significant contrast in cycling rates between the key urban conurbations along the A27. For instance, in Worthing the proportion of residents cycling to work is high at 5.46% compared to Arundel which has 2.04% of residents cycling to work. This can be attributed to various factors, including the level of connectivity and local topography.

4.6 Current Travel Provision along the A27

Travel Provision – Highway Network (Car and Heavy Goods Vehicles)

- 4.6.1 **Current Provision:** The highway network along the A27 consists of dual carriageway for the majority of its 67 mile length, with the exception of single carriageway sections through Arundel, Worthing and Lancing, and between Lewes and Polegate. Along these single carriageway sections there are at-grade junctions with limited capacity at Ford Road Roundabout, Crossbush Junction, Offington Corner and Grove Lodge Roundabout providing access onto the local road network.
- 4.6.2 There is very little room for alternative routes / locations for transport infrastructure due to the constraints of urban areas, the coast to the south and the presence of the South Downs Park to the north of the coastal plain. The number of suitable north-south routes are restricted to the A24/A264 (County Road) and the M23/A23 SRN. Less suitable north-south routes are the A22 (County Road) an all-purpose single carriageway road and the A21 (SRN) to the north of Hastings which has a sinuous single carriageway route within its East Sussex section.
- 4.6.3 If the A27 is not available due to incidents or maintenance closures, the alternative coastal A259 has little extra capacity to absorb additional traffic and runs mainly through built up areas in West Sussex, the centre of Brighton and Coastal communities and towns in East Sussex. Traffic does have the choice to seek alternative routes through the South Downs National Park but some roads are not suitable for heavy traffic and the use of many routes through the Downs is not compatible with the objectives of the National Park.

Travel Provision – Public Transport (Rail)

- 4.6.4 **Current Provision:** In addition to services between the coast (Southampton, Portsmouth, Bognor Regis, Littlehampton, Eastbourne) and London, the pattern of rail services along the A27 corridor consists of two primary coastal services:
- West Coastway (Southampton-Fareham-Havant-Worthing-Hove-Brighton); and
 - East Coastway (Brighton-Eastbourne-Hastings).

- 4.6.5 In addition, there are secondary services linking:
- Portsmouth to Brighton;
 - Southampton to Portsmouth;
 - Bognor Regis to Littlehampton; and
 - Littlehampton to Newhaven/ Seaford.
- 4.6.6 Most East and West Coastway services are relatively slow, catering for local stopping stations, thus providing good rail accessibility for shorter journeys but lengthy journey times for longer distance journeys. In contrast, services between the coast and London are fast services and connect with Gatwick Airport and larger towns en route.
- 4.6.7 The Route Strategy Evidence Report noted that that the rail system operates reasonably efficiently with frequent service, and a good density of stations, on a route which parallels much of the A27 corridor. Though some peak hour congestion exists on the rail corridor, outside of the peak hour there is generally sufficient capacity available, and good links exist for north-south services to London from Portsmouth, Bognor Regis, Littlehampton, Eastbourne and Brighton.

Travel Provision – Public Transport (Bus)

- 4.6.8 **Current Provision:** The bus services which operate along the south coast corridor generally are considered to be adequate, if basic, in terms of service provision. Local services, some long-distance, extend along the corridor via the A259 and some local services use sections of the A27 for part of their route. Specialist local services and park-and-ride and community buses provide limited weekend and evening services.

Travel Provision - Non-Motorised Users (pedestrian/cyclist/motorcyclist/horse rider)

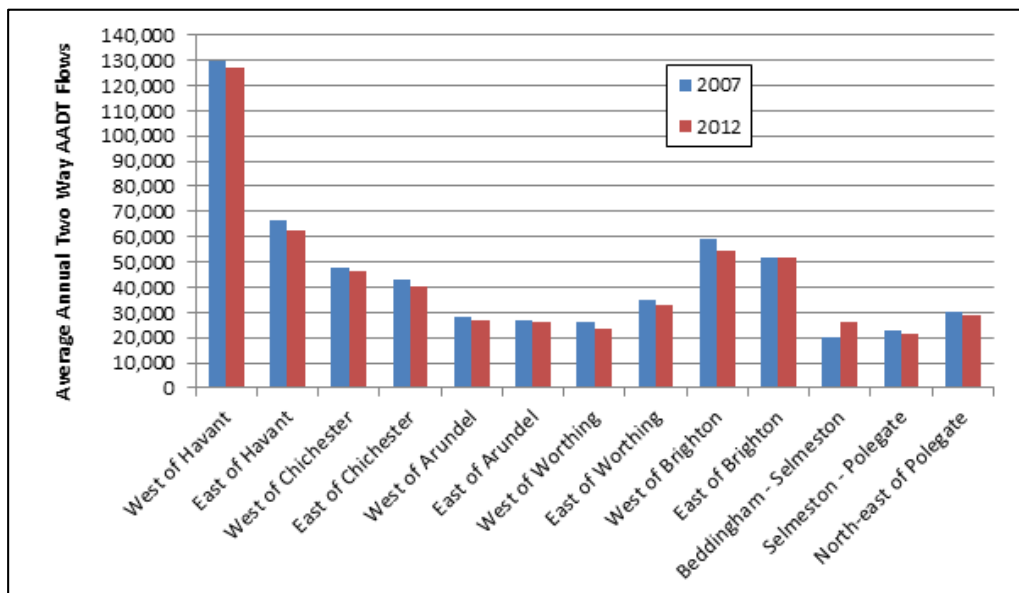
- 4.6.9 **Provision - Cycling:** There are a number of local cycle routes which cross the A27. These include the Tangmere to Chichester Cycle Route, Bognor Regis to Chichester Cycle Route and routes within Worthing. National Cycle Network 2 is a long distance cycle route which, when complete, will link Dover in Kent with St. Austell in Cornwall via the south coast of England. The route crosses the A27 east of Chichester at the Bognor Road Roundabout (via a footbridge); it goes under the A27 west of the city at Fishbourne, and crosses the A27 at Alfriston and Pevensy.
- 4.6.10 **Provision - Walking:** The South Downs Way walking trail is a 160 kilometre long National Trail that follows the chalk escarpment and ridges of the South Downs. This historic trail runs from Winchester in Hampshire to Eastbourne in East Sussex crossing the A27 at grade to the west of Lewes and allows cyclists, horses and walkers to enjoy the countryside. Other long distance trails include The Arun Way (which runs through West Sussex from Littlehampton to Pulborough along the Lower Arun Valley) and Monarch's Way (which runs from Powick Bridge, Worcester to Shoreham-by-Sea, West Sussex).

4.7 Current Travel Conditions along the A27 – Traffic Volumes

- 4.7.1 Figure 4-3 shows the average annual daily traffic (AADT) volumes along the A27, which has been recorded by the HA. It shows that traffic volumes have generally decreased slightly along the corridor between 2007 and 2012. (Volumes have been shown for 2012 as these provide the most comprehensive comparison with 2007).

4.7.2 The average traffic volumes are close to or above the theoretical capacity of the road (a single carriageway is expected to accommodate AADT volumes up to 13,000 vehicles) along the single carriageway sections. For example, AADT volumes in 2013 were over 15,300 at Arundel, over 17,800 at Worthing and over 11,400 on the stretch between Lewes and Polegate.

Figure 4-3: Average Daily Traffic Volumes along the A27 (two-way)



4.7.3 Conversely, volumes on most sections of the dual carriageway along the A27 are within the theoretical road capacity (a dual carriageway can accommodate up to 39,000 AADT). For example, the link north of Shoreham had an AADT flow of around 25,400 in 2013.

4.7.4 The HGV percentages along the route have been sourced from HA traffic data records along the A27. The number of HGV as a proportion of all daily traffic typically ranged from 9 to 12%. The highest HGV percentages along the A27 occur on links in close proximity to Newhaven and the Cliff Industrial Estate in East Sussex.

4.7.5 Overall, goods vehicles represent more than 15% of the daily traffic volumes along A27.

4.8 Current Travel Conditions along the A27 – Journey Time Reliability

4.8.1 The On Time Reliability Measure (OTRM) provided by the HA gives some context to the roles of junctions along the corridor and their current performance. The OTRM monitors the percentage of journeys on the SRN that are 'on time'. This is assessed against a base level of time for the journey for different times of the day. The HA ranks the OTRM nationally out of 2,497 links across the whole SRN.

4.8.2 The 10 worst links along the A27 in terms of OTRM are detailed below in Table 4-1.

4.8.3 The latest published OTRM figures (Jan-Dec 2013) show that the percentage of journeys on time varies along the length of the route between 50 and 60% in the poorest sections. Other sections are slightly more reliable at between 60 and 70%, and the better performing sections operate at between 70 and 80%. The last quarter of 2013 showed a deteriorating performance of between 1 and 2%.

Table 4-1: Route Performance based on Journey Time Reliability

Road Link Description	On Time Reliability- Percentage Vehicle Miles On Time	On Time Reliability National Rank (out of 2497 road links countrywide) Rank 1 has lowest reliability
A27 between A2025 and A283 east-bound (EB)	56.6%	36 <i>(WORST SECTION ALONG A27)</i>
A27 between A2270 and A22 (EB)	57.4%	43
A27 between A259 and A285 (EB)	59.4%	63
A27 between A285 and A259 west-bound (WB)	60.0%	73
A27 between A22 and A2270 (WB)	60.8%	96
A27 between A283 and A2025 (WB)	60.8%	98
A27 between A3023 and A259 (EB)	61.8%	125
A27 between A26 and A26 (EB)	62.9%	158
A27 between A286 and A259 (EB)	63.8%	196
A27 between A24 and A2025 (EB)	64.1%	215

4.9 Current Travel Conditions along the A27 – Ratio of Flow to Link Capacity

4.9.1 As part of the study, a simplified model was developed to relate the observed demand on the network (from traffic counts) to the available link capacity in the highway network. The current conditions (based on 2013 traffic data) are shown in Figure 4-4.

4.9.2 It should be noted that this is a high level assessment of congestion, as the capacity on the network is a product of both link and junction capacity.

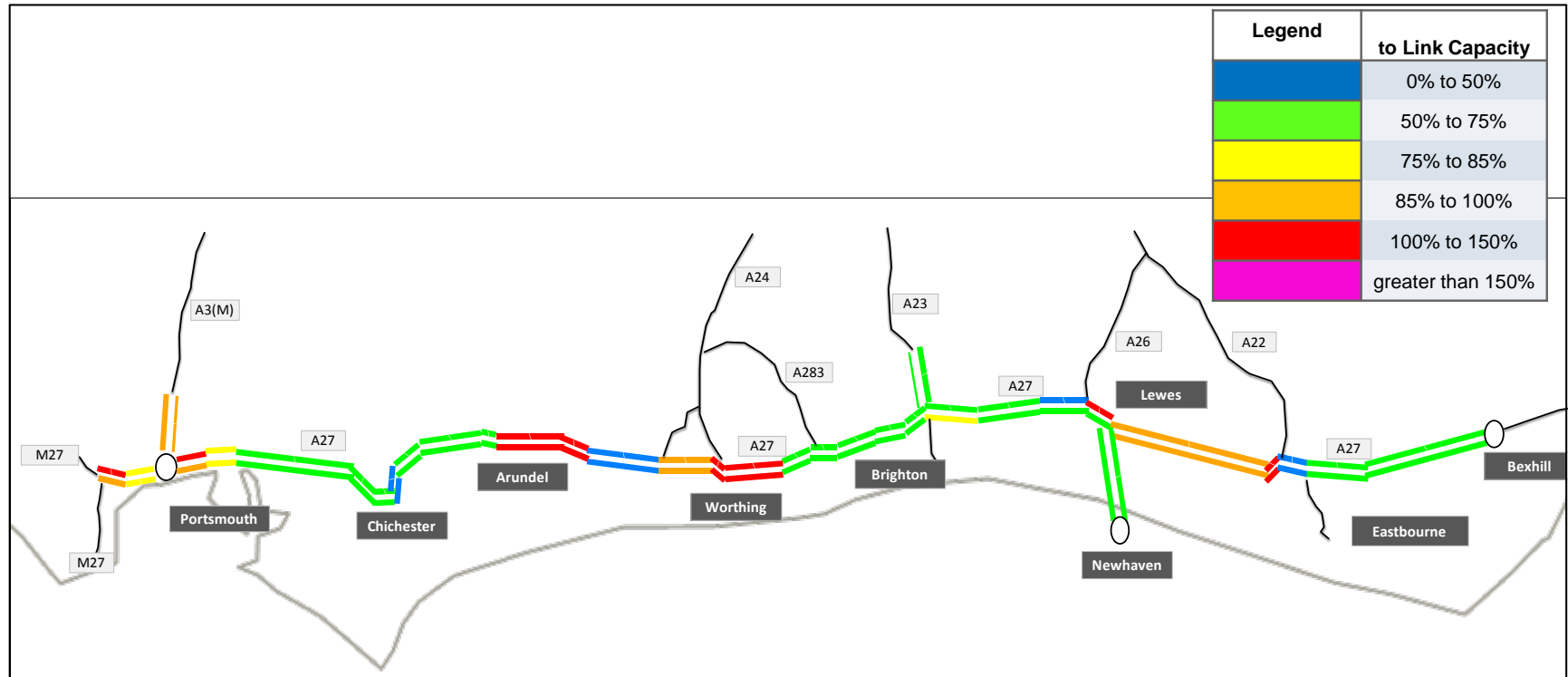
4.9.3 This figure highlights the high ratio of link flow (volume in vehicles/hour) to link capacity for the single carriageway sections at Arundel, Worthing and between Lewes and Polegate.

4.10 Current Travel Conditions along the A27 – Road Safety and Incidents

4.10.1 Data on the road safety record of the A27 data has been sourced from the HA's Area 4 Road Safety Statement 2012. It details trends in casualties within certain sections of the A27. It splits the A27 into two sections:

- West Sussex: Pook Lane Overbridge to the East of the South Wick Tunnel
- Brighton and East Sussex: East Portal of Southwick tunnel to the West of A259 Pevensey Roundabout.

Figure 4-4: Map of 2013 Ratio of Link Flow to Link Capacity (vehs/hour)



4.10.2 Table 4-2 shows the trend in casualties on the A27 in West Sussex from 2005 to 2011. It shows that 101 fewer casualties occurred between 2009-2011 compared with 2005-2007.

Table 4-2 Casualty trend for every three year period West Sussex (Source: 5.11.3, Area 4 Road Safety Statement 2012, Highways Agency)

Casualty trend for every three year period

Time Period	Number of Casualties	Percentage Difference	Trend
2005 - 2007	630	+ 8.2%	▲
2006 - 2008	611	- 3.0%	▼
2007 - 2009	594	- 2.8%	▼
2008 - 2010	543	- 8.6%	▼
2009 - 2011	529	- 2.6%	▼

4.10.3 Overall, the casualty rate for the West Sussex section of the A27 is 40.7 Personal Injury Collisions (PICs) per million vehicle miles, which is higher than the comparative average level of 30.5 PICs per 100 million vehicle miles for all 'A' roads as indicated in the 'Reported Road Casualties on the SRN 2011' document¹⁶.

4.10.4 Table 4-3 shows the trend in casualties on the A27 in Brighton and East Sussex from 2005 to 2011. It shows 102 fewer casualties occurred between 2009-2011 compared with 2005-2007.

Table 4-3 Casualty trend for every three year period East Sussex (Source: 5.11.3, Area 4 Road Safety Statement 2012, Highways Agency)

Collision trend for every three year period

Time Period	Number of Collisions	Percentage Difference	Trend
2005 - 2007	540	- 7.1%	▼
2006 - 2008	541	+ 0.2%	▲
2007 - 2009	511	- 5.5%	▼
2008 - 2010	477	- 6.7%	▼
2009 - 2011	438	- 8.2%	▼

4.10.5 Overall, the casualty rate for the Brighton and East Sussex section of the A27 is 39.2 PICs (Personal Injury Collisions) per million vehicle miles, which is above the comparative investigatory level of 30.7 PICs per 100 million vehicle miles for all 'A' roads as indicated in the 'Reported Road Casualties on the SRN 2011' document.

4.10.6 The Route Strategy Evidence Report indicated that there are several locations along the A27 with high collision rates falling in the HA's nationwide *top 250 Collision locations*:

- A27 between Shoreham-by-Sea and Southwick – ranking 123
- A27/A23 junction Brighton – ranking 158
- A27 near the junction with the A2025 near Lancing – ranking 158
- A27 Chichester By-Pass east of the city – ranking 202

¹⁶ Table 5-1, page 72 of Reported Road Casualties on the Strategic Network 2011 (September 2012)

<http://assets.highways.gov.uk/our-road-network/our-network/Safety/SRN%20Casualty%20Report%20v2%200%20Final.pdf>

Incidents and Incident Recovery

4.10.7 The Route Strategy Evidence Report identifies that the section of the A27 between Portsmouth and Brighton has several links demonstrating a high incident frequency in both directions; around Chichester, Arundel, and between Lewes and Eastbourne including in the Polegate area.

4.10.8 The Highways Agency Customer Feedback 1st Quarter 2013-2014 notes that the unreliability of travel along the corridor, resulting from a long incident clearing times, severely undermines accessibility and negatively impacts on the opportunities for jobs and business. In many instances on the corridor as a whole, this poor reliability issue is exacerbated by a lack of viable alternative diversionary routes during times of corridor congestion or accidents.

4.11 Current Conditions along the A27 – Community Severance and Access

4.11.1 There are a number of community severance issues where the A27 acts as a barrier to movements within local communities. Examples of this include Arundel, Worthing (Salvington, Broadwater), Sompting and Lancing, Selmeston and Wilmington.

4.11.2 The Route Strategy Evidence Report notes that the needs and access requirements of non-motorised users are of particular significance in this route with high levels of local accessibility required for either access within towns, or for recreational users accessing local sites and features. This is particularly true of areas adjacent to the National Park or other sites of local / regional interest.

4.11.3 The problems of access are exacerbated by a lack of on/offline facilities on adjacent routes. The local traffic function of many roads such as the A27 also means that vulnerable users will often seek to use the A27 as it forms the most direct route for them. Consequently, more safe crossings are needed for the range of non-motorised user traffic along a number of sections of the corridor.

4.11.4 Horses and their riders in the South Downs National Park are particularly vulnerable. Many of these riders feel there is no safe way of crossing the A27 to access the Rights of Way. In addition, and to the south of the A27 on the Manhood Peninsula, there are no bridleway links between Hunston, Mundham, Runcton or Sidlesham and the highway links are too hazardous for equestrians. This has caused the riders and carriage drivers to use horseboxes to access the South Downs, but they are finding this increasingly difficult due to the number of height bars on car parks. 25 local businesses are totally or partially dependant on local horse owners/riders.

4.12 Summary of Current Travel Conditions along the A27

4.12.1 An overview of the current situation along the A27 corridor is summarised in Figure 4-5. This displays a total of 30 links, with each link representing a section of the A27 between two junctions. These links are rated in terms of six performance factors detailed in the legend.

4.12.2 Issues identified along the A27 can be summarised as follows:

- **Environmental Constraints:** The route passes along and through the South Downs National Park and north of the coastal floodplains of the River Arun and River Adur. A number of areas are also protected by environmental designations.

- **Air Quality:** Traffic and congestion affect air quality, in particular at locations such as Worthing and Storrington where AQMA's have been declared due to high volumes of traffic.
- **Capacity:** Annual average daily traffic volumes (AADT) on specific single carriageway links were close to or above the theoretical capacity of the road at Arundel, Worthing and on the stretch between Lewes and Polegate. AADT volumes on most sections of the dual carriageway along the A27 are within the theoretical road capacity.
- **Reliability:** sections of single carriageway and at-grade junctions result in congestion and delays which impact on the efficient and safe movement of people and goods. Congestion is a problem at a number of locations including Chichester, Arundel, Worthing and between Lewes and Polegate.
- **Road Safety:** Accidents are a significant challenge along certain links, with incidents leading to further impacts on journey-time reliability.
- **Severance:** The route runs through and close to settlements causing severance issues at Arundel, Worthing and Lancing and villages east of Lewes.

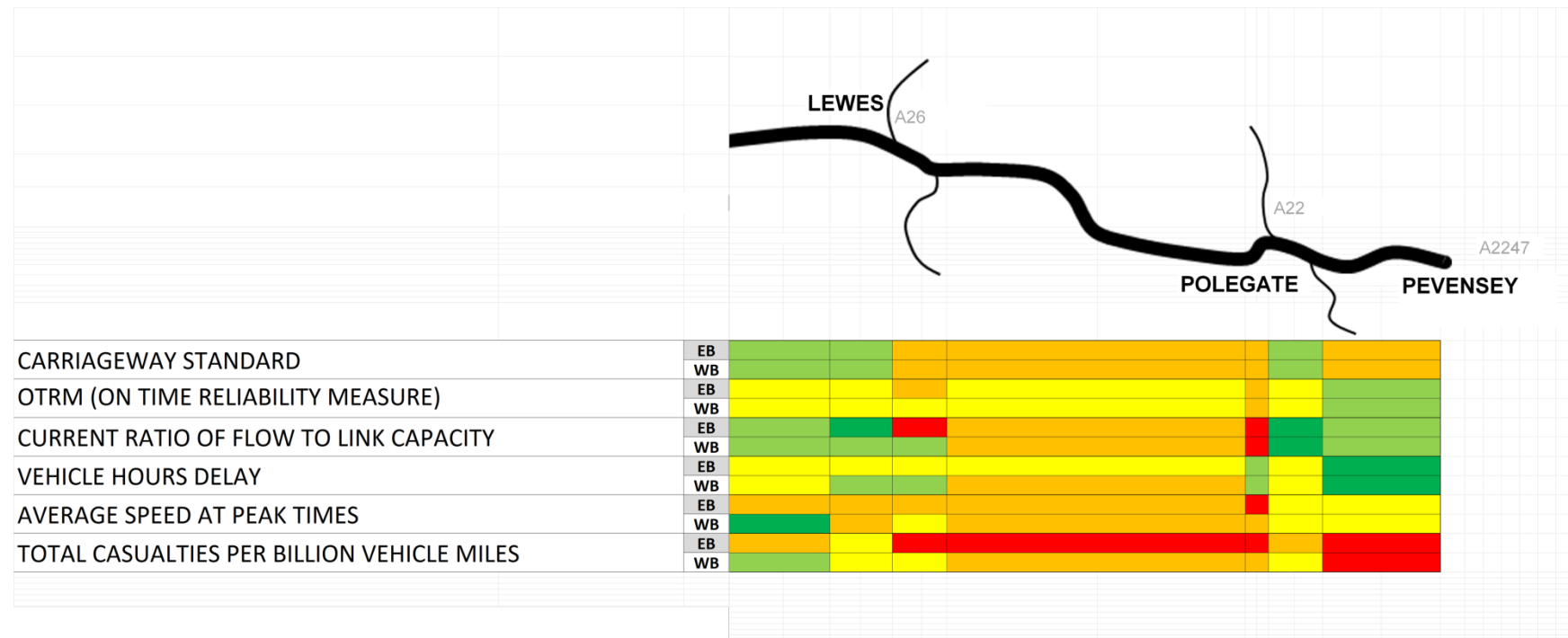
4.12.3 Whilst the coastal area is served by a number of rail routes, which run in parallel to the A27, these routes cater for local stopping stations, thus providing good rail accessibility for shorter journeys and lengthy journey times for longer distance journeys.

4.12.4 Figure 4-5 shows those areas where travel conditions are affected by ratio of traffic demand to available capacity, resulting in poor journey time reliability and reduced average speeds. The four main locations which were identified as most affected are:

- Chichester¹⁷;
- Worthing and environs;
- Arundel; and
- The corridor to the East of Lewes.

¹⁷ The Highways Agency has already identified a scheme for improvements along the A27 through Chichester, planned as a major scheme. <http://www.highways.gov.uk/roads/road-projects/a27-chichester-improvement/>

Figure 4-5: Summary of Current Travel Conditions along the A27



Data	Rating
Carriageway Standard (Standard which the worst section of the link meets)	Urban Single Carriageway
	Rural Single Carriageway
	Urban 30-40mph Dual Carriageway
	Dual Carriageway, grade separated
OTRM% (ON TIME RELIABILITY MEASURE)	5- High Quality Dual Carriageway
	Below 54%
	>=54- 64%
	>=64- 74% (National Average)
	>=74- 84%
Ratio of Flow to Capacity (RFC%)	>=84-100%
	>=100-150%
	>=85-100%
	>=75-85%
	>=50-75%
Vehicle Hours Delay Is an estimate of the total time experienced by all road users over and above the expected theoretical free-flow travel time. Ranked against the whole SRN	<50%
	Top 10%
	Next 10%
	Next 20%
	Next 40%
Average Speed at Peak Times (mph) Peak times are Monday to Friday 7-10am and 4-7pm	Bottom 20%
	<30
	>=30-40
	>=40-50
	>=50-60
Total casualties per billion vehicle miles Ranked against the whole SRN	>=60-70
	Top 10%
	Next 15%
	Next 20%
	Next 25%
Bottom 30%	

5 STEP 2: UNDERSTANDING THE FUTURE SITUATION

This chapter establishes the predicted performance of the A27 Corridor. The chapter sets out information about planned transport improvements in the A27 corridor, the regional growth aspirations, and the resulting traffic growth implications.

5.1 Extant Planned Transport Infrastructure

5.1.1 **Highway Network:** There is commitment from the HA, LEPs and local highway authorities to invest, to a limited extent, along the A27 as set in their planned transport programmes. For the purposes of this study, the following schemes have been assumed to form part of any 'Do Minimum' considerations:

- Chichester: A27 improvements – upgrading of junctions along the A27 to grade-separated (HA major scheme)
- Polegate/Eastbourne: A27 Cophall Roundabout improvements (TR3 recommendations as part of Wealden Local Plan, now SELEP scheme)
- Polegate/Eastbourne: A27 / A2270 Signalised junction (TR3 recommendations as part of Wealden Local Plan, now SELEP scheme)
- Polegate/Eastbourne: Quality Bus Corridor (SELEP scheme proposal)

5.1.2 **Rail Network:** the rail operator – Southern - provided the following comments:

- Southern expects continued steady demand growth in the corridor (2% per annum by volume) but has no immediate plans for a 'step change' in capacity or service delivery. Southern identify that rail demand may increase above this level at localised points due to increased economic activity or growth in housing.
- Buses are accepted as the most significant form of competition for Southern's market although road congestion may undermine their role over time.
- The franchise bid has made commitments about enhanced stations, smartcard technology and season tickets and the benefits of these are built into anticipated increases in levels of demand.
- Without significant platform lengthening and or station closures, Southern identifies little scope for significant capacity enhancement on the corridor as a whole.
- Southern identifies that Arundel Chord will primarily offer operational benefits. A Lewes to Uckfield link would offer benefits but these are primarily for London bound traffic from Brighton and Lewes. Both schemes would require funding by Network Rail.

5.1.3 Network Rail has been consulted and has no plans to significantly increase the capacity of the rail network in the area.

5.1.4 **Bus Network:** Consultation with the various Local Authorities along the corridor indicates that they do not expect major roads based public transport investment.

5.2 Growth Plans – Strategic Economic Plans

5.2.1 The Coast to Capital (C2C) Strategic Economic Plan¹⁸ (SEP) and the South East Strategic Economic Plan (SEP) cover the majority of the A27 corridor. The Coast to Capital SEP covers the A27 to the west of the A23 and the South East SEP covers the A27 within East Sussex (approximating to the east of the A23). Each SEP identifies the key objectives that transport interventions can help to achieve.

South East LEP – Planned Growth

5.2.2 Through its growth deal the South East LEP (SELEP) aims to unlock the total capacity for some 35,000 additional jobs and 18,000 new homes in the LEP area. The area includes Essex, Kent and East Sussex.

5.2.3 It focuses on Building its Economic Strengths and Creating the Conditions for Growth and one of its key challenges is to improve the productivity of the LEP area which is the lowest of all the south east LEP areas. It sets out a number of initiatives on training and skills and infrastructure investment and geographical areas where it will focus investment. Specifically in relation to the A27 the SEP identifies two growth corridors which are served by the road, namely the Newhaven Clean Tech and Maritime Growth Corridor and the A22/A27 Eastbourne – South Wealden growth Corridor.

5.2.1 The Plan proposes infrastructure works for Newhaven which would allow in time for Brownfield Growth providing 4,500 jobs and 190 homes. By 2021 wider transport schemes in the Plan will facilitate 725 jobs and 1700 homes. It proposes the A22/A27 Growth Corridor will directly create 1,400 jobs by 2021 and a further 800 by 2025.

Coast to Capital LEP – Planned Growth

5.2.2 The C2C Growth Deal concluded between the Government and the LEP in July 2014 for the period to 2020/21 includes:

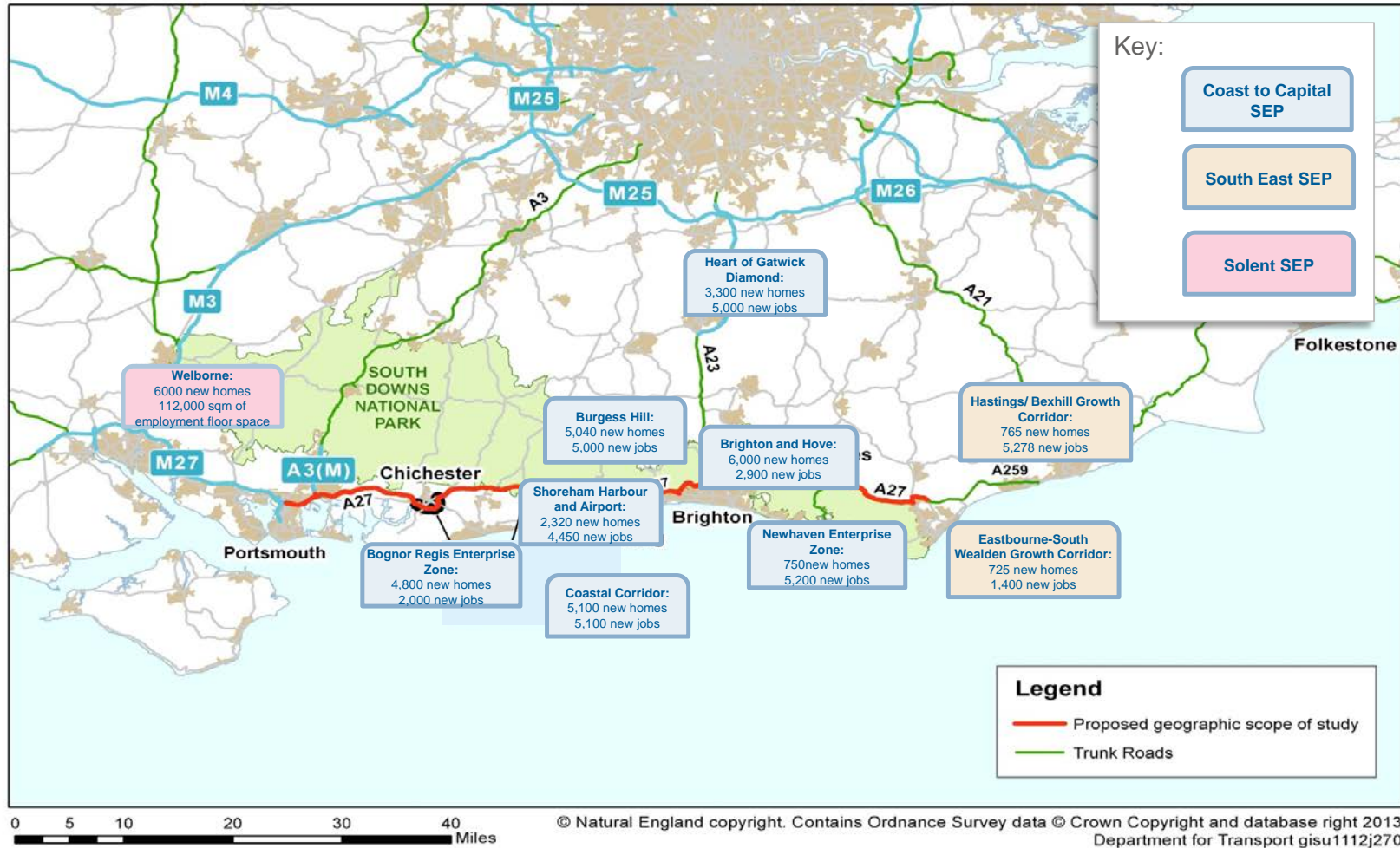
- Plans to create 20,000 new jobs, 7,000 new homes and £350m of public/private investment, 445 sq. metres of employment space.

5.2.3 Within the C2C SEP further detail is provided on the ambition of investment potential of 'The Coastal Corridor'. It states "*The Coastal corridor is identified as having excellent development and regeneration opportunities that could transform the area's economy and provide significant new jobs and homes. The largest of these are Shoreham Harbour and Enterprise Bognor Regis. Significant development opportunities exist in Worthing and Littlehampton.*"

5.2.4 An outline diagram which displays the amount of development activity which the SEPs predict near the A27 corridor is shown in Figure 5-1..

¹⁸ Coast to Capital (C2C) Local Enterprise Partnership, Strategic Economic Plan (SEP), March 2014.
<http://www.coast2capital.org.uk/strategic-objectives/strategic-economic-plan>

Figure 5-1: Proposals identified in Strategic Economic Plans (SEP)



5.3 Growth Plans - Local Authority Aspirations

5.3.1 In support of local plan policy objectives, Table 5-1 displays the known key housing and economic growth aspirations that would impact on the route, with the data providing context about the nature, scale and timing of the proposals. These figures were provided to the HA during the engagement for the Route Strategies and the collation of the Route Strategies Evidence Report. The local authority plans were filtered to reflect planned development within a 5 mile radius of the A27 corridor to 2021 and 2031.

Table 5-1: Local Authority Growth Plans

Local authority area	To 2021	To 2031
Chichester District	4,300 residential units and 135,000sq.m of business and industrial	7,050 homes
Arun District (including Arundel, Littlehampton; Bognor Regis; Angmering)	12,399 jobs;15,000 residential units	3,025 jobs; 9,200 residential units
Worthing Borough	Residential units - provide 200 dwellings per year from 2011 to 2021 = 2000. <i>Note that the number of completions from 2011 to 2014 has been 547.</i> There is no target provision in the Core Strategy for commercial development. Although need figures are provided up to 2026, this is dependent on sites coming forward through the refurbishment of existing sites and through the areas of change proposed in the Core Strategy. The floor space need figures are: 72,464 sq. m for industry and warehousing and 22,296 sq. m for offices.	Residential Units - provide 200 dwellings per year from 2011 to 2021 = 2000.
Adur District	Residential units - provide approximately 147 dwellings per year from 2011 to 2021 for a total of 1,470 units. <i>Note the number of completions from 2011 to 2014 has been 437.</i> Commercial Development - To provide 41,000 sq. m floor space of a mix of mainly business and storage / distribution up to 2031. There will be some industrial but smaller proportion.	Residential Units -. Providing approximately 147 dwellings per year from 2011 to 2031 for a total of 2940 units.
Brighton & Hove	9022 jobs;1906 residential units	6199 jobs; 2074 residential units
Lewes District	530 homes, 416 jobs	360 homes (up to 2030)
Wealden District		9,414 homes up to 2027 38,500 sq. m up to 2027

5.4 Growth Plans – Airports Commission

- 5.4.1 There will be potential implications resulting from the outcomes of and follow up to the Airports Commission deliberations. However, at this stage, these implications are not clear.
- 5.4.2 The Airports Commission is examining the need for additional UK airport capacity and will recommend to government how this can be met in the short, medium and long term.
- 5.4.3 In its interim report, published in December 2013, the commission identified a need for a single additional runway in London and the south east and included - under the proposals shortlisted for detailed appraisal and public consultation - a proposal from Gatwick Airport Ltd. for an additional runway to the south of the existing runway at Gatwick Airport.
- 5.4.4 An expansion of Gatwick airport could create further opportunities for growth within the 'Gatwick Diamond' which links Brighton, Haywards Heath, Burgess Hill, Horsham, East Grinstead, Redhill and Croydon amongst others. Increased international connectivity in the local area could strengthen opportunity to diversify the local economy and strengthen knowledge-based industries. This is recognised in existing plans and strategies.
- 5.4.5 The current regional growth plans do not take the implications of the Airports Commission into account. An expansion of Gatwick Airport is estimated to provide additional jobs ranging between 200 and 23,600 (by 2030) and up to 32,500 additional jobs by 2050¹⁹, which could be expected to have an implication for growth along the A27 corridor.
- 5.4.6 Hence, it will be likely that in future the implications of an expansion at Gatwick Airport, following the Airports Commission deliberations, will be a requirement.

5.5 Predicted Future Traffic Conditions along the A27

Modelling Future Land-Use and Traffic Impacts

- 5.5.1 To create an initial picture of the future growth along the A27 corridor a model using current Annual Average Daily Traffic (AADT) across the corridor has been created. This is a 'first principles' spreadsheet based model that considers the future travel demand situation in terms of a defined 30 link sections. The model has been used to assess current and future travel demand, and provide a visual representation of demand relative to link capacity. Links are considered for eastbound and westbound travel directional demands.
- 5.5.2 The purpose of the model is to understand the current and future performance of the A27 corridor, and to determine which link sections will be under the most capacity pressure now and into the future. The improvements on the A27 at Chichester have been assumed to be in place.

¹⁹ Airports Commission: Gatwick Airport Second Runway: Business Case and Sustainability Assessment, February 2015, https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/374662/evidence-base-gatwick-airport-second-runway.pdf

- 5.5.3 The factors accounted for within the model links include; type of junction and downstream junction type. These factors are used to create lane capacity estimates which, in turn, create an overall capacity estimate for each link. The model has been derived from the South East Plan²⁰ model which was used in an Examination in Public (EIP).
- 5.5.4 Once the capacity of each link had been established, current traffic volumes AADT (Passenger Car Unit per hour: PCU/h) representing an AM peak hour has been sourced using an assumed 10% of the available daily Annual Average Daily Traffic (AADT). This has been used to provide a representation of the current situation 2013 Ratio of Flow to Capacity (RFC) for each link within the model. This is the same method used in the South East Plan model.
- 5.5.5 The projected 2021 and 2031 RFC figures are shown in Figure 5-2 and Figure 5-3.
- 5.5.6 An overview of the predicted future situations along the A27 corridor is summarised in Figure 5-4. They display a total of 30 links, with each link representing a section of the A27 between two junctions. The links are the same as those identified and analysed in previous figures. These links are rated in terms of two factors:
- **Congestion in 2021 AM peak** (measured by 2021 RFC%)
 - **Congestion in 2031 AM peak** (measured by 2031 RFC%)
- 5.5.7 This analysis identifies areas which are predicted to be operating at a RFC of approaching or exceeding 100% as the following:
- Havant;
 - Worthing;
 - Arundel; and
 - East of Lewes.
- Implications of Planned Growth along the A27
- 5.5.8 Links through Arundel, Worthing and between Lewes and Polegate are clearly identified as exceeding the available road capacity in 2021 and 2031 under the assumed growth scenarios. The assessment also highlights that traffic around Havant and Portsmouth is expected to exceed the link capacities of the A27 in 2031 (and certain sections in 2021).
- 5.5.9 A significant change is shown when compared to the current situation. This is due to traffic volumes on the network (in particular on single carriageway sections) in current situation approaching the capacity of these links.
- 5.5.10 The conclusion is that, under the planned growth in the A27 corridor, congestion at Worthing, Arundel, and East of Lewes is predicted to worsen significantly in the future, and in addition delays at Havant and close to the A23/A27 junction are also likely to worsen.

²⁰ South East Plan (also known as the Regional Spatial Strategy for the South East) 2009

Figure 5-2: Map of 2021 Ratio of Flow to Capacity

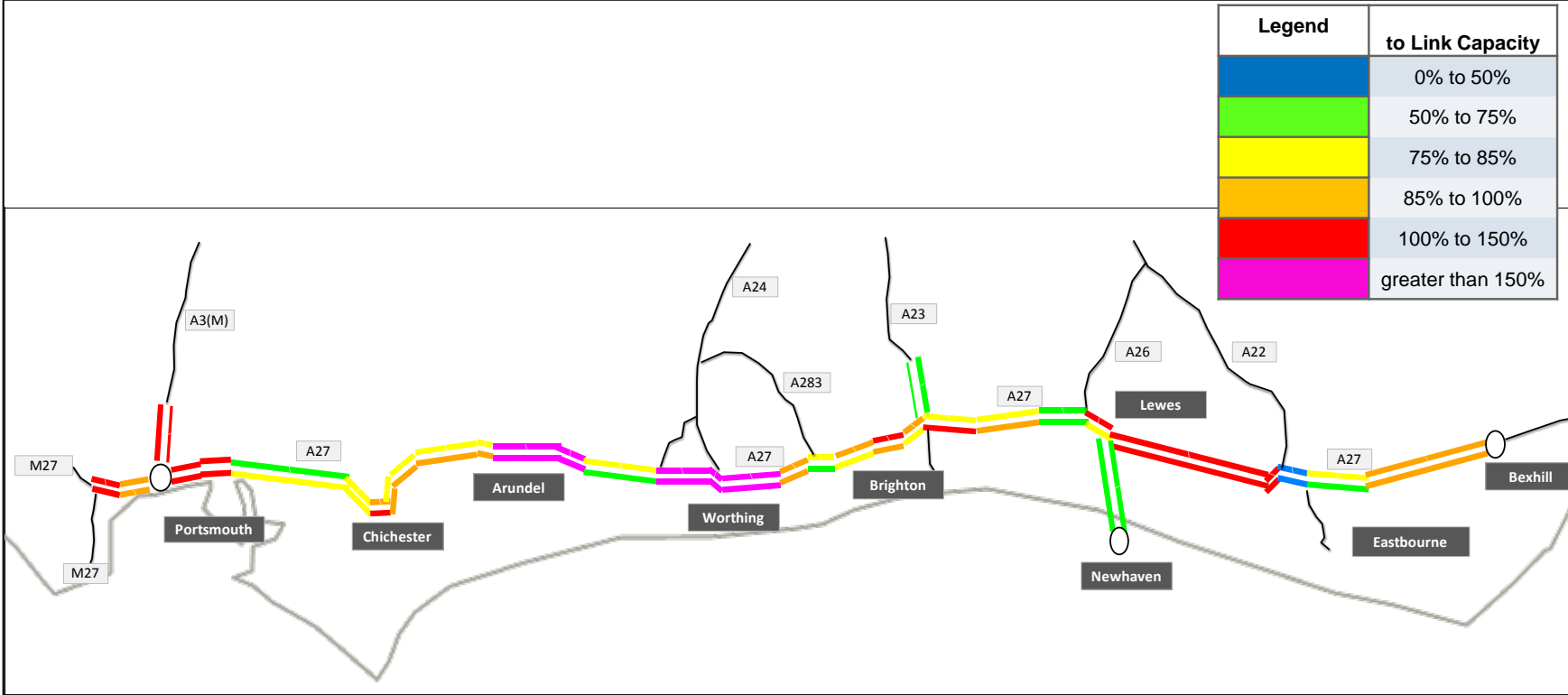


Figure 5-3: Map of 2031 Ratio of Flow to Capacity

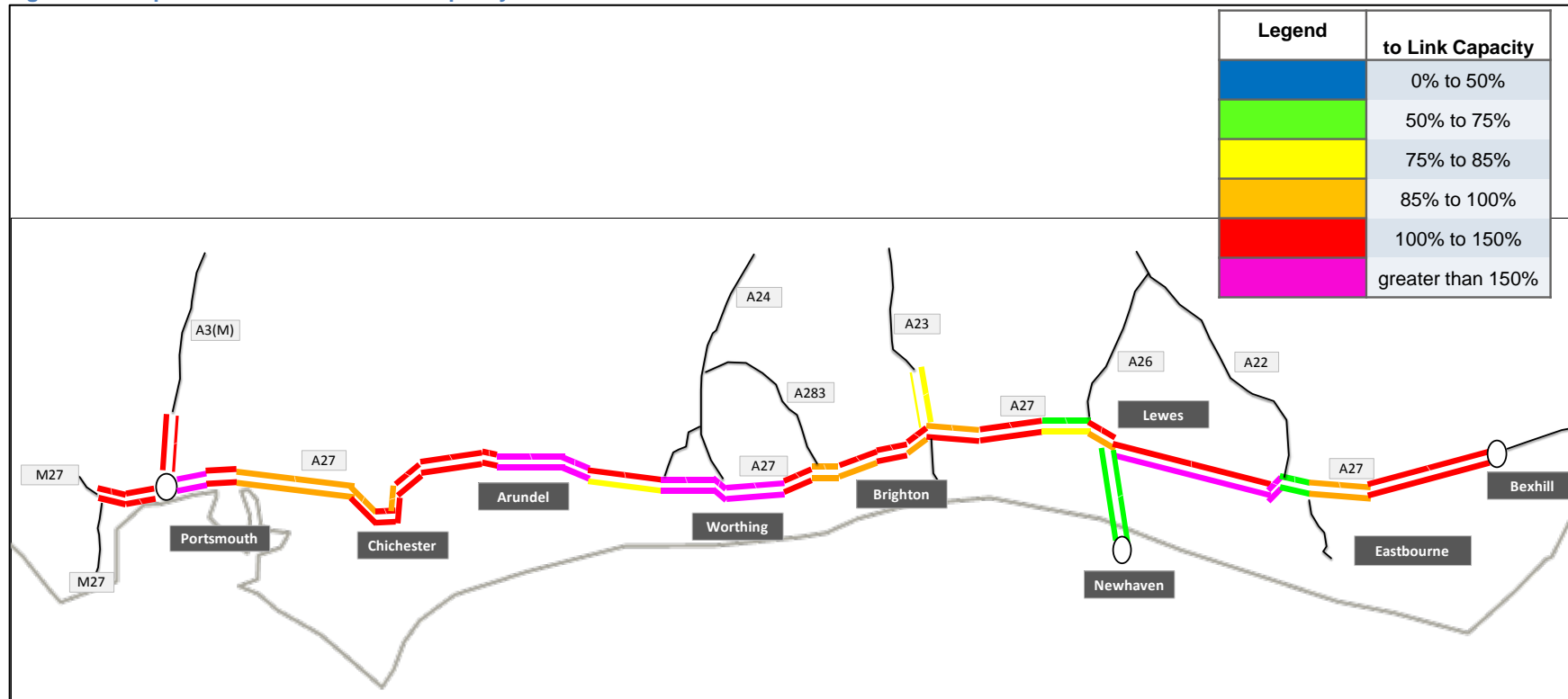
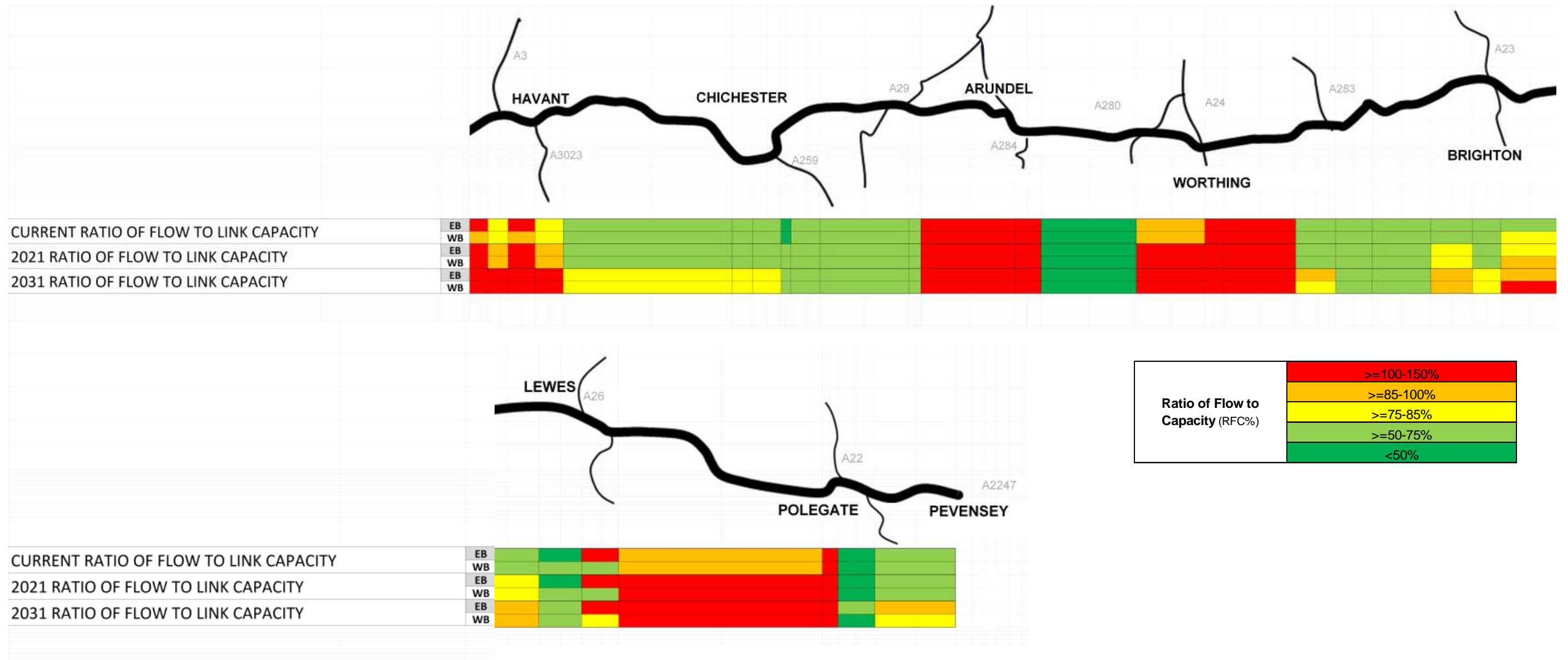


Figure 5-4: Summary of Predicted Future Traffic Conditions along the A27



Ratio of Flow to Capacity (RFC%)	>=100-150%
	>=85-100%
	>=75-85%
	>=50-75%
	<50%

6 STEP 3: ESTABLISHING THE NEED FOR INTERVENTION

This chapter draws together the evidence reported in the preceding chapters to summarise the problems and their underlying causes, to set out the mismatch between the performance of the route (currently and in future) against the policy ambitions for the SRN, and to establish from these the need for intervention along the A27 corridor.

6.1 Mismatch between Policy Ambition and Current and Future Route Performance

6.1.1 Government's policy on the SRN is to ensure that it operates effectively and efficiently, and that it supports and facilitates economic growth. A more efficient network would enable firms reliant on the A27 for access to operate more efficiently, and encourage investment in existing and new businesses. With greater certainty over journey times, businesses would be better positioned to compete internationally.

6.1.2 The regional and local authorities continue to plan for significant growth. Over 60,000 new homes and substantial employment development are expected within the coastal area.

6.1.3 The ability of the transport system to support such growth will, however, be constrained by:

- the capacity of the A27, the capacity of the local road network and the junctions linking the routes; and
- limitations on rail and other public transport modes to significantly improve their offer of an alternative choice of travel, other than in the larger urban areas.

6.1.4 Traffic growth from existing and planned development along the A27 will increase pressure on the road. High level traffic modelling, undertaken as part of this study, indicates that congestion is expected to worsen in future, particularly along the single carriageway and narrow lane sections with reduced capacity.

6.1.5 The evidence demonstrates that, whilst bus/rail network or alternative methods such as Light Rail and demand management measures may provide opportunities for modal transfer, these measures are unlikely to be able to adequately address the study objectives of reducing travel time, improving journey time reliability and enabling local planning authorities to manage the impact of planned growth.

6.1.6 In light of the current problems of constrained capacity, planned growth in housing and employment are likely to result in the worsening of congestion and delays. There are clear limitations to alternative public transport solutions, and hence **there is a need to invest in road-based solutions**.

6.1.7 As part of work undertaken by WSCC prior to this A27 Corridor Feasibility Study, the implications of a transport intervention along the A27 upon economic growth were estimated. A summary of the outputs of this study are included below as an example of the potential benefits of a transport intervention, the need for which has been established in this report.

6.2 Example: The Implications of Transport Interventions on Economic Growth

6.2.1 The local evidence for the relationship between the quality of the road network and an improvement in economic activity comes from the Arundel Bypass Wider Economic Impact Study, Stage 1, prepared by Parsons Brinckerhoff for Arun DC (2013) which

concluded that an Arundel Bypass could add £493m to the West Sussex GVA of £15.3bn.

6.2.2 The study reported a number of other economic impacts which the bypass could create:

- An additional annualised total of 12,600 jobs would be added throughout the seven districts in West Sussex;
- Across all seven districts, an annualised total of £82m would accrue to Government in the form of personal income tax receipts from new employment;
- Across all seven districts, Government would gain approximately £38m from reductions in Jobseekers' Allowance payment;
- The increase in employment will support additional disposable income being spent in the county. The preliminary estimate of this is £108m throughout all seven districts;
- The bypass will remove the current bottleneck on the A27 and will significantly improve the 'attractiveness' of the corridor in terms of attracting investment and inducing land development (through distribution and business parks etc.); and
- The impact of these developments will include increases in land values (and land sale values) as planning permission is given for specific developments.

7 STEP 4A: IDENTIFYING AND REFINING OBJECTIVES

This chapter sets out the objectives for interventions that address the identified problems. These objectives are specific to the A27 corridor.

7.1 Identifying and refining objectives

7.1.1 The study Scope document specified that the aim of the study is to: identify the opportunities and the case for future interventions on the corridor which are deliverable, affordable and offer value for money.

7.1.2 The objectives identified in the study Scope Document were to:

- assess the case, deliverability and timing of specific infrastructure investments that address existing priority problems on the A27 corridor;
- understand the balance of benefits and impacts from potential individual investment proposals and any additional benefits or impacts from potential packages of investment on the national and local transport networks; and
- evidence where possible, the wider economic benefits from the transport investment in the corridor.

7.1.3 Based on the analysis of available evidence and discussion with the SSRG, the study team defined a number of intervention-specific objectives. These were important for assessing options for addressing the identified problems, and are as outlined below:

- Reducing travel time and improving journey time reliability in the key hotspot area;
- Reducing severance impacts, particularly at Worthing for villages east of Lewes;
- Enabling local planning authorities to manage the impact of planned growth and in doing so support the wider economy;
- Providing safer roads which are resilient to delay and which are able to adequately cater for the impacts of adverse weather;
- Minimising impacts on the natural environment and optimising environmental opportunities and mitigation; and
- Providing opportunities for improved accessibility for all users.

7.1.4 These intervention-specific objectives will be used to evaluate the effectiveness of potential interventions and subsequently prioritise those which met the defined intervention-specific objectives in further stages of this study.

8 STEP 4B: REDEFINING GEOGRAPHIC AREA OF INTEREST

This chapter refines the geographic areas of interest to be addressed in the next stages of the study by considering potential interventions.

8.1.1 The single carriageway sections are inhibiting growth and investment in the local economy. It is a key issue for the ambitions of the two SEPs covering the study area which propose considerable growth in jobs and housing and place reliance on improving the A27 to meet this requirement. The study has been used to identify key areas of future focus for the study.

8.1.2 The need for intervention has been considered at the following locations on the basis of:

- a historic assessment of their 'hotspot' nature;
- an assessment of current year conditions, identifying problems and issues (summarised in Figure 4-5); and
- an assessment of future year conditions and problems (summarised in Figure 5-4), and the likelihood of these areas remaining as operational 'hotspots' which will frustrate the potential for achieving economic and environmental improvements in the area.

1) Havant:

- The A27 between Chichester and Havant (westbound) is currently a high quality dual carriageway and is not constrained by at-grade junctions. This section currently has good journey reliability, and is projected to reach capacity toward 2031.
- As this section is not currently a problem area, and is not a historical 'hotspot'.
- *Hence, there is NOT a need for intervention identified.*
-

2) Chichester:

- There are existing problems with congestion due to at-grade junction capacity along the A27 around Chichester. However, a scheme has already been identified by the HA to address these capacity issues.
- *Hence, there is NOT a need for intervention at Chichester.*

3) Arundel:

- There are existing capacity constraints due to the single carriageway section through Arundel, worsened by constrained capacity at the Ford Roundabout and Crossbush junctions.
- The current demand exceeds the theoretical capacity of a single carriageway roadway in Arundel.
- Future growth will result in the demand further exceeding capacity through Arundel, and this section of the A27 will act as a constraint to the planned growth in housing and employment in the corridor.
- The A27 results in severance through the town of Arundel.
- *Hence, there IS a need for intervention at Arundel.*

4) Worthing and Lancing:

- There are existing capacity constraints due to the single carriageway section through Worthing and the narrow two-lane carriageway through Lancing, worsened by constrained capacity at the Offington Corner and Grove Lodge Roundabouts.
- The current demand exceeds the theoretical capacity of a single carriageway roadway in Worthing.
- Future growth will result in the demand further exceeding capacity through Worthing and Lancing, and this section of the A27 will act as a constraint to the planned growth in housing and employment in the corridor.
- The A27 results in severance through Worthing and Lancing.
- *Hence, there IS a need for intervention at Worthing and Landcing.*

5) The corridor to the east of Lewes (Lewes to Polegate):

- There are existing capacity constraints due to the single carriageway between Lewes and Polegate.
- The current demand is nearing the theoretical capacity of a single carriageway roadway in Arundel.
- Future growth will result in the demand further exceeding capacity along this section of the A27, and it will act as a constraint to the planned growth in housing and employment in the corridor.
- The A27 results in severance through the villages of Selmeston and Wilmington.
- *Hence, there IS a need for intervention on the A27 east of Lewes.*

8.1.3 From the above consideration, there is a clear need for intervention identified at Arundel, Worthing/Lancing and East of Lewes.

8.1.4 The geographic scope of the A27 Corridor Feasibility Study is from the junction with the M27 in the (between Cosham and Portsmouth), and its junction with the A259 at Pevensey in the east. The area of interest, defined as the priority problem areas along the A27 based on the need for intervention identified, are:

- Arundel;
- Worthing and Lancing; and
- The corridor to the East of Lewes (specifically between Lewes and Polegate).

9 SUMMARY OF STUDY STAGE 1 REPORT

- 9.1.1 This report is the first of three reports for this this feasibility study. It summarises the evidence gathering phase of the A27 Corridor Feasibility Study with an emphasis on gaining a comprehensive understanding of the current and future transport situation and the need for intervention.
- 9.1.2 The evidence assessment has been used to identify the need for intervention, to set out intervention specific objectives and to define the geographic area of interest.
- 9.1.3 In view of current problems of constrained capacity, planned growth in housing and employment, and the limited scope for alternative rail and other solutions to address the current and future problems, **there is a need to invest in road-based solutions.**
- 9.1.4 The analysis was used to prioritise three locations or 'hotspot areas' for targeting interventions:
- Arundel
 - Worthing and Lancing, and
 - East of Lewes - specifically the stretch of road between Lewes and Polegate.
- 9.1.5 Based on the analysis of available evidence and discussion with the Study Stakeholder Reference Group, the study team defined a number of intervention specific objectives:
- Reducing travel time and improving journey time reliability in the key hotspot areas;
 - Reducing severance and pollution impacts;
 - Enabling local planning authorities to manage the impact of planned growth and in doing so support the wider economy;
 - Providing safer roads which are resilient to delay and which are able to adequately cater for the impacts of adverse weather;
 - Minimising impacts on the natural environment and optimising environmental opportunities and mitigation; and
 - Providing opportunities for improved accessibility for all users.

9.2 Next Steps

- 9.2.1 The three priority locations for targeting interventions will be considered further during Study Stage 2 of the A27 Corridor Feasibility Study, wherein potential intervention options will be identified and assessed against an Options Assessment Framework.

GLOSSARY

Annual Average Daily Traffic (AADT): Total number of vehicles using the road per day.

Area 4: Highways Agency area consisting of Kent, Surrey, East Sussex, West Sussex covering the following roads: M2, M20, M23, A2, A20, A21, A23, A26, A27, A259, A2070.

AQMA: Air Quality Management Area.

BMV: Best and Most Versatile.

Core Strategy: Primary and strategic document of the local development framework developed by local planning authorities.

CUBE: A transport modelling tool.

Delivering a Sustainable Transport System: (DaSTS) a 2009 DfT report that outlines five goals for transport, focusing on the challenge of delivering strong economic growth while at the same time reducing greenhouse gas emissions.

Department of Transport (DfT): The government department responsible for the English transport network.

DETR: Department for Environment Transport and the Regions.

EA: Environment Agency.

Examination in Public (EIP): A form of public inquiry where an independent planning inspector, appointed by the Secretary of State, will 'test' the document to determine whether it meets the requirements of the relevant legislation and to determine whether it is 'sound'.

ESCC: East Sussex County Council.

Gatwick Diamond: A business led partnership that focuses on the area centred by Gatwick.

Gross Value Added (GVA): A measure in economics of the value of goods and services produced in an area.

Highways Agency: Agency with responsibility of operation, maintenance and improvement of the SRN in England.

HGV: Heavy Goods Vehicle.

LNR: Local Nature Reserves.

Local Enterprise Partnership: A body, designated by the Secretary of State for Communities and Local Government, established for the purpose of creating or improving the conditions for economic growth in an area.

Local Plan: A Local Plan is the plan for the future development of the local area drawn up by the local planning authority in consultation with the community.

Local Transport Plan: Statutory transport plan developed by highway authorities.

National Cycle Network: A national cycling route network of the United Kingdom, created by the charity Sustrans.

National Planning Policy Framework (NPPF): The Framework sets out planning policies for England and how they are expected to be applied. It provides guidance for local planning authorities and decision-takers, both in drawing up plans and making decisions about planning applications.

Network Rail: Authority responsible for the United Kingdom's railway network.

Non-Motorised Users (NMU): Classification consisting of cyclists, pedestrians, equestrians and those with mobility/access issues.

NNR: National Nature Reserve.

Origin/Destination Survey: Survey where the journeys start and finish are recorded.

OTRM: On Time Reliability Measure.

PCU: Passenger Car Units.

RFC: Ratio of Flow to Capacity.

Route Strategies (RS): Documents produced by the Highways Agency that identify network wide problems and challenges and what investment needs to be delivered on key routes.

SAC: Special Areas of Conservation.

SATURN: Simulation and Assignment of Traffic to Urban Road Networks, A suite of network analysis programmes.

Soft measures: Provision of information, marketing and awareness raising to encourage modal shift from the private car to walking, cycling, car sharing and public transport.

South Coast Multi Modal Study (SoCoMMS): This 2002 study developed a transport strategy for the corridor between Southampton and Margate to address congestion, safety and environmental problems and support regeneration and economic growth. Further information available at: <http://www.socomms.org.uk>

South Downs National Park (SDNP): England's newest national park covering an area from Winchester in the West to Eastbourne in the East.

South Downs National Park Authority (SDNPA): Statutory planning body covering the South Down National park area.

SPA: Special Protection Area, an environmental designation.

SSSI: Sites of Special Scientific Interest, an environmental designation.

Strategic Economic Plans (SEPs): Multiyear strategic ambitious and visionary economic plans document created by LEAs.

Strategic Route Network (SRN): The SRN comprises nationally significant roads used for the distribution of goods and services, and a network for the travelling public. In legal terms, it can be

defined as those roads which are the responsibility of the Secretary of State for Transport and managed by the Highways Agency.

TBC: to be confirmed.

TRIPS: TRIPS is used to predict public transport mode choice within a multi-modal model based on SATURN or similar software.

Trunk Road: Roads which constitute the 'national system of roads for through traffic' and 'roads of national importance'.

WASTM: Worthing and Adur Strategic Transport Model.

WSCC: West Sussex County Council