Stage 1 Report

A303/A30/A358 Corridor Feasibility Study

Prepared for

The Highways Agency

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CH2MHILL®

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Acronyms and abbreviations

AADT	Annual Average Daily Traffic
ADT	Average Daily Traffic
ARCADY	Assessment of Roundabout Capacity And DelaY A software tool to analyse roundabout capacity and delay.
AQMA	Air Quality Management Area
AONB	Area of Outstanding Natural Beauty
ASC	Asset Support Contract
ASR	Appraisal Specification Report
AWT	Average Weekly Traffic
BCR	Benefit Cost Ratio
BIS	Department for Business, Innovation & Skills
CC	County Council
CCTV	Closed-Circuit Television
CRF	Congestion Reference Flow
DCLG	Department of Communities and Local Government
Defra	Department for Environment, Food and Rural Affairs
DfT	Department for Transport
DIADEM	Dynamic Integrated Assignment and DEmand Modelling A software tool enabling users to set-up WebTAG-compliant variable demand models.
DMRB	Design Manual for Roads and Bridges
D2	Two-Lane Dual Carriageway
EA	Environment Agency
FEMA	Functional Economic Market Area
FPL	First Priority Location
GVA	Gross Value Added
HA	Highways Agency
HGV	Heavy Goods Vehicle
HM	Her Majesty's
HOSW	Heart of the South West
IMD	Index of Multiple Deprivation
KSI	Killed or Seriously Injured
LEP	Local Enterprise Partnership
LNR	Local Nature Reserve

LSOA	Lower Super Output Area
MAGIC	Multi-Agency Geographic Information for the Countryside
MP	Member of Parliament
NNR	National Nature Reserve
NPPF	National Planning Policy Framework
NO2	Nitrogen Dioxide
NTM	National Trip End Model
ONS	Office for National Statistics
OTRM	On Time Reliability Measure
	Monitors the reliability of journeys made on the Highways Agency's motorway and 'A' road network. Measured by the percentage of 'journeys' on the network that are 'on time'.
OUV	Outstanding Universal Value
PCF	Project Control Framework
PIA	Personal Injury Accident
PICADY	Priority Intersection Capacity and Delay
	A software tool to analyse priority junction capacity and delay.
PPP	Pinch Point Programme
Q1, Q2, …	Quarter 1, Quarter 2, …
RCC	Regional Control Centre
RDA	Regional Development Agency
RES	Regional Economic Strategy
RS	Route Strategy
RSI	Road-side Interview
SAC	Special Area of Conservation
SATURN	Simulation and Assignment of Traffic to Urban Road Networks
	A suite of highway network assignment and analysis programs.
SEIP	Stonehenge Environmental Improvements Programme
SEP	Strategic Economic Plan
SME	Small and Medium sized Enterprise
SPA	Special Protection Area
SSSI	Site of Special Scientific Interest
SOUV	Statement of Outstanding Universal Value
STAG	Stonehenge Traffic Action Group
SWARMMS	London to South West and South Wales Multi-Modal Study
SWO	South West Observatory
SWP	South West Peninsula
S2	Two-Lane Single Carriageway

S3	Three-Lane Single Carriageway
TAME	The HA's Traffic Appraisal, Modelling and Economics team
TASM	The DfT's Transport Appraisal and Strategic Modelling division
TEN-T	Trans-European Transport Networks
TEMPRO	Trip End Model Presentation Program A database of population, employment, households by car ownership, trip ends and traffic growth forecasts based on data from the National Transport Model (NTM).
TOS	Traffic Officer Service
TRADS	Traffic Flow Database System
TRL	Transport Research Laboratory
VMS	Variable Message Sign
WebTAG	Web Transport Analysis Guidance
WHS	World Heritage Site

Executive summary

Introduction

1. The A303/A30 is part of the Strategic Road Network and together with the A358 forms a key strategic link between the far South West Peninsula connecting Cornwall and Devon with Dorset, Somerset and Wiltshire with the rest of the south, south east, and London. The route is also on the Trans-European Network - Transport (TEN-T) comprehensive network. In conjunction with the A358 the corridor covers approximately 195Km.

2. Although it is dualled over much of its length there are several unimproved single carriageway sections between the M3 motorway at Basingstoke and the M5 at Taunton and Exeter which cause congestion, especially during summer weekends. The A303 also passes through the Stonehenge World Heritage Site (WHS) and through the Cranborne Chase and West Wiltshire Downs and Blackdown Hills Areas of Outstanding Natural Beauty (AONB).

3. Besides its importance as a key strategic link it also has significant importance linking the local road network and facilitating many shorter distance journeys between the main population and employment centres along and adjacent to the route (Andover, Amesbury, Shaftesbury, Yeovil, Honiton and Exeter) and provides the key link connecting the South West Penninsular (SWP) to the rest of England providing one of the main conduits for business and economic growth for the south west.

4. The route is characterised by varying carriageway standards (63% dual carriageway, 37% single carriageway), speed limits (from 40mph to 70mh) and numerous major (at grade and grade separated) and minor junctions and accesses which together with significant seasonal traffic growth contributes to detrimental traffic congestion and delays with associated economic, environmental and social costs. Proposed housing and employment growth in and along the corridor will increase traffic locally and strategically which will only exacerbate the current problems.

Context and background

5. Proposals to complete the dualling of the route were made in the 2002 London to South West and South Wales Multi-Modal Study (SWARMMS). Together with improvements to the A358 between Ilminster and Taunton this would have created a ‘second strategic route’ (in addition to the M5) into the South West.

6. However, by 2007, with the cancellation of the Amesbury to Berwick Down Scheme (which included Stonehenge) due to increasing costs and the South West Region’s conclusion that some schemes could not be funded from the Regional Funding Allocation, the Highways Agency could no longer pursue the SWARMMS strategy.

7. Following the 2013 Spending Review, the Government announced plans for the biggest ever upgrade of the strategic national roads network. The HM Treasury document, Investing in Britain’s Future (July 2013), set out details of the programmes of infrastructure investment, which included the tripling of annual investment on HA major roads enhancements from today’s levels to over £3bn by 2020/21.

8. As part of that investment programme, the Government announced that it would identify and fund solutions, initially through 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 A303/A30/A358 corridor was identified as part of that process and is one of the feasibility studies.

9. This report is the output from Stage 1 of the study (following the WebTAG Transport Appraisal Process) which comprehensively reviews existing evidence to identify key transport issues and challenges which should form the basis for option development in stages 2 and 3.

Summary of current/future transport issues and challenges

Traffic Flows

10. The traffic flows on the corridor are comprised of many different types and purposes including commuting, leisure, business and retail with these heavily influenced by seasonal variation. The highest traffic flows on the corridor are on the eastern portion of the route between the A342 and M3 with flows varying from 35,000 to 50,000 AADT and the far western section adjacent to Exeter at approximately 40,000 AADT. The lowest flows are found on the section through the AONB at Blackdown Hills at around 13,000 to 15,000 AADT. Many of the sections in between these areas have flows between 20,000 and 25,000 AADT. Typical HGV proportions are 10% which, bearing in mind the high variation in flow, indicates a high proportion of local as well as longer distance HGV traffic.

11. Traffic flows along the whole corridor are significantly affected during the summer months with increases due to tourist and holiday traffic. The largest increase is over 50% in traffic across the Blackdown Hills with other increase being of the order of 20 to 30%. The percentage increase in traffic flows tends to increase as you travel from east to west.

Route Capacity

12. The impact of traffic flows on the occurrence of congestion and delay has been estimated via the calculation of the stress factor which is the ratio of AADT to the congestion reference flow (the flow at which the carriageway is likely to be congested in the peak periods on an average day). Where the stress factor exceeds 100% this indicates congestion will be experienced due to a lack of link capacity and unstable flow, flow breakdown and unreliable journey times are likely to be experienced. It should also be noted that where the stress factor lies between 85% and 100% turbulent traffic conditions will also be experienced during peak periods.

13. Under normal conditions stress at or above 100% is experienced on the following sections:

- South Petherton to Southfields;
- Sparkford to Ilchester;
- Amesbury to Berwick Down.

14. In the seasonal summer peak stress values on the above sections increase but additional sections also exceed 100% at:

- Chicklade Bottom to Mere;
- Wyle to Stockton Wood;

- A358, M5 J25 to A378 at 98%.

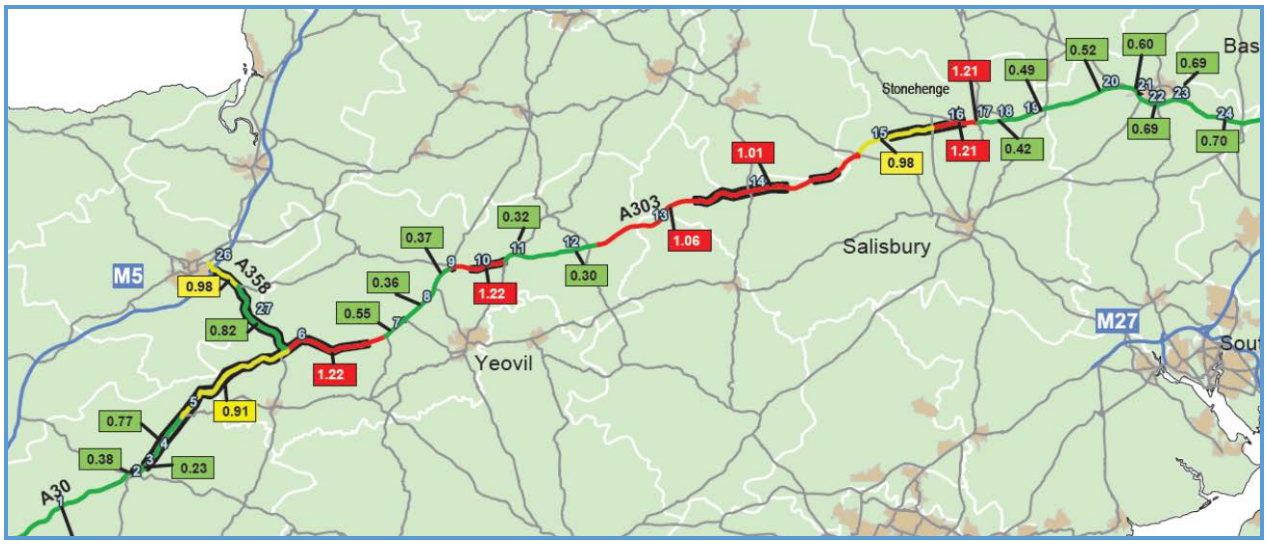


Figure ES1 Indicative "Stress" levels Summer Traffic 2013

15. In conjunction with high seasonal traffic levels on the M5 between Bristol and Exeter the prevalence of congestion and delay on these single carriageway sections creates significant resilience issues and impacts upon the ability of the route to provide a suitable alternative to access the South West

Travel Times

16. Journey time reliability is a key element identified by stakeholders which is required to support economic growth. The recent South West Peninsula Route Strategy identified the following links as having particularly poor journey time performance:

    - A30 between Honiton and the M5;
    - A303 in the vicinity of Sparkford;
    - A303 in the vicinity of Andover.

17. More recent (2013) journey time reliability data was examined using the On Time Reliability Measure (OTRM) which measures the percentage of journeys that are on time against a reference time based on historical data. Analysis of this data reiterated the Route Strategy (RS) conclusion that the A30 around Honiton and A303 at Andover and Sparkford were poor performers with reliability levels at only 70%. The worst performing section was between the A360 and A344 westbound at Stonehenge where reliability is only around 55%. Along the route as a whole the majority of sections operate at between 70% and 80% reliability.

Road Safety

18. Along the A303/A30 corridor as a whole approximately 160 personal injury accidents per annum were recorded between 2008 and 2012 with a further 83 PIAs on the A358 between 2009 and 2013. The A303/A30 has seen a general reduction in PIAs over this period with those in 2012 being some 30% lower than the 2008 level reflecting some of the accident safety measures and improvements made along the corridor over that period.

19. However what is of concern and significance is that whilst the single carriageway sections only account for 37% of the route length, nearly 70% of the fatal accidents occurred upon them with a total of 47% of all PIAs being recorded on these single carriageway sections. The poorest performing sections in terms of fatal accidents are:

    - Southfields to Honiton (10 fatal accidents (28%));
    - Chicklade Bottom to Mere (5 fatal accidents (14%));
    - Amesbury to Berwick Down (4 fatal accidents (11%))

20. Based on the total number of PIA per kilometre of the single carriageway sections the worst performing sections were:

    - Amesbury to Berwick Down at 6.2pia/km;
    - Southfields to M5 J25 at 5.35pia/km;
    - Chicklade Bottom to Mere/South Petherton to Southfields at 4.6pia/km, and
    - Sparkford to Ilchester at 4.5pia/km.

21. The prevalence of fatal accidents in particular and the high volume of accidents in general on the single carriageway sections would have significant deleterious impacts due to the carriageway standard and impacting on the resilience of the route to such incidents. Such accidents would most likely close the road for a significant period causing substantial delay and knock-on effects on the surrounding network

Environmental

22. Due to the length of the route it naturally passes through a vast array of differing landscapes. The most significant site along the route is Stonehenge which has World Heritage Status within which is the Amesbury to Berwick Down section of the route. Apart from this WHS, Grade I Listed buildings are present adjacent to the majority of the single carriageway sections.

23. A MAGIC (Multi Agency Geographic Information for the Countryside) side also identified SSSI sites adjacent to all single carriageway sections as well as bat habitats and special areas of conservation adjacent to the Amesbury to Berwick Down and Wyle to Stockton Wood sections.

24. Three single carriageway sections (Wylye to Stockton Wood, Chicklade Bottom to Mere and Southfields to Honiton) of the route also fall within AONBs at Cranborne Chase and West Wiltshire Downs and the Blackdown Hills.

Current Issues and Priorities

25. From the detailed review of the evidence summarised above four priority transport issues have been identified.

    - A key transport problem is the prevalence of peak congestion and delay under normal conditions on a number of sections of the route which is exacerbated by seasonal influences;

- The knock-on impacts of associated journey time reliability specific to single carriageway sections;

- A lack of resilience of the route. Whilst the frequency of accidents is not unduly different to comparable sections of road elsewhere the impacts of these on the route and local economy can be significant due to the route characteristics and the absence of suitable re-routing alternatives. There is scope therefore to reduce accident rates and frequency by improving the standard of the road;

- Significant environmental constraints and concerns not withstanding those related to the WHS of Stonehenge.

Impact of Growth

26. There are a number of key drivers of growth which will impact on the level of future traffic using this corridor:

- Background growth related to changing social, demographic and economic factors i.e. greater car use with rising GDP;

- Specific growth related to the housing and employment related developments planned for either the corridor, region or beyond

27. Specific growth proposals which may impact on corridor flows are related to, but not exclusive to, the Exeter area, Yeovil Western corridor, M5 J25, Hinkley Point C, Stonehenge visitor centre, Solstice Park in Amesbury and growth in Andover. Taken together all developments planned for the SWP area up to 2031 amounts to 242,000 residential units and 150,000 jobs which may increase traffic flows by up to 20% to 2021 and 30% to 2031.

28. Ultimately growth pressures are estimated to raise stress levels to over 100% for the majority of the single carriageway sections along the route in normal conditions with a further 2 sections being above 85% thus representing all single carriageway sections of the route. In particular is the increasing levels of stress at levels above 85% in summer months. In Figure ES2 below mvkm refers to the distance travelled at different stress levels and is calculated by multiplying the link length by the annual number of vehicles travelling that link.

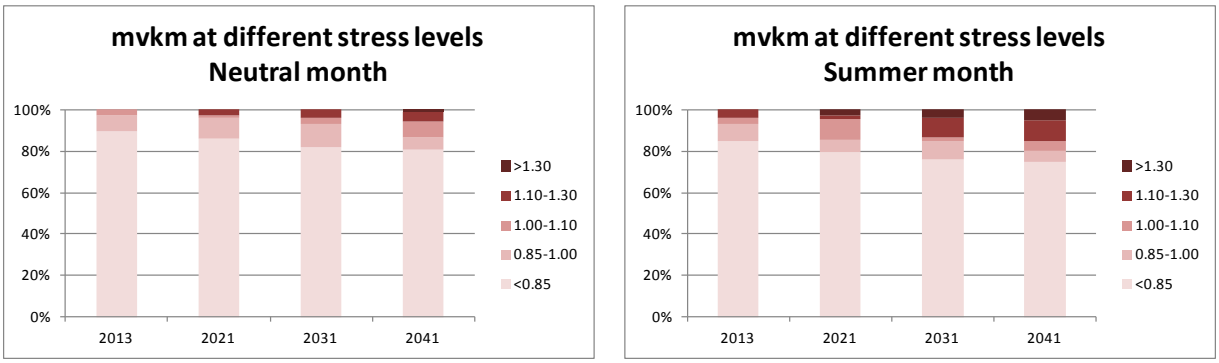


Figure ES2: A303/A30/A358 Stress Levels

29. Clearly this growth under normal conditions will exacerbate the current transport issues and worsen associated economic, environmental and social impacts.

Need for intervention

30. Based on the assessment above there is a clear need for intervention to improve travel conditions, journey times, and safety or to safeguard environmentally sensitive areas along the route. These locations are by their very nature constrained to the single carriageway sections and can be summarised as the sections within Table ES1.

Section	Congestion/ Stress (2013 Neutral)	Safety (A303/A30 (2008-12)) A358 (2009-13)		Journey Time reliability	Environmental
		Fatal	PIA/km		
Amesbury to Berwick Down	1.06	4	6.23	X	Stonehenge WHS
Wyle to Stockton Wood	0.86	1	3.85	X	Cranborne Chase and West Wiltshire Downs AONB
Chicklade Bottom to Mere	0.89	5	4.67		Cranborne Chase and West Wiltshire Downs AONB
Sparkford to Ilchester	0.99	1	4.55	X	
Podimore Roundabout	0.99	0	33.33		
Cartgate Roundabout	0.29	0	56.67		
South Petherton to Southfields	1.03	2	4.6		
Southfields to M5 J25	0.94	1	5.36	Data not available	
Southfields to Honiton	0.69	10	4.91	X	Blackdown Hills AONB

Table ES1: Key Issues on Single Carriageway Sections

31. The sensitivity or severity of the above impacts are not weighted and only represent the presence of such an issue or problem from the data reviewed.

32. Due to the population density, employment opportunities, urban concentrations and tourist attraction of the SWP the A303/A30/A358 corridor experiences a wide range of traffic flows which lead directly to severe and regular instances of congestion and delay. There are some sections that frequently experience high levels of congestion even outside of the peak period. South Petherton, Sparkford to Ilchester and Stonehenge in particular are identified but there are other sections which experience similar, if slightly less, congestion problems leading to journey time unpredictability which is demonstrated by the HA's OTRM data. Any additional developments, industrial or residential or both, adjacent to the route corridor will inevitably increase the pressure on the route and will exacerbate the current situation to unsustainable

levels leading to further social, economic and environmental issues being experienced throughout the region.

33. The presence of each of the above safety, reliability and resilience issues impacts the connectivity (and the perception of connectivity) of the region and is seen by many to adversely affect the economic prosperity of the region whose view is supported by the fact that the average GVA per head is lower than the UK average and the volume of foreign trade, both import and export, is falling.

34. In summary the current standards and nature of the route, without a viable close alternative, exacerbates problems relating to the following:

- Poor Connectivity
- Poor Resilience
- Poor Road Safety
- Poor Journey Times
- Poor Journey Time Reliability

35. These issues are well known and continue to maintain the A303 A30 A358 corridor status as one of the most notorious and long-standing road hot spots in the country and an unreliable route to access the South West.

Objectives

36. Stage 1 of this feasibility study has identified some key issues, both current and future, on the A303/A30/A358 corridor which were used to develop a number of interventions/specific objectives, against which options for improvement will be investigated and sifted in Stage 2 of the study.

Strategic Objectives	**Supporting Economic Growth**	Facilitate growth in employment at key centres and locations along the A303/A358/A30 corridor	Facilitate growth in housing a key development hotspots along the corridor
Operational Objectives	**Capacity**	Reduce delay and queues that occur during peak hours and seasonal times of the year	
	Resilience	Improve the resilience of the route such that the number of incidents and the effect of incidents is reduced	
	Safety	Reduce the number of collisions on the A303/A358/A30 corridor	
	Connectivity	Improve the connectivity of the South West to the rest of the UK, to reduce peripherality and improve business and growth prospects.	
	Environmental	Avoid unacceptable impacts on the surrounding natural environment and landscape and optimise the environmental opportunities and mitigation that the intervention could bring.	

Table ES2: Feasibility Study Objectives

Recommendation

37. Following the conclusion of Stage 1 of this feasibility study it is recommended that previous scheme option information be collated and reviewed to develop a long list of potential solutions to the problems and issues.

38. Specifically further analysis of options for improvement are to be considered for the following sections:

- Amesbury to Berwick Down;
- Chicklade Bottom to Mere;
- Sparkford to Ilchester;
- South Petherton to Southfields,and;
- Southfields to Honiton.

39. Furthermore it is recommended that a strategic transport model be developed to enable a consistent and region based assessment of improvement options and for the impacts of those to be realised over the south west region and on competing routes. This model wold be developed in conjunction with current guidance and the DfT TASM and HA TAME departments.

1 Introduction and purpose[1]

1.1 Introduction

Following the 2013 Spending Review, the Government announced plans for the biggest ever upgrade of the strategic national roads network. The HM Treasury document, Investing in Britain's Future (July 2013), set out details of the programmes of infrastructure investment, which included the tripling of annual investment on HA major roads enhancements from today's levels to over £3bn by 2020/21.

As part of that investment programme, the Government announced that it will identify and fund solutions, initially through 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 locations identified were:

- the A303/A30/A358 corridor;
- the A1 North of Newcastle;
- the A1 Newcastle-Gateshead Western Bypass;
- the A27 Corridor (including Arundel and Worthing);
- Trans-Pennine routes; and
- the A47 A12 corridor.

Feasibility studies for all of these routes are being progressed alongside the HA's Route Strategy programme which is considering the current and future performance of the entire network to inform future investment decisions.

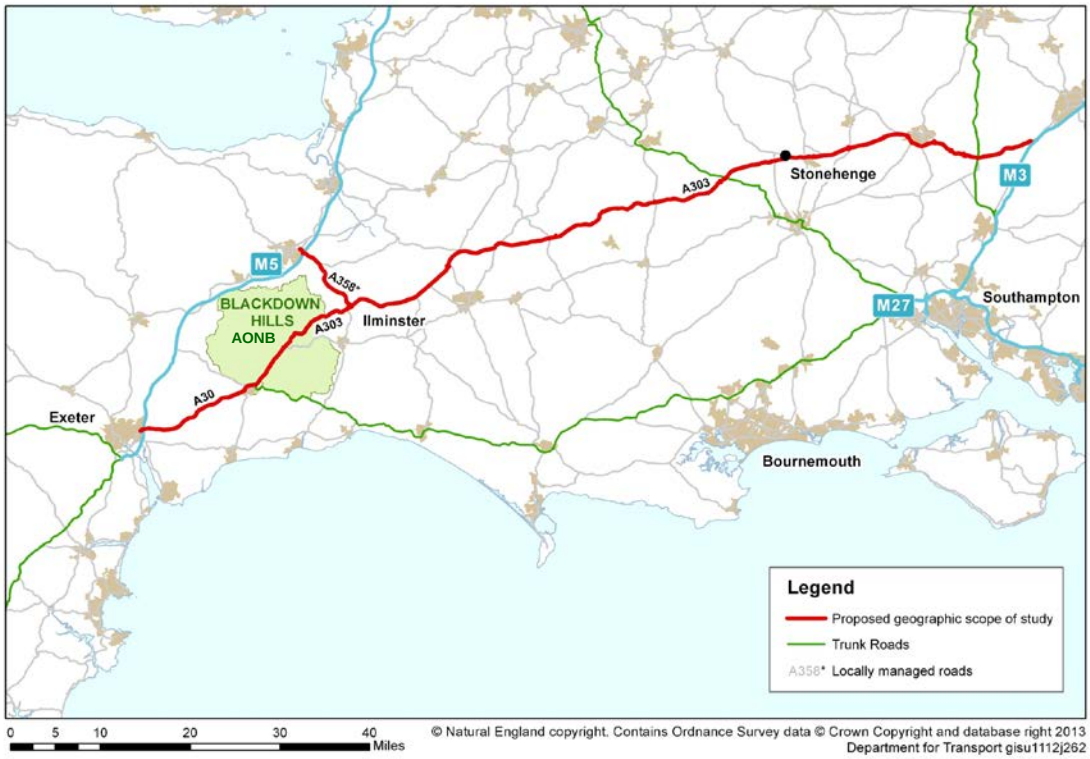
1.2 Study scope

The Feasibility Study is concerned with the A303/A30/A358 corridor, which comprises:

- the A303 between the M3 and the A30;
- the A30 between the A303 and the M5; and
- the A358 between the A303 and the M5.

Figure 1-1 shows these lengths of road in red.

[1] Extracted from A303/A30/A358 Corridor Feasibility Study, Scope Document, DfT and HA, March 2014.



Note: Figure 1 of A303/A30/A358 Corridor Feasibility Study, Scope Document.

Figure 1-1: A303/A30/A358 Corridor

The road passes through the Stonehenge WHS and Cranborne Chase and West Wiltshire Downs and Blackdown Hills AONBs. Amongst other things, the Feasibility Study will need to understand the effects of any proposed work on the WHS and AONBs and major road investments may not be considered appropriate in the case of the latter – AONBs have been confirmed by the Government as having the highest status of protection in relation to landscape and scenic beauty. Stakeholder discussions as well as the scale of environmental impacts will inform considerations around both of these locations, and certain schemes may be deemed undeliverable.

The modal scope of the study is predominantly road-based[2], although the impacts of improvements to the A303/A30/A358 corridor on other roads (e.g. the M4 and M5) need to be considered. Specific proposals for other strategic roads will be considered as part of the HA's SWP RS.

The study will need to consider a range of individual potential investment proposals and, potentially, combinations of investment propositions. However, the study will look to initially build on work done to date on potential proposals rather than completing a specific fresh process of identification of investment proposals.

The study will be conducted in a number of steps specifically as follows:

Stage 1: Review of evidence and identification of problems along the corridor

- Preparation of a report (i.e. this report) summarising the evidence gathered as part of the Stage 1 SWP RS and other relevant study work and analysis and setting out problems and issues along the route.

[2] Section 3.7 of the report cites SWARMMS evidence justifying a road-based focus.

Stage 2: Work to identify the range of infrastructure proposals that could address problems along the corridor

- Production of an Option Assessment Report (step 8, TAG unit 2.1.2), setting out the range of infrastructure proposals that could address problems along the corridor.

Stage 3: Work to assess the affordability, value for money and deliverability of prioritised infrastructure proposals

- Production of a high level economic appraisal for each of the infrastructure proposals deemed a priority (by the Project Board).
- Production of an assessment based on HM Treasury's five case model (strategic, economic, financial, commercial and management cases) for addressing all of the problems on the corridor, determining whether considering the corridor as a whole produces more benefits than considering each of the proposals in isolation.
- Provision of an explanation of the additional work that would be necessary to allow Government to take an investment decision, including how long this work would take.

1.3 Study aims and objectives

The aim of the A303/A30/A358 Corridor Feasibility Study is to identify the opportunities and understand the case for future investment solutions on the A303/A30/A358 corridor that are deliverable, affordable and offer value for money.

More specifically, the objectives of the Feasibility Study, as contained in the scope document[3], are to:

- identify and assess the benefits, deliverability and timing of specific infrastructure investments that address the existing problems along the A303 corridor;
- understand the balance of benefits and impacts from potential individual investment proposals and any additional benefits or impacts from an investment on a corridor basis;
- evidence where possible, the wider economic benefits from the transport investment in the corridor;
- understand the balance and impacts from potential investment in the A303 corridor compared to the performance and investment in other road transport corridors to the South West region; and
- understand the impacts on the resilience of the road transport network from the proposed investment in the A303 corridor.

The Feasibility Study will follow WebTAG on Transport Appraisal and this particular element of the study (Stage 1) follows steps 1 to 4b of the process as indicated in *Figure 1-2*. Stage 2 will follow steps 5 to 9 in identifying options to appraise with Stage 3 undertaking an appraisal of options. The final element of the study will be to identify the additional appraisal and other work required to take identified schemes forwards to confirm investment and delivery.

This report is the first in a series of reports which will form the deliverables of the Feasibility Study. It describes existing conditions, issues and problems. Continuing work will both uncover and also generate new evidence, the substance of which will be reported on during subsequent stages.

Subsequent reports will cover option generation, appraisal and assessment using the HM Treasury 5 Case model.

[3] A303/A30/A358 Corridor Feasibility Study, Scope Document, DfT and HA, March 2014.

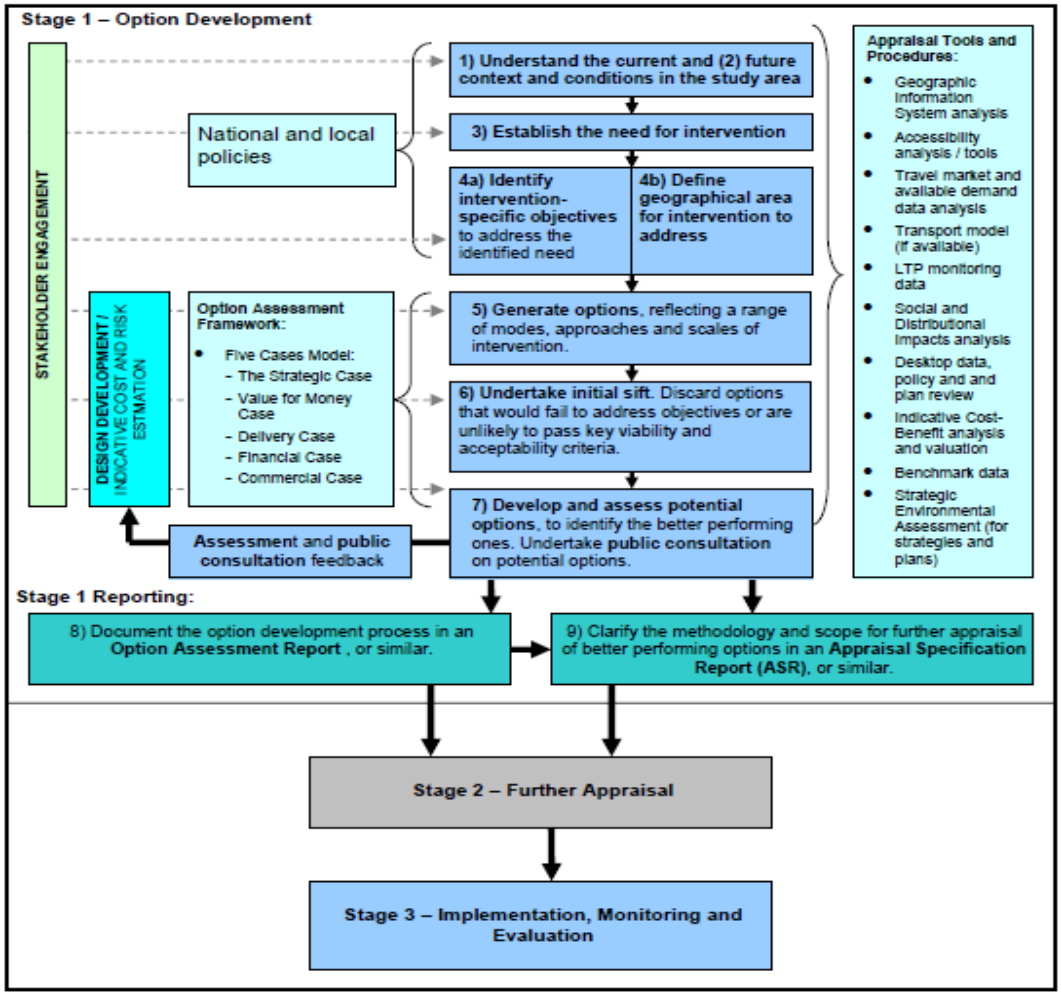


Figure 1-2: The WebTAG Appraisal Process

Although the Appraisal Specification Report (ASR) is identified as an output at step 9 it is being produced as an early deliverable as the complexity of the study corridor and the interaction of the improvement options between themselves and other strategic corridors make the justification for the development of a suitable traffic model a pre-requisite for the appraisal requirements later in the study timetable.

1.4 Report structure

This report is structured as follows:

- Section 2 covers the history and timeline to the schemes with a review of modal transfer and traffic model availability;
- Section 3 covers the current existing status and conditions on the corridor including carriageway status, congestion, constraints and performance;
- Section 4 covers the future situation in terms of land use and transport systems, future demands and performance;
- Section 5 discusses the need for intervention;
- Section 6 provides the objectives for the study;
- Section 7 identifies the region of impact of the schemes;
- Section 8 concludes the report; and
- the appendices are in a companion document.

2 Background and historical work

2.1 Background

The A303 corridor provides an important role in connecting the South East and South West regions. Although it is dualled over much of its length there are several unimproved single carriageway sections between the M3 motorway at Basingstoke and the M5 at Taunton and Exeter which cause congestion, especially during summer weekends. The A303 also passes in close proximity to the Stonehenge World Heritage Site (WHS) and through the Blackdown Hills Area of Outstanding Natural Beauty (AONB).

The Government recognises the importance of the A303 corridor in terms of its role in providing access to the South West and the role it plays in facilitating the movement of goods and people, and its contribution to the economic performance of locations along the corridor. However, given the history of progress with investment proposals in the A303 corridor, the Government did not have sufficiently developed business cases for investment proposals at the time of the 2010 Spending Review to be able to confirm specific investment projects in the A303 corridor.

Because of the importance of the A303 corridor, Somerset County Council held a summit with other relevant stakeholders in 2012 the outcome of which was a commitment by the region for further work on the relative prioritisation of potential interventions and consideration of possible funding avenues. The grouping of local authorities and Local Enterprise Partnerships produced an initial analysis and business case for future improvements to the A303 corridor, to reiterate the importance of investment in the corridor, particularly the wider economic benefits to the South West economy. This feasibility study builds on the momentum gained from this previous work.

2.2 Previous work and decisions

Work has been undertaken over many decades into the transport and traffic conditions on the A303/A30 corridor, with many schemes being forwarded and assessments undertaken since the early 1990s in particular but with problems being identified since the 1950s.

Proposals to complete the dualling of the route were made in the 2002 London to South West and South Wales Multi-Modal Study (SWARMMS).[4] Together with improvements to the A358 between Ilminster and Taunton this would have created a ‘second strategic route’ (in addition to the M5) into the South West.

However, by 2007, with the cancellation of the Amesbury to Berwick Down Scheme (which included Stonehenge) due to increasing costs and the South West Region’s conclusion that some schemes could not be funded from the Regional Funding Allocation, the Highways Agency could no longer pursue the SWARMMS strategy.

The Department set out the outcomes of the Government's Comprehensive Spending Review in 2010, publishing details of investment decisions for major roads projects on the strategic road network. Given the cancellation of the schemes by the previous Government, consideration of such proposals was not included in the 2010 Comprehensive Spending Review. Consequently, the Highways Agency did not develop any dualling proposals but continued to deliver on a number of smaller schemes along the route.

Although the cancelling of the tunnel at Stonehenge set back plans for the dualling of the entire corridor, aspirations for it to become a second strategic route for the South West are still very much alive.

[4] Can be accessed online at http://www.swarmms.org.uk.

2.3 A303 Working Group

Somerset County Council and authorities along the A303 corridor were keen to dual the remaining sections of the A303, citing its importance in terms of contributing to economic growth but also providing a second strategic route (in addition to the M5) to the South West.

Somerset organised a summit with other relevant stakeholders which took place on 6 January 2012. The outcome of the summit, which the HA attended, was a commitment by the region for further work on the relative prioritisation of potential interventions and consideration of possible funding avenues.

A study was commissioned by the Working Group comprised of Somerset, Devon and Wiltshire County Councils and the Heart of the South West LEP to identify, assess and appraise appropriate interventions for the route. An important part of the study was the consideration of the wider economic benefits afforded by improving the A303 corridor.

In May 2013, the Working Group presented its findings to the DfT and the Minister through its brochure '*A303 Corridor Improvement Programme (including A358 and A30) – Outline economic case and proposed next steps'* to request funding for its proposals. The document provides an overview of the A303 and its current performance and also suggests three single carriageway sections which it believes should be the first to be addressed. These are:

- A303 Sparkford to Ilchester (carriageway dualling)
- A303 Southfields to Honiton (smaller scheme improvements)
- A303 Chicklade Bottom to Mere (carriageway dualling)

Following the meeting in May 2013 between the Minister and the Working Group, the Minister tasked the HA to review the work undertaken by the Working Group to provide assurance for any decisions he may make in funding the schemes following the Spending Review. The scope of work for the HA was to:

- review and develop the work to provide assurance on the design, programme, cost and economics.
- consider all of the schemes contained in the route and not just the three proposed by the group.
- consider schemes on a stand-alone basis and in combination.

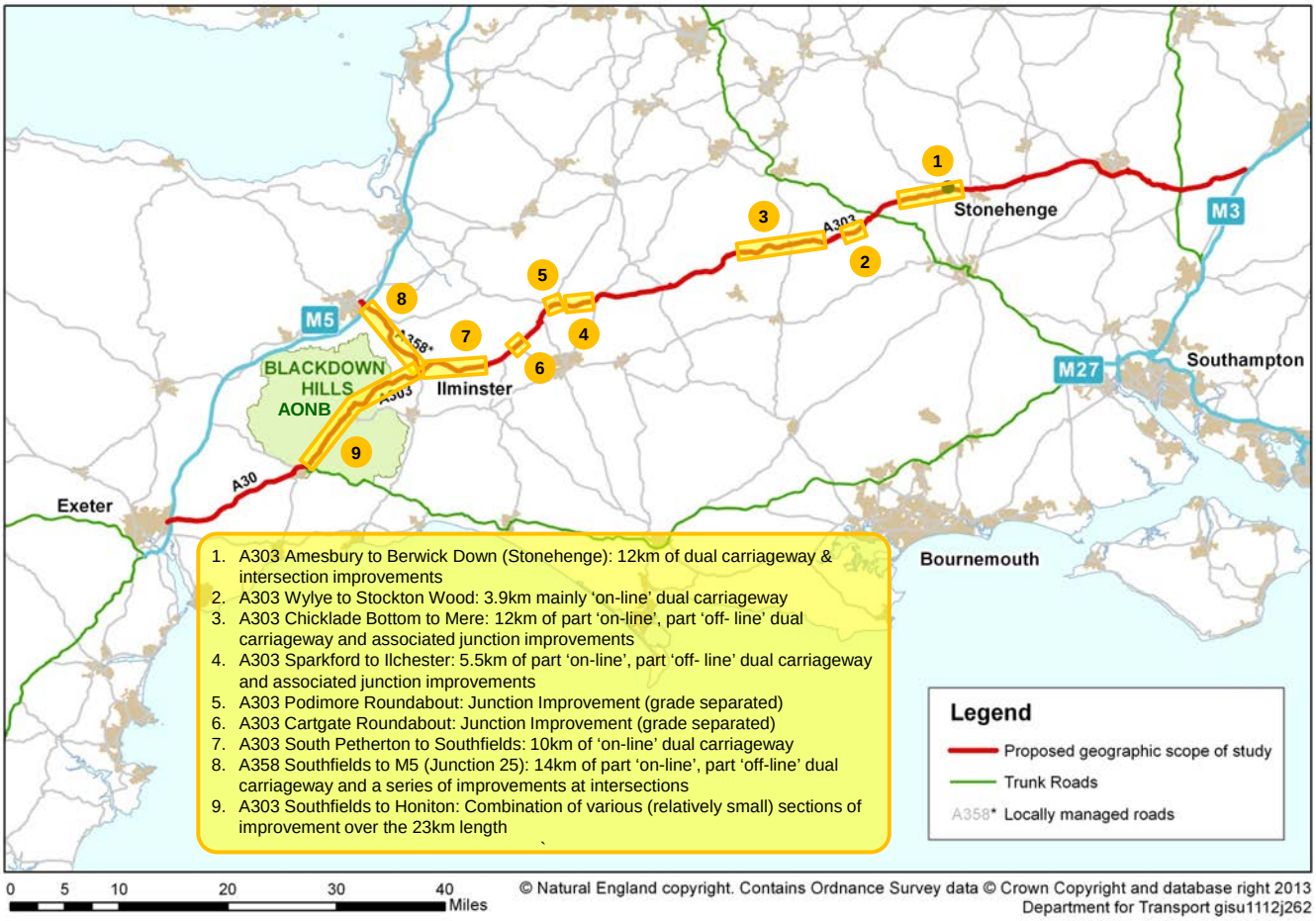
The Highways Agency completed this work in July and the report provides observations and the actions required to provide robust cases for the proposed improvement schemes, which the feasibility study will look to address where appropriate.

2.3.1 Options generated as part of A303 Working Group

Although the study will consider a range of individual potential investment proposals and, potentially, combinations of investment propositions, it will initially build on proposals identified by the HA rather than start afresh with option identification as significant work has already been undertaken on these schemes. Further in later stages of the feasibility study, options will be considered and assessed from a Value for Money and deliverability perspective.

Figure 2.1 shows the location of the proposals from the 'A303 Corridor Improvement Programme' that will be considered as part of the study. *Table 2-1* briefly describes their nature.

As part of this feasibility study the extent to which these proposals are deliverable and offer value for money will be examined. In addition, the suitability of these options will be considered in relation to the current and future performance of the routes, as well as their impacts both in terms of the economy and their potential environmental impacts.



Note: Based on Figure 1 of A303/A30/A358 Corridor Feasibility Study, Scope Document

Figure 2-1: Initial Improvement Options

No.	Location	Description
1	A303 Amesbury to Berwick Down (Stonehenge)	12km of dual carriageway & intersection improvements
2	A303 Wylye to Stockton Wood	3.9km mainly 'on-line' dual carriageway
3	A303 Chicklade Bottom to Mere	12km of part 'on-line', part 'off- line' dual carriageway and associated junction improvements
4	A303 Sparkford to Ilchester	5.5km of part 'on-line', part 'off- line' dual carriageway and associated junction improvements
5	A303 Podimore Roundabout	Junction Improvement (grade separated)
6	A303 Cartgate Roundabout	Junction Improvement (grade separated)
7	A303 South Petherton to Southfields	10km of 'on-line' dual carriageway
8	A358 Southfields to M5 (Junction 25)	14km of part 'on-line', part 'off-line' dual carriageway and a series of improvements at intersections
9	A303 Southfields to Honiton	Combination of various (relatively small) sections of improvement over the 23km length

Note: HA schemes identified in A303/A30/A358 Corridor Feasibility Study, Scope Document

Table 2-1*: *Initial Improvement Options

These scheme proposals were identified over a number of years or decades and have been assessed and appraised using the appraisal frameworks and HA procedures at that time. Currently the established governance framework for evaluating improvement schemes for the HA is the Project Control Framework (PCF). Launched in 2008 the PCF sets out how major improvement projects (>£10m) are managed and delivered and is designed to ensure the delivery of projects is cost effective, timely and meets customer aspirations.

The PCF contains 3 main phases:

- Options phase (identifies the preferred solution)
    - Stage 1 – Options identification
    - Stage 2 – Option selection
- Development Phase (focussing upon design and statutory procedures)
    - Stage 3 – Preliminary design
    - Stage 4 – Statutory procedures and powers
    - Stage 5 – Construction preparation
- Construction phase (building and hand over of the completed solution)
    - Stage 6 – Construction, commissioning and handover
    - Stage 7 – Closeout

In addition to the above stages, there is a Pre-project stage (Stage 0 – Strategy, shaping and prioritisation) and it is generally assumed that before a project enters the PCF it will have completed the activities contained within this stage. Key activities contained within this stage include:

- Identification and prioritisation of potential transport issues
- Shaping, investigation and assessment to ensure the viability of the scheme solutions, including road network solutions
- Initiation of a major road project (if deemed the most viable solution to the problem)

On completion of the investigatory work outlined in Stage 0, it will be clear whether a scheme has only one option.

As already stated, previous schemes for improvement on sections along the route have been undertaken at different times dating back to 1991. These have been reviewed and assigned an equivalent PCF stage as indicated in *Table 2-2*. *Figure 2-2* also presents this information graphically.

Scheme Ref.	Title	Approximate PCF Stage Reached*	Notes
1	A303 Amesbury to Berwick Down	4	Further 'Options' consultation during Scheme Review 2006 Scheme Development stopped 2007
2	A303 Wylye to Stockton Wood	1	Public Consultation 1991. Stakeholder Consultation in preparation of 2005 Technical Appraisal Report (TAR) Scheme Development stopped 2005
3	A303 Chicklade Bottom to Mere	3	Preferred Route 1994. Stakeholder Consultation in preparation of 2006 TAR Scheme Development stopped 2006
4	A303 Sparkford to Ilchester	3	Orders Made 1995. Public Exhibition of previous Preferred Route held in 2003 Scheme Development stopped 2005
5	A303 Podimore Roundabout (originally part of A303 Sparkford to Ilchester scheme)	3	Orders Made 1995. Public Exhibition of previous Preferred Route held in 2003 Scheme Development stopped 2005
6	A303 Cartgate Roundabout	1	Scheme Assessment Report produced 2004 Scheme Development stopped 2007
7	A303 South Petherton to Southfields	2	Public Consultation held 2007 Scheme Development stopped 2007
8	A358 Southfields to M5 J25	2	Public Consultation held 2007 Scheme Development stopped 2007
9	A358 A303/A30 Southfields to Honiton	0	At pre-feasibility stage

Table 2-2: Current PCF Stage of Improvement Schemes/Sections

Appendix A contains additional information on the historical proposed schemes.

Scheme	Description	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
1	A303 Amesbury to Berwick Down (Stonehenge)									PRA							Options con	Pub Exh Scheme stopped					A303 Corridor Improvement Study - Parsons Brinckerhoff and Working Group		A303 Feasibilty Study
2	A303 Wylye to Stockton Wood	Pub Con														TAR Scheme stopped									
3	A303 Chicklade Bottom to Mere				PRA												TAR Scheme Stopped								
4	A303 Sparkford to Ilchester					Orders Made								Pub Exhib		Scheme Stopped									
5	A303 Podimore Roundabout					Orders Made								Pub Exhib		Scheme Stopped									
6	A303 Cartgate Roundabout														SAR			Scheme Stopped							
7	A303 South Petherton to Southfields																	Pub Con Scheme Stopped							
8	A358 Southfields to M5 (Junction 25)																	Pub Con Scheme Stopped							
9	A303 Southfields to Honiton														PI - dualling dropped										

PCF Stage	0	1	2	3	4

PRA	Preferred Route Announcement
SAR	Scheme Assessment Report
Pub Con	Public Consultation
Pub Exhib	Public Exhibition
PI	Public Inquiry

Figure 2-2: Improvement Scheme Historic Timeline & PCF Stage

2.4 Sources

This report has been compiled from a wealth of existing information and reports and also available traffic data. The list of information sources used is contained within Appendix B.

2.5 Availability of existing transport modelling

2.5.1 Introduction

A technical note[5] was prepared to address the matter of existing transport modelling and to make outline modelling recommendations specifically for the A303/A30/A358 Corridor Feasibility Study. The following and Appendix C represent the pertinent content of the technical note.

2.5.2 Existing traffic modelling materials

Table C-1 in Appendix C lists traffic models with possible relevance to the A303/A30/A358 Corridor Feasibility Study. The suitability of and limitations associated with each model are provided in relatively high level but sufficient terms. Figure C-1 and C-2 in Appendix C indicate the coverage of three of the four "strategic" models and ten of the eleven relevant "local" models.

The information in Appendix C allows the following conclusions to be drawn:

- Only the SWARMMS model offers the coverage required for the strategic-level modelling required for the Feasibility Study. Importantly, a SATURN version of the original 2002 highway model exists;
- With the exception of the Taunton Local Traffic Model East microsimulation model (Paramics; 2010), Turks Head local junction models (ARCADY, PICADY and LinSig; 2010) and, to a slightly lesser extent, the East of Exeter Area Model (SATURN; 2009) and North and West Dorset Transport Strategy Model (SATURN; 2009), all of the other models are quite dated;
- Recent or imminent models, like the South Hampshire Sub-Regional and North Hampshire Transport Models are either unnecessarily sophisticated for the purposes of the Feasibility Study or will not be ready for it. Both would also require substantial and expensive extension to consistently cover the corridor in its entirety as well as key alternative routes. Traffic data (e.g. traffic counts and RSIs) from both models, however, may be useful;
- There are very few readily available local junction models of the required type (e.g. ARCADY, PICADY and LinSig) to more realistically model and assess traffic operations at the local level. When such models are required they will therefore have to be built from first principles.

2.5.3 Recommendation

Modelling needs and model availability render the recommendation of a modelling framework for the A303/A30/A358 Corridor Feasibility Study relatively straightforward.

In order to ensure a consistent assessment of improvement proposals overall and potentially in combination, an updated SATURN version of the SWARMMS highway model is proposed. Subsequent discussion with both HA TAME and DfT TASM approved this proposal allied to a fixed trip matrix approach to modelling future traffic demand.

[5] A303/A30/A358 Corridor Feasibility Study – Traffic Model Availability, CH2M HILL, February 2014.

2.6 Potential for modal transfer and travel demand reduction

Transfer possibilities

The vast majority of movements on the broader A303/A30/A358 corridor (i.e. considering more than the highway element) are road-based (the UK Tourism Survey 2009 identified 83% of tourism trips to the SWP being car based). The most important competing modes to road-based private, business or goods travel comprise rail and express bus services. Of the two, rail is by far the most significant alternative. Indeed, coach and express bus operations are limited. Although air options exist, they are also limited, particularly with the closure of Plymouth Airport and current flight schedules to Newquay.

Rail

Considering rail alone, the most significant alternative to road travel on the corridor, it can take a substantial amount of time to get to Exeter and beyond by rail from London.[6] Although a car trip on a typical weekday between the centres of Exeter and London is either comparable or longer in duration (SWARMMS cited a time of 3 hours 15 mins), especially during weekend and holiday peaks, the vast majority of travellers travelling to and from the southwest appear to need a car at the destination end and therefore drive. Further, and particularly during times of peak demand, the rail alternative is often fraught with journey time reliability problems and crowding, off-setting any benefit normally experienced in non-peak times. Table 2-3 summarises recent investigations into travel times between key centres.

A lack of convenient and efficient road-rail transfer/interchange facilities within the corridor also hampers and obstructs modal transfer or bi-modal travel for trips with one or both ends within the corridor.

Additionally, potential shifts from rail to road rather than the other way around are more likely, especially if previously and currently recommended rail improvements are not forthcoming.[7]

Mode	Exeter to London	Plymouth to London	Taunton to London
Road	3hrs 22mins (Victoria Station)	3hrs 59mins (Victoria Station)	2hrs 57mins (Victoria Station)
Rail	2hrs 20 mins (Paddington)	3hrs 20 mins (Paddington)	2hrs 09 mins (Paddington)
Coach	4hrs 20mins (Victoria Coach Station)	4hrs 45mins (Victoria Coach Station)	3hrs 25mins (Victoria Coach Station)

Table 2-3 : C*omparison of journey times between the south west and London*

[Note: Coach timings vary considerably – the fastest scheduled are shown. Road Route uses A303]

[6] SWARMMS cited the following: Exeter-Waterloo 3hrs 25mins via Yeovil and Exeter-Paddington via Taunton and Reading 2hrs 20mins. National Rail's journey planner confirms both journey times.

[7] c.f. *"Already poor railway reliability would deteriorate and overcrowding would increase. The growth in rail travel would be stifled and the role of the railways in carrying more commuting traffic would lessen. As a consequence, road congestion would worsen. The absence of new stations would limit access to the system and improvements in accessibility to the far South West would be much reduced."* (London to South West and South Wales Multi-Modal Study, SWARMMS, Government Office for the South West, Halcrow, May 2002).

SWARMMS evidence

Apart from the relatively recent study for the far west of the A303/A30/A358 corridor, considering M5/A358 and A303/A30 options between Ilminster and Exeter[8], the SWARMMS study was the last to comprehensively consider the A303/A30/A358 corridor in its entirety including all modes, modal transfer and travel demand possibilities across them.

SWARMMS recommended a preferred strategy that featured significant upgrading of both rail and road provision between London and Exeter with, for example:

- significantly upgraded rail, bus and coach services and facilities;
- enhanced public transport interchanges;
- significantly upgraded A303 road corridor (dual carriageway between the M3 and Exeter);
- a variety of other highway measures (including ITS and local safety schemes);
- a number of new and innovative public transport schemes in the rural areas; and,
- a proactive strategy to reduce travel demand growth and encourage mode shift for some tourism-related journeys.

However the SWARMMS study concluded that whilst there is a degree of interaction between rail and road within the corridor, the extent to which they 'compete' for the same travellers is quite small. The vast majority of travellers are effectively captive to one mode or the other. Indeed, in 2016 model tests Exeter-Waterloo rail line patronage fell by less than 1% with an upgraded A303/A30 compared to a situation with the Exeter-Waterloo line upgraded in isolation. This reduction was associated with rail passenger kilometres on the Exeter-Waterloo line approximately 50% greater (in 2016 tests) than base 2001 levels.

Travel demand changes

Reducing growth in travel demand was an important element of the SWARMMS transport strategy[9] and continues to be an important element of transport planning for congested areas and facilities at all levels. Unfortunately, experience with 'softer' travel demand management measures continues to be limited (as noted in the SWARMMS study) and evidence for real results is scarcer, meaning in turn that travel reduction forecasts can be somewhat speculative.

SWARMMS identified three particular travel demand measures as being more likely to have material effects on longer distance travel – namely, teleworking, video-conferencing and Workplace Travel Plans. Individualised marketing plans and bus quality partnerships were expected to have important but more localised effects within busier urban corridors, none of which coinciding with the A303/A30/A358 corridor. Leisure trip spreading would also help, but was not addressed by SWARMMS and hasn't been noted in any subsequent study.

Although potential travel reductions predicted by the SWARMMS study were estimated to be equivalent to 3% of total car traffic generally, and potentially higher for peak and longer distance traffic, it was recognised that it would take a concerted effort on the part of numerous parties (a number of agencies and levels of Government) to realise them.

It seems unlikely that this situation has changed in the intervening years since SWARMMS reported.

[8] Devon Blackdown Hills Study, Parsons Brinkerhoff, current.
[9] London to South West and South Wales Multi-Modal Study, Reducing the Growth in Travel Demand, Government Office for the South West, Halcrow, May 2002, Final.

3 Understanding the current situation

3.1 Introduction

This chapter of the report is to inform an understanding of the current situation along the study corridor. As such it provides information on the following:

- Current transport and other policies at the national, regional and local level;
- Current travel demand and levels of service; and,
- Current opportunities and constraints.

Overall it seeks to consider the current performance of the local road and rail services and has been collated from a variety of data sources including:

- Data collected during the Route Strategy process;
- The A303 Corridor Management Study
- HA TRADS and other traffic data;
- The A303 Working Group and associated consultancy reports (Parsons Brinckerhoff)

3.2 National, Regional and Local Policy

The following outlines relevant policy at the national, regional and local government levels. Other sources of relevant policy, including non-governmental bodies and groups, are also considered.

National Policy

The Coalition Agreement[10] sets out the government priorities for the UK. It includes a commitment to promote a competitive economy, sustain the recovery, promote green spaces and wildlife corridors in order to halt the loss of habitats and restore biodiversity and support sustainable travel. These objectives are reflected by the Department for Transport who have a strategic priority to invest in the road network to promote growth, address congestion and improve road safety.

The Department's Command Paper *Action for Roads* sets out the Department's vision for the future of the road network and explains that Government is making a transformational investment in the road network to support the economy and the environment, and to build a network that is fit for the future. Government has committed to an investment of over £28 billion for the enhancement and maintenance of national and local roads and confirmed funding to build a number of Highways Agency major road projects, tackling the most congested parts of the network, subject to value for money and deliverability. Government has also committed to identifying and funding solutions to tackle some of the most notorious and longstanding road hotspots, including the A303 A30 A358 corridor.

The Department's also recently consulted on the draft National Policy Statement for National Networks which sets out Government's vision and policy for the future development of nationally significant infrastructure projects on the national road and rail networks. The Department's consultation on the National Policy Statement closed on 26 February 2014 and

10 https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/78977/coalition_programme_for_government.pdf accessed 10 October 2014

the Department is currently considering consultation responses and will respond later this year. The draft National Policy Statement sets out the following strategic objectives for the national networks:

- Networks with the capacity and connectivity to support national and local economic activity and facilitate growth and create jobs.
- Networks which support and improve journey quality, reliability and safety.
- Networks which support the delivery of environmental goals and the move to a low carbon economy.
- Networks which join up our communities and link effectively to each other.

Building on the *Action for Roads* and the draft National Networks National Policy Statement, the Department is also currently developing a Road Investment Strategy which will set out the Government's vision for the strategic road network by 2040.

Investing in Britain's Future – June 2013

The Government recognises the need for continued investment and is now committed to publicly fund a pipeline of specific projects worth over £100 billion over the next parliament, including over £70 billion in transport, over £20 billion in schools, and over £10 billion in science, housing and flood defences.

As part of that investment programme the Government announced that it would identify and fund solutions to tackle some of the most notorious and longstanding road hot spots in the country, including the commissioning of feasibility studies to look at problems on

- the A303 to the South West;
- the A27 on the south coast;
- the A1 north of Newcastle;
- the A1 Newcastle-Gateshead Western by-pass;
- Trans-Pennine routes; and
- The A47/A12 Corridor.

This study, the A303/A30/A358 Corridor Feasibility Study, is thus a result of that announcement

Regional Policy

The HA is responsible for planning the long term future and development of the strategic road network. The recently initiated RSs, another key aspect of Investing in Britain's Future, present a fresh approach to identifying investment needs on the strategic road network – more specifically in terms of identifying network needs relating to operations, maintenance and where appropriate, improvements which proactively facilitate economic growth. The RS work is being carried out in two stages:

- Stage 1 – gathering evidence and identifying issues, due to report in Spring 2014; and
- Stage 2 – setting priorities and identifying options and solutions to the issues identified in Stage 1, and due to report in Spring 2015.

The A303-A30 falls within the SWP RS. The London to Wales (M4) RS is also relevant.

Local Enterprise Partnerships

The Heart of the South West LEP recognises that at present the area is underperforming and its vision identifies transport as a major barrier to growth.[11] Cornwall and the Isles of Scilly

[11] http://www.heartofswlep.co.uk/current-priorities accessed 10 October 2014

LEP also highlight the fact that GVA per capita is below that of the south west and of England as a whole.[12] Tourism and leisure services make a major contribution to the local economy. Dorset LEP, for example, has calculated that tourism, leisure, hospitality and international education supports over 31,000 jobs, contributing over £1bn to the local economy, with food and drink contributing a further 12,500 jobs and £418m[13].

Other

The "Connecting Cornwall: 2030 Strategy"[14] states that Cornwall will work with partners to deliver a second strategic route to the South West to reduce reliance on the M4/M5 route. The A303/A30/A358 corridor is the obvious second route. This echoes the aspirations of Somerset and Wiltshire councils for the A303 to act as a "second strategic route".

Regional business leaders have also recorded their aspirations for the A303 to be upgraded to dual-carriageway standard, with a local paper running a "A303 Dual it!" campaign.

The Dorset LEP[15] Transport Group (well represented by Port and freight representatives) has expressed significant concern at the lack of an effective (SRN designation/standard) North-South route between the Ports at Poole and Portland (Weymouth) and Bristol and the West Midlands and the negative effects this has on the economy. Evidence indicates that there is a significant movement of freight and bulk between these ports and that business is growing. A more effective link other than the A35 and A36 currently provide is needed - possibly the A35 to Dorchester, the A37 to A303 and then the A358 to the M5.[16]

Local Policy

The A30/A303/A358 passes through a number of different Local Authority areas and as such a review of the LTPs for each of the areas listed below is presented:

- Devon
- Somerset
- Dorset
- Hampshire
- Wiltshire

Devon LTP

- recognises the importance of the trunk road network and the inevitable effects that closures and major delays on either of the two major routes into the South West – i.e. the M5 and A303/A30 – have on businesses and the tourism industry
- priorities include:
  - making the best use of the existing transport network and improving connections with London and other major cities
  - lobbying for improved rail services
  - supporting growth through a reliable and efficient transport network
  - managing pressures on the road network during peak and seasonal high traffic periods

[12] http://www.cornwallandislesofscillylep.com/assets/file/LEP%20Strategy/Evidence%20Base%201.pdf accessed 10 October 2014

[13] http://www.dorsetlep.co.uk/about-the-dorset-lep/project-themes/#Tourism, leisure, hospitality & International Education: accessed 13 October 2014

[14] Cornwall's third Local Transport Plan.

[15] Dorset LEP Transport Group meeting, Poole, 15 October 2013.

[16] The need for the Feasibility Study to include the A358 was raised at the 15 October 2013 Dorset LEP meeting.

- highlights the need to mitigate against growth in tourist traffic pushing the A303 over capacity, particularly in terms of supporting modest enhancements to the A303 to improve resilience and journey time reliability.

Somerset LTP

- strategic urban extensions are planned for Yeovil, Bridgwater and Taunton, of which the Yeovil extension, comprising 7,800 new homes between 2011 and 2026,[17] is most expected to affect the operation of the A303, especially at and between the junctions of the A303 with the A3088 and A359;
- makes a point that A303 improvements are needed to improve economic performance;
- believes that improvements to the A30/A303/A358 corridor, alongside improvements to broadband infrastructure through investment in superfast broadband, will transform connectivity for businesses;
- specific economic benefits from improvements for Somerset potentially include:
    - making Somerset (and neighbouring areas) more accessible for tourists;
    - providing opportunities to further Somerset's strengths as a short break destination from London and the South East;
    - strengthening Somerset's inward investment attractiveness by reducing journey times to markets;
    - helping to strengthen and develop local supply chains, including the aerospace and advanced engineering sector clustered around Yeovil and Augusta Westland;
- wants, alongside Wiltshire, the corridor to be a second strategic route into and through the South West.

Dorset LTP

- will work with the HA to ensure maximum operational efficiency of its network, including the short section of the A303 running through Dorset

Hampshire LTP

- advocates securing investment to improve capacity and journey time reliability on strategic national corridors (M3, A34 and A303) using “managed motorway” solutions;
- investigate, in association with the HA, the potential for enhancing the M3/A303 junction west of Basingstoke, including noise-reducing measures;
- reduce dependence on the private car by improving bus services and better access to rail stations, including upgrades to existing routes and stations and (where viable) new or re-opened stations or rail links.

Wiltshire LTP

- minimise traffic delays and disruption and improve journey time reliability on key routes to support economic growth and competitiveness;
- new development is proposed in Salisbury where a greater degree of self-containment can be achieved - however, some growth will also occur in other market towns and smaller towns and villages;
- increased numbers of military personnel moving to the Tidworth and Bulford garrisons within the Salisbury Plain Super Garrison as it continues its programme of resettlement are likely to affect the eastern end of the A303, especially in the area between Stonehenge and Andover;
- aspirations for the A303 to act as 'second strategic route';
- liaise on diversionary routes which may impact on smaller settlements (cross-boundary issue with Somerset).

[17] As outlined in the Local Plan of the South Somerset Proposed Submission Local Plan.

3.3 Route description, characteristics and standards

3.3.1 General

For presentation and data consistency purposes the study corridor has been divided into 27 sections so as to be compatible with the HA link referencing system. These are shown in Table 3-1 and Figure 3-1. Two exceptions are the two sections comprising the A358, which is not an HA road. Data provided in the appendices (specifically Appendix D: Traffic Data) is in a more detailed 66 section format.

The primary sources of information comprise:

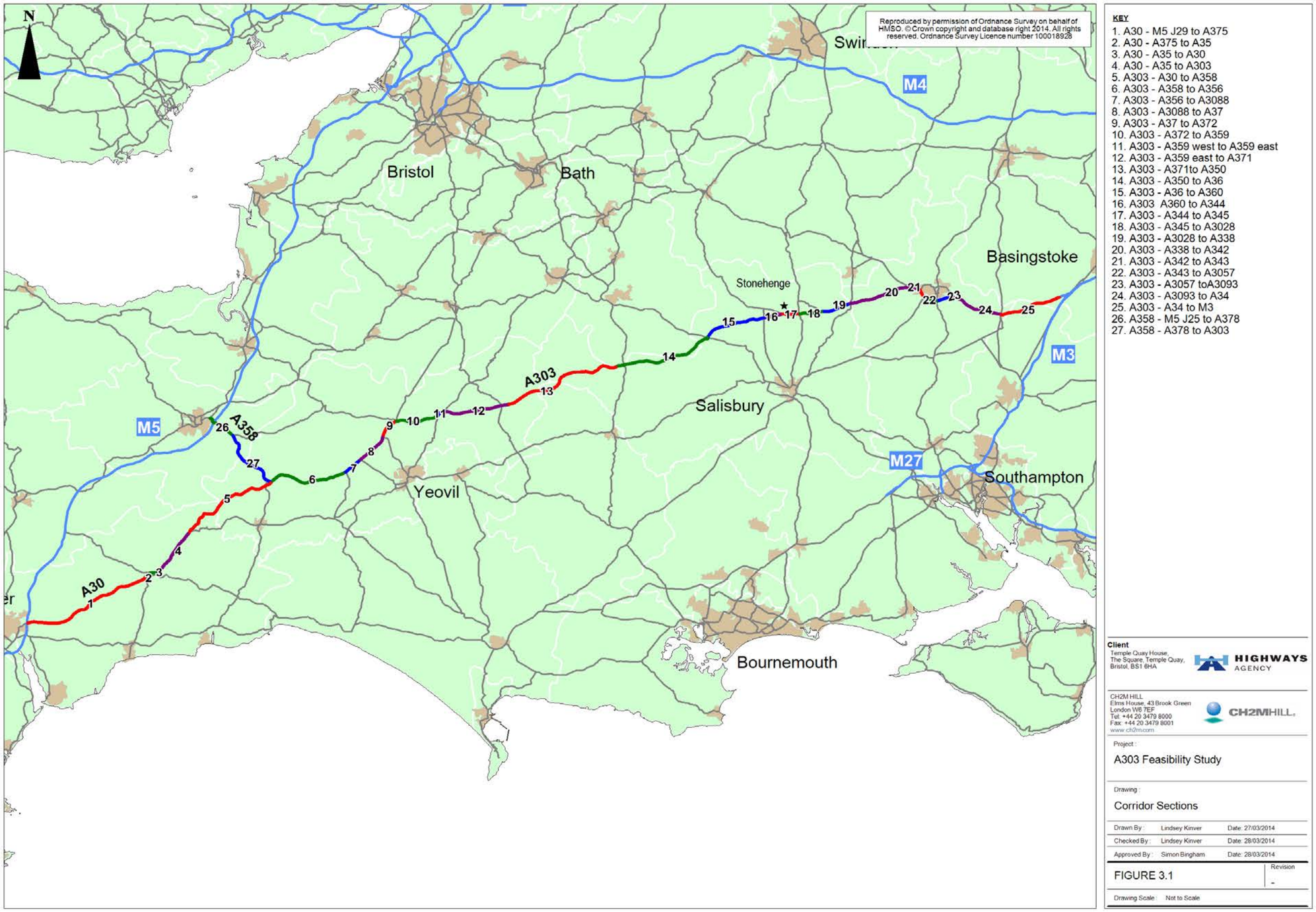
- the SWP RS report;
- traffic data supplied by the HA; and
- DfT's traffic database.

The following presents an overview of the corridor whilst Tables F-1 to F-27 in Appendix F provide section summaries which provide more detail on a section-by-section basis.

Section				Length (km)			Route Sections	
No.	Road	From	To	EB	WB	Av	No.	Description
1	A30	M5 J29	A375	20.14	20.10	20.12		
2		A375	A35	2.52	2.58	2.55		
3		A35	A30	0.54	0.46	0.50		
4		A35	A303	7.76	7.76	7.76	9	Southfields to Honiton
5	A303	A30	A358	16.20	16.30	16.25		
6		A358	A356	12.64	12.54	12.59	7	South Petherton to Southfields
7		A356	A3088	2.94	3.02	2.98	6	Cartgate Roundabout:
8		A3088	A37	5.08	5.02	5.05		
9		A37	A372	3.42	3.52	3.47	5	Podimore Roundabout
10		A372	A359 W	6.62	6.50	6.56	4	Sparkford to Ilchester
11		A359 W	A359 E	1.20	1.12	1.16		
12		A359 E	A371	10.56	10.80	10.68		
13		A371	A350	19.90	19.68	19.79	3	Chicklade Bottom to Mere
14		A350	A36	14.06	14.12	14.09	2	Wylye to Stockton Wood
15		A36	A360	9.66	9.68	9.67	1	Amesbury to Berwick Down (Stonehenge)
16		A360	A344	2.94	2.88	2.91		
17		A344	A345	2.58	2.70	2.64		
18		A345	A3028	3.42	3.34	3.38		
19		A3028	A338	4.74	4.68	4.71		
20		A338	A342	11.16	11.18	11.17		
21		A342	A343	1.24	1.24	1.24		
22		A343	A3057	2.00	2.02	2.01		
23		A3057	A3093	2.24	2.26	2.25		
24		A3093	A34	8.48	8.48	8.48		
25		A34	M3	9.56	9.60	9.58		
26	A358	M5 J25	A378	3.77	3.75	3.76	8	Southfields to M5 Junction 25
27		A378	A303	10.41	10.40	10.41		
Totals				195.8	195.7	195.8		

Table 3-1: Corridor Sections and Lengths

Figure 3-1: Corridor Sections



3.3.2 Role and function

The strategic importance of the A303/A30/A358 corridor, along with the M4/M5, the only national route serving the South West, is widely recognised.[18] Whilst not a part of the DfT's Strategic National Corridors, the A303 and A30 elements of the corridor are part of the TEN-T comprehensive network.

The corridor plays a particularly important role linking the South East and South West as well as carrying and distributing traffic with a variety of local and broader origins and destinations within the South West. Three of the ten largest urban settlements (by 2011 population) in the SWP area are close to the corridor, namely:

- Exeter with 113,507 people;
- Yeovil with 45,784 people; and
- Salisbury with 44,748 people.

Significantly, the western end of the A303 / A30 corridor converges with the M5, A38 and A380 at Exeter to form the main interchange on the South West Peninsula (SWP) network. The most trafficked section of the corridor, however, is situated towards the opposite end of the corridor near the M3. Indeed, two coincidental sections of the A303 between the A3093 (Andover) and the A34, are ranked 7th and 8th in the eastbound and westbound directions respectively relative to the entire SWP network (based on data within the Route Strategy Report).

3.3.3 Standard

The standard of the A303/A30/A358 corridor varies considerably along its length. Although extended lengths are 4-lane dual carriageway with grade-separated access junctions, there are numerous 2-lane and 3-lane single carriageway sections. Between Ilminster and Honiton the A303 and A30 are almost exclusively single carriageway with tight curves at points, limited overtaking opportunities and numerous local road junctions and private accesses of varying standards.

Figure 3-2 shows the road cross-sections prevailing over different lengths of the corridor. *Table 3-2* indicates the actual road lengths involved. Overall 63% of the corridor is of dual carriageway standard with the remaining 37% being of single carriageway standard.

Cross-section types	Length (km)							
	A30		A303		A358		Totals	
Dual 2	23.22	75%	97.99	65%	2.73	19%	123.94	63%
Single 3	0.66	2%	11.83	8%	0.00	0%	11.83	6%
Single 2	7.05	23%	40.85	27%	11.43	81%	59.99	31%
Totals	30.93	100%	150.66	100%	14.17	100%	195.76	100%

Notes:
Dual 2 = dual carriageway with 2 lanes in each direction
Single 3 = single carriageway with 3 lanes with l in one direction and 2 in the other direction, usually 1 of which a climbing lane
Single 2 = single carriageway with 1 lane in each direction

Table 3-2: Corridor Cross-Section Lengths

[18] A303/A30 Corridor Management Study Problem Identification Study, February 2010, Highways Agency, emerging Regional Spatial Strategy.

3.3.4 Management/operation/technology

The A30 Trunk Road from Exeter to Honiton is part of a privately run road, including the A35 Trunk Road from Honiton to Bere Regis, managed, operated and maintained under a contract between the Secretary of State for Transport and Connect A30/A35 Limited. The section of the A30 between Honiton and the A303 as well as the entire length of the A303 between the A30 and the A338 are part of the HA's Area 2 which is managed by Skanska through an Asset Support Contract (ASC). [19,] The section of the A303 between the A338 and the M3 is part of the HA's Area 3 which is managed by EM Highway Services Ltd, also through an ASC. The A358 is a county road under Somerset's jurisdiction.

There are seven Regional Control Centres (RCC) across England as a whole coordinating incident management and controlling road technology like VMSs and CCTV surveillance to provide information to customers on the Traffic England website, through hands-free traffic apps and VMSs. A single National Traffic Control Centre provides a strategic overview of the entire trunk road network, coordinating information services and events that affect more than one region.

In the South West only the motorways and the A38 between Exeter and Plymouth, including Tamar Bridge, have a dedicated Traffic Officer Service (TOS). All other trunk roads in the South West, including those making up the A303/A30/A358 corridor, are subject to a limited level of service.

Figure 3-3 shows the locations of the following road-side and road user facilities:

- fuel stations
- laybys
- food outlets

Overall, the fuel and refreshment offer is fairly well-spaced. Formal and informal pull-offs are available at numerous points along the corridor, except the A358, which only has only one layby in each direction.

[19] Route-based strategy: Evidence Report, South West Peninsula, February 2014, Final draft for stakeholders comments, Highways Agency. See also http://www.highways.gov.uk/our-road-network/managing-our-roads/operating-our-network/how-we-manage-our-roads/area-teams/area-2/.

Figure 3-2: Corridor Cross-Sections

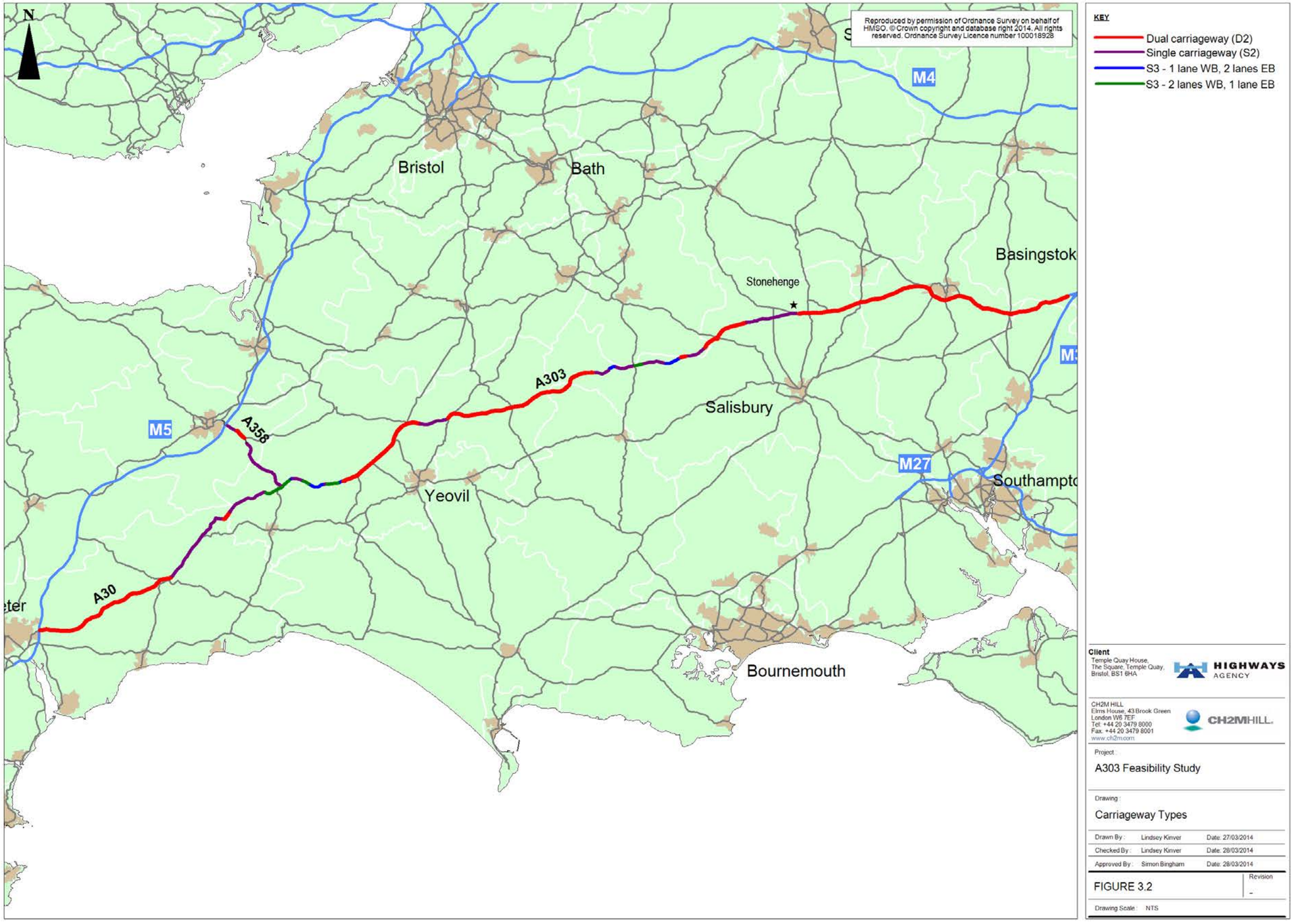
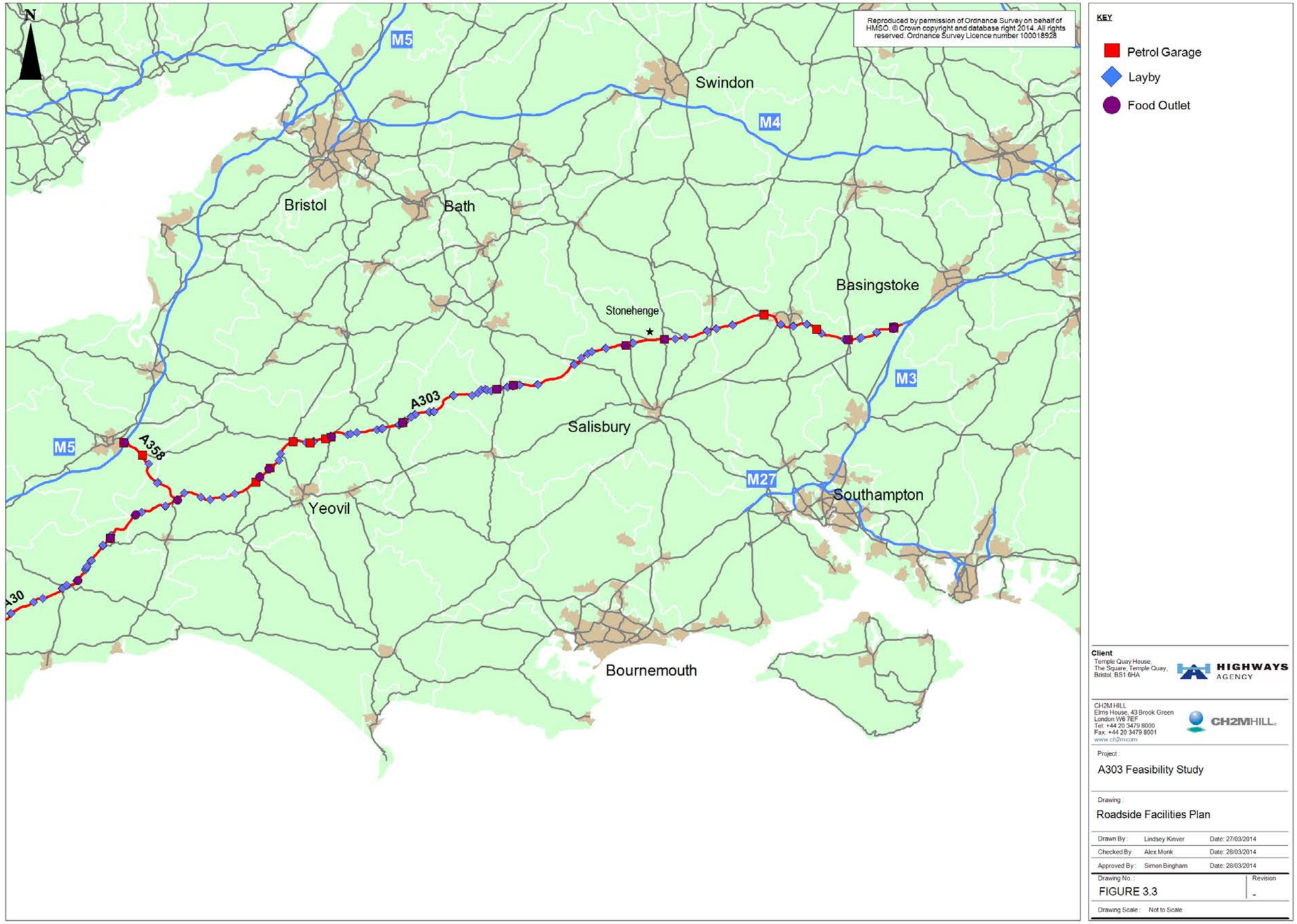


Figure 3-3: Roadside Facilities



3.4 Traffic

3.4.1 Traffic Flows

The A303/A30/A358 corridor carries a variety of different traffic types and trip purposes – the latter including commuting, leisure, business and retail trips and substantial volumes of holiday traffic during summer and bank holidays. Indeed, traffic flows on the SWP network generally are marked by high degrees of seasonal variation.

Evidence supplied by "Visit Cornwall", cited in the SWP RS report, indicates that the South East (19%) and West Midlands (14%) generate the most tourism journeys to Cornwall outside of Cornwall itself. The SWP RS report also states that one section of the A303, between the A371 and A350, has one of the top ten highest seasonal proportions (8th) on the SWP network with a 39% uplift. Seasonal additional traffic generally occurs on Fridays and Saturdays - the traditional change-over days for holiday accommodation.

Figure 3-4 and Figure 3-5 and Table D-1 in Appendix D show 2013 AADT and HGV traffic flows over the whole length of the corridor. Table D-1 also provides daily average flows for a non-holiday (October) and summer holiday month (August) to demonstrate the degree of seasonal variation. Table 3-3 provides a summary of this information.

Corridor section				Non-holiday month ADT (October 2013)			Summer holiday month ADT (August 2013)			
No.	Road	From	To	EB	WB	Two Way	EB	WB	Two Way	Summer extra
1	A30	M5 J29	A375	20,047	20,539	40,586	23,420	24,046	47,466	17.0%
2		A375	A35	11,974	12,016	23,990	15,394	15,272	30,666	27.8%
3		A35	A30	5,927	6,160	12,087	9,146	9,371	18,517	53.2%
4		A35	A303	5,927	6,160	12,087	9,146	9,371	18,517	53.2%
5	A303	A30	A358	6,361	6,719	13,080	8,459	9,228	17,687	35.2%
6		A358	A356	12,698	12,770	25,468	15,778	15,678	31,456	23.5%
7		A356	A3088	15,263	16,933	32,196	20,190	20,385	40,575	26.0%
8		A3088	A37	12,056	12,071	24,127	15,559	15,377	30,936	28.2%
9		A37	A372	13,854	13,986	27,840	17,602	17,622	35,224	26.5%
10		A372	A359 west	11,006	11,343	22,350	13,953	14,213	28,166	26.0%
11		A359 west	A359 east	10,614	10,954	21,568	15,274	14,552	29,826	38.3%
12		A359 east	A371	11,618	11,040	22,658	14,066	14,752	28,818	27.2%
13		A371	A350	11,995	12,132	24,127	15,230	13,611	28,841	19.5%
14		A350	A36	9,997	10,202	20,199	12,711	12,555	25,266	25.1%
15		A36	A360	10,604	10,567	21,171	13,168	12,687	25,855	22.1%
16		A360	A344	12,120	11,919	24,038	14,646	14,106	28,752	19.6%
17		A344	A345	12,120	11,919	24,038	14,646	14,106	28,752	19.6%
18		A345	A3028	14,471	13,611	28,082	16,490	14,967	31,457	12.0%
19		A3028	A338	16,257	16,391	32,649	18,592	18,606	37,198	13.9%
20		A338	A342	15,772	15,866	31,638	18,141	18,262	36,403	15.1%
21		A342	A343	21,859	21,313	43,172	23,708	23,227	46,935	8.7%
22		A343	A3057	22,737	22,554	45,291	24,778	24,950	49,728	9.8%
23		A3057	A3093	22,839	22,295	45,134	25,525	25,159	50,684	12.3%
24		A3093	A34	24,828	24,701	49,529	26,986	26,985	53,971	9.0%
25		A34	M3	17,290	18,317	35,608	19,446	20,474	39,920	12.1%
26	A358	M5 J25	A378	13,826	12,916	26,742	15,026	14,135	29,161	9.0%
27		A378	A303	11,058	10,949	22,007	12,229	12,004	24,233	10.1%

Table 3-3 A303/A30/A358 2013 Traffic Flows

The highest volumes on the corridor are on the eastern portion of the corridor between the A342 and M3 (sections 21 to 25) and vary between 35,000 and almost 50,000 AADT in a neutral month. Traffic flows on all of the single carriageway sections i.e. between sections 3

to 17) have traffic flows significantly in excess of the 13,000 AADT based on current Highways Agency guidance for rural single carriageways (TA 46/97.[20]).

The lowest volumes are found on the A30 and A303 as they run through the Blackdown Hills (sections 3, 4 and 5) where they vary between approximately 12,000 and 15,000 AADT and up to 18,000 ADT in the summer peak.

HGV proportions vary between 8% and 11.6%, with a majority between 9% and 10%. Such proportions are expected on a corridor like the A303/A30.

Traffic Flow Seasonality

Tourist traffic impacts heavily on traffic flows to and from the South West. TRADS data has been extracted from the HA website for October and August 2013 which identifies the fluctuation in flows along the study area during peak seasonal periods.

The 2013 August and October data shown in Table D-1 in Appendix D confirms the high degree of seasonal variation, suggesting high August uplifts relative to October. Table 3-4 indicates the most significant of the August uplifts. Figure 3-6 shows their locations.

Road	Section(s)	Between	Summer extra
A30	3 & 4	A35 & A303	53.2%
A303	11	A359 west & A359 east	38.3%
	5	A30 & A358	35.2%
	8	A3088 & A37	28.2%
	2	A375 & A35	27.8%
	12	A359 east & A371	27.2%
	9	A37 & A372	26.5%
	7	A356 & A3088	26.0%
	10	A372 & A359	26.0%
	14	A350 & A36	25.1%

Note: Being based on ADT rather than AWT, the uplift percentages are analogous to but not actually equivalent to the Seasonality Index which, by definition, is the ratio of the average August weekday flow (Monday to Friday) to the average weekday flow in the neutral months, April, May, June, September and October excluding periods affected by bank holidays.

Table 3-4: August Uplifts Relative October - 2013

Overall, taking the corridor in its entirety, August traffic is 20% higher in terms of vehicle kilometres travelled.

[20] "Traffic flow ranges for use in the assessment of new rural roads", DMRB vol 5, part 1,section 3..

Figure 3-4: Corridor ADTs – Neutral Month

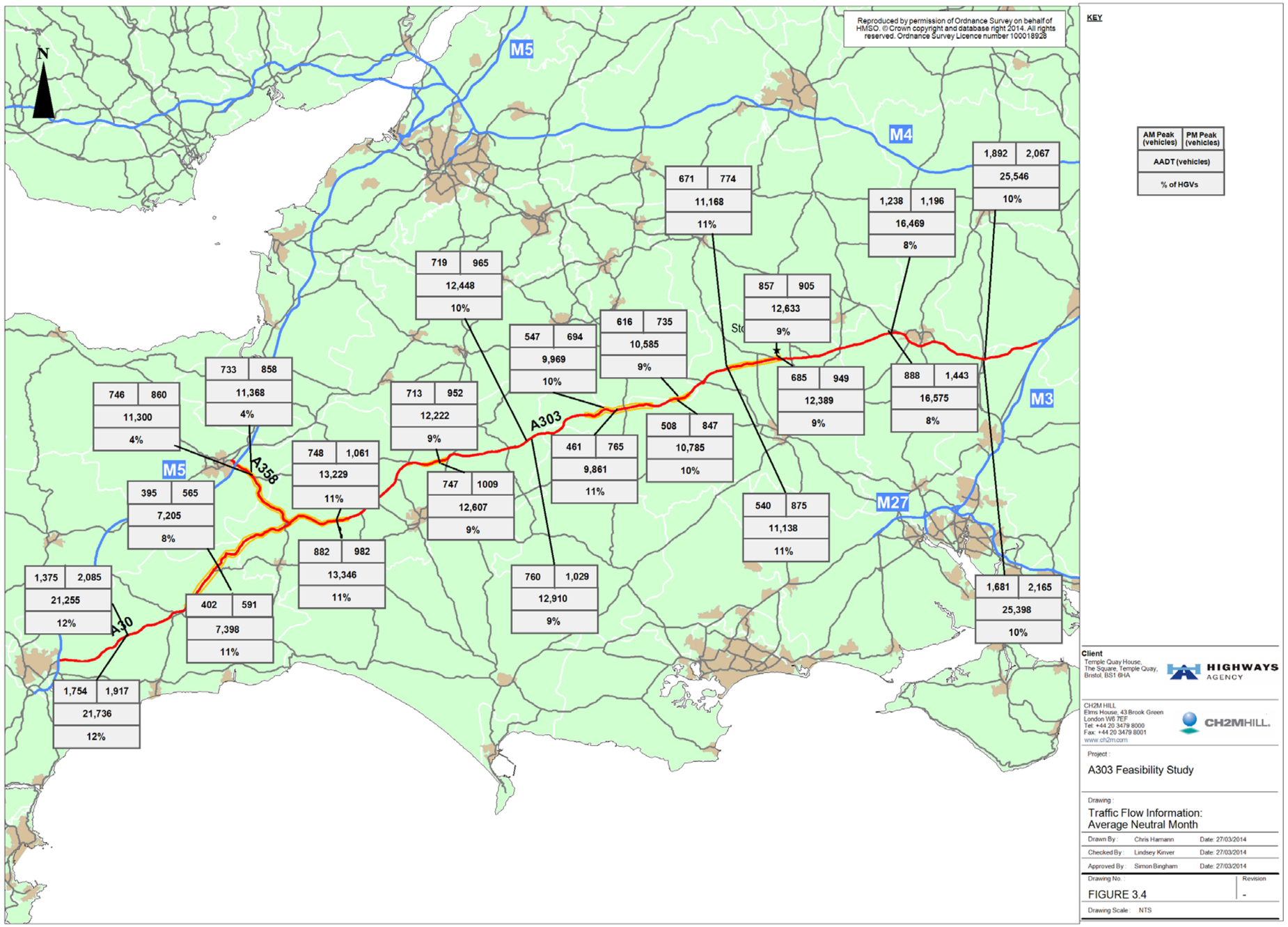


Figure 3-5: Corridor ADTs – Summer Month

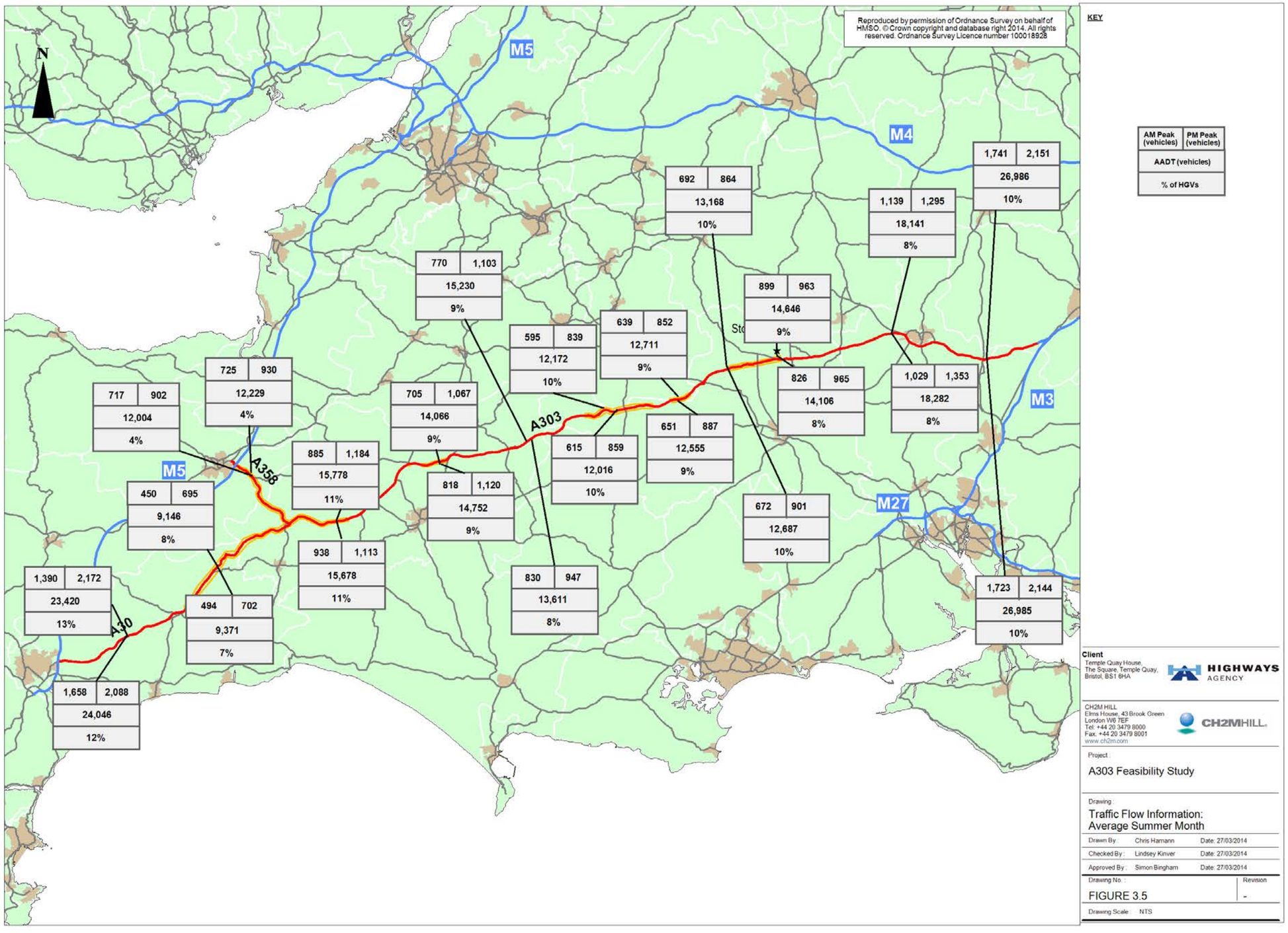
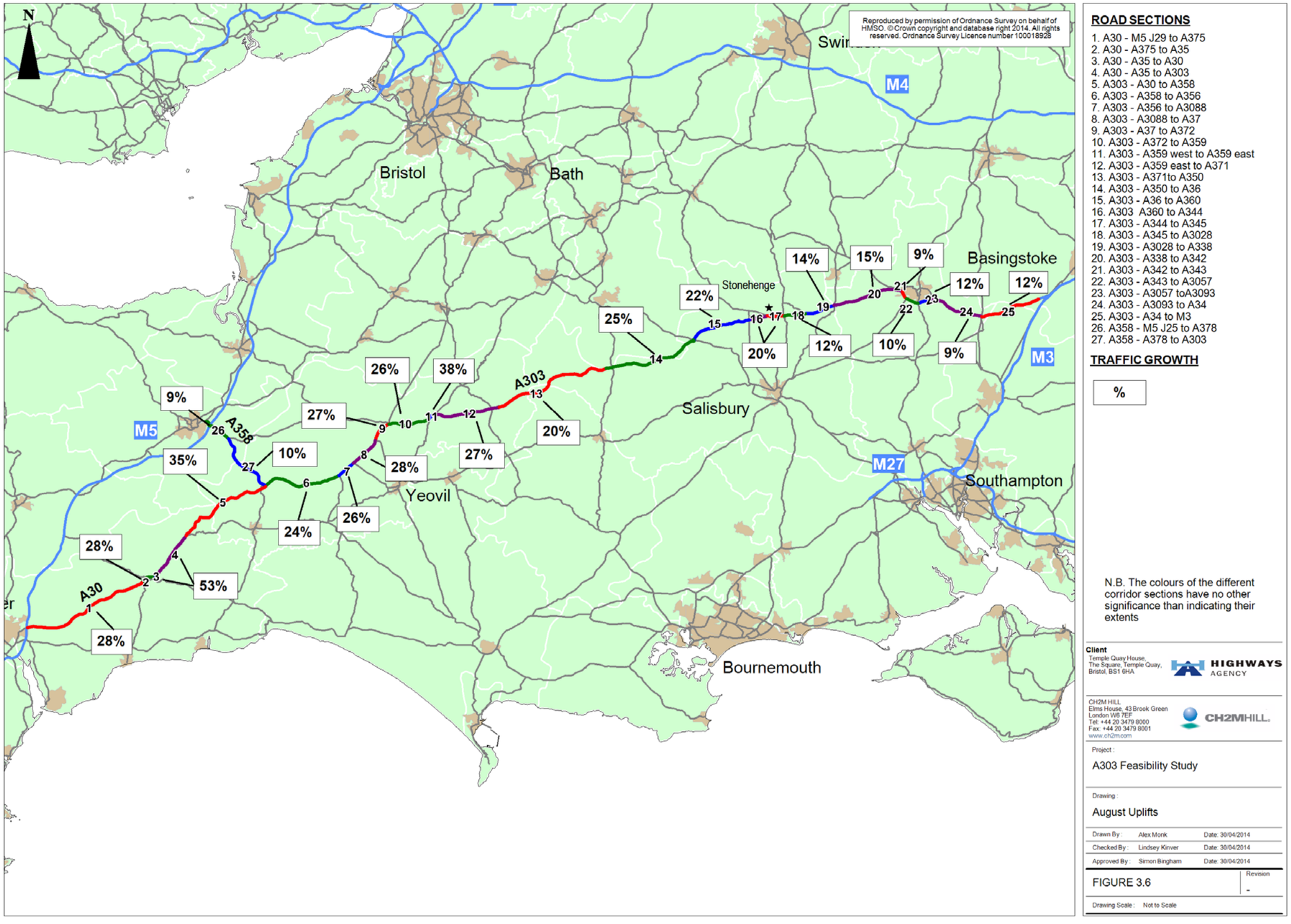


Figure 3-6: August Uplifts



3.4.2 Traffic growth

Table 3-5 indicates the traffic growth over various sections of the HA portion of the corridor between 2008 and 2013 where data was available. This has used 2008 flows cited by the A303/A30 Corridor Management Study Problem Identification Study and 2013 AADTs.[21] Comparison of the 2008 and 2013 traffic flows suggests that traffic volumes on the corridor have generally fallen since 2008 by between 2.4% and 14.8% with the overall average reduction on the corridor being 5.2%. Part of the reduction in section 17 maybe due to the recent closure of the A344 junction with the A303 near Stonehenge.

Corridor section				2008 AADT	2013 AADT	2008 to 2013 AADT change
No.	Road	From	To			
1	A30	M5 J29	A375	[redacted]	32,871	[redacted]
2		A375	A35		23,726	
3		A35	A30		13,017	
4		A35	A303	15,300	15,410	0.7%
5	A303	A30	A358	13,850	12,888	-6.9%
6		A358	A356	26,700	25,936	-2.9%
7		A356	A3088	35,100	32,128	-8.5%
8		A3088	A37	25,900	24,072	-7.1%
9		A37	A372	29,100	27,727	-4.7%
10		A372	A359 west	23,700	22,334	-5.8%
11		A359 west	A359 east	25,800	23,925	-7.3%
12		A359 east	A371	25,800	23,224	-10.0%
13		A371	A350	21,600	18,852	-12.7%
14		A350	A36	21,650	20,225	-6.6%
15		A36	A360	22,019	21,102	-4.2%
16		A360	A344	22,019	22,372	1.6%
17		A344	A345	29,960	25,534	-14.8%
18		A345	A3028	29,960	29,235	-2.4%
19		A3028	A338	29,960	32,691	9.1%
20		A338	A342	[redacted]	31,877	[redacted]
21		A342	A343		42,801	
22		A343	A3057		44,863	
23		A3057	A3093	[redacted]	44,203	[redacted]
24		A3093	A34		49,249	
25		A34	M3		35,733	
			Totals	398,418	377,657	-5.2%

Table 3-5: AADT Traffic Growth on the A30 & A303 Since 2008

Table 3-6 comprises a longer comparison of traffic flows for four sites on the corridor using a consistent set of TRADS data and covering both HA and non-HA portions of the corridor. Although a decrease in traffic flows since 2008 is evident, it is not as great as that suggested by the data in Table 3-5. Overall, traffic flows have not altered very much since 2004 levels.

[21] Limiting comparisons to the HA portion of the corridor.

Year	A303			A358
	Blackdown Hills A30 to A358	Yeovil between A3088 to A37	Andover between A343 to A3057	Henlade between M5 to A378
2004	12,727	24,421	43,973	27,751
2005	12,573	24,481	43,954	27,678
2006	13,320	25,341	44,406	28,612
2007	13,567	25,642	45,120	27,768
2008	13,173	24,861	46,115	27,922
2009	13,032	24,329	45,441	27,423
2010	12,917	24,130	45,973	27,354
2011	12,964	24,386	44,456	26,978
2012	12,736	23,694	44,628	26,743
2013	13,137	24,150	45,310	26,748
growth 2004 to 2013 (%)	3.2%	-1.1%	3.0%	-3.6%
growth 2004 to 2013 (%pa)	0.35%	-0.12%	0.33%	-0.41%
growth 2008 to 2013 (%)	-0.3%	-2.9%	-1.7%	-4.2%
growth 2008 to 2013 (%pa)	-0.05%	-0.58%	-0.35%	-0.86%

Table 3-6: AADT Traffic Growth Since 2004 (DfT Sources)

Examination of eastbound and westbound traffic flows for the data in *Table 3-6* (shown in Table D-2 in Appendix D) reveals that eastbound flows at the A358 site are consistently and significant higher than westbound flows over the ten years (5% to 7%), suggesting that some traffic is using a different route for the westbound movement.

3.5 Current Route Performance Indicators

Following the presentation of the current traffic flows this section considers what those levels of flow mean for travel conditions along the corridor. Initially the summary findings of the recent Route Strategy study into the SWP are presented followed by performance indicators based on data gathered for this feasibility study detailing:

- Congestion and Stress
- Reliability
- Travel Times
- Accidents

3.5.1 Route Based Strategy Summary Observations

Resilience is repeatedly raised as an issue in the SWP RS report. Indeed, route resilience is recorded as the main operational priority reported by stakeholders, with the A303 mentioned as a specific instance.

From available evidence the A303 is a major safety concern, both for cyclists who may choose to cycle along the carriageway and for those who wish to cross the road.

The major tourist attraction on the route is Stonehenge. Despite commitments in the Stonehenge Master Plan to improve access for walkers and cyclists, cycling groups are concerned, that the new visitor centre is significantly lacking in terms of provision for these modes. The main issue identified is the absence of adequate crossing facilities on the A303.

Safety

Seven of the top ten ranking road links in the SWP network in terms of casualties per 100 million vehicle miles are located on the corridor[22]. They are:

- the A303 between the A34 and the M3 (ranked 2 and 6)
- the A303 between the A338 and Andover (ranked 3, 4, 5, 7 and 10)

Stakeholders also identified a number of other locations where safety records needed improvement, including A303 single carriageway sections.

Journey times

The SWP RS report also identifies sections of the SWP network with the least reliable journey times. Three sections of the corridor currently fall within the worst 10% nationally specifically on the A303 between the A359 west and east at Sparkford, Somerset.

The A303 at Sparkford will be affected by the expected growth in South Somerset which includes 5,871 residential units and 3,368 jobs by the end of the RS period which could exacerbate the already poor journey times.

Congestion

In terms of congestion, parts of the A303 perform well on average through the year but perform badly through the summer months. Indeed, the sections of the A303 either side of Stonehenge are among the best performing 15% of the SRN nationally when considered on an annual average basis. In the summer months, however, the A303 at Stonehenge is the worst performing section of the entire SWP network, performing as badly as the 2nd worst section nationally.

Route Strategy: Evidence Report – London to Wales

The London to Wales route influences and interacts with a large geographical area, including the A303 for access to the South West region. Incidents or road works on one of these routes can significantly influence the operation of the other routes.

3.5.2 Congestion and Stress

A robust approach to understand the impact of traffic flow on network performance is to calculate network "stress" using actual flow data and the calculation of the Congestion Reference Flow (CRF). The CRF is the maximum achievable hourly throughput of a link expressed in terms of Annual Average Daily Traffic (AADT). Links which operate with flows in excess of this value (i.e. above 100%) are likely to suffer from operational issues and congestion, including flow breakdown and queuing. It should also be noted that where the stress factor lies between 85% (0.85) and 100% (1.00) turbulent traffic conditions will also be experienced during peak periods. Consideration is not given to the effect that junctions have on the operation of links and this would need to be considered as part of a separate exercise.

The preferred approach uses the link specific information gained from the HA's traffic database (TRADS) and applies this to the CRF formula to gain a 'local' CRF value as shown below.

[22] Table A2.7, technical annex, SWP RS report.

CRF = CAPACITY * NL * Wf * 100/PkF * 100/PkD * AADT/AAWT

where …

- CAPACITY is the maximum hourly lane throughput;
- NL is the Number of Lanes per direction;
- Wf is a Width Factor;
- PkF is the proportion (percentage) of the total daily flow (2-way) that occurs in the peak hour;
- PkD is the directional split (percentage) of the peak hour flow;
- AADT is the Annual Average Daily Traffic flow on the link; and
- AAWT is the Annual Average Weekday Traffic flow on the link.

Typical values contained within TA 46/97 Appendix D indicate the CRF for a single carriageway would be of the order of 22,000 vehicles per day and that for a dual carriageway in the region of 68,000 vehicles per day.

Table 3-7 and *Table 3-8* show typical two-way limiting Congestion Reference Flows (CRFs) for the 27 corridor sections taking road geometries and prevailing traffic profiles including HGV proportions into account for a 2013 neutral and 2013 summer month. Road stress ratios, the ratio of actual traffic demand to CRF, are also shown.[23] *Figure 3-7* and *Figure 3-8* show the neutral and summer month stress ratios along the corridor.

Table D-3 and D-4 Appendix D provide a more refined breakdown of section capacity taking into account the varying cross-sections that occur within each section.

[23] The ratio of actual traffic flow to CRF is an indication of link-based congestion levels or stress. The effect of junctions must be considered separately.

Corridor section				Eastbound			Westbound			Both directions		
No.	Road	From	To	CRF	ADT	Stress factor	CRF	AADT	Stress factor	CRF	ADT	Stress factor
1	A30	M5 J29	A375	32,315	20,047	0.62	32,315	20,539	0.64	64,629	40,586	0.63
2		A375	A35	39,752	11,974	0.30	39,752	12,016	0.30	79,505	23,990	0.30
3		A35	A30	39,752	5,927	0.15	39,752	6,160	0.15	79,505	12,087	0.15
4		A35	A303	11,595	5,927	0.51	11,595	6,160	0.53	23,189	12,087	0.52
5	A303	A30	A358	9,514	6,361	0.67	9,514	6,719	0.71	19,029	13,080	0.69
6		A358	A356	11,947	12,698	1.06	12,335	12,770	1.04	24,670	25,468	1.03
7		A356	A3088	35,009	15,263	0.44	35,009	16,933	0.48	70,019	32,196	0.46
8		A3088	A37	42,085	12,056	0.29	42,085	12,071	0.29	84,170	24,127	0.29
9		A37	A372	47,221	13,854	0.29	47,221	13,986	0.30	94,442	27,840	0.29
10		A372	A359 west	11,337	11,006	0.97	11,337	11,343	1.00	22,674	22,350	0.99
11		A359 west	A359 east	46,414	10,614	0.23	46,414	10,954	0.24	92,828	21,568	0.23
12		A359 east	A371	47,297	11,618	0.25	47,297	11,040	0.23	94,593	22,658	0.24
13		A371	A350	13,516	11,995	0.89	13,516	12,132	0.90	27,031	24,127	0.89
14		A350	A36	11,770	9,997	0.85	11,770	10,202	0.87	23,540	20,199	0.86
15		A36	A360	12,375	10,604	0.86	12,375	10,567	0.85	24,750	21,171	0.86
16		A360	A344	11,369	12,120	1.07	11,369	11,919	1.05	22,737	24,038	1.06
17		A344	A345	11,369	12,120	1.07	11,369	11,919	1.05	22,737	24,038	1.06
18		A345	A3028	34,776	14,471	0.42	34,776	13,611	0.39	69,551	28,082	0.40
19		A3028	A338	35,311	16,257	0.46	35,311	16,391	0.46	70,622	32,649	0.46
20		A338	A342	32,446	15,772	0.49	32,446	15,866	0.49	64,892	31,638	0.49
21		A342	A343	37,578	21,859	0.58	37,578	21,313	0.57	75,156	43,172	0.57
22		A343	A3057	34,495	22,737	0.66	34,495	22,554	0.65	68,991	45,291	0.66
23		A3057	A3093	34,848	22,839	0.66	34,848	22,295	0.64	69,696	45,134	0.65
24		A3093	A34	37,179	24,828	0.67	37,179	24,701	0.66	74,358	49,529	0.67
25		A34	M3	34,799	17,290	0.50	34,799	18,317	0.53	69,598	35,608	0.51
26	A358	M5 J25	A378	14,179	13,826	0.98	14,179	12,916	0.91	28,358	26,742	0.94
27		A378	A303	14,405	11,058	0.77	14,405	10,949	0.76	28,810	22,007	0.76

Table 3-7: Corridor CRFs & Stresses – 2013 Neutral Month

Corridor section				Eastbound			Westbound			Both directions		
No.	Road	From	To	CRF	ADT	Stress factor	CRF	AADT	Stress factor	CRF	ADT	Stress factor
1	A30	M5 J29	A375	35,056	23,420	0.67	35,056	24,046	0.69	70,113	47,466	0.68
2		A375	A35	40,545	15,394	0.38	40,545	15,272	0.38	81,091	30,666	0.38
3		A35	A30	40,545	9,146	0.23	40,545	9,371	0.23	81,091	18,517	0.23
4		A35	A303	11,954	9,146	0.77	11,954	9,371	0.78	23,908	18,517	0.77
5	A303	A30	A358	9,690	8,459	0.87	9,690	9,228	0.95	19,379	17,687	0.91
6		A358	A356	12,457	15,778	1.27	12,862	15,678	1.22	25,723	31,456	1.22
7		A356	A3088	36,758	20,190	0.55	36,758	20,385	0.55	73,516	40,575	0.55
8		A3088	A37	43,424	15,559	0.36	43,424	15,377	0.35	86,848	30,936	0.36
9		A37	A372	48,005	17,602	0.37	48,005	17,622	0.37	96,010	35,224	0.37
10		A372	A359 west	11,552	13,953	1.21	11,552	14,213	1.23	23,104	28,166	1.22
11		A359 west	A359 east	46,902	15,274	0.33	46,902	14,552	0.31	93,804	29,826	0.32
12		A359 east	A371	47,623	14,066	0.30	47,623	14,752	0.31	95,245	28,818	0.30
13		A371	A350	13,618	15,230	1.12	13,618	13,611	1.00	27,235	28,841	1.06
14		A350	A36	12,505	12,711	1.02	12,505	12,555	1.00	25,010	25,266	1.01
15		A36	A360	13,207	13,168	1.00	13,207	12,687	0.96	26,414	25,855	0.98
16		A360	A344	11,855	14,646	1.24	11,855	14,106	1.19	23,709	28,752	1.21
17		A344	A345	11,855	14,646	1.24	11,855	14,106	1.19	23,709	28,752	1.21
18		A345	A3028	37,782	16,490	0.44	37,782	14,967	0.40	75,563	31,457	0.42
19		A3028	A338	37,807	18,592	0.49	37,807	18,606	0.49	75,614	37,198	0.49
20		A338	A342	34,953	18,141	0.52	34,953	18,262	0.52	69,907	36,403	0.52
21		A342	A343	39,018	23,708	0.61	39,018	23,227	0.60	78,036	46,935	0.60
22		A343	A3057	35,832	24,778	0.69	35,832	24,950	0.70	71,663	49,728	0.69
23		A3057	A3093	36,915	25,525	0.69	36,915	25,159	0.68	73,830	50,684	0.69
24		A3093	A34	38,578	26,986	0.70	38,578	26,985	0.70	77,156	53,971	0.70
25		A34	M3	36,768	19,446	0.53	36,768	20,474	0.56	73,536	39,920	0.54
26	A358	M5 J25	A378	14,881	15,026	1.01	14,881	14,135	0.95	29,763	29,161	0.98
27		A378	A303	14,742	12,229	0.83	14,742	12,004	0.81	29,484	24,233	0.82

Table 3-8: Corridor CRFs & Stresses – 2013 Summer Month

The data presented in Table 3-7 and Table 3-8 and Figure 3-7 and Figure 3-8 clearly indicates capacity issues on the corridor in both neutral and summer months.

As expected, the A303 adjacent to Stonehenge is an issue, as well as the A303 in the vicinity of Sparkford. The northern section of the A358 also has problems.

In the summer, congestion in the Sparkford vicinity worsens and two sites, one to the west of the A36 and one to the west of the A350, become congested.

3.5.3 Travel times and speeds

Table 3-9 to *Table 3-11* show the average 12 hour speeds and travel times measured on sections of the corridor during August and October 2013 – a summer holiday and non-holiday month. Figure E-1 in Appendix E shows the current speed limits on the corridor. The tables show:

- generally relatively low increases in speed in the summer holiday month during the weekdays, with the A30 between Exeter and Honiton seeing a small increase in travel speed;
- increases in speed in the summer holiday month of around 14% in a westbound direction during the weekday and in an eastbound direction on the weekend on the eastern section of the A303 between the A338 and the M3;
- much higher speeds on the summer holiday Saturdays compared with a non-holiday Saturday, especially in an eastbound direction, with the highest being around 18% for the A303 and A30 between the A358 and the A35 in Somerset and Devon;
- slight decreases in speeds in some directions on a Sunday in the holiday month, including a decrease of 3% between the M3 and the A338 in Wiltshire/Hampshire; and,
- larger reductions in average daily speed are present between the A36 and A338 where reductions are up to 14%.

Tables 3.9 to 3.11 however provide a more aggregate level of analysis of speed changes which masks the more discrete changes on the single carriageway sections.

Table D-5 to D-9 in Appendix D provide travel time and speed data breakdowns by each of the 27 sections of the corridor as well as more refined and analytical breakdowns. More particularly, they show effects of holiday flows. Reductions in speed on certain sections of the corridor can be pronounced – as much as 57%. Overall, the travel time over the entire corridor can increase by almost 20%.

The following sections of the corridor experienced speed reduction of more than 25% in August 2013 compared to October 2013:

- Section 3, the A30 between the A35 and A30 in the eastbound direction
- Section 6, the A303 between the A358 and A356 in both directions
- Section 10, the A303 between the A372 and A359 in the eastbound direction
- Sections 16, the A303 between the A360 and A344 in both directions
- Section 17, the A303 between the A344 and A345 in the westbound direction

Figure 3-7: 2013 Corridor Stresses - Neutral Month

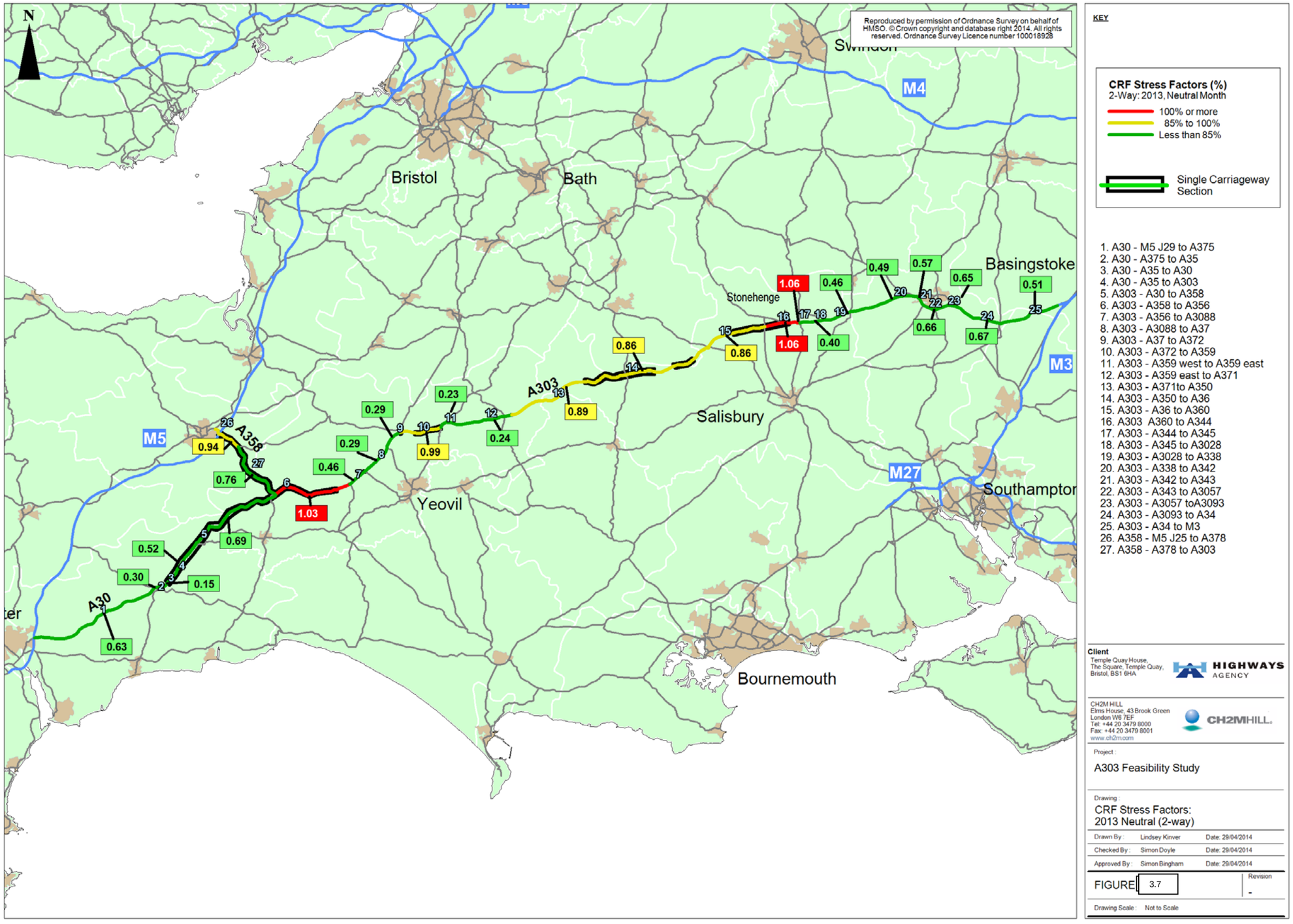
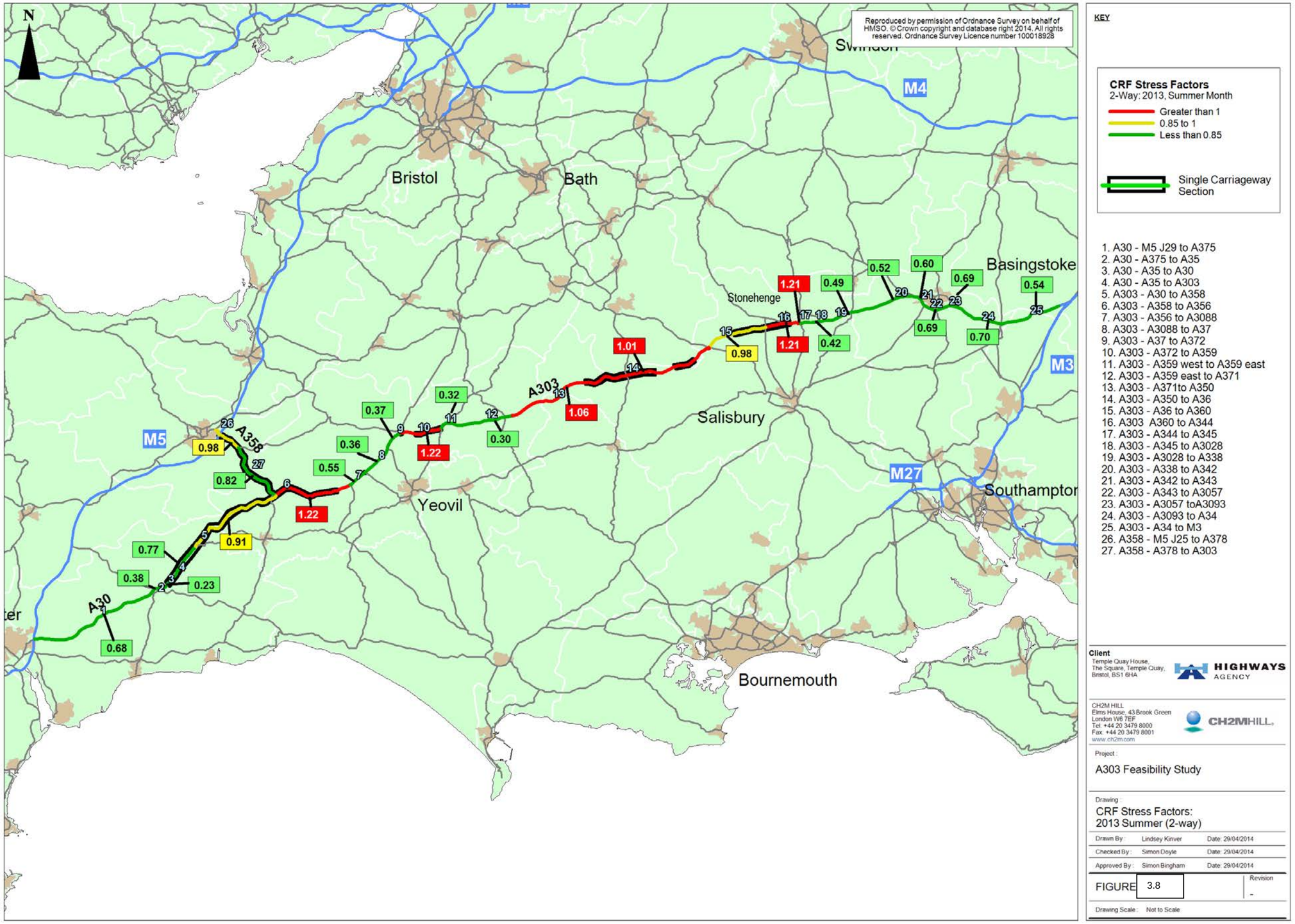


Figure 3-8: 2013 Corridor Stresses - Summer Month



Road	From	To	Travel times (secs)				Travel speeds (kph)				Summer travel speed decreases	
			EB		WB		EB		WB			
			Neutral	Summer	Neutral	Summer	Neutral	Summer	Neutral	Summer	EB	WB
A30	M5 J29	A35	755.69	750.32	775.08	762.81	106	107	104	106	-1%	-1%
A30,A303	A35	A358	1,224.68	1,282.11	1,276.31	1,288.36	81	77	78	78	5%	0%
A303	A358	A37	807.06	901.97	809.34	846.82	97	93	97	94	4%	2%
A303	A37	A350	1,550.18	1,646.83	1,558.42	1,584.01	95	92	95	93	4%	2%
A303	A350	A36	577.80	608.34	590.26	618.94	88	83	86	82	5%	5%
A303	A36	A338	958.82	1,057.15	1,012.51	1,140.67	89	84	83	73	6%	14%
A303	A338	M3	1,145.34	1,139.40	1,146.49	1,156.18	107	107	107	106	0%	1%
A358	M5 J25	A303	data not available									

Table 3-9: Weekday Travel Times & Speeds

Road	From	To	Travel times (secs)				Travel speeds (kph)				Summer travel speed decreases	
			EB		WB		EB		WB			
			Neutral	Summer	Neutral	Summer	Neutral	Summer	Neutral	Summer	EB	WB
A30	M5 J29	A35	759.84	768.39	749.25	781.57	105	103	107	104	2%	3%
A30,A303	A35	A358	1,195.17	1,344.48	1,265.65	1,331.55	82	70	78	76	18%	3%
A303	A358	A37	783.68	979.25	770.64	919.64	100	90	101	92	11%	9%
A303	A37	A350	1,515.14	1,688.44	1,487.44	1,558.01	97	91	99	95	7%	4%
A303	A350	A36	558.35	613.35	560.70	608.08	91	83	91	84	10%	8%
A303	A36	A338	919.07	1,155.86	1,012.03	1,088.97	92	81	84	77	14%	9%
A303	A338	M3	1,099.08	1,115.27	1,093.92	1,133.56	112	110	113	109	2%	4%
A358	M5 J25	A303	data not available									

Table 3-10: Saturday Travel Times & Speeds

Road	From	To	Travel times (secs)				Travel speeds (kph)				Summer travel speed decreases	
			EB		WB		EB		WB			
			Neutral	Summer	Neutral	Summer	Neutral	Summer	Neutral	Summer	EB	WB
A30	M5 J29	A35	730.72	748.78	752.08	753.96	111	109	107	107	2%	0%
A30,A303	A35	A358	1,179.15	1,182.38	1,252.93	1,236.25	85	84	80	80	1%	0%
A303	A358	A37	793.18	831.95	783.14	769.40	100	97	99	101	3%	-2%
A303	A37	A350	1,555.57	1,529.08	1,516.17	1,493.42	98	97	97	99	0%	-2%
A303	A350	A36	577.57	585.37	569.78	579.21	88	86	89	88	1%	2%
A303	A36	A338	1,092.61	1,087.50	994.02	1,019.96	84	85	86	84	-1%	3%
A303	A338	M3	1,117.48	1,083.25	1,107.31	1,102.24	110	113	111	111	-3%	0%
A358	M5 J25	A303	data not available									

Table 3-11: Sunday Travel Times & Speeds

3.5.4 Reliability and Resilience

Improving the capacity and reliability of the SRN to support economic growth is by far the highest priority of stakeholders. In the South West, the A303 in its entirety is the main priority overall, particularly given general operating conditions on the corridor which worsen during holiday periods.

A further measure of performance concerns the reliability of journey times which is monitored by OTRM – the On time Reliability Measure. The reliability of the SRN in the SW is a high priority in supporting economic growth.

The SWP RS report identifies the following three sections of the corridor as performing particularly poorly in terms of the on-time reliability measure (OTRM)[24]:

- the A30 between Honiton and the M5;
- the A303 in the vicinity of Sparkford; and
- the A303 in the vicinity of Andover.

Particular capacity issues occur where dual carriageways convert to single carriageway.

The A303 at Stonehenge is a particular concern in summer periods when passers-by slow down to take a look at the historic stones. Table 2.5 in the SWP RS report technical annex shows that this section of road is the worst performing of the entire SWP network during August. At busy times the car park of the new visitor centre cannot cope with demands, leading to traffic queuing back along the A360 blocking it to other users. In extreme cases traffic has reached as far as the A303 at Longbarrow Roundabout causing congestion on the A303.

Table 3-12 presents 2013 OTRM data for the 27 sections of the corridor by direction. *Figure 3-9* shows the "overall" data graphically. Separate data for neutral and summer months is supplied Table D-10 and D-11 in Appendix D.

The On Time Reliability Measure (OTRM) monitors the percentage of 'journeys' on the SRN that are 'on time'. For this measure:

- a 'journey' represents travel between adjacent junctions on the network.
- an 'on time journey' is defined as one which is completed within a set reference time.

Reference times are based on historic data, including a fixed tolerance, and reflect the typical 'journey' time for that time and day, on that part of the network. As a result, reference times will not always relate to free-flow conditions as they will reflect the impact of historical levels of congestion at different times of the day.

Reference times for each junction to junction link are updated on an annual basis, in order to reflect the latest conditions experienced on each part of the network.

The number of sections where less than 70% of journeys are 'on time' is clearly evident.

Table 3-12 reiterates the SWP RS report in that the A30 between Honiton and the M5 and the A303 in the vicinities of Andover and Sparkford are below the 70% reliability level during the majority of the day. In addition, the worst reliability is on the A303 between the A360 and A344 at Stonehenge in a westbound direction. Even during the interpeak reliability reduces to around 55% on this section of road westbound.

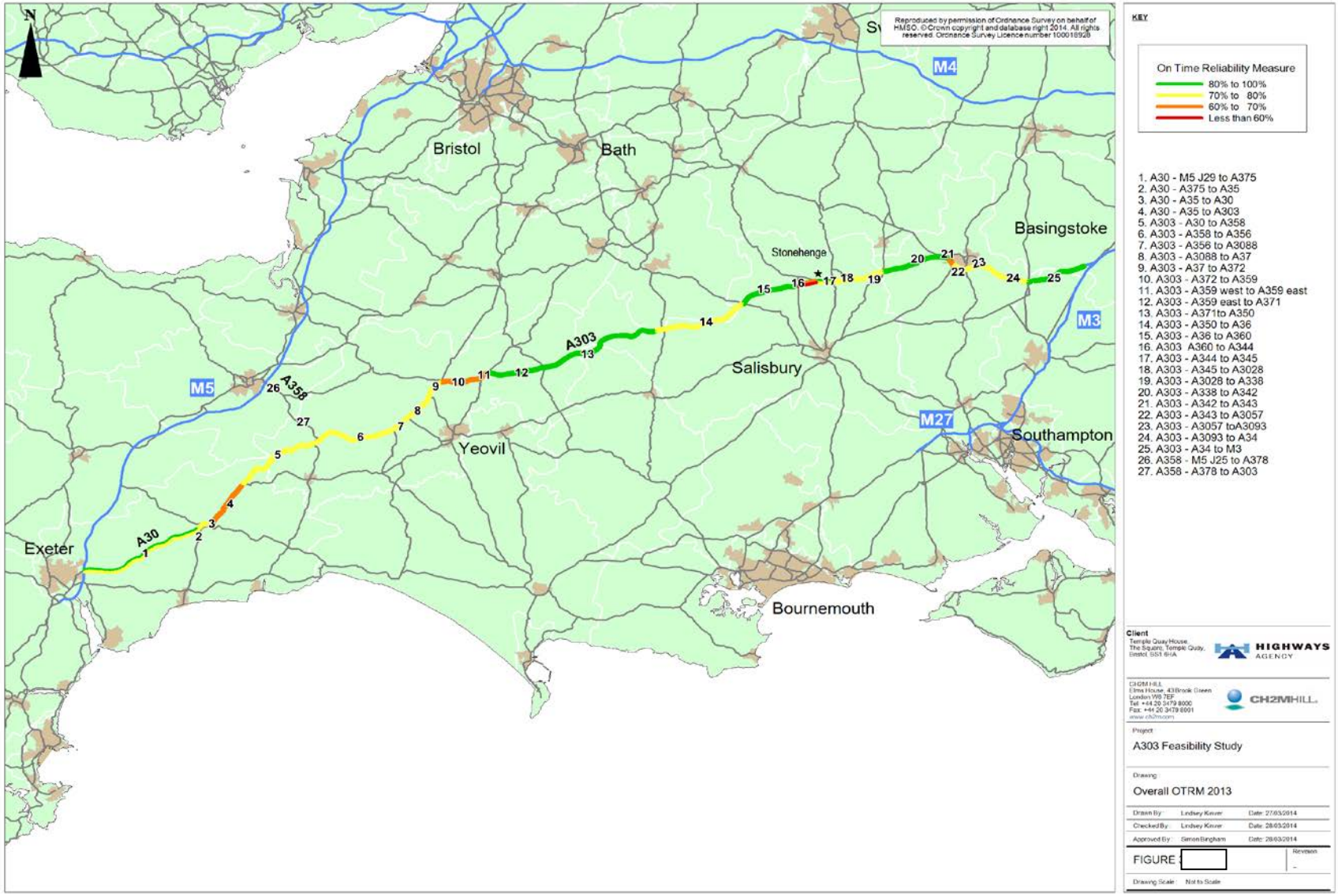
Looking at the overall performance of the route, the majority of the sections are either below the 70% reliability level or between 70-80%. The best performing sections are between Sparkford and Mere, the section through Winterbourne Stoke and close to Thruxton. However, the statistics indicate that generally no more than 85% of journeys are 'on time'.

[24] Monitors the reliability of journeys made on the HA's motorway and 'A' road network. Measured by the percentage of 'journeys' on the network that are 'on time'.

Corridor section				Eastbound					Westbound				
No.	Road	From	To	AM peak	Daytime inter-peak	PM peak	Off peak	Overall	AM peak	Daytime inter-peak	PM peak	Off peak	Overall
1	A30	M5 J29	A375	89.1%	88.9%	89.1%	84.9%	88.3%	80.6%	77.8%	75.6%	77.7%	77.8%
2		A375	A35	71.3%	74.2%	72.9%	76.1%	73.6%	78.2%	72.0%	68.6%	75.9%	72.7%
3		A35	A30	70.1%	69.4%	69.6%	75.2%	70.4%	76.5%	69.6%	66.3%	75.1%	70.7%
4		A35	A303	68.1%	69.1%	68.6%	75.6%	69.6%	68.9%	66.0%	63.8%	74.1%	67.1%
5	A303	A30	A358	73.7%	72.5%	71.5%	77.4%	73.2%	72.1%	71.2%	70.6%	76.8%	72.0%
6		A358	A356	76.2%	70.9%	70.3%	78.4%	72.9%	80.0%	76.8%	73.5%	72.6%	75.8%
7		A356	A3088	78.1%	76.9%	73.9%	76.4%	76.3%	75.4%	76.4%	76.6%	69.5%	75.1%
8		A3088	A37	74.4%	73.1%	75.5%	74.4%	74.2%	78.2%	76.2%	74.3%	76.2%	75.9%
9		A37	A372	74.4%	73.7%	74.3%	73.7%	74.0%	75.1%	72.9%	71.9%	74.2%	73.2%
10		A372	A359 west	68.2%	65.0%	66.8%	72.3%	67.3%	72.2%	69.8%	66.3%	71.9%	69.5%
11		A359 west	A359 east	68.2%	65.2%	67.2%	74.4%	67.8%	66.1%	61.9%	64.8%	71.7%	65.2%
12		A359 east	A371	81.6%	77.3%	82.8%	79.6%	80.1%	85.4%	83.9%	85.4%	82.7%	84.4%
13		A371	A350	94.3%	88.5%	89.5%	87.3%	89.5%	85.7%	84.9%	84.4%	83.1%	84.5%
14		A350	A36	75.9%	75.5%	76.7%	77.9%	76.3%	74.4%	74.0%	69.3%	76.0%	73.0%
15		A36	A360	81.9%	79.0%	79.5%	80.9%	80.0%	87.9%	87.0%	84.1%	81.0%	85.1%
16		A360	A344	71.7%	63.9%	63.9%	72.3%	67.0%	69.0%	55.1%	55.0%	62.7%	58.8%
17		A344	A345	82.9%	82.4%	80.2%	75.1%	80.5%	73.4%	70.1%	68.9%	71.3%	70.5%
18		A345	A3028	79.6%	76.0%	76.1%	73.0%	76.2%	80.3%	76.5%	79.3%	75.4%	77.7%
19		A3028	A338	79.7%	77.4%	77.9%	76.5%	77.8%	73.7%	74.2%	74.0%	71.4%	73.5%
20		A338	A342	89.8%	86.6%	89.2%	81.4%	86.9%	87.0%	84.3%	83.8%	81.8%	84.2%
21		A342	A343	70.5%	68.0%	69.7%	65.2%	68.5%	68.5%	66.0%	71.2%	64.7%	67.7%
22		A343	A3057	74.6%	75.8%	78.2%	69.5%	75.1%	78.1%	73.4%	73.9%	73.9%	74.5%
23		A3057	A3093	74.5%	71.1%	73.7%	68.3%	72.0%	79.9%	75.1%	74.6%	74.2%	75.6%
24		A3093	A34	76.2%	78.0%	77.1%	71.0%	76.1%	79.1%	78.9%	78.8%	73.8%	77.9%
25		A34	M3	85.8%	82.3%	80.5%	81.0%	82.2%	82.1%	79.9%	83.1%	82.6%	81.8%
26	A358	M5 J25	A378	not available									
27		A378	A303	not available									

Table 3-12: OTRM 2013 Summary

Figure 3-9: Overall OTRM 2013



3.5.5 Safety and accidents

An analysis of personal injury accident data for the study corridor has been undertaken with Table 3-13 showing the year-on-year fatal, serious and slight PIAs for the A30/A303 and A358 parts of the corridor. A downward trend, particularly in total and slight PIAs which drop by as much as a quarter or a third over the five years, is clearly evident, possibly due in part to local safety improvements put in place by both the Highways Agency and Somerset Council (for the A358).

As highways authorities, the HA and Somerset county council work to ensure the safe operation of their networks. Indeed, the strategic framework for road safety 2011 forecasts the potential for a 40% reduction of the numbers killed or seriously injured on the roads by 2020 compared with 2005-2009. Table 3-13 indciates progress is being made towards this target.

	A30/A303				A358			
Year	**Fatal**	**Serious**	**Slight**	**All**	**Fatal**	**Serious**	**Slight**	**All**
2008	9	29	158	196				
2009	4	19	125	148	0	1	18	19
2010	9	38	108	155	1	3	14	18
2011	5	34	117	156	0	2	15	17
2012	8	23	107	138	0	3	12	15
2013					0	2	12	14
Totals	35	143	615	793	1	11	71	83

Table 3-13: Personal Injury Accident Severity by Year for Study Corridor

*T*he SWP RS report identified that compared to the rest of the SWP road network the corridor is the worst performing overall.

Additionally according to the SWP RS report, eight of the top ten worse performing lengths of HA road in terms of casualties on the SWP network are on the corridor. They are:

- the A30 between Honiton and Exeter (ranked 1st);
- the A303 between the A34 and the M3 (ranked 2nd and 6th); and
- the A303 between the A338 and Andover (ranked 3rd, 4th, 5th, 7th and 10th).

Disaggregated information for the 27 sections of the corridor are present in Tables G-1 and G-2 of appendix G. These show KSI ratios and PIA/mvkm rates in addition to weighted COBA accident rates. Appendix G also contains plots showing the locations of fatal, serious and slight PIAs on the main single carriageway sections of the corridor.

Further detail on the injury accidents by direction in tables G-1 and G-2 shows a large number of westbound rates are significantly higher than the corresponding eastbound rates to the extent that the westbound PIA rate for the entire A30/A303 section of the corridor is 1.6 times higher than the eastbound rate.

With the exception of four of the corridor sections, all of which dealt with immediately below, the corridor performs favourably against a weighted COBA rate derived from individual section COBA rates (shown in table G-1).

The sections where PIA rates exceed or are similar to relevant COBA rates are:

- Section 7, the A303 between the A356 and A3088
- Section 8, the A303 between A3088 and A37
- Section 17, the A303 between the A344 and A345
- Section 26, the A358 between the M5 and A378

Only one of these has a PIA rate significantly higher than COBA rates being the northern section of the A358 approaching M5 J25.

The perception amongst stakeholders that the route generally has a poor safety record possibly reflects the fact that, with the exception of the M4 and M5, the road is the busiest road in the general area and therefore dominates accident reports. Overall the corridor's accident record is comparable with other roads of a similar standard.

Table 3-14 and Table 3-15 show PIA and casualty data for the remaining single carriageway sections of the corridor. Table 3-14 shows that while the single carriageway sections account for only 37% of the corridor by length, they account for 48% of PIAs and 56% of fatal PIAs i.e. proportionally, there are more PIAs generally and more fatalities particularly on the single carriageway sections than elsewhere on the corridor. In the case of casualties, the single carriageway sections account for 52% of all casualties and 55% of fatalities. Appendix G shows the geographical location of the PIAs.

Section No.	Section Name	Length		PIA							
				Fatal		Serious		Slight		Total	
		Km	%	Total	%	Total	%	Total	%	Total	%
1	Amesbury to Berwick Down	11.24	5.7%	4	11.1%	14	9.1%	53	7.7%	71	8.1%
2	Wylye to Stockton Wood	3.70	1.9%	1	2.8%	6	3.9%	12	1.7%	19	2.2%
3	Chicklade Bottom to Mere	13.46	6.9%	5	13.9%	15	9.7%	43	6.3%	63	7.2%
4	Sparkford to Ilchester	5.14	2.6%	1	2.8%	5	3.2%	24	3.5%	30	3.4%
5	Podimore Roundabout	1.31	0.7%	0	0.0%	1	0.6%	12	1.7%	13	1.5%
6	Cartgate Roundabout	1.20	0.6%	0	0.0%	1	0.6%	21	3.1%	22	2.5%
7	South Petherton to Southfields	10.79	5.5%	2	5.6%	9	5.8%	46	6.7%	57	6.5%
8	Southfields to M5 J25	14.00	7.2%	1	2.8%	11	7.1%	71	10.3%	83	9.5%
9.1	Southfields to Honiton - Eagle Tavern to Broadway	3.10	1.6%	0	0.0%	2	1.3%	7	1.0%	9	1.0%
9.2	Southfields to Honiton - Rawridge Hil to Stopgate Cross	4.67	2.4%	4	11.1%	2	1.3%	19	2.8%	25	2.9%
9.3	Southfields to Honiton - Honiton to Rawridge Hill	3.76	1.9%	2	5.6%	2	1.3%	21	3.1%	25	2.9%
Total for All Sections		72.37	37.0%	20	55.6%	68	44.2%	329	48.0%	417	47.6%
Total for Corridor		195.80	100.0%	36	100.0%	154	100.0%	686	100.0%	876	100.0%

NB (2008 to 2012 for A30 and A303, 2009 to 2013 for A358)

Table 3-14: PIA Data for Single Carriageway Sections of the Corridor

Based on the data in table 3-14 it can be calculated that on average the single carriageway sections have an PIA rate of 5.8 per km compared to 3.7 per km for the remaining dual carriageway sections, thus 57% higher

Section No.	Section Name	Length		Casualty							
				Fatal		Serious		Slight		Total	
		km	%	Total	%	Total	%	Total	%	Total	%
1	Amesbury to Berwick Down	11.24	5.7%	4	10.5%	19	9.1%	98	8.6%	121	8.7%
2	Wylye to Stockton Wood	3.70	1.9%	1	2.6%	8	3.8%	27	2.4%	36	2.6%
3	Chicklade Bottom to Mere	13.46	6.9%	5	13.2%	28	13.5%	92	8.0%	125	9.0%
4	Sparkford to Ilchester	5.14	2.6%	1	2.6%	7	3.4%	36	3.1%	44	3.2%
5	Podimore Roundabout	1.31	0.7%	0	0.0%	1	0.5%	17	1.5%	18	1.3%
6	Cartgate Roundabout	1.20	0.6%	0	0.0%	1	0.5%	33	2.9%	34	2.4%
7	South Petherton to Southfields	10.79	5.5%	3	7.9%	17	8.2%	84	7.3%	104	7.5%
8	Southfields to M5 J25	14.00	7.2%	1	2.6%	11	5.3%	117	10.2%	129	9.3%
9.1	Southfields to Honiton - Eagle Tavern to Broadway	3.10	1.6%	0	0.0%	2	1.0%	12	1.0%	14	1.0%
9.2	Southfields to Honiton - Rawridge Hil to Stopgate Cross	4.67	2.4%	4	10.5%	10	4.8%	38	3.3%	52	3.7%
9.3	Southfields to Honiton - Honiton to Rawridge Hill	3.76	1.9%	2	5.3%	2	1.0%	44	3.8%	48	3.4%
Total for All Sections		72.37	37.0%	21	55.3%	106	51.0%	598	52.2%	725	52.1%
Total for Corridor		195.80	100.0%	38	100.0%	208	100.0%	1146	100.0%	1392	100.0%

NB. (2008 to 2012 for A30 and A303, 2009 to 2013 for A358)

Table 3-15 : Casualty Data for Single Carriageway Sections of the Corridor

The relatively higher number of PIAs and casualties per unit length associated with sections 5 and 6, Cartgate and Podimore Roundabouts respectively, is also evident even though the vast majority are slight injury accidents.

Visual inspection of the PIA data plots in Appendix G revealed the following accident clusters along the corridor:

- A358/M5 J25
- A303/A358
- A303/Hayes End (South Petherton)
- A303/A3088 (Cartgate Roundabout)
- A303/A359 west (Sparkford)
- A303/A360

3.5.6 Vulnerable road users

The South West generally has numerous public rights of way and other designated routes because of its nature and numerous AONBs. The popularity of the area as a holiday location not only brings large and seasonal volumes of vehicular traffic but also attracts large numbers of leisure walkers and cyclists.

There are a number of recreational walking paths and routes in the area that cross or are crossed by the corridor - e.g. the River Parrett Trail that crosses the A303 section of the corridor just to the east of South Petherton. There are also a number of NCN Routes that cross or intersect with the corridor:

- Route 266 Castle Cary to A26 at A303;

- Route 24 Bath to Eastleigh;
- Route 25 Gillingham to Warminster;
- Route 26 Portishead in Somerset to Portland Bill in Dorset;
- Route 33 Bristol to Seaton;
- Route 45 Swindon to Salisbury via the World Heritage site at Avebury (the route is discontinuous in vicinity of Amesbury); and
- Route 246 Tinsbury to Kintbury via Andover.

Specific safety concerns associated with the South West trunk road network are mainly related to the use of the SRN by cyclists. Stakeholders generally feel that insufficient consideration is given to cyclists in the development of highway improvement schemes. The All Party Parliamentary Cycling Group Report "Get Britain Cycling" recommended that "The HA should draw up a programme to remove the barriers to cycle journeys parallel to or across trunk roads and motorway corridors, starting with the places where the potential for increased cycle use is greatest".

Infrastructure improvements are not the only area where cyclists need to be considered - maintenance is also important. Carriageway defects and obstacles like debris can have more serious consequences for cyclists than general vehicular traffic and, worse, are often located on road edges where cyclists travel.

Available evidence shows that the A303 is a major safety concern - both for cyclists who choose to actually use the road as a route as well as those who merely cross it. Despite commitments in the Stonehenge Master Plan to improve access for walkers and cyclists, cyclists are concerned that the new visitor centre is significantly lacking in pedestrian and cyclist provision, specifically the absence of adequate crossing facilities over the A303.

Stakeholders also feel that a general lack of facilities for cyclists and pedestrians deters walk and cycle trips. In certain locations the SRN cuts across walk and cycle desire lines. Improved pedestrian and cyclist facilities would encourage greater use leading in turn to a reduced car use for short journeys and possibly freeing up highway capacity.

3.6 Environmental Constraints

3.6.1 Flooding and severe weather generally

Highways authorities aim to minimise the impacts of severe weather like strong winds, snow and flooding on network performance and road safety wherever possible. Understandably, maintaining minimum desirable standards of operation, or even keeping routes partially or fully open, can be challenging at times. Most severe weather issues are flooding rather than strong wind or snow -related.

The HA's SWP RS report identifies parts of the South West network that are at risk of repeated flooding. As one would expect, the majority of the locations vulnerable to flooding are either close to or actually coincide with water courses. Particular examples on the corridor include the A303 as it approaches and passes Podimore and West Camel. Here, the A303 runs next to Park Brook and the various streams which feed into the River Yeo.

Table 3-16 gives more specific details for the A30 and A303 sections of the corridor identified in the SWP RS report annex.

Corridor Section	Location
A30	Long stretch of the A30 between the A35 outside Honiton and the A303, as the corridor runs alongside the River Otter.
A303	Couple of small stretches of the A303 either side of the B3170, the latter at the start of a stream that feeds into the River Yartley.
	An area to the west of Yeovil where the A303 meets the River Parrett.
	Large stretch of the A303 heading through Podimore and West Camel to the north of Yeovil where the road runs next to Park Brook and various streams which feed into the River Yeo.
	Stretch of the A303 road north of Mere as it runs close to Shreen Water.
	Small stretch of the A303 just to the east of the junction with the A350.
	Stretch of the A303 to the south of Sherrington Wood and to north of Fonthill Lake.
	Long stretch of the A303 as it passes by Thruxton and crosses over the Pillhill Brook.
	Small area around the junction with the A3093 to the east of Andover.
	Stretch of the A303 as it crosses over the River Test to the east of Andover.
	Large stretch of the A303 to the east of the junction with the A34, which is just to the north of the River Dever.
	Couple of small points before the A303 ends at its junction with the M3.

Table 3-16: Locations of Flood Risk on the A30 and A303

There have been numerous flooding events in the South West generally over the past year and the corridor has not been exempt. There is no reason to believe the flooding risk and dangers will change much in future given known flooding problems. Indeed, flood risk is likely to become a bigger issue with ongoing climate change and the deterioration of the current condition of highway assets.

Recent snow events caused road closures on the A303 in Devon and blocked one lane of the A30 eastbound between the B3184 and the A35.

Additional locations that are vulnerable to flooding were recently identified by the HA in response to the flooding of early 2014 and to inform the Action Plan for the Somerset Moors and Levels initiated by the Prime Minister and the then Secretary of State for Environment Food and Rural Affairs and being developed by affected local authorities, Defra, the EA, the DfT and the HA. Transport and Infrastructure is one of five workstreams.

The draft Action Plan encompasses the RS, the current Feasibility Study and A303 Ilchester study areas as well as routine maintenance and addresses:

- dredging and rivers management;
- potential sluice or barrage on the River Parrett;
- management of the entire river catchment, from rain falling on hills through to drainage and water storage systems;
- resilience of infrastructure including road, rail and sewage systems; and
- community and business adaptation and resilience.

Early discussions highlighted the flooding, particularly of the A303 at Ilchester over 2013 Christmas, that had caused transport problems on the strategic and local road networks and rail network within the area. Transport-related priorities lie in looking at those areas, particularly in the short-term, which are not too costly and where solutions can be delivered relatively quickly, based on first identifying transport issues and problems before arriving at solutions. Further, resilience of the overall transport network was important, meaning modes should not be looked at in isolation.

Potential short term proposals included a comprehensive programme of drain and gully cleansing on the part of Somerset CC on the local road network and a rapid study of the events that led to the flood incident on the A303 on the part of the HA, EA and Local Drainage Board to inform plans to address future flood events at this location. A more detailed listing of possible short, medium and long term proposals follows:

Potential Short Term (12month) Actions:[25]

- review condition of gullies and culverts using CCTV and prioritise by risk areas; and
- deep cleaning of drainage on the basis of the above, subject to specialist sub-contractor availability, commencing with culverts over gullies and connectors.

Potential Medium and Long term (2015-2020 & 2021-2030) Actions:

- identify the cause and likelihood of recurrence of flooding on the A303 at Ilchester in conjunction with EA and stakeholders in order to understand the implications of any options required to mitigate risk and implement preferred option; and
- review flooding evidence gathered through RS and A303 Feasibility Study work and include in the prioritisation of issues on the highway network.

The section summaries in Appendix F provide further information.

A desk top study was undertaken specifically for the Feasibility Study to determine the flood zones of the study area and whether a Main River is present. Figure 3-13 shows the results. Within the study area there are main rivers and tributaries that cross the scheme corridor. The main rivers from east to west are the River Test; the River Avon and the River Stour. As indicated by Table 3-17, all of the proposed improvement sections fall within flood zones 1 and 2 with all schemes except 2 and 3 also including some flood zone 3 areas where there are main rivers and tributaries that cross the scheme corridors.

Location reference on Figure 3-13	Flood Zone 1	Flood Zone 2	Flood Zone 3
1	✓	✓	✓
2	✓	✓	
3	✓	✓	
4	✓	✓	✓
5	✓	✓	✓
6	✓	✓	✓
7	✓	✓	✓
8	✓	✓	✓
9	✓	✓	✓

Note:
✓ denotes feature present within proposed improvement section
– denotes feature not present within proposed improvement section

Table 3-17: Water Environment Designations

3.6.2 Heritage

Wherever possible, and in balance with other interests, highway schemes are designed to avoid or minimise negative impacts on heritage-related assets. Stonehenge, on the A303 between Amesbury and Winterbourne Stoke, has occasioned substantial debate and planning effort over recent decades. Indeed, a cost effective, heritage-friendly and affordable solution for the A303 in the Stonehenge vicinity comprises one of the most important issues on the corridor as a whole. To date, affordability has been the sticking point.

[25] A more refined listing of potential short term (12 month) actions highlighted the following specific problem locations on the corridor:

- A303 Illchester
- A303 Wylye (eastbound entry slip)
- A303 Winterbourne Stoke (water held back by the bridge)

Other areas along the A303 of cultural or historical heritage status and value include:

- King Alfred's Tower and its associated woodland between Wincanton and Mere; and
- Amport House in the village of Amport to the west of Andover which currently contains the Museum of Army Chaplaincy.

A high level review of the highway corridor was undertaken specifically for the Feasibility Study to identify sites of historical or heritage value. Figure 3-11 shows the results. Apart from the WHS already mentioned above, the review identified Grade I listed buildings at the locations shown in Table 3-18.

Location reference on Figure 3-11	World Heritage Site	Grade I Listed Building
1	✓	✓
2	-	-
3	-	✓
4	-	✓
5	-	✓
6	-	✓
7	-	✓
8	-	✓
9	-	-

Note:
✓ denotes feature present within proposed improvement section
– denotes feature not present within proposed improvement section

Table 3-18: Heritage & Historic Resources

3.6.3 Ecology and biodiversity

Roads, as well as road construction projects and maintenance schemes, have the potential to impact on protected sites, habitats and species. Highways authorities aim to minimise the impact or their road assets and activities on the surrounding ecology, wherever possible creating, with others if and as necessary, coherent and resilient ecological networks.

On the A303 to the west of Winterbourne Stoke there is a small ecologically sensitive area at Parsonage Down. To the east of Andover, where the River Test crosses underneath the A303, is another ecological site.

A search was undertaken specifically for the Feasibility Study via the Multi-Agency Geographic Information for the Countryside (MAGIC) to establish ecologically designated sites within the area. This search considered a 5km radius apart from designations for all designations apart from Special Areas of Conservation related to Bats which is extended to a 30km radius in accordance with the DMRB Volume 11 Section 4 'Assessment of Implication on European Sites.'

Table 3-19 summarises the sites relative to the proposed improvement sections and Figure 3-12 illustrates their locations.

Location reference on Figure 3.7	Feature						
	SPA	Ramsar	SSSI	NNR	LNR	SAC	Bat SAC
1	✓	-	✓	✓	-	✓	✓
2	✓	-	✓	✓	-	✓	✓
3	✓	-	✓	-	-	-	✓
4	-	-	✓	-	-	-	✓
5	-	✓	✓	-	-	-	✓
6	-	✓	✓	-	-	-	✓
7	-	-	✓	-	-	-	✓
8	-	✓	✓	-	-	-	✓
9	-	-	✓	✓	-	-	✓

Note:
✓ denotes feature present within proposed improvement section
– denotes feature not present within proposed improvement section

Table 3-19: Ecological Sites

A desk top study returned no results for Local Nature Reserves or Royal Society for the Protection of Birds (RSPB) Reserves within the 5km radius study area.

3.6.4 Landscape

Although roads and other transport infrastructure have been an integral part of the English landscape for centuries, large increases in traffic volumes and modern highway configurations and requirements create situations at odds with the surroundings.

Such a situation occurs where the A303 and A30 pass through the Blackdowns between Ilminster and Honiton. The gently rolling landscape on the A303 generally, especially when crossed or interrupted by river courses and woodlands, present other occasions where careful and sensitive road design is imperative.

A high level review of the highway corridor was undertaken specifically for the Feasibility Study to identify AONBs, one of which already mentioned above. Figure 3-11 shows the results. Table 3-20 indicates whether the proposed improvement sections have any AONBs present.

Three locations are within the Cranborne Chase and West Wiltshire Downs Area of Outstanding Natural Beauty (AONB) and one within the Blackdown Hills AONB.

Location reference on Figure 3-11	AONB
1	✓
2	✓
3	✓
4	-
5	-
6	-
7	-
8	-
9	✓

Note:
✓ denotes feature present within proposed improvement section
– denotes feature not present within proposed improvement section

Table 3-20: Landscape Features

3.6.5 Noise and vibration

Trunk road noise is recognised as a major source of noise pollution and highways authorities take a number of practical steps to minimise noise and disturbance arising from their roads including appropriate highway designs including noise reduction features and noise reducing technologies.

In 2012 Defra completed the first round of noise mapping and action planning and identified the top one per cent of noisiest locations adjacent to major roads based on the conditions in 2006. According to the SWP RS report, locations on the corridor include:

- the A30 near Exeter and at Honiton near the junction with the A35;
- the A303 near to Yeovil, Stoke-Sub-Hamdon and Tintinhull, Wincanton, Mere, Chicklade and Andover (to the west of the city as it passes through Thruxton and four further areas as it loops around the city).

A high level review of the highway corridor was undertaken specifically for the Feasibility Study and First Priority Locations (FPLs) identified. Figure 3-11 shows the results. Table 3-21 indicates the presence of FPLs relative to the proposed improvement sections.

There are 23 FPLs, as defined by the Department for Environment, Food and Rural Affairs (Defra) Noise Action Plan, proposed for action planning work along the highway corridors identified in *Figure 1-1*. The purpose of noise action planning is to assist in the management of environmental noise and its effects, including noise reduction if necessary in the context of government policy on sustainable development. Of the 23, there are 18 FPLs from the M3 Junction 8 to the A303/A30 Honiton and 5 FPLs from the A358 Southfields to M5.

Location reference on Figure 3-11	First Priority Location (FPL) within 1km of scheme area
1	✓
2	✓
3	✓
4	✓
5	✓
6	✓
7	✓
8	✓
9	✓

Note:
✓ denotes feature present within proposed improvement section
– denotes feature not present within proposed improvement section

Table 3-21: First Priority Location Summary

3.6.6 Air quality

Vehicles are a source of air pollution, which affects human health and the environment. Construction activities also have air quality effects which need to be managed. The two highways authorities responsible for the corridor are committed to operating and developing their networks respecting statutory air quality limits and in-house environmental policies and strategies.

According to the SWP RS report the following three AQMAs are near the corridor:

- the Yeovil AQMA, encompassing the entire built-up area of Yeovil, a nearby airfield and several potential development areas identified in the emerging local plan;
- the East Devon AQMA, including several roads in and in the vicinity of Honiton like the A30 Exeter Road, A35 Monkton Road and the A35 Kings Road; and
- the Exeter AQMA, comprising a network of major roads running across the city.

Defra monitors and identifies any exceedances of European air quality limits for annual average levels of nitrogen dioxide (NO2) in all of these AQMAs.

3.6.7 Water pollution risk

Highways authorities have a duty not to pollute water courses and ground water. Although there are numerous areas of existing water pollution risk along all the HA roads in the South West, the majority are concentrated in a small number of areas away from the corridor.

Table 3-22 gives more specific details for the A30 and A303 sections of the corridor identified in the SWP RS report annex.

Corridor Section	Location
A30	Single point at the northern junction of the A30 with the M5 on the outskirts of Exeter.
A303	Single point on the A303 north of Mere as it crosses streams which feed into Shreen Water.
	Several points around the junction of the A303 with the A338, between Amesbury and Andover, which is directly next to the River Bourne.
	Single point in the vicinity of Thruxton as the A303 crosses over the Pillhill Brook.
	Single point to the south of Andover as the A303 passes next to Brooks Lake and crosses over Pillhill Brook.
	Couple of points as the road crosses over the River Test to the east of Andover.
	Small cluster at the junction with the A34 to the east of Andover just to the north of the River Dever.

Table 3-22: Locations of Water Pollution Risk on the A30 and A303

3.6.8 Materials

A desk top search was conducted specifically for the Feasibility Study to establish historic landfills (potential sources of contamination) and any active landfills within the search area. Figure 3-11 shows the results. Interim Advice Note 153/11 requires an assessment of materials for any scheme over £300k. The assessment requires the identification of waste facilities within the area. Historical landfills have been identified as they have the potential to cause contaminated land issues.

Table 3-23 shows the locations of historic and active landfills relative to the proposed improvement sections.

Location reference on Figure 3-11	Historic landfill	Active landfill
1	✓	-
2	-	-
3	-	-
4	✓	-
5	-	-
6	✓	-
7	✓	-
8	✓	-
9	✓	-

Note:
✓ denotes feature present within proposed improvement section
– denotes feature not present within proposed improvement section

Table 3-23: Landfill Designation

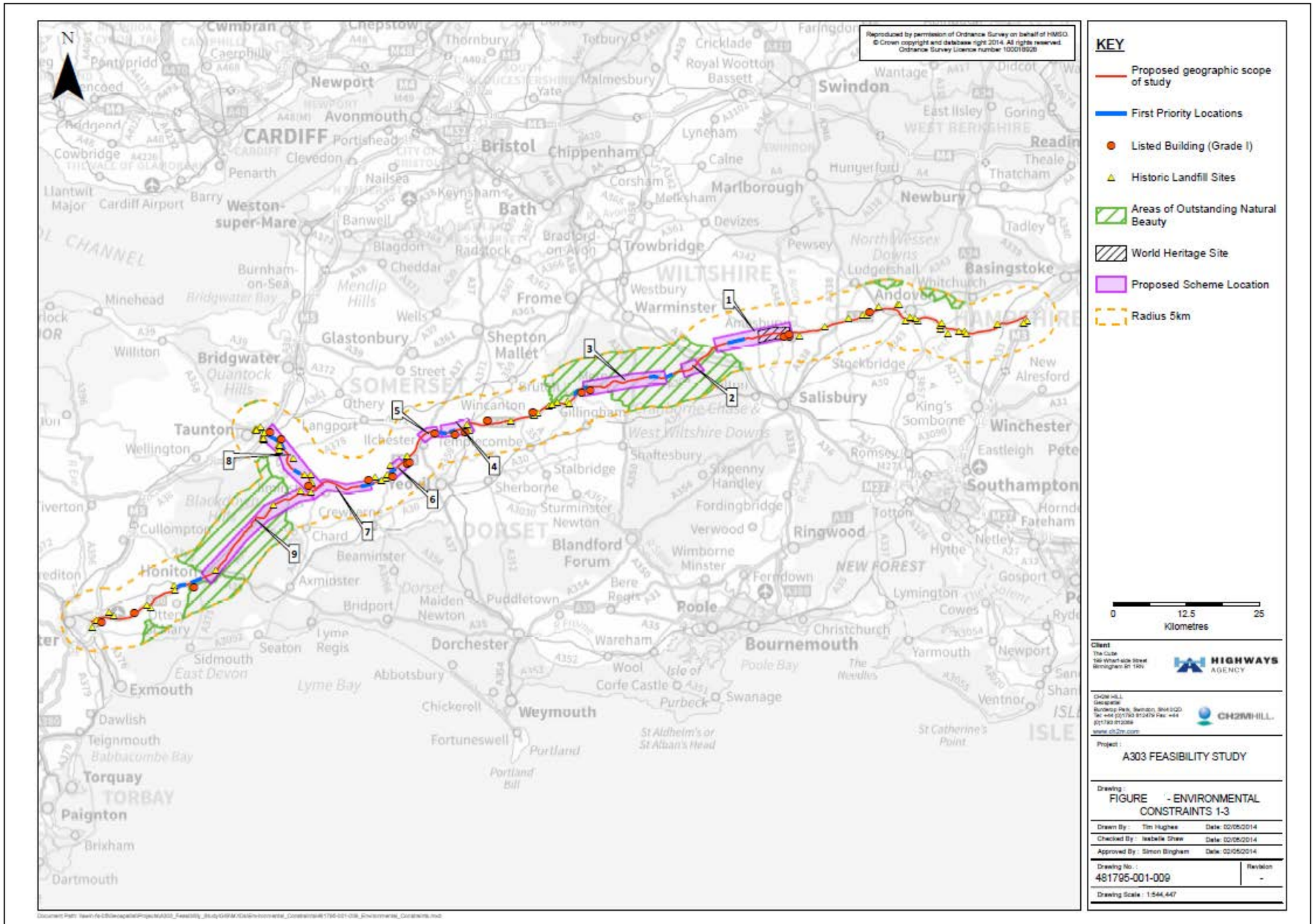


Figure 3-10: Environmental Constraints 1-3

Figure 3-11: Environmental Constraints 2-3

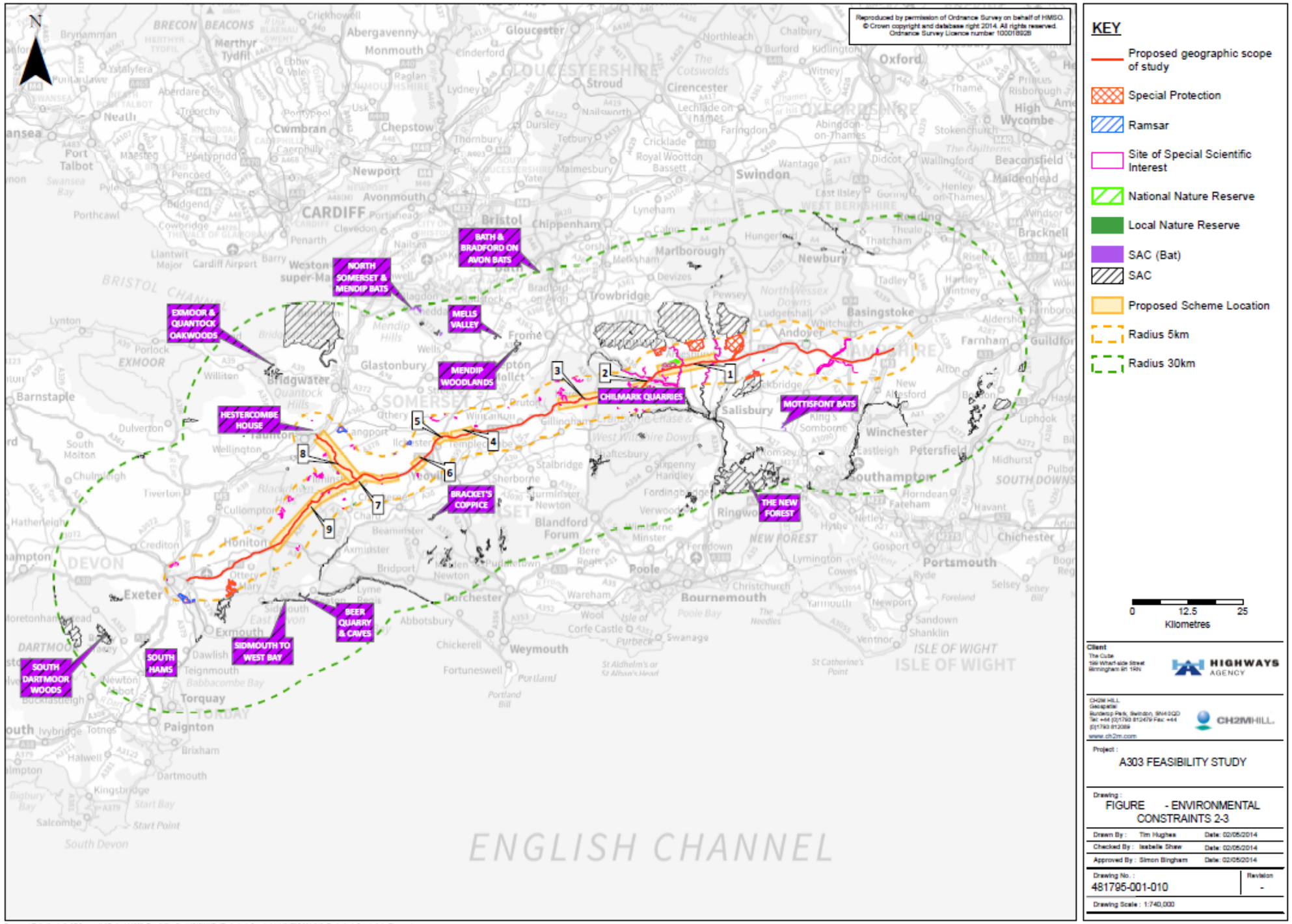
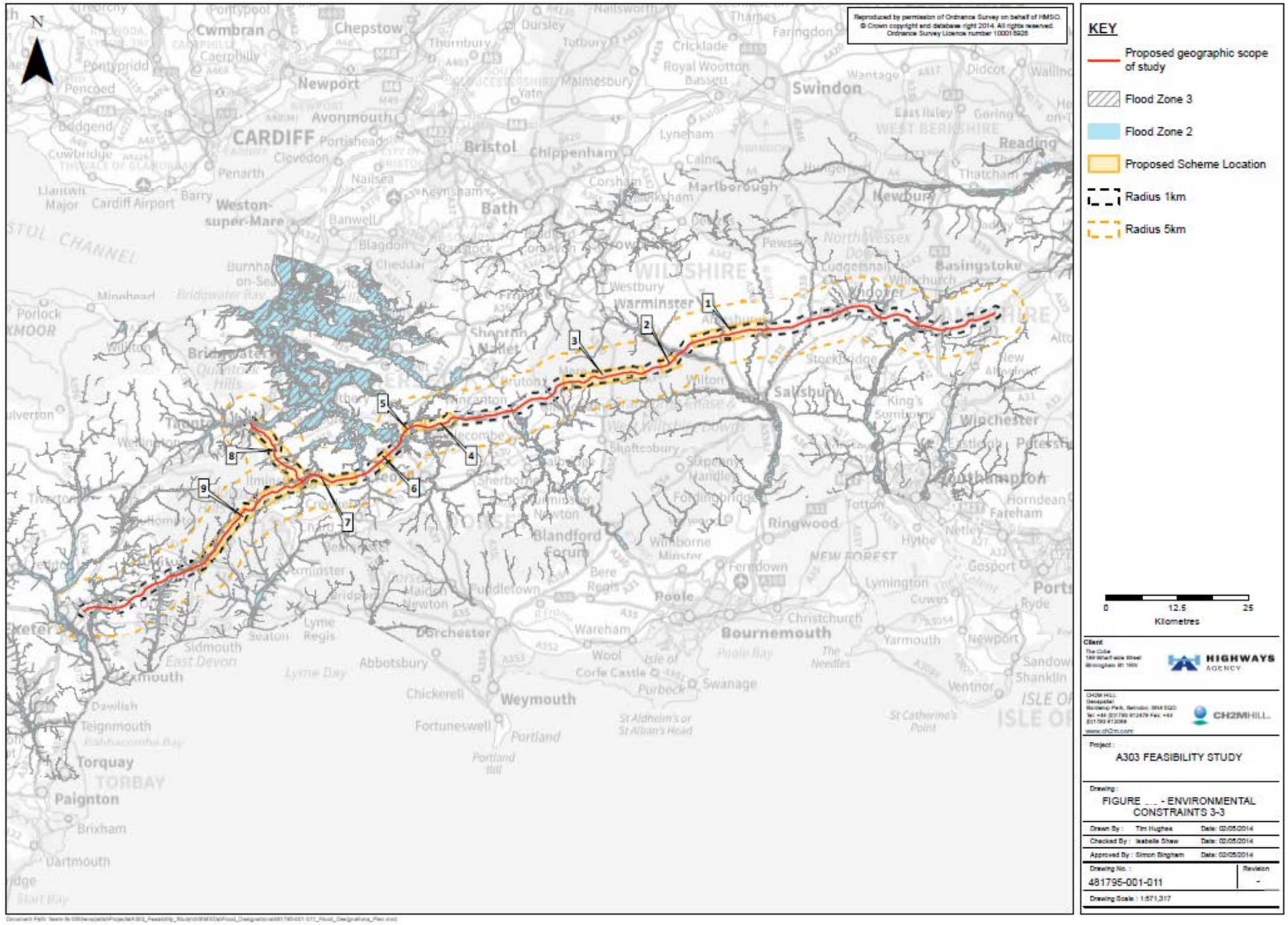


Figure 3-12: Environmental Constraints 3-3



3.7 Other Issues and Constraints

3.7.1 Geotechnical

The SWP RS report notes that geotechnical challenges in the SWP area include a geological formation along the A30 in Devon with an extremely high proportion of geological observations. In terms of sections of network constructed in areas that are considered geologically unstable or where ongoing large scale movement is prevalent the RS report cites the A303 at Rawridge Hill as an example (located on sidelong ground).

Materials supplied by stakeholders[26] draw attention to a number of natural features related to the unique geology surrounding Stonehenge which have substantial implications for a tunnel solution. Notwithstanding these geological features, the costs of a tunnel at Stonehenge could now be lower than historic cost estimates due to recent developments in tunnelling.

3.7.2 Maintenance

Because trunk roads are generally built on historic alignments which were in use long before they were upgraded to their current standard, they are not often constructed to withstand greatly increased traffic flows. Accordingly, enhanced maintenance regimes are often necessary to retain the integrity of structures. Particular examples include the structures on the A303 at Newcott and Sparkford.

Drainage and earthworks comprise other asset types that can be challenging to manage due to the frequent need for intrusive inspection and maintenance. Large amounts of the drainage asset on the corridor are older than 30-40 years and have therefore exceeded their serviceable life. The South West generally has a larger than average amount of filter drain (provides effective removal of surface water from the carriageway) nearing the end of its serviceable life.

According to the SWP RS report, more than 50% of the lighting asset in Area 2 is considered beyond its expected life

3.7.3 Carriageway Surface Condition

The SWP RS report identifies key locations on the HA's SWP network where carriageway surfacing may reach the end of its design life by 2020. They include the A303 along the majority of its entire length. Locations where carriageway surfacing is already approaching the end of its design life include the A303 east of Bullington Cross and the A303 Wincanton to Snag Farm. The HA has a robust ongoing maintenance programme which could see these sites being resurfaced prior to 2015.

Appendix F provides further information concerning road condition on a section-by-section basis where information is available.

[26] More specifically, accompanying a letter to Parliamentary Undersecretary of State from John Glen MP.

3.8 Economic baseline

3.8.1 Economic and policy context

The Economics Story (South West RDA, 2011) notes that overall, the South West Economy performs as well, or better, than most parts of the UK, but lags behind the 'leaders'. In some ways, it is like the greater South East, but in others it is more in line with more peripheral UK areas. This document also notes that parts of the South West economy are good at creating jobs, but the workforce is less productive than it could be.

The South West population increased from 5.09m people in 2005 to 5.27m in 2010. This is an increase of almost 183,000 people over the 5 years (an average of approximately 36,500 per year). Since 2008 and the subsequent recession, data indicates that the South West economy did not suffer as sharp a decline as the rest of the UK economy, identifying that the South West as a whole had a slightly higher resilience to the economic recession.

Economic data compiled by the South West Observatory (SWO) in their publication "The Changing State of the South West 2012" shows that there are considerable differences in economic activity and performance by area within the region. GVA trends for the SW since 1989 have been in line with UK patterns showing an increase, with a decrease since 2008 as a result of the economic recession.

However GVA per head data (for 2009, the latest year in which data is available from the ONS) indicates considerable variations across the region. Bristol and Swindon (both in the 'M4 corridor') have relatively high GVA per head totals compared to those in other parts of the region. In addition, both Bristol and Swindon have GVA per head totals (£25,000 and £27,000 respectively) significantly above the national average.

By contrast, GVA per head is significantly lower in the counties and areas served by the A303 with Wiltshire (£17,000), Dorset (£15,000), Somerset (£16,000) and Devon (£16,000) all demonstrating totals lower than the national average (approximately £20,000) and regional (at £18,000). The GVA for Cornwall at approximately £13,000 is significantly lower than either the region or national average. Clearly these areas are reliant on the A303 corridor to link to London and the SE and all perform below regional and UK averages.

The South West Regional Economic Strategy (RES) 2006–2015 provided a shared vision for the development of the region's economy as well as sustainable development and is identified as a priority that "the region ensures better connections with markets and ideas within the region and beyond". This has been reinforced by the Heart of the South West Draft Strategic Economic Plan 2014-2030.

One of the eleven headline economic priorities is to improve transport networks and to create an 'effective' and 'confident' region. Journey times from parts of the region to major markets are identified as representing a *"significant brake on productivity".* In addition, congestion remains a problem in urban centres.

Connectivity, particularly the reliability and resilience of access to major markets such as London and the South East, is recognised as an essential component of supporting a successful economy. This is said to be particularly important in the South West which faces challenges because of its geographical context and peripheral nature.

The RES notes that "our cities and towns cannot realise their economic potential and accommodate the projected population growth without better transport networks." The RES identified the importance of managing demand alongside increasing capacity. Improving the region's transport network is one of the priorities for improving strategic communications infrastructure to support business need. Lobbying for improvements to the strategic A30/A303 corridor and A358 link is listed as a potential measure to deliver this, along with other schemes such as improvements to the Waterloo to Exeter rail line. Wider measures are

also highlighted including improving broadband access and developing a regional image campaign.

3.8.2 Transport and the South West Economy – overview

Peripherality is an issue affecting the South West economy. Research has shown that for every 100 minutes travel time from London, productivity reduces by 6%, and by 2- 3% for other major conurbations (Meeting the Productivity Challenge, Universities of West of England and Bath, Boddy et al. 2005). The South West, particularly Cornwall and Devon, are relatively peripheral locations, and distance from key product markets is a factor in the lower levels of productivity seen in these areas. By improving transport connections, and therefore access to product markets and labour, the economic output of these areas can be improved.

The South West Observatory (2011) published a report entitled "Transport in the South West – Does It Matter for the Performance of the Economy?" It notes that where capacity or reliability deficiencies exist, an economic cost of missed opportunities might follow, including increased costs, reduced economic competitiveness and reduced productivity.

In general, transport affects the performance of the economy through two channels: product markets and labour.

The transport services industry is estimated to account for £3.5m of GVA in the South East in 2008 (South West Regional Accounts, 2011). The sector employed 85,594 FTE workers, 4% of those in the region. The highest share of these is in North Somerset (7%) and Swindon (6%) (South West Regional Accounts, 2011).

The South West Observatory (2011) quotes the average household expenditure on transport in the South West between 2008 and 2010 as 14% of total expenditure. Nationally this is second only to the South East as a percentage of total expenditure. This represents an increase of 13% from the expenditure figure in 2001.

3.8.3 Predicted employment growth

Both jobs and workforce figures are expected to increase generally year on year (based on TEMPRO v6.2 projections) across the South West with the exception of Dorset. Wiltshire and Devon are forecast to experience high growth in both the number of jobs and the size of the workforce over the same time period.

Projections indicate that future jobs and workforce in Dorset will decline by approximately 4% by 2030. Although an explanation as to why the projected figures decrease is not provided within TEMPRO, the 'Workplace Strategy Autumn 2011 Update Draft' commissioned by the Dorset Local Authorities suggests that employment will continue to grow by up to 1.2% annually from 2011 to 2026. A 1.2% increase would give an increase of 9.6% by 2020 over 2012 figures.

3.8.4 Tourism in the South West

Tourism is an important sector for the region's economy (Value of Tourism, South West alliance, 2008). In 2008 there were over 118 million tourism trips to the South West (from UK and overseas visitors). Total spend by staying visitors (from the UK and overseas visitors) was £4.6bn, combined with £4.4bn from day trips and £397m from people visiting friends, relatives and second homes. This gives a total for all tourism spend in 2008 of £9.4bn (Value of Tourism, South West alliance, 2008).

Although this tourism supports economic growth, it also puts pressure on the transport network, especially in holiday periods. The South West Visitor Survey (2009) recorded 65% of trips as overnight stays and 35% as day visits. The average length of stay was 5.71 nights and 82% of visitors had previously stayed overnight in the South West.

Tourists from the UK spent £4.1bn in South West England in 2009, and stayed for 82 million nights (UK Tourism Survey, 2009). This was an increase from £3.6bn in 2008 and represents

19% of the expenditure of UK residents on UK tourism trips. A total of 21m trips were made to the region in 2009 from the UK (UK Tourism Survey, 2009).

For UK based visitors to the South West, 32% come from the South West itself. The next most common origins are the South East (20%), West Midlands (9%) and London (8%) (UK Tourism Survey, 2009). A large proportion of these, particularly those from the South East are likely to use the A303/A358/A30 to access their destinations.

In terms of visitors from overseas, the South West accommodated 7% of England's trips, 9% of nights and 6% of spend (International Passenger Survey, 2008).

Of the total £9.4bn spent in 2008, an estimated £1.67bn was spent on accommodation, £2.3bn on shopping, £2.8bn on food and drink, £980m on attractions and entertainment and £1.27bn on travel and transport (Value of Tourism, South West Tourism Alliance, 2008).

The average spend of a UK staying visitor across the South West is £182, ranging from £255 in Cornwall to £142 in Wiltshire. For overseas visitors the average is higher at £370. This is highest in Dorset at £434 and lowest in Somerset at £289 (Value of Tourism, South West Tourism Alliance, 2008).

The tourism sector in the South West is estimated to contribute to 198,457 full time equivalent jobs, including the direct employment of 193,336 people. 11% of people in the region are employed in the tourism sector (Value of Tourism, South West Tourism Alliance, 2008).

Compared to all UK tourism, trips to the South West in 2009 had a higher proportion of trips in April and also between June and September, highlighting its seasonality and impacting on transport disproportionally during these periods.

The South West Visitor Survey (2009) identified Devon and Cornwall as the most popular locations for visitors to the South West. Around 68% of visitors arrived by car, van or motorcycle into the South West. The average number of hours spent in a car per day for each staying visitor was 1h 35 minutes, with a maximum of 6 hours (South West Visitor Survey, 2009).

The UK Tourism Survey (2009) found that compared to all UK tourism, trips to the South West had a higher proportion of car usage (83%) and a lower proportion of train and plane usage. The South West also has a higher percentage of trips involving self-catering, camping or caravanning.

3.9 Summary

South West economy

Peripherality is an issue affecting the South West economy, with distance from key markets being a factor in the lower levels of productivity seen in the area. Network capacity and reliability deficiencies, on the A303/A30/A358 corridor as well as elsewhere on the SWP network, aggravate matters, increasing costs and reducing economic competitiveness. The improvement of transport connections, and with them access to product markets and labour, would improve the economic output of the area.

Road standards

Road cross-sections and quality vary considerably along the length of the corridor. Although extended lengths are 4-lane dual carriageway with grade-separated access junctions, there are numerous 2-lane and 3-lane single carriageway sections, many of which associated with operational issues. The A303/A30 between Ilminster to Honiton is almost exclusively single carriageway with tight curves at points, limited overtaking opportunities and numerous local road junctions and private accesses of varying standards.

The ability of the route to accommodate traffic demands is not merely a function of link capacities - junction capacities at a number of key locations (e.g. Cartgate Roundabout) are also a constraint.

Resilience, capacity, stress, journey times and safety

Resilience is repeatedly raised as an issue in the SWP area. According to stakeholders it is the main operational priority, specifically on the A303. High summer uplifts – over 50% on the A30 between the A35 and A303 and as much as 20% higher overall over the entire length of the corridor in terms of vehicle kilometres travelled – aggravate matters. The practicality of accommodating and managing such seasonality without significant corridor improvements should not be underestimated.

Several sections of the corridor are at or close to capacity now. Particular capacity issues occur where dual carriageways convert to single carriageways. Although parts of the A303 perform well on average through the year they perform badly through the summer months. Indeed, the sections of the A303 either side of Stonehenge are among the best performing 15% of the SRN nationally when considered on an annual average basis. In the summer months, however, the A303 at Stonehenge is the worst performing section of the entire SWP network, performing as badly as the 2nd worst section nationally. Blocking back from the car park of the new visitor centre sometimes aggravates congestion on the A303.

Locations with particularly high stress levels comprise:

- the A303 between the A358 and A356, A372 and A359 west, A360 and A345 (Stonehenge); and
- the northern end of the A358 near M5 J25.

In the summer holiday period, stress levels increase with the following sections also having high stress levels:

- the A303 between the A30 and A358 (Blackdown Hills), A371 to A360 (i.e. entire section of the A303 between the A371 and A345 is stressed).

Holiday period reductions in speed on certain sections of the corridor can be pronounced – as much as 57%. Overall, the travel time over the entire corridor can increase by almost 20%.

Speed reductions of more than 25% in August 2013 compared to October 2013 occur on:

- the A30 between the A35 and A30 in the eastbound direction; and
- the A303 between the A358 and A356 in both directions, between the A372 and A359 in the eastbound direction, between the A360 and A344 in both directions and the A303 between the A344 and A345 in the westbound direction.

The following sections of the corridor perform particularly poorly in terms of the on-time reliability measure (OTRM):

- the A30 between Honiton and the M5; and
- and the A303 in the vicinity of Sparkford, Amesbury and Andover.

According to the SWP RS report, three sections of the corridor currently fall within the worst 10% nationally for least reliable journey times, the most critical of which being the A303 between the A359 west and east at Sparkford, Somerset.

Safety

Seven of the top ten ranking road links for safety issues in the SWP network (in terms of casualties per 100 million vehicle miles) are located on the corridor. They are:

- the A303 between the A34 and the M3 (ranked 2 and 6); and
- the A303 between the A338 and Andover (ranked 3, 4, 5, 7 and 10)

Stakeholders also identified a number of other locations where safety records needed improvement, including A303 single carriageway sections with a major safety concern being cyclists using or crossing it.

The perception amongst stakeholders that the route generally has a poor safety record possibly reflects the fact that, with the exception of the M4 and M5, the road is the busiest road in the general area and therefore dominates accident reports. With the exception of four of the corridor sections, PIA rates do not appear overly high when compared to COBA (nationally accepted) rates. Only three sections of the route have PIA rates similar to COBA rates (the A303 between the A356 and A3088, A3088 and A37, the A344 and A345 (between Stonehenge and Countess Roundabout) and only one has a PIA rate higher (the A358 between the M5 and A378).

Of particular interest following more discrete analysis of the PIA data was that the remaining single carriageway sections, whilst comprising 37% of the length accounted for approximately 50% of all injury accidents and nearly 60% of fatal accidents over the five year analysis period. Thus proportionally, there are more PIAs generally and more fatalities particularly on the single carriageway sections of the corridor than elsewhere along the corridor. The PIA rate per km is over 50% higher for the single carriageway sections at 5.8per km compared to 3.7 per km for the remaining sections providing further evidence of the poor performance of those sections.

Severance

Severance is an issue where the corridor runs through communities located on the route. This is particularly relevant to the unimproved single carriageway lengths where through traffic and inadequate crossing points create a number of severe problems for residents, exacerbated by increasing numbers of vehicles.

Flooding

Numerous sections of the route are either close to water courses or in low lying areas and thus are at risk to repeated flooding. Particular examples include the A303 as it approaches and passes Podimore and West Camel. Flood risk is likely to become a bigger issue with ongoing climate change and the deterioration of the current condition of highway assets.

Alternatives

Alternative routes and modes provide one way of reducing existing demands on the corridor. Unfortunately, viable alternative routes do not exist or are circuitous. Exceptions comprise the M4/M5 and M3, M27, A31 and A35, which are suitable for some but not all long distance end-to-end trips. The end-to-end through traffic component, while significant, is potentially not big enough if totally re-routed to yield the type of volume reductions that really matter.

In addition, limited opportunities exist for modal transfer or travel demand reduction, although the latter probably offers more.

Stonehenge /Cranborne Chase and West Wiltshire Downs/Blackdown Hills

Perhaps the single biggest challenges on the corridor as a whole comprise the identification of a cost effective, heritage-friendly and affordable solutions for the A303/A30 in the Stonehenge and Blackdown Hills vicinities. To date, affordability has been the sticking point for the first and the AONB for the second.

Although volumes on the western sections, and more particularly the Blackdown Hills section, are as much as two-thirds lower than those on the eastern sections, offering opportunities for potentially more modest and less costly solutions, volumes are still of an order warranting more than simple upgraded 2 or 3 lane solutions.

As suitable solutions are identified, all but the most local will present traffic accommodation challenges during construction. As already noted above, the end-to-end through traffic component, while significant, is potentially not big enough if totally re-routed to yield the type

of volume reductions that will totally mitigate construction-related impacts. At the most critical locations on the corridor – Stonehenge and Blackdown Hills – there is limited opportunity for local detours

Other issues

The above addresses the more important issues. The following are also considerations:

- Challenging geotechnical conditions or complications, particular examples comprising the A303 at Rawridge Hill (sidelong ground) and Stonehenge (subsurface geology).
- The age and quality of earthworks, drainage (large amounts of which, being older than 30-40 years, having exceeded their serviceable life) and structures (e.g. on A303 at Newcott and Sparkford) render inspection and maintenance demanding and more difficult. Further, carriageway surfacing may reach the end of its design life by 2020 over the majority of the A303's length. Indeed, carriageway surfacing is already approaching the end of its design life at a number of locations including the A303 east of Bullington Cross and between Wincanton and Snag Farm.
- Numerous PROWs and other designated routes (e.g. cycle routes), create both actual and potential conflict points between vehicles and pedestrians and cyclists.
- Given the nature of the area, there are a number of other ecologically and landscape-related sensitive locations in addition to Stonehenge and Blackdown Hills.
- There are noise issues on the A30 near Exeter and at Honiton near the junction with the A35 and on the A303 near Yeovil, Stoke-Sub-Hamdon and Tintinhull, Wincanton, Mere, Chicklade and Andover (particularly to the west of the city as it passes through Thruxton and at four further locations as it loops around the city).
- Air pollution, which is generally a highways issue, is of particular concern near the three AQMAs near the corridor - the Yeovil AQMA, the East Devon AQMA and the Exeter AQMA (the corridor being only one and not necessarily the most critical of a number of roads affecting the AQMA).
- There are a number of locations of water pollution risk along the length of the corridor.
- There is no dedicated Traffic Officer Service (TOS), and therefore subject to a limited operational management level of service compared to other trunk roads in the South West.
- Appendix H summarises the challenges, issues and problems identified in the Route Strategy report for the corridor

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4 Understanding the future situation

4.1 General

As with road networks generally, a key aspect of managing the corridor lies in ensuring that it is capable of supporting housing, business and broader economic growth in the sub-regions that rely on it. Significantly, the A303 is a strategic route with a strategic function connecting urban areas distant from it (e.g. Plymouth in Cornwall with London and the rest of the South East).

The following outlines:

- future policies of relevance to the corridor's future;
- future development proposals along the corridor;
- future changes to the transport system generally as well as more specific to the corridor itself affecting or influencing future demands and operational conditions; and
- future possible demands and conditions.

4.2 Future policies and priorities

The HA is responsible for planning the long term future and development of the strategic road network. The recently initiated Route Strategies (RSs) present a fresh approach to identifying investment needs on that network, more specifically in terms of identifying network needs relating to operations, maintenance and where appropriate, improvements which proactively facilitate economic growth.

Although not strictly a statement of future policy, the SWP RS report's identification of current issues is a practical source of future priorities which details safety, journey times and congestion specifically under Section 3.4.

4.3 Future growth

During SWP RS stakeholder workshops, the importance of economic growth and jobs and the key role that transport and infrastructure play in facilitating growth were raised. The focus of new jobs and housing was felt to be around existing towns and centres. Particular growth and development locations mentioned with specific reference to the corridor were:

- the Exeter area, where considerable growth is expected/planned;
- the new Stonehenge visitor centre, which was still to be opened when stakeholders were consulted;
- Solstice Park in Amesbury, which still to be fully developed; and
- Andover, one of the fastest growing towns in the Solent region.

Figure 4-1 show the key housing and economic growth proposals for the corridor. Appendix I, Table I-1 contains the growth proposals for the whole of the SWP area with areas immediately adjacent the corridor shaded.

The SWP area generally is a focal point for future local economic growth, with 242,000 residential units and 150,000 new jobs planned by 2031. The main concentrations are at Plymouth, Yeovil, Bath, Exeter, Salisbury, Bodmin, Dorchester and Frome. Other strategic growth locations include Taunton, Newton Abbot, St Austell and Clay Country, Truro, Camborne-Pool-Redruth and Barnstaple.

Given that the A303/A30/A358 corridor is one of only two main road links connecting a number of these areas with each other, and almost all of them with other parts of the United Kingdom, corridor volumes can be expected to increase significantly.

4.3.1 TEMPRO projections

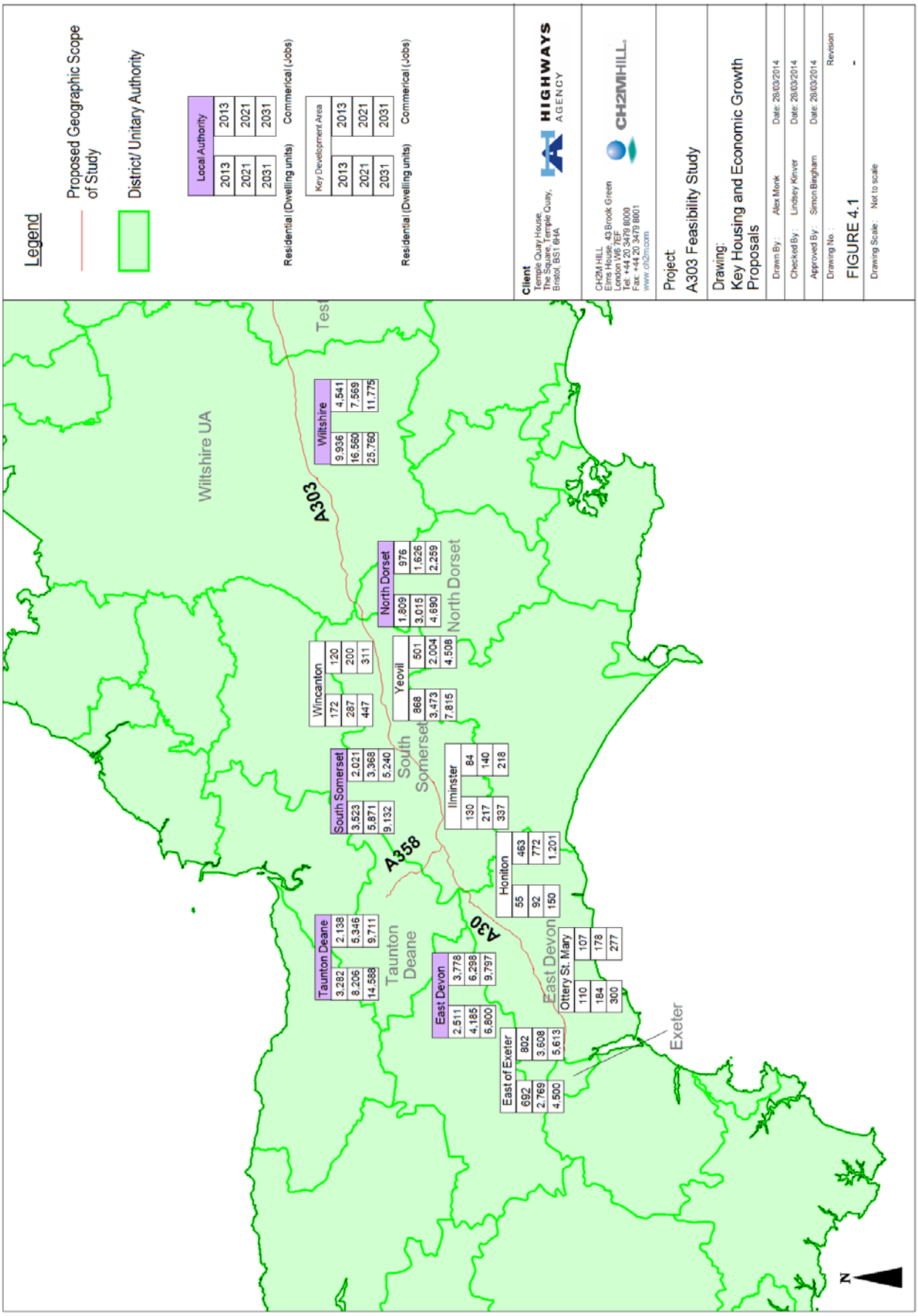
With the exception of Dorset, TEMPRO 6.2 has both jobs and workforce figures increasing generally year on year across the South West. Wiltshire and Devon are forecast to experience high growth in both the number of jobs and the size of the workforce over the same time period.

Projections indicate that future jobs and workforce in Dorset will decline by approximately 4% by 2030. Although an explanation as to why the projected figures decrease is not provided within TEMPRO, the 'Workplace Strategy Autumn 2011 Update Draft' commissioned by the Dorset Local Authorities suggests that employment will continue to grow by up to 1.2% annually from 2011 to 2026. A 1.2% increase would give an increase of 9.6% by 2020 over 2012 figures.

4.3.2 Other key development and facilities close to or next to the corridor

Exeter International Airport is located adjacent the western end of the A30 section of the corridor close to M5 Junction 29. It offers both scheduled and holiday-related charter flights to destinations within the United Kingdom and Europe. The airport's masterplan predicts an average annual growth of 6.2% per annum in air traffic between 2000 and 2030.

Figure 4-1: Key Housing & Economic Growth Proposals



4.4 Future changes to the transport system

The 2013 Spending Review and subsequent report from HM Treasury Investing in Britain's Future referenced a series of potential new pipeline schemes for the strategic road network in the United Kingdom as a whole. There were no pipeline schemes for the SWP network, let alone the corridor. The HM Treasury report 'Investing in Britain's Future', however, did promote a number of feasibility studies to inform potential future investment in highway improvements. The A303/A30/A358 Corridor Feasibility Study was one of them.

4.4.1 Network improvements and operational changes

The HA is currently delivering a large capital programme of enhancement schemes nationally. This includes Major Schemes greater than £10m in value, plus smaller enhancement schemes including the current Pinch Point Programme.

Throughout the SWP network generally, and therefore including the corridor, there are numerous maintenance issues that need attention in the short term, including:

- ongoing aging deterioration of carriageway conditions and structures; and
- ability of existing drainage infrastructure to cope with increased demands as a result of climate change.

Planned maintenance includes the re-surfacing of the A303 between Wincanton and Snag's Farm (with an estimate cost of £5.2m).[27]

4.4.2 M5 Junction 25

The HA is working with TDBC, SCC and the HoSW LEP on potential improvements to M5 J25 to accommodate growth at Taunton. A Local Growth Scheme (proposed by HoSW LEP) to accommodate the short to medium term proposed growth provided for in the adopted Local Plan and an aspirational (i.e. additional to adopted growth plans) strategic employment site next to the junction. It is likely that this would be supplemented if a dualled link from the A303 to the M5 included the enlargement of J25.

The key issue at J25 relates to the impacts of growth at Taunton and potential longer term improvements to the A358 arising from the A303/A358 Corridor Feasibility Study and concurrent need for clarity on design early in the process. The key capacity issue is the volume of east-west traffic on the A358 at peak times, which impacts on M5 main line entry/exit capacities.

The HA is currently studying the capacity of J25 and potential impacts of strategic growth proposals on its operation, following which there will be a clearer understanding on the impacts of growth on junction capacity and the amount of additional capacity that the local growth scheme generates. The junction will also be considered in the emerging M5 Exeter to Birmingham RS.

4.4.3 Wider transport networks

The June 2013 report from HM Treasury Investing in Britain's Future listed local transport schemes either completed, under construction or due to start before May 2015, plus any other funded local network commitments that should be delivered before 2021. ***Table 4-1***[28] lists the schemes with relevance to the corridor.

[27] See Figure 3, SWP RS report.
[28] From Table 3.3, SWP RS report.

Location	Scheme Type	Completion Year	Anticipated Benefits
Exeter Principal Urban Area scheme	Public Transport Scheme	2013	Improved congestion by the removal of traffic bottlenecks, construction of bus lanes and a new Park and Ride facility, close to M5 J30.
Bullington Cross	Road Scheme	Unknown	Improvement of access from A34/A30 on slip road A303 West at Bullington Cross to reduce dangerous back-up of traffic, particularly at peak time.
East Anton	Developer Contribution	Unknown	A303/A3093 interchange at East Anton - Improved merge arrangements at the on-slip to increase capacity.

Table 4-1: Committed Local Transport Network Enhancement Schemes with Relevance to the Corridor

4.4.4 Rail Investment in South West

Network Rail's strategic business plan for Wessex, which covers the route from London Waterloo to the south and south west of England sets out proposals which may help drive local, regional and national economies. Investment and improvements on the Wessex route will contribute to Network Rail's plan to enhance the capacity and capability of the network. The Wessex strategic business plan covers the period from 2014 to 2019 and maps out a programme of investment and projects designed to maintain and improve an ageing infrastructure while reducing the cost of running the rail network and is being implemented by the Network Rail and South West Trains Alliance.

Over the period 2004 – 2014 South West Trains ran an additional 4.6% more trains on the Wessex route and to address this continuing increase in train movements, £1.025bn will be spent on the infrastructure across the south and south west of England between 2014 and 2019 to make it more reliable and able to cope with the continued increase in use.

As part of the investment, a total of £247.5m will be spent on track renewals; £273.9m on signalling enhancements; £182m on bridges, tunnels, major structures, culverts, footbridges and earthworks; £127.4m on building improvements; £87.6m on electrification; £32.7m on telecommunications; and £23.3m on plant and machinery.

This investment includes:

- a £140m signalling renewal scheme in south west London between Richmond, Chiswick and Norbiton and Chertsey, Frimley and Bracknell, to be controlled by the new signalling centre at Basingstoke
- a £26m signalling renewal scheme between Yeovil Pen Mill and Castle Cary Junction to be controlled by the new signalling centre at Basingstoke
- a £25m signalling renewal scheme on the Portsmouth line
- up to £30m track renewals in the Southampton area
- a £40m power supply upgrade for 10 car trains to run to Reading
- 43 miles of track renewal and refurbishment between Worting Junction and Southampton
- Track renewal between Queenstown Road and London Waterloo
- Track renewal between Worting Junction and Salisbury
- Track renewals and refurbishment in the Staines area
- Earthworks to improve performance of cuttings at Honiton, Crewkerne and Gillingham during heavy rainfall.

A £300m investment is proposed to increase capacity into London Waterloo as part of a longer term enhancement programme that will deliver significant capacity improvements during this Control Period (CP5) (2014-19) and into the next. During CP5, improvements will focus on suburban routes into London with platform extensions to accommodate longer 10 car trains and the integration of the former Waterloo International terminal and its platforms to increase capacity within the station.

Wessex will also benefit from investment to future-proof critical infrastructure against the impact of changing weather patterns including more frequent flooding. Also, a major resignalling project will take place in the Feltham area to replace aging equipment and make the infrastructure more reliable.

4.5 Future travel demands

Indications of future travel demands along the corridor have been provided via recourse to TEMPro (the DfT Trip End Model Presentation Program) data. TEMPro was used to provide summaries of traffic growth using data from the National Transport Model (NTM) at county and district level.

TEMPROv6.2 (the current definitive dataset) derived traffic growth for 2013 to 2041 differs along the corridor, varying between 17% for the Wiltshire section, where traffic flows are generally the highest, and 27% on the Somerset section.

Table 4-2 shows the projected growth in households and jobs off a 2013 base underlying the TEMPRO 6.2 derived traffic growth for those counties and districts through which the study corridor runs.

In the absence of detailed traffic forecasts, a set of interim traffic forecasts were generated applying district council level TEMPRO 6.2 traffic growth to current neutral and summer month traffic demands. *Table 4-3* and *Table 4-4*, which comprise expanded forms of Table 3-7 and Table 3-8 in Section 3.3, show possible traffic demands for 2021, 2031 and 2041.

4.6 Future performance

Table 4-3 and *Table 4-4* also show neutral and summer month road stress ratios for the full length of the corridor for 2013, 2021, 2031 and 2041, assuming limiting Congestion Reference Flows (CRFs) on each section as previously calculated. *Figure 4-2* presents this data graphically for 2013, 2021 and 2031.

Table D-3 and D-4 in Appendix D provide a more refined breakdown of section capacity and stress taking the varying cross-sections that occur within each section into account.

Stress levels generally increase and the following additional portions of the corridor will become over-stressed by 2041 compared to 2013:

- the A30 between the A35 and A303; and
- the A358 between the A378 and A303.

Stress levels at locations that are already stressed or over-stressed in 2013 increase significantly.

Location	2013		2021				2031				2041			
	Households	Jobs	Households	vs 2013	Jobs	vs 2013	Households	vs 2013	Jobs	vs 2013	Households	vs 2013	Jobs	vs 2013
Hampshire	749,407	925,536	793,158	6%	968,238	5%	835,062	11%	985,931	7%	878,728	17%	1,014,150	10%
Basingstoke and Dean	71,779	97,972	75,572	5%	104,756	7%	80,684	12%	107,750	10%	85,798	20%	110,600	13%
Test Valley	49,236	58,281	54,127	10%	60,984	5%	59,715	21%	61,102	5%	65,294	33%	61,675	6%
Devon	518,166	582,199	570,136	10%	602,067	3%	633,825	22%	615,982	6%	691,761	34%	634,338	9%
East Devon	61,470	57,949	69,979	14%	60,431	4%	82,695	35%	62,581	8%	93,500	52%	65,479	13%
Dorset	335,917	335,773	359,947	7%	359,947	7%	391,416	17%	322,277	-4%	414,233	23%	314,424	-6%
North Dorset	30,240	31,239	33,104	9%	31,326	0%	36,907	22%	31,169	0%	39,902	32%	31,296	0%
Somerset	241,725	264,019	273,538	13%	266,686	1%	314,416	30%	266,176	1%	347,091	44%	267,253	1%
South Somerset	74,181	86,862	90,386	22%	87,053	0%	112,040	51%	85,685	-1%	128,082	73%	84,730	-2%
Wiltshire	293,672	350,305	332,298	13%	359,520	3%	367,525	25%	362,407	3%	403,098	37%	367,627	5%
Salisbury	51,985	71,733	56,555	9%	73,315	2%	61,324	18%	73,108	2%	65,121	25%	73,125	2%
Totals	2,477,778	2,861,868	2,708,800	9%	2,974,323	4%	2,975,609	20%	2,974,168	4%	3,212,608	30%	3,024,697	6%

Table 4-2: TEMPRO 6.2 2021, 2031 and 2041 Household & Jobs Forecasts

Corridor section				Eastbound									Westbound									Both directions								
					ADT				Stress factor					ADT					Stress factor					ADT					Stress factor			
No.	Road	From	To	CRF	2013	2021	2031	2041	2013	2021	2031	2041	CRF	2013	2021	2031	2041	2013	2021	2031	2041	CRF	2013	2021	2031	2041	2013	2021	2031	2041
1	A30	M5 J29	A375	32,315	20,047	21,460	23,116	24,789	0.62	0.66	0.72	0.77	32,315	20,539	21,987	23,684	25,398	0.64	0.68	0.73	0.79	64,629	40,586	43,448	46,800	50,187	0.63	0.67	0.72	0.78
2		A375	A35	39,752	11,974	12,818	13,807	14,806	0.30	0.32	0.35	0.37	39,752	12,016	12,863	13,856	14,858	0.30	0.32	0.35	0.37	79,505	23,990	25,681	27,663	29,665	0.30	0.32	0.35	0.37
3		A35	A30	39,752	5,927	6,345	6,835	7,329	0.15	0.16	0.17	0.18	39,752	6,160	6,594	7,103	7,617	0.15	0.17	0.18	0.19	79,505	12,087	12,939	13,937	14,946	0.15	0.16	0.18	0.19
4		A35	A303	11,595	5,927	6,345	6,835	7,329	0.51	0.55	0.59	0.63	11,595	6,160	6,594	7,103	7,617	0.53	0.57	0.61	0.66	23,189	12,087	12,939	13,937	14,946	0.52	0.56	0.60	0.64
5	A303	A30	A358	9,514	6,361	6,876	7,487	8,050	0.67	0.72	0.79	0.85	9,514	6,719	7,263	7,908	8,503	0.71	0.76	0.83	0.89	19,029	13,080	14,139	15,394	16,553	0.69	0.74	0.81	0.87
6		A358	A356	11,947	12,698	13,725	14,944	16,069	1.06	1.15	1.25	1.35	12,335	12,770	13,803	15,029	16,161	1.04	1.12	1.22	1.31	24,670	25,468	27,529	29,974	32,230	1.03	1.12	1.21	1.31
7		A356	A3088	35,009	15,263	16,498	17,963	19,315	0.44	0.47	0.51	0.55	35,009	16,933	18,303	19,929	21,429	0.48	0.52	0.57	0.61	70,019	32,196	34,801	37,891	40,744	0.46	0.50	0.54	0.58
8		A3088	A37	42,085	12,056	13,031	14,189	15,257	0.29	0.31	0.34	0.36	42,085	12,071	13,048	14,207	15,276	0.29	0.31	0.34	0.36	84,170	24,127	26,079	28,395	30,533	0.29	0.31	0.34	0.36
9		A37	A372	47,221	13,854	14,975	16,305	17,532	0.29	0.32	0.35	0.37	47,221	13,986	15,117	16,460	17,699	0.30	0.32	0.35	0.37	94,442	27,840	30,092	32,765	35,231	0.29	0.32	0.35	0.37
10		A372	A359 west	11,337	11,006	11,897	12,953	13,929	0.97	1.05	1.14	1.23	11,337	11,343	12,261	13,350	14,355	1.00	1.08	1.18	1.27	22,674	22,350	24,158	26,304	28,284	0.99	1.07	1.16	1.25
11		A359 west	A359 east	46,414	10,614	11,472	12,491	13,432	0.23	0.25	0.27	0.29	46,414	10,954	11,840	12,892	13,863	0.24	0.26	0.28	0.30	92,828	21,568	23,313	25,383	27,294	0.23	0.25	0.27	0.29
12		A359 east	A371	47,297	11,618	12,558	13,673	14,702	0.25	0.27	0.29	0.31	47,297	11,040	11,933	12,993	13,971	0.23	0.25	0.27	0.30	94,593	22,658	24,491	26,666	28,673	0.24	0.26	0.28	0.30
13		A371	A350	13,516	11,995	12,965	14,117	15,180	0.89	0.96	1.04	1.12	13,516	12,132	13,114	14,279	15,354	0.90	0.97	1.06	1.14	27,031	24,127	26,079	28,396	30,533	0.89	0.96	1.05	1.13
14		A350	A36	11,770	9,997	10,775	11,441	12,173	0.85	0.92	0.97	1.03	11,770	10,202	10,996	11,675	12,423	0.87	0.93	0.99	1.06	23,540	20,199	21,770	23,116	24,596	0.86	0.92	0.98	1.04
15		A36	A360	12,375	10,604	11,429	12,135	12,912	0.86	0.92	0.98	1.04	12,375	10,567	11,389	12,093	12,868	0.85	0.92	0.98	1.04	24,750	21,171	22,818	24,228	25,780	0.86	0.92	0.98	1.04
16		A360	A344	11,369	12,120	13,063	13,870	14,758	1.07	1.15	1.22	1.30	11,369	11,919	12,846	13,640	14,513	1.05	1.13	1.20	1.28	22,737	24,038	25,908	27,509	29,271	1.06	1.14	1.21	1.29
17		A344	A345	11,369	12,120	13,063	13,870	14,758	1.07	1.15	1.22	1.30	11,369	11,919	12,846	13,640	14,513	1.05	1.13	1.20	1.28	22,737	24,038	25,908	27,509	29,271	1.06	1.14	1.21	1.29
18		A345	A3028	34,776	14,471	15,597	16,561	17,622	0.42	0.45	0.48	0.51	34,776	13,611	14,670	15,576	16,574	0.39	0.42	0.45	0.48	69,551	28,082	30,267	32,137	34,196	0.40	0.44	0.46	0.49
19		A3028	A338	35,311	16,257	17,522	18,605	19,796	0.46	0.50	0.53	0.56	35,311	16,391	17,667	18,758	19,960	0.46	0.50	0.53	0.57	70,622	32,649	35,189	37,363	39,756	0.46	0.50	0.53	0.56
20		A338	A342	32,446	15,772	16,698	17,521	18,479	0.49	0.51	0.54	0.57	32,446	15,866	16,797	17,626	18,589	0.49	0.52	0.54	0.57	64,892	31,638	33,495	35,147	37,067	0.49	0.52	0.54	0.57
21		A342	A343	37,578	21,859	23,142	24,283	25,610	0.58	0.62	0.65	0.68	37,578	21,313	22,564	23,676	24,970	0.57	0.60	0.63	0.66	75,156	43,172	45,706	47,959	50,580	0.57	0.61	0.64	0.67
22		A343	A3057	34,495	22,737	24,072	25,259	26,639	0.66	0.70	0.73	0.77	34,495	22,554	23,878	25,055	26,424	0.65	0.69	0.73	0.77	68,991	45,291	47,950	50,314	53,063	0.66	0.70	0.73	0.77
23		A3057	A3093	34,848	22,839	24,179	25,372	26,758	0.66	0.69	0.73	0.77	34,848	22,295	23,604	24,768	26,121	0.64	0.68	0.71	0.75	69,696	45,134	47,784	50,140	52,879	0.65	0.69	0.72	0.76
24		A3093	A34	37,179	24,828	26,285	27,581	29,088	0.67	0.71	0.74	0.78	37,179	24,701	26,151	27,440	28,939	0.66	0.70	0.74	0.78	74,358	49,529	52,436	55,021	58,028	0.67	0.71	0.74	0.78
25		A34	M3	34,799	17,290	18,305	19,208	20,257	0.50	0.53	0.55	0.58	34,799	18,317	19,392	20,349	21,460	0.53	0.56	0.58	0.62	69,598	35,608	37,698	39,556	41,718	0.51	0.54	0.57	0.60
26	A358	M5 J25	A378	14,179	13,826	14,944	16,271	17,496	0.98	1.05	1.15	1.23	14,179	12,916	13,961	15,201	16,346	0.91	0.98	1.07	1.15	28,358	26,742	28,905	31,473	33,842	0.94	1.02	1.11	1.19
27		A378	A303	14,405	11,058	11,952	13,014	13,993	0.77	0.83	0.90	0.97	14,405	10,949	11,835	12,886	13,856	0.76	0.82	0.89	0.96	28,810	22,007	23,787	25,900	27,850	0.76	0.83	0.90	0.97

Table 4-3: Corridor CRFs & Stresses – Neutral Month

Corridor section				Eastbound									Westbound									Both directions								
					ADT				Stress factor					ADT					Stress factor					ADT					Stress factor			
No.	Road	From	To	CRF	2013	2021	2031	2041	2013	2021	2031	2041	CRF	2013	2021	2031	2041	2013	2021	2031	2041	CRF	2013	2021	2031	2041	2013	2021	2031	2041
1	A30	M5 J29	A375	35,056	23,420	25,071	27,006	28,960	0.67	0.72	0.77	0.83	35,056	24,046	25,741	27,727	29,734	0.69	0.73	0.79	0.85	70,113	47,466	50,812	54,733	58,694	0.68	0.72	0.78	0.84
2		A375	A35	40,545	15,394	16,479	17,751	19,035	0.38	0.41	0.44	0.47	40,545	15,272	16,349	17,610	18,885	0.38	0.40	0.43	0.47	81,091	30,666	32,828	35,361	37,920	0.38	0.40	0.44	0.47
3		A35	A30	40,545	9,146	9,791	10,546	11,309	0.23	0.24	0.26	0.28	40,545	9,371	10,032	10,806	11,588	0.23	0.25	0.27	0.29	81,091	18,517	19,822	21,352	22,897	0.23	0.24	0.26	0.28
4		A35	A303	11,954	9,146	9,791	10,546	11,309	0.77	0.82	0.88	0.95	11,954	9,371	10,032	10,806	11,588	0.78	0.84	0.90	0.97	23,908	18,517	19,822	21,352	22,897	0.77	0.83	0.89	0.96
5	A303	A30	A358	9,690	8,459	9,143	9,955	10,705	0.87	0.94	1.03	1.10	9,690	9,228	9,975	10,860	11,678	0.95	1.03	1.12	1.21	19,379	17,687	19,118	20,816	22,383	0.91	0.99	1.07	1.16
6		A358	A356	12,457	15,778	17,054	18,569	19,967	1.27	1.37	1.49	1.60	12,862	15,678	16,946	18,451	19,841	1.22	1.32	1.43	1.54	25,723	31,456	34,001	37,021	39,808	1.22	1.32	1.44	1.55
7		A356	A3088	36,758	20,190	21,823	23,762	25,550	0.55	0.59	0.65	0.70	36,758	20,385	22,034	23,991	25,797	0.55	0.60	0.65	0.70	73,516	40,575	43,858	47,753	51,348	0.55	0.60	0.65	0.70
8		A3088	A37	43,424	15,559	16,818	18,311	19,690	0.36	0.39	0.42	0.45	43,424	15,377	16,621	18,097	19,460	0.35	0.38	0.42	0.45	86,848	30,936	33,439	36,409	39,150	0.36	0.39	0.42	0.45
9		A37	A372	48,005	17,602	19,026	20,716	22,275	0.37	0.40	0.43	0.46	48,005	17,622	19,048	20,739	22,301	0.37	0.40	0.43	0.46	96,010	35,224	38,074	41,455	44,576	0.37	0.40	0.43	0.46
10		A372	A359 west	11,552	13,953	15,082	16,421	17,658	1.21	1.31	1.42	1.53	11,552	14,213	15,363	16,727	17,987	1.23	1.33	1.45	1.56	23,104	28,166	30,445	33,149	35,644	1.22	1.32	1.43	1.54
11		A359 west	A359 east	46,902	15,274	16,510	17,976	19,329	0.33	0.35	0.38	0.41	46,902	14,552	15,729	17,126	18,416	0.31	0.34	0.37	0.39	93,804	29,826	32,239	35,102	37,745	0.32	0.34	0.37	0.40
12		A359 east	A371	47,623	14,066	15,204	16,554	17,801	0.30	0.32	0.35	0.37	47,623	14,752	15,945	17,362	18,669	0.31	0.33	0.36	0.39	95,245	28,818	31,149	33,916	36,469	0.30	0.33	0.36	0.38
13		A371	A350	13,618	15,230	16,462	17,924	19,274	1.12	1.21	1.32	1.42	13,618	13,611	14,712	16,019	17,225	1.00	1.08	1.18	1.26	27,235	28,841	31,174	33,943	36,498	1.06	1.14	1.25	1.34
14		A350	A36	12,505	12,711	13,700	14,546	15,478	1.02	1.10	1.16	1.24	12,505	12,555	13,532	14,368	15,288	1.00	1.08	1.15	1.22	25,010	25,266	27,232	28,914	30,766	1.01	1.09	1.16	1.23
15		A36	A360	13,207	13,168	14,192	15,069	16,035	1.00	1.07	1.14	1.21	13,207	12,687	13,674	14,519	15,449	0.96	1.04	1.10	1.17	26,414	25,855	27,867	29,588	31,484	0.98	1.06	1.12	1.19
16		A360	A344	11,855	14,646	15,785	16,761	17,834	1.24	1.33	1.41	1.50	11,855	14,106	15,203	16,143	17,177	1.19	1.28	1.36	1.45	23,709	28,752	30,989	32,904	35,011	1.21	1.31	1.39	1.48
17		A344	A345	11,855	14,646	15,785	16,761	17,834	1.24	1.33	1.41	1.50	11,855	14,106	15,203	16,143	17,177	1.19	1.28	1.36	1.45	23,709	28,752	30,989	32,904	35,011	1.21	1.31	1.39	1.48
18		A345	A3028	37,782	16,490	17,773	18,871	20,080	0.44	0.47	0.50	0.53	37,782	14,967	16,131	17,128	18,225	0.40	0.43	0.45	0.48	75,563	31,457	33,904	35,999	38,305	0.42	0.45	0.48	0.51
19		A3028	A338	37,807	18,592	20,038	21,277	22,639	0.49	0.53	0.56	0.60	37,807	18,606	20,054	21,293	22,657	0.49	0.53	0.56	0.60	75,614	37,198	40,092	42,569	45,296	0.49	0.53	0.56	0.60
20		A338	A342	34,953	18,141	19,206	20,153	21,254	0.52	0.55	0.58	0.61	34,953	18,262	19,334	20,287	21,396	0.52	0.55	0.58	0.61	69,907	36,403	38,540	40,440	42,650	0.52	0.55	0.58	0.61
21		A342	A343	39,018	23,708	25,100	26,337	27,776	0.61	0.64	0.68	0.71	39,018	23,227	24,590	25,803	27,213	0.60	0.63	0.66	0.70	78,036	46,935	49,690	52,140	54,989	0.60	0.64	0.67	0.70
22		A343	A3057	35,832	24,778	26,232	27,526	29,030	0.69	0.73	0.77	0.81	35,832	24,950	26,415	27,717	29,231	0.70	0.74	0.77	0.82	71,663	49,728	52,647	55,243	58,261	0.69	0.73	0.77	0.81
23		A3057	A3093	36,915	25,525	27,023	28,356	29,905	0.69	0.73	0.77	0.81	36,915	25,159	26,636	27,949	29,476	0.68	0.72	0.76	0.80	73,830	50,684	53,659	56,305	59,381	0.69	0.73	0.76	0.80
24		A3093	A34	38,578	26,986	28,570	29,979	31,617	0.70	0.74	0.78	0.82	38,578	26,985	28,569	29,978	31,616	0.70	0.74	0.78	0.82	77,156	53,971	57,139	59,956	63,232	0.70	0.74	0.78	0.82
25		A34	M3	36,768	19,446	20,587	21,603	22,783	0.53	0.56	0.59	0.62	36,768	20,474	21,676	22,745	23,987	0.56	0.59	0.62	0.65	73,536	39,920	42,263	44,347	46,770	0.54	0.57	0.60	0.64
26	A358	M5 J25	A378	14,881	15,026	16,242	17,684	19,015	1.01	1.09	1.19	1.28	14,881	14,135	15,279	16,635	17,888	0.95	1.03	1.12	1.20	29,763	29,161	31,520	34,320	36,903	0.98	1.06	1.15	1.24
27		A378	A303	14,742	12,229	13,218	14,392	15,476	0.83	0.90	0.98	1.05	14,742	12,004	12,975	14,128	15,191	0.81	0.88	0.96	1.03	29,484	24,233	26,193	28,520	30,667	0.82	0.89	0.97	1.04

Table 4-4: Corridor CRFs & Stresses – Summer Month

Figure 4-2: Corridor Stresses – Neutral and Summer Month

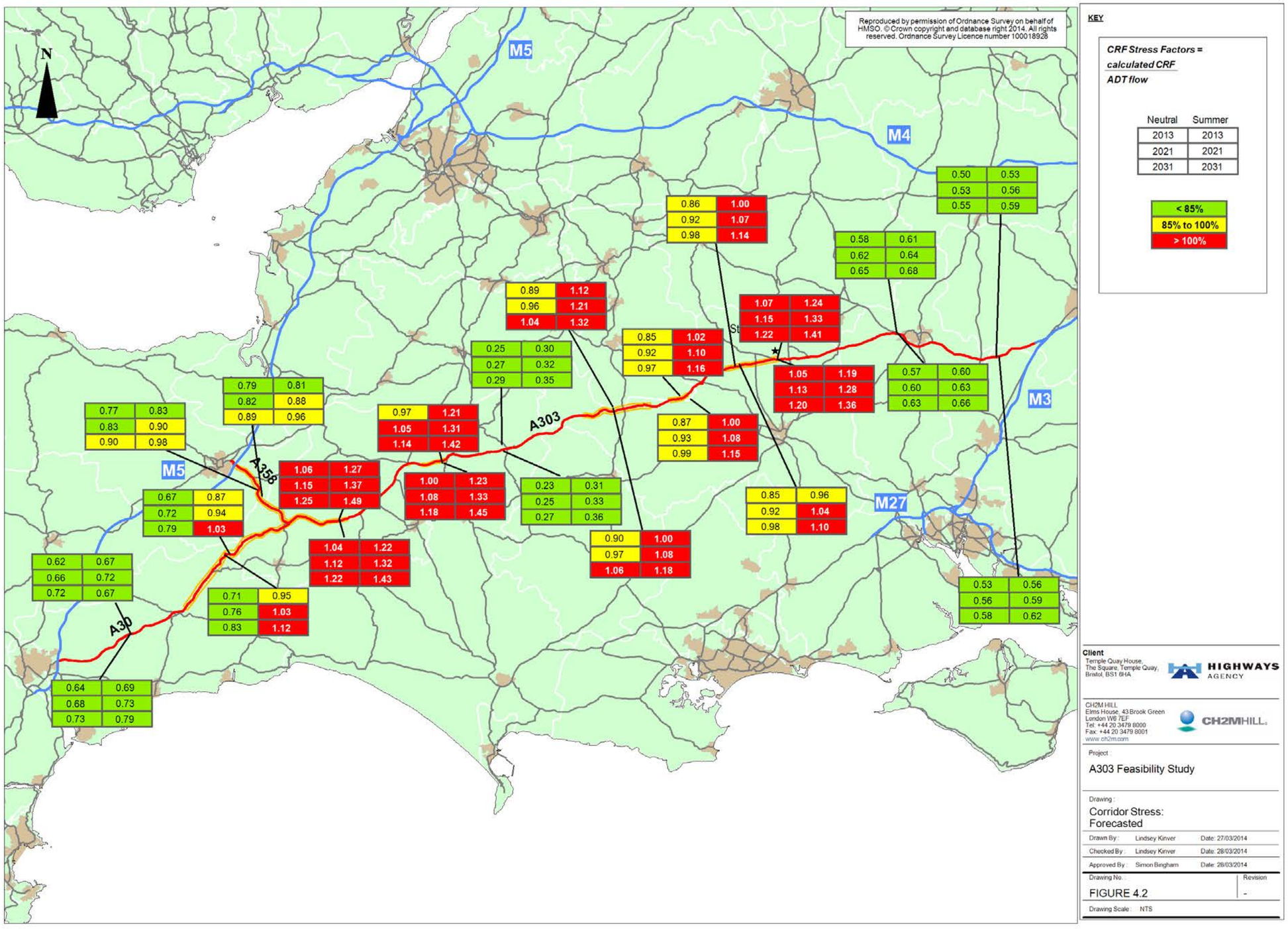


Table 4-5 to Table 4-10 show the amounts of corridor length and million vehicle KM (mvkm) travelled at different stress levels for neutral and summer months in 2013, 2021, 2031 and 2041. Mvkm refers to the distance travelled at different stress levels and is calculated by multiplying the link length by the annual number of vehicles travelling that link. Two sets of figures are provided for "Both directions" reflecting (i) the mathematical addition of the eastbound and westbound statistics and (ii) a pure two-way capacity estimates. The former would be the more realistic.

Of particular significance in the tables are the forecast increases in the corridor lengths and mvkm operating at stress levels greater than 1.0. Vehicle-kilometres at stress levels greater than 1.0 multiply substantially in the neutral (5 to 7 times) and summer (3 to 5 times) months respectively. This presents a persuasive case for improvements on the corridor.

Direction		Year	Stress factor				
			<0.85	0.85-1.0	1.0-1.1	1.1-1.3	>1.3
EB		2013	175.9	14.3	5.6	0.0	0.0
		2021	164.2	22.6	3.3	5.6	0.0
		2031	153.5	27.7	5.6	9.0	0.0
		2041	153.5	11.6	18.5	10.1	2.1
WB		2013	168.6	19.9	7.2	0.0	0.0
		2021	164.3	24.3	1.6	5.6	0.0
		2031	153.9	27.4	7.3	7.2	0.0
		2041	149.0	15.3	19.4	10.0	2.1
Both directions	Average of EB & WB statistics	2013	172.3	17.1	6.4	0.0	0.0
		2021	164.2	23.4	2.5	5.6	0.0
		2031	153.7	27.5	6.5	8.1	0.0
		2041	151.3	13.4	19.0	10.0	2.1
	Based on two-way capacity estimates	2013	173.7	17.8	4.3	0.0	0.0
		2021	169.1	19.1	3.3	4.3	0.0
		2031	159.2	23.3	5.6	7.6	0.0
		2041	153.3	16.7	15.0	10.0	0.7

Table 4-5: Lengths (km) of Corridor at Different Stresses - Neutral Month

These figures are based on the total corridor length being 195km. Table 4-6 shows the increasing proportion of the corridor in significant stress categories in the future years.

Direction		Year	Stress factor				
			<0.85	0.85-1.0	1.0-1.1	1.1-1.3	>1.3
EB		2013	90%	7%	3%	0%	0%
		2021	84%	12%	2%	3%	0%
		2031	78%	14%	3%	5%	0%
		2041	78%	6%	9%	5%	1%
WB		2013	86%	10%	4%	0%	0%
		2021	84%	12%	1%	3%	0%
		2031	79%	14%	4%	4%	0%
		2041	76%	8%	10%	5%	1%
Both directions	Average of EB & WB statistics	2013	88%	9%	3%	0%	0%
		2021	84%	12%	1%	3%	0%
		2031	79%	14%	3%	4%	0%
		2041	77%	7%	10%	5%	1%
	Based on two-way capacity estimates	2013	89%	9%	2%	0%	0%
		2021	86%	10%	2%	2%	0%
		2031	81%	12%	3%	4%	0%
		2041	78%	9%	8%	5%	0%

Table 4-6: Lengths (%) of Corridor at Different Stresses - Neutral Month

Direction		Year	Stress factor					Increase in >1.0 relative 2013
			<0.85	0.85-1.00	1.00-1.10	1.10-1.30	>1.30	
EB		2013	2.40	0.17	0.07	0.00	0.00	
		2021	2.43	0.27	0.04	0.07	0.00	72%
		2031	2.47	0.35	0.08	0.13	0.00	201%
		2041	2.63	0.16	0.25	0.15	0.03	529%
WB		2013	2.35	0.22	0.09	0.00	0.00	
		2021	2.46	0.30	0.02	0.07	0.00	8%
		2031	2.50	0.35	0.11	0.10	0.00	138%
		2041	2.63	0.19	0.26	0.15	0.03	418%
Both directions	Sum of EB & WB statistics	2013	4.74	0.39	0.16	0.00	0.00	
		2021	4.89	0.57	0.06	0.15	0.00	37%
		2031	4.97	0.70	0.19	0.23	0.00	166%
		2041	5.26	0.35	0.51	0.30	0.07	467%
	Based on two-way capacity estimates	2013	4.78	0.40	0.10	0.00	0.00	
		2021	5.02	0.45	0.09	0.11	0.00	93%
		2031	5.13	0.57	0.16	0.21	0.00	262%
		2041	5.36	0.42	0.39	0.30	0.02	594%

Table 4-7: Mvkm at Different Stresses - Neutral Month

Previous tables and table 4.7 demonstrate the worsening performance of the A303/a30 corridor over time. In particular Table 4.7 indicates that the number of vehicle kilometres

travelled at stress levels over 100% more than doubles to 2031 and increases fivefold by 2041. In addition the proportion of travel at more significant stress levels i.e. above 1.1 also increases in future years. The stress levels by year are shown in Figure 4.2.

Direction		Year	Stress factor				
			<0.85	0.85-1.0	1.0-1.1	1.1-1.3	>1.3
EB		2013	159.6	18.0	7.7	10.5	0.0
		2021	149.2	15.0	18.7	5.6	7.3
		2031	140.5	19.1	4.6	21.1	10.5
		2041	133.2	16.1	10.4	23.3	12.9
WB		2013	159.7	25.3	3.6	7.2	0.0
		2021	144.0	15.7	28.9	3.5	3.7
		2031	134.1	25.6	6.2	22.7	7.2
		2041	133.3	15.6	10.8	28.9	7.2
Both directions	Average of EB & WB statistics	2013	159.6	21.7	5.6	8.8	0.0
		2021	146.6	15.3	23.8	4.6	5.5
		2031	137.3	22.4	5.4	21.9	8.8
		2041	133.2	15.8	10.6	26.1	10.0
	Based on two-way capacity estimates	2013	164.5	16.3	9.2	5.9	0.0
		2021	153.3	15.8	15.2	5.6	5.9
		2031	141.6	22.8	5.5	19.9	5.9
		2041	138.0	15.3	11.2	22.2	9.1

Table 4-8: Lengths (km) of Corridor at Different Stresses - Summer Month

Direction		Year	Stress factor				
			<0.85	0.85-1.0	1.0-1.1	1.1-1.3	>1.3
EB		2013	82%	9%	4%	5%	0%
		2021	76%	8%	10%	3%	4%
		2031	72%	10%	2%	11%	5%
		2041	68%	8%	5%	12%	7%
WB		2013	82%	13%	2%	4%	0%
		2021	74%	8%	15%	2%	2%
		2031	68%	13%	3%	12%	4%
		2041	68%	8%	6%	15%	4%
Both directions	Average of EB & WB statistics	2013	82%	11%	3%	5%	0%
		2021	75%	8%	12%	2%	3%
		2031	70%	11%	3%	11%	5%
		2041	68%	8%	5%	13%	5%
	Based on two-way capacity estimates	2013	84%	8%	5%	3%	0%
		2021	78%	8%	8%	3%	3%
		2031	72%	12%	3%	10%	3%
		2041	71%	8%	6%	11%	5%

Table 4-9: Lengths (%) of Corridor at Different Stresses - Summer Month

Direction		Year	Stress factor					Increase in >1.0 relative 2013	Totals
			<0.85	0.85-1.00	1.00-1.10	1.10-1.30	>1.30		
EB		2013	2.67	0.22	0.11	0.16	0.00		3.16
		2021	2.72	0.18	0.27	0.09	0.12	83%	3.39
		2031	2.80	0.27	0.05	0.34	0.18	114%	3.63
		2041	2.90	0.22	0.16	0.36	0.24	190%	3.88
WB		2013	2.67	0.32	0.04	0.10	0.00		3.14
		2021	2.65	0.21	0.40	0.05	0.06	241%	3.37
		2031	2.73	0.34	0.09	0.34	0.12	267%	3.62
		2041	2.90	0.22	0.16	0.46	0.13	402%	3.87
Both directions	Sum of EB & WB statistics	2013	5.34	0.55	0.15	0.26	0.00		6.30
		2021	5.37	0.39	0.67	0.15	0.18	140%	6.76
		2031	5.53	0.61	0.14	0.67	0.30	169%	7.25
		2041	5.80	0.43	0.32	0.82	0.37	266%	7.75
	Based on two-way capacity estimates	2013	5.49	0.39	0.25	0.17	0.00		6.30
		2021	5.59	0.39	0.42	0.18	0.18	86%	6.76
		2031	5.68	0.64	0.12	0.62	0.20	122%	7.25
		2041	5.98	0.41	0.36	0.67	0.33	221%	7.75

Table 4-10: Mkm at Different Stresses - Summer Month

Table 4.10 shows the dramatic increase in mvkm at stress levels above 1.3 which rises from around 0% in 2013 to above 30% in 2041.

4.7 Summary

4.7.1 Future growth and development

General

The importance of economic growth and jobs and the key role that transport and infrastructure play in facilitating growth were raised at SWP RS stakeholder workshops.

Although traffic volumes on the corridor over recent years appear to have either fallen, albeit modestly, future development along with desired corridor improvements will lead to significant increases.

The SWP area generally is a focal point for future local economic growth, with 242,000 residential units and 150,000 new jobs planned by 2031. The main concentrations are at Plymouth, Yeovil, Bath, Exeter, Salisbury, Bodmin, Dorchester and Frome. Other strategic growth locations include Taunton, Newton Abbot, St Austell and Clay Country, Truro, Camborne-Pool-Redruth and Barnstaple.

Given that the corridor is one of only two main road links connecting a number of these areas with each other, and almost all of them with other parts of the United Kingdom, corridor volumes can be expected to increase significantly.

On the corridor

With the exception of Dorset, TEMPRO 6.2 has both jobs and workforce figures increasing generally year-on-year across the South West. Wiltshire and Devon are forecast to experience high growth in both the number of jobs and the size of the workforce over the same time period. Interestingly, TEMPRO2 projections indicate that future jobs and workforce in Dorset will decline by approximately 4% by 2030 whereas Dorsets' 'Workplace Strategy

Autumn 2011 Update Draft' suggests that employment will grow by up to 1.2% annually from 2011 to 2026. A 1.2% increase would give an increase of 9.6% by 2020 over 2012 figures.

Particular growth and development locations on the corridor include:

- the Exeter area, where considerable growth is expected/planned;
- the new Stonehenge visitor centre, which was still to be opened when stakeholders were consulted;
- Solstice Park in Amesbury, which still to be fully developed; and
- Andover, one of the fastest growing towns in the Solent region.

Exeter International Airport is located adjacent the western end of the A30 section of the corridor close to M5 Junction 29. The airport's masterplan predicts an average annual growth of 6.2% per annum in air traffic between 2000 and 2030.

4.7.2 Future changes to the transport system

Network improvements and operational changes

Throughout the SWP network generally, and therefore also the A303/A30/A358 corridor, there are numerous maintenance issues that need attention in the short term, including:

- ongoing aging deterioration of carriageway conditions and structures; and
- ability of existing drainage infrastructure to cope with increased demands as a result of climate change.

Planned maintenance includes the re-surfacing of the A303 between Wincanton and Snag's Farm (£5.2m).

The HA is also working with others on potential improvements to M5 J25 to accommodate growth at Taunton. The junction will be considered in the emerging M5 Exeter to Birmingham RS.

Local transport schemes either completed, under construction or due to start before May 2015, plus any other funded local network commitments that should be delivered before 2021, include a public transport scheme in Exeter and a road schemes in Bullington Cross and East Anton.

Given the age and quality of much of the road (in terms of earthworks, drainage, surfacing and structures) there will be key maintenance challenges and opportunities on the route in the short term (see section 3 for details).

Although the existing programme of enhancement and pipeline schemes will go some way to tackling capacity problems in the short term, further enhancements will be needed before 2021. In terms of parts of the route which have capacity to support growth, these are extremely limited by the variable nature of the roads that make up the route and by the range of traffic flows that use the route. The ability of the route to accommodate growth is also as much if not more constrained by junction capacity as it is link capacity – Cartgate and Podimore Roundabouts being specific instances.

Overall, the evidence suggests that the key future challenge for the corridor lies in its ability to accommodate and support growth, both the areas it travels through and also the broader SWP area, especially that the west (e.g. Devon and Cornwall).

Rail

Network Rail's strategic business plan for the Wessex region intends to enhance the capacity and capability of the network with infrastructure plans totalling £1.025bn planned to be spent

between 2014 and 2019. Of this figure nearly £250m will be spent on track renewals, £274m on signalling, £180m on bridges, tunnels, structures and a further £270m on buildings, electrification, telecommunications and plant.

Wessex will also benefit from investment to future proof critical infrastructure against changing weather patterns particularly including more frequent flooding.

4.7.3 Possible traffic growth

Interim traffic forecasts generated by applying district level TEMPRO 6.2 traffic growth to current neutral and summer month traffic demands yield differing 2013 to 2041 traffic growth along the corridor, varying between 17% for the Wiltshire section, where traffic flows are generally the highest, and 27% on the Somerset section.

4.7.4 Possible future traffic operating conditions

Congestion, travel times and general resilience

Stress calculations for the corridor assuming TEMPRO 6.2 –derived traffic demands and existing corridor configurations showed that stress levels generally increase and the following additional portions of the corridor will become over-stressed by 2041 compared to 2013:

- the A30 between the A35 and A303; and
- the A358 between the A378 and A303.

Stress levels at locations that are already stressed or over-stressed in 2013 increase significantly.

Estimates of the amounts of corridor length and mvkm travelled at different stress levels for neutral and summer months in 2013, 2021, 2031 and 2041 show that vehicle-kilometres at stress levels greater than 1.0 multiply substantially in the neutral (5 to 7 times) and summer (3 to 5 times) months respectively. The effect of increasing stress levels on travel times and general corridor and broader network resilience will be explored in following study stages. Stress increases of this magnitude, however, present a persuasive case for improvements on the corridor, particularly where the higher stress levels occur – i.e. the single existing carriageway sections

5 Establish the need for intervention

5.1 Current transport-related problems

Chapters 3 and 4 have documented the current and future conditions likely to be experienced by travellers along the corridor and the potential conditions which are likely to prevail should potential improvement works not be implemented.

The current corridor consists of approximately 195km of carriageway of varying standards, speed limits and capacity. Approximately 100km have identified improvement options albeit the Cartgate and Podimore improvement schemes are located on 11.5km of those sections. Approximately 35% of the study corridor is of single carriageway standard (whether this is 2 or 3 lane in width).

The current transport related problems have been highlighted and are directly related to the following key elements of the corridor:

- Large number of local accesses (particularly on single carriageway sections);
- Changing speed limits;
- Changing carriageway standards;
- Difficulty of VRU/NMU to cross sections of carriageway;
- Presence of major junctions;
- Presence of slower moving farm and agricultural vehicles;
- High HGV flows with lower acceleration and occupying more road space;
- High traffic volumes at either end and constrained by carriageway standard along the route;
- Resilience;
- Seasonality of traffic volumes;
- Flood risk;
- Safety.

The combination of these key elements leads to congestion at peak times where carriageway standard reduces from dual to single carriageway and within the single carriageway standard the change from 3 to 2 lanes.

This is demonstrated by the journey time performance of the route and also the calculation of the prevalent “stress” level by comparing the CRF with AADT.

The stress level is seen to be over 100% on the S2/S3 segments indicating peak hour congestion, delay and flow breakdown for a number of sections in a standard neutral month. This is exacerbated in the summer peak months when journey times lengthen by up to 50% and stress values increase to 127% depending on direction and section. The length of road experiencing stress levels above 100% also effectively doubles between the neutral and summer months.

The key links which demonstrate stress at or above 100% are listed below. These links indicate where further analysis and option generation should be directed in the first instance.

- Amesbury to Berwick Down;
- Chicklade Bottom to Mere;
- Wylye to Stockton Wood;
- Sparkford to Ilchester;

- South Petherton to Southfields;
- A358 (northern section).

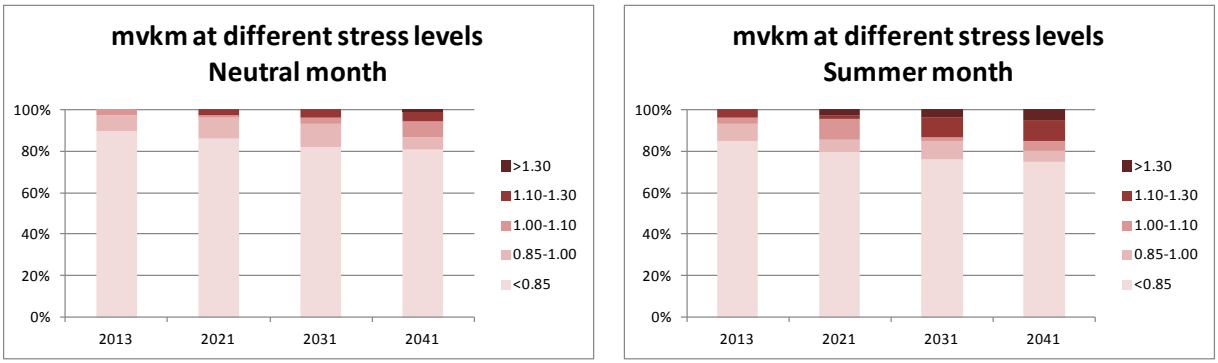


Figure 5-1: Lengths of Corridor at Different Stresses – Neutral and Summer Months

Clearly these factors alone can lead to direct economic, social and environmental consequences in terms of loss of productive time, AQMA issues and increased safety problems.

The route as a whole experienced some 876 PIAs between 2008 and 2012 on the A30 and A303 and between 2009 and 2013 on the A358 with the majority of these on the single carriageway sections. There is also the occurrence of accidents at the change in carriageway standard and also the change in speed limit where the change in the average speed of traffic has been attributed to be a direct cause of accidents in TRL reports i.e. a 1mph difference in average speed can influence accident occurrence by +/- 5%.

Further analysis of the accidents on the corridor as a whole indicates that 47% of all injury accidents occur on the single carriageway sections which accounts for 40% of the route length. Significantly, 67% (24 of 36) of all fatal accidents on the entire corridor occurred on the improvement sections which are all generally single carriageways. *Table 5-1* summarises the figures.

Accident Type	9 Single Carriageway Sections	Total Corridor	% of Total
Fatal	20	36	56
Serious	68	154	44
Slight	329	686	48
Total	417	876	48

Table 5-1: PIA Summary (2008 to 2012 for A30 and A303, 2009 to 2013 for A358)

The worst performing sections in terms of fatal accident occurrence are as follows:

- Amesbury to Berwick Down;
- Chicklade Bottom to Mere; and
- Southfields to Honiton.

In terms of the number of PIAs per km the following links were the worst performing:

- Amesbury to Berwick Down;
- Chicklade Bottom to Mere;

- Sparkford to Ilchester;
- South Petherton to Southfields; and
- A358 Southfields to M5 J25.

The occurrence of accidents on incidents on any of the single carriageway sections can lead to a complete closure of the route due to the lack of a local alternative with direct and far reaching resilience issues. This also leads to increased incident response times due to a blocked route and limited alternatives for emergency service vehicles to be able to access either the specific site or gain access to other incidents and emergencies via the route leading to severe consequences.

The presence of various bottlenecks at changing carriageway standards leads to journeys being subject to variable levels of reliability which are exacerbated in the summer months. Travel conditions and times can fluctuate considerably depending on the time of day, day of week or time of year. Bottlenecks and flow breakdown can develop quickly, reducing reliability and taking considerable time to clear.

Currently the route has poor resilience particularly due to inclement weather (seen particularly in recent events in January/ February 2014), unforeseen incidents or accidents (particularly in the single carriageway sections) and in periods when the road is put under additional pressure due to the closure of other major corridors i.e. the M5.

The availability of two carriageways will improve resilience to such unforeseen events

In summary the current transport related problems can be summed up as:

- poor connectivity
- poor resilience
- poor road safety
- poor journey time reliability

5.2 Future transport-related problems

Without any improvement to the route the journey time, asset and safety condition will deteriorate with the impending development pressures around the network. The previous paragraphs on connectivity, reliability and resilience all allude to the need for dualling and the implicit benefits it would bring.

Population and employment figures from TEMPRO (in *Table 4-2*) indicate that the overarching anticipated growth in the region will involve a growth of approximately 9, 20 and 30% growth in households to 2021, 2031 and 2041 respectively. The growth in jobs is, however, much lower with growth rates only between 4% and 6% between 2021 and 2041. Indeed some counties (Dorset in particular) show a reduction in jobs available in these forecast years.

This level of growth will increase the number of links where congestion is likely to occur. When combined with an estimate of the total vehicle kilometres travelled on the different sections of road Table 5-2 indicates that the relative amount of travel on roads with a stress level above 100% will increase by up to 5 times in neutral month conditions and by almost 9 times during the summer peak months.

By 2021 all single carriageway sections are either approaching or exceed 100% stress. By 2041 all exceed 100% with three sections being in the region of 150% in the summer months these being:

- Amesbury to Berwick Down;
- Sparkford to Ilchester; and,
- South Petherton to Southfields.

Year	Stress factor					Increase in >1.0 relative 2013	Totals	
	<0.85	0.85-1.00	1.00-1.10	1.10-1.30	>1.30			
Neutral month								
2013	4.74	0.39	0.16	0.00	0.00		5.29	Growth over 2013
2021	4.89	0.57	0.06	0.15	0.00	37%	5.67	7%
2031	4.97	0.70	0.19	0.23	0.00	166%	6.08	15%
2041	5.26	0.35	0.51	0.30	0.07	467%	6.49	23%
Summer month								
2013	5.34	0.55	0.15	0.26	0.00		6.30	Growth over 2013
2021	5.37	0.39	0.67	0.15	0.18	537%	6.76	7%
2031	5.53	0.61	0.14	0.67	0.30	615%	7.25	15%
2041	5.80	0.43	0.32	0.82	0.37	872%	7.75	23%

Table 5-2: Million Vehicle Kilometres at Different Stresses

With this applied to the current base problems it is clear there will be additional and severe issues. These will contribute to hindering economic growth and letting the South West region fall behind both the rest of the UK and its foreign counterparts and will lead to the exacerbation of the following key issues:.

- Connectivity;
- Severance;
- Accidents;
- Journey times;
- Resilience; and,
- Lost productive time.

The HOSW SEP recognises that as a baseline the A303/A30/A358 corridor is below modern standards and that by 2020 a core aim is to achieve partial dualling of the A303/A30 corridor which should be completed by 2030 in order to create the conditions for growth.

6 Identifying objectives for the study

The main aim of the study is to identify the opportunities and understand the case for future investment solutions on the A303/A30/A358 corridor that are deliverable, affordable and offer value for money.

The specific objectives of the study were presented fully in section 1.3 with specific details of national, regional and local policy objectives described in detail in section 3.2.

Combining both sets of objectives leads to the development of some strategic outcomes required for the overall improvement schemes which are summarised in Table 6.1.

Strategic Objectives	**Supporting Economic Growth**	**Facilitate growth in employment at key centres and locations along the A303/A358/A30 corridor**	**Facilitate growth in housing a key development hotspots along the corridor**
Operational Objectives	**Capacity**	Reduce delay and queues that occur during eh peak hours and seasonal times of the year	
	Resilience	Improve the resilience of the route such that the number of incidents and the effect of accidents is reduced	
	Safety	Reduce the number of collisions on the A303/A358/A30 corridor	
	Connectivity	Improve the connectivity of the South West to the rest of the UK, to reduce peripherality and improve business and growth prospects.	
	Environmental	Avoid unacceptable impacts on the surrounding natural environment and landscape and optimise the environmental opportunities and mitigation that the intervention could bring.	

Table 6-1: A303 Feasibility Study Strategic Objectives

There will be a number of challenges associated with achieving these goals which may need a refinement of how they are termed during the project lifecycle.

7 Geographic area of interest

This feasibility study is concerned with the A303/A30/A358 corridor, which comprises:

- the A303 between the M3 and the A30;
- the A30 between the A303 and the M5; and
- the A358 between the A303 and the M5.

Figure 1-1 showed the extent and scope of this study. Overall, these three sections of road cover a total of 195km. The A303/A30 section between the M3 and M5 Junction 29 at Exeter is approximately 180km long.

The previous sections of this stage 1 report have examined the current conditions and performance of the network which also concluded that previous scheme option information be collated and reviewed to develop a long list of potential solutions to the problems and issues.

Specifically further analysis of options for improvement are to be considered for the following sections:

- Amesbury to Berwick Down;
- Chicklade Bottom to Mere;
- Sparkford to Ilchester;
- South Petherton to Southfields,and;
- Southfields to Honiton.

In order to assess and appraise the impacts of improvements to these sections it is proposed that a strategic transport model be developed to enable a consistent and region based assessment of improvement options and for the impacts of those to be realised over the south west region and on competing routes. This model would be developed in conjunction with current guidance and the DfT TASM and HA TAME departments.

This would allow consistent high-level assessments of each of the identified proposals and combinations thereof in terms of increased roadway capacity, reduced journey times and delays, relief on alternative routes, environmental benefits and a range of TEMRO-determined future horizons off a reasonably robust base.

Due to the differing locations of the sections identified for further investigation the likely geographical extent of impacts will be widespread. In addition the ultimate aspiration would be for a full improvement to all single carriageway sections of the corridor.

Previous assessment of such an improvement (during the SWARMMS study) identified that such a scheme would have impacts on traffic flows on the major routes to the south west i.e. the M4/M5 and M3/M27/A35.

The level of transfer to an improved corridor will depend on the level of end to end through traffic and the degree to which improvements would contribute to more local trip distribution patterns.

The underlying drivers of current and future transport issues are dominated by but also extend beyond the corridor itself and its immediate hinterland. The travel market and key origins and destinations using the corridor cover the entire South West and South East, in so far as the two interact. The corridor also carries and distributes traffic with a variety of local and also broader origins and destinations within the South West along portions of its length.

Demand drivers, therefore, comprise general growth in the South West, particularly adjacent the corridor but also in the heart of the South West, and broader growth across the South East. Growth elsewhere in the United Kingdom has limited effects on corridor. As

identified in Section 4, the SWP area generally is a focal point for future local economic growth, with 242,000 residential units and 150,000 new jobs planned by 2031. The main concentrations are at Plymouth, Yeovil, Bath, Exeter, Salisbury, Bodmin, Dorchester and Frome. Other strategic growth locations include Taunton, Newton Abbot, St Austell and Clay Country, Truro, Camborne-Pool-Redruth and Barnstaple.

Demand forecasting will need to take the broader South West and South East into account so that 'through trip' growth is realistically addressed.

8 Conclusions and recommendations

8.1 Conclusions

The A303/A30/A358 corridor covers some 195km between Andover and Exeter (including the A358 (Southfields to M5 J25)) providing access between London and South East and the South West. The route varies in standard from single two lane, to single three lane to dual two all-purpose carriageway with speed limits also varying from 40 to 70mph. Changing carriageway widths and number of available lanes as well as local accesses, major junctions and central reserve crossings add to the problems experienced by road users. Additionally, the variety of vehicles types (cars, agricultural and a high percentage of heavy goods vehicles) using the route also exacerbate the issues.

In summary, the current standard and nature of the route contributes to and exacerbates problems relating to the following:

- Poor Resilience
- Poor Road Safety
- Poor Journey Times
- Poor Journey Time Reliability
- Poor Connectivity

Resilience problems are particularly evident on the single carriageway sections at times of inclement weather, accidents and other unforeseen incidents. The results being that severe delays are regularly experienced during such events, with consequential impacts for emergency response vehicles attending an incident either on the route or at another location beyond the incident.

The interaction of such a variety such vehicle types and speeds along with other physical features (changing standards and access arrangements) also contribute to the road safety problems. Analysis of the PIAs specifically within the single carriageway sections identified that nearly 56% of all fatal accidents and approximately 47% of all PIAs have occurred on these sections which only represent 37% of the total route length.

Due to the population density, employment opportunities, urban concentrations and the fact that the south west is a popular tourist destination, the A303/A30/A358 corridor experiences a considerable fluctuation in traffic flows. The increases in flow cause particular problems when available traffic lanes are reduced causing bottlenecks which in turn lead directly to severe and regular instances of congestion and delay in some sections resulting in increased journey times. This problem is more prevalent during the summer months when traffic flows increase considerably.

The combination of the problems described inevitably contributes to unpredictable journey times which is evidenced by the details contained within the HA's On Time Reliability Measurement data. The tool indicates that a large proportion of the entire route length has reliability within the 70 – 80% band but a number of sections fall below the 70% level and one below 60% in the westbound direction (Stonehenge).

Particularly poorly performing sections are:

- Amesbury to Berwick Down;
- Sparkford to Ilchester, and,
- A30 Honiton to M5.

The presence of the above safety, reliability and resilience issues affect the connectivity and the perception of connectivity of the region. Stakeholder views indicate that this hampers economic prosperity in the region. The average GVA per head in the South West is lower

than the UK average and the volume of foreign trade in either import or export markets is falling.

TEMPRO v6.2 (in Table 4.3) indicates that the overarching anticipated growth in households in the region will range from approximately 9% in 2021 to 20% in 2031 and up to 30% by 2041. The growth in jobs is, however, much lower with growth rates only between 4% and 6% between 2021 and 2041. The level of growth is variable between counties but overall this may reflect the reduced opportunities to be experienced in the south west due to its perceived peripherality and poor connectivity. Additional growth in Cornwall will clearly create additional stress as traffic to/from the region will need to use one of the two key strategic corridors into the region.

Ultimately the addition of these development pressures to the existing and prevalent nature of travel conditions within and on the corridor will exacerbate the current situation leading to further social, economic and environmental issues being experienced throughout the region.

8.2 Recommendations

Having considered the conclusions above, and building on the existing evidence bases, it is recommended that the following be pursued during subsequent stages of this feasibility study:

Scheme options should be developed/reviewed for each of the following single carriageway sections of the route:

I. Amesbury to Berwick Down
II. Chicklade Bottom to Mere
III. Sparkford to Ilchester
IV. South Petherton to Southfields
V. Southfields to Honiton

Furthermore, it is recommended that the following should be pursued:

- The development of a strategic traffic model based on the existing highway network developed during the SWARMMS study. This will enable for a consistent and region based assessment of improvement options coming forwards and for the impacts of those to be realised over the South West region and on other competing routes;
- The robustness of the traffic model to achieve current acceptability criteria levels but that to be reviewed by both HA TAME and DfT TASM divisions;
- The evidence base to be refined and augmented where necessary should new information come to light; and
- Previous study information on scheme options to be collated and reviewed during Stage 2 to develop a series of potential highway solutions to the problems currently being experienced.