Staffordshire County Council

Stafford Western Access Route

Major Scheme Business Case
Main Report

January 2015

CONTENTS

Executive Summary…… 1

1. Introduction…… 5

2. The Strategic Case…….. 6

2.1 Transport Problems…… 6
2.2 Impact of the Wider Integrated Transport Strategy…….. 9
2.3 Impact of Stafford Western Access Route…… 9
2.4 Key Objectives…….. 11
2.5 Scheme Options…….. 12
2.6 Scheme Description and Scope of Sections A and B…….. 13

2.6.1 Scheme Description…….. 15
2.6.2 Vertical Alignment…….. 18
2.6.3 Drainage…….. 18
2.6.4 Landscaping…….. 18
2.6.5 Highway Design Principles…….. 19
2.6.6 Maintenance and Construction Proposals…….. 20
2.6.7 Wider Sustainable Transport Strategy…….. 22

2.7 Constraints, Dependencies and Stakeholders..... 25
2.8 What would happen if the scheme does not go ahead? 25
2.9 Why is the scheme needed now? 26
2.10 Alignment with Local Objectives…… 26

2.10.1 Policy Background…….. 26
2.10.2 Stoke-on-Trent and Staffordshire LEP…… 27
2.10.3 Stoke-on-Trent and Staffordshire LTB…….. 28
2.10.4 Staffordshire County Council Strategic Plan for 2014 to 2018……... 28
2.10.5 The Adopted Plan for Stafford Borough (2011-2031)……..... 28
2.10.6 Strategic Development Location to the West of Stafford……..... 33

2.11 Measures for Success…….. 36

3. The Economic Case……... 38

3.1 Appraisal Specification Summary…….. 38

3.1.1 Modelling and Economic Appraisal Approach…….. 38
3.1.2 Cost and Design Approach…….. 38
3.1.3 Scope for Proportionality in the Assessment……... 39

3.2 Value for Money Statement…….. 41

3.2.1 Initial BCR…….. 41
3.2.2 Potential to Adjust the BCR…….. 41
3.2.3 Qualitative Assessment……... 42

3.2.4 Sensitivity and Scenario Analysis..... 42
3.2.5 Appraisal Summary……. 42

3.3 Traffic Modelling Methodology……..... 45

3.3.1 2010 Major Scheme Business Case……..... 45
3.3.2 2014 Revised Model Forecasting……. 46

3.4 Economic Appraisal Assumptions……. 47

3.4.1 Estimation of Costs……. 47
3.4.2 Estimation of Benefits……. 47

3.5 Economic Impact……..…….. 53

3.5.1 Transport Economic Efficiency (TEE)……... 53
3.5.2 Public Accounts……... 54
3.5.3 Analysis of Monetised Costs and Benefits……... 54
3.5.4 Construction and Maintenance Delays……... 55
3.5.5 Reliability Impact (Business Users)……. 56
3.5.6 Inter-Peak Benefits……... 56
3.5.7 Sensitivity and Scenario Analysis……. 57
3.5.8 Spatial Distribution of Benefits……..... 59

3.6 Environmental Impact……. 64

3.6.1 Noise……..... 64
3.6.2 Air Quality……. 67
3.6.3 Greenhouse Gases……. 71
3.6.4 Landscape…….. 72
3.6.5 Townscape…….. 72
3.6.6 Historic Environment……. 73
3.6.7 Biodiversity……..... 76
3.6.8 Water Environment……... 78

3.7 Social Impact……. 83

3.7.1 Commuting and Other Users…….. 83
3.7.2 Reliability Impact (Commuting and Other Users)……. 83
3.7.3 Physical Activity…….. 83
3.7.4 Journey Quality…….. 84
3.7.5 Accidents…….. 85
3.7.6 Security……..... 88
3.7.7 Access to Services……... 88
3.7.8 Personal Affordability…… 88
3.7.9 Severance……... 89

3.8 Distributional Impact Appraisal…… 90

3.8.1 User Benefits…….. 90
3.8.2 Noise…… 92
3.8.3 Air Quality…… 92
3.8.4 Accidents……... 93
3.8.5 Severance…….. 95
3.8.6 Personal Affordability……..... 95

4 The Financial Case…….. 98

4.1 Introduction…….. 98
4.2 Stoke-on-Trent and Staffordshire's Growth Deal…….. 98
4.3 Optimism Bias…….. 98
4.4 Independent Cost Review…… 100
4.5 Base Cost Estimate…… 100
4.6 Preparatory Costs……..... 101
4.7 Maintenance Costs……. 101
4.8 Inflation Assumptions…… 101
4.9 Quantified Cost Estimate……..... 102
4.10 Funding Profile……..... 103

5 The Commercial Case…… 104

5.1 Output Based Specification……..…… 104
5.2 Procurement Strategy…… 104

5.2.1 Preferred Delivery Option……..... 104
5.2.2 Reserve Option…….. 105

5.3 Contract Arrangements…… 105

6 The Management Case……... 107

6.1 Introduction…….. …… 107
6.2 Governance …… 108

6.2.1 Stoke-on-Trent and Staffordshire LEP……..... 108
6.2.2 Staffordshire County Council…… 109

6.3 Project Plan…… 110
6.4 Key Project Dependencies……..... 113

6.4.1 Planning Consent……..... 113
6.4.2 Delivery of Section C…… 113
6.4.3 Land Acquisition…… 113
6.4.4 Network Rail…… 114

6.5 Assurance and Approvals…… 115

6.5.1 Gateway Review Process…… 115
6.5.2 Project Management Systems…… 115
6.5.3 Quality Control…… 116

6.6 Risk Assessment and Management…… 116

6.6.1 Risk Assessment…… 116
6.6.2 Risk Management Plan…… 117

6.7 Communication Plan and Stakeholder Management…… 119

6.7.1 Public Consultation…… 119
6.7.2 Statutory Consultation…… 119
6.7.3 Stakeholder Management…… 121

6.8 Benefits Realisation..... 122
6.9 Monitoring and Evaluation Framework…… 123

6.9.1 Scheme Build…… 123
6.9.2 Delivered Scheme…… 124
6.9.3 Outturn costs…… 124
6.9.4 Monitoring of Benefits Realisation…… 124

Figures

2.1 Stafford Location Plan
2.2 Impact of Western Access Route on 2033 AM Peak Hour Traffic Flow
2.3 Impact of Western Access Route on 2033 PM Peak Hour Traffic Flow
2.4 Scheme Layout
2.5 Public Rights of Way
2.6 West of Stafford Sustainable Transport Measures
2.7 Housing Trajectory for Stafford Town
2.8 Land Use Allocations for Stafford Town
2.9 Concept Plan for West of Stafford Strategic Development Location
2.10 Logic Map

3.1 Geographical Extent of Stafford Model
3.2 Benefits (PVB) Disaggregated by Time Period
3.3 60-Year Benefits Profiles for Core Scenario and Sensitivity Tests
3.4 Main Nine Area Sector System
3.5 Detailed Sector System
3.6 Monetary Benefits by Sector Destinations (60 year period)
3.7 Landscape Constraints and Mitigation
3.8 Townscape and Heritage Constraints
3.9 Biodiversity Constraints and Mitigation
3.10 Flood Zones
3.11 Local Watercourses
3.12 Five Year Accident Locations
3.13 Spatial Distribution of Accident Benefits (60 year period)

3.14 Distribution of User Benefits by Income Quintile
3.15 Distribution of Affordability Benefits by Income Quintile

4.1 Construction Price Trend Information

6.1 Governance Structure
6.2 Project Plan

Appendices

2.1 Transport Evidence to Support a Western Direction of Growth 2012
2.2 Stafford Borough Integrated Transport Strategy 2013
2.3 The Plan for Stafford Borough: Key Performance Indicators 2013
2.4 Options Assessment Report 2010
2.5 Junction designs and long sections of the route
2.6 Growth Deal award letter July 2014
2.7 Letter of Support from Stafford Borough Council

3.1 Traffic Assessment Report, Atkins 2014
3.2 Stafford Transport Model Survey Completion Report, 2007
3.3 Survey Analysis Note, 2007
3.4 Local Model Validation Report, 2010
3.5 Atkins DfT Compliance Modelling Note, 2009
3.6 Present Value of Scheme Investment Costs
3.7 TEE Tables for sensitivity tests
3.8 Environmental Impact Assessment Scoping Response 2014
3.9 TAG Worksheets
3.10 Letters of support from environmental stakeholders
3.11 Castlefields Travel Survey 2010
3.12 Distributional Impact Screening Analysis
3.13 Socio-demographic Data

4.1 Section 151 SCC officer sign-off for cost estimate
4.2 Optimism Bias Note
4.3 Independent Cost Review and Output Based Specification
4.4 Quantified Cost Risk Assessment Report

5.1 Infrastructure+ Cabinet Report

6.1 Staffordshire County Council Cabinet Report, May 2010
6.2 Land requirements
6.3 Letter of Commitment from developer/landowner
6.4 Staffordshire County Council Cabinet Report, November 2014
6.5 Network Rail consultations
6.6 Communication Plan
6.7 Consultation Report April 2010
6.8 Letter of Support from Member of Parliament
6.9 Consultation Report November 2014

EXECUTIVE SUMMARY

The Strategic Case

The Stafford Western Access Route is to be delivered as part of a wider package of measures as proposed in the Stafford Borough Integrated Transport Strategy 2013. Sections A and B of the scheme have been appraised as part of this business case. This includes a 7.3 metre wide, two lane, single carriageway road, approximately one kilometre in length between Doxey Road and A34 Foregate Street (including Browning Street junction). It will tie into a further section of new single carriageway road linking Martin Drive and Doxey Road to be funded by developers. This section has been identified as Section C and has not been considered as part of the economic appraisal.

The following three key objectives of the Stafford Western Access Route reflect the problems and opportunities identified:

- Provide high quality transport infrastructure required to deliver development in Stafford
- Reduce congestion on routes into and around the town centre which act as a constraint on growth proposals
- Facilitate improved access by sustainable modes between housing growth areas and the town centre

These objectives closely reflect the objectives of the Stoke-on-Trent and Staffordshire Local Enterprise Partnership's (LEP) Strategic Economic Plan.

An Options Assessment Report was published in 2010 that clearly identifies a preferred option that delivers against the intervention objectives. All other highway options were ruled out and it was concluded that a solely sustainable transport solution would not satisfactorily meet the objectives.

Evidence concludes that without the scheme, there will be significantly more congestion in Stafford. If the route is not progressed in the proposed timescale it is likely that the delivery of new homes will be delayed and the highway network that serves the retail and service growth that is currently taking place in the town centre will not operate efficiently. This will potentially jeopardise economic prosperity and growth and will hinder the opportunity to maximise sustainable transport access to the town.

The Western Access Route is forecast to improve the overall performance of the highway network in Stafford, reducing overall queuing times by 33% and 26% in the 2033 AM and PM peaks respectively. Traffic flows on A518 Chell Road, for example, are expected to reduce by 20% and 14% in the AM and PM peaks respectively.

Stafford Borough Council fully supports the scheme. Provision of the Stafford Western Access Route, as part of a wider package of infrastructure and sustainable transport measures, will help to ensure that the objectives of the Adopted Plan for Stafford Borough can be achieved. This includes provision of 5,233 new homes, largely on three Strategic Development Locations, and 36 hectares of new employment land in Stafford Town. Section C is required as an access road to serve 2,200 new homes at the Strategic Development Location in the West of Stafford.

The Economic Case

The scheme provides high value for money and the economic appraisal results are summarised in Table 1.

Table 1: Assessment Summary

	Overall Assessment of the Stafford Western Access Route
Economic Impact	• Facilitates the delivery of The Plan for Stafford Borough and reduces town centre congestion • Provides substantial benefits amounting to £94.2 million over a 60 year appraisal period mainly due to travel time savings • Provides high value for money with a Benefit to Cost Ratio (BCR) of 2.67 • The inclusion of journey time reliability benefits and inter-peak benefits would increase the BCR to 3.61
Environmental Impact	• National air quality strategy objectives will not be exceeded • Net population annoyed by noise is estimated to be 12 • There will be landscape benefits and a neutral impact on the Site of Special Scientific Interest • The potential impact on archaeological remains is low • Evidence suggests the impact on water can be mitigated. Hydrological Assessments will confirm this
Social Impact	• There will be large journey quality benefits • There will be a reduction in accidents, generating benefits of £1.8m • Severance for pedestrians will be significantly reduced • Complementary sustainable transport measures will be provided in the town following completion of the scheme
Distributional Impact	• There are no concerns about how benefits will be distributed between social and vulnerable groups

The Financial Case

Staffordshire County Council is confident that the cost estimates are realistic and robust. The base cost has been estimated using realistic unit rates and quantities and has taken into account responses from environmental stakeholders, Network Rail, utility companies and an independent property specialist. The Quantified Cost Estimate has been agreed by Faithful+Gould, an independent consultant, and is summarised in Table 2. In addition to the Quantified Cost Estimate, the County Council has adopted the use of 15% optimism bias as required by the Department for Transport for the economic appraisal.

Table 2: Summary of Quantified Cost Estimate (Sections A and B)

Element	Cost Estimate £'000s
Base Cost	32,432
Quantified Risk Assessment	633
Inflation	1,889
Total	**34,954**

In the Growth Deal announcement in July 2014 the Government committed to investing £16.1m in the Western Access Route and there is also a Local Growth Fund pre-commitment of £8.2m. This total sum of £24.3m for the Western Access Route is based on the 2010 business case that was the latest information available at the time of submitting the Strategic Economic Plan.

Since then the business case for the scheme has progressed substantially, resulting in costs that are more robust and accurate. Although the cost of the scheme has increased to £34.95m, this is in the light of further detailed design, ground investigation works, stakeholder engagement, early contractor involvement, a quantified risk assessment, a review of optimism bias and new inflation forecasts. Through detailed design and value engineering the overall cost will be aligned to the final agreed budget provision which will be a combination of growth funds and local contribution as agreed by the County Council's Section 151 Officer.

The Commercial Case

The preferred delivery option is to use the County Council's Infrastructure+ public/private partnership with Amey. This will have the added benefit of facilitating early contractor involvement. There is also a reserve option to deliver the scheme through the Midlands Highway Alliance (MHA) framework which, if pursued, would not delay the start of construction. The County Council is confident that both options represent a modern approach to procurement that will provide value for money. Section C will be delivered through an agreement with developers under Section 278 of the Highways Act 1980.

The Management Case

Staffordshire County Council is confident that the full scheme is deliverable and its feasibility and practicality is demonstrated with a Project Plan and a governance structure that allocates clear roles and responsibilities for the delivery and management of all three sections. The governance structure includes a clear decision-making line to Stoke-on-Trent and Staffordshire Local Enterprise Partnership.

A Project Plan has been developed which identifies the tasks required to achieve key milestones and the critical path of the project. The main project dependencies are the achievement of planning consent and the acquisition of land from the private sector. The key milestones are summarised in Table 3.

Table 3: Key Milestones of the Project

Key Milestones	Timescale
Programme Entry with Outline Business Case for Sections A and B	July to Oct 2014
Planning Consent (A,B and C)	April 2014 to Nov 2015
Side Road Orders (A, B and C)	Sept 2014 to Oct 2015
Land Acquisition (A, B and C)	Feb 2014 to April 2016
Confirmation of Final Approval of Business Case (A and B)	Jan 2016
Construction of A and B	April 2016 to Jan 2018
Construction of C	Jan to Sept 2018
Post-scheme opening evaluation	2019 and 2023

The management of the risks will be critical to the successful delivery of this major project. A Quantified Cost Risk Assessment (QCRA) has been completed to ensure that all key risks are identified and costed. The Risk Register will be maintained and regularly reviewed by the Project Delivery Team.

During December 2009 and January 2010 Staffordshire County Council carried out a consultation exercise to explain to local residents and stakeholders the options for improving transport infrastructure in Stafford. Following this, formal political approval for the preferred option was received in May 2010. A further information event will be undertaken in October/November 2014 to explain the scheme's progress.

Staffordshire County Council has been fully engaged with the Borough Council in statutory consultations on The Plan for Stafford Borough including public consultation events in 2011 and hearings at the Independent Examination in 2013. Planning pre-application consultations have also been completed in 2014 as part of the planning pre-application process and the Environmental Impact Assessment scoping opinion. Going forward, consultations will continue with all key stakeholders.

Monitoring and evaluation reports will be published one year after opening in 2019, once traffic flows have settled down, and five years after opening in 2023. They will report on the scheme build process including any changes to the scheme, outturn costs and realisation of the expected benefits.

1. INTRODUCTION

This is the 2014 revised Major Scheme Business Case for the Stafford Western Access Route which has been produced by Staffordshire County Council and our term consultants Atkins. It replaces the 2010 business case.

The Stafford Western Access Route is an intrinsic part of the Stafford Borough Integrated Transport Strategy for Stafford for the period to 2031. The full route will help to accommodate future development traffic in Stafford and, in particular, it will improve the access arrangements to proposed development sites in the West of Stafford that are included in the Adopted Local Plan. It will also enable the removal of through traffic from the town centre, creating improved conditions for bus services, pedestrians and cyclists and opening up further opportunities to provide complementary sustainable transport measures within and to the town centre.

In 2010, the Government made the decision not to give Staffordshire County Council Programme Entry for the Stafford Western Access Route. This was due to the fact that the value for money assessment in the business case was sensitive to assumptions about development coming forward within Stafford. It showed that if uncommitted development did not take place then the scheme would offer low value for money. Since then The Plan for Stafford Borough has been adopted and development has become more certain. Despite the recession there is clear evidence of continued developer activity in Stafford urban area.

The preferred option has evolved since the 2010 business case when the scheme was split into three sections: Sections A, B and C. The appraisal within this 2014 business case relates solely to Sections A and B. Section C is considered an access road to proposed development sites in the West of Stafford to be fully funded by developers, thus included in the 'Do minimum' scenario. Also the substantial re-build of the Doxey Road West Coast Main Line rail bridge in Section B has been removed from the scheme, along with the related costs.

In 2013, the revised scheme went through a full prioritisation process of potential major transport schemes completed by Atkins acting as the independent technical advisor to the Local Transport Body, on behalf of the Stoke-on-Trent and Staffordshire Local Enterprise Partnership (LEP). The scheme was assessed in terms of its Strategic, Economic, Management, Commercial and Financial Case. On the basis of this assessment, the Stafford Western Access Route was identified as a priority scheme in the LEP's Strategic Economic Plan. As a result, the Growth Deal announcement in July 2014 committed to building the scheme.

This business case follows Department for Transport up-to-date WebTAG guidance on transport business cases. It indicates that the scheme is deliverable, has a good prospect of achieving high value for money and is supported by key stakeholders.

2. THE STRATEGIC CASE

2.1 Transport Problems

Stafford Borough occupies a strategic position to the north of the West Midlands region and Stafford is the County Town of Staffordshire. The M6 runs north-south to the west of Stafford providing connections to Stoke-on-Trent, Birmingham, Manchester, the M54, the M42 and the M6 Toll. The location of Stafford is shown on Figure 2.1 and the preferred option for the Western Access Route is located within Stafford urban area to the west of the town centre.

Stafford lies at the intersection of several strategic routes (A34, A518 and A449) and the A518 passes directly through the town centre. This results in severance of many critical town centre activities and acts as a constraint on proposals to regenerate a number of development sites. As well as causing severance for pedestrians and cyclists, traffic volumes have become a barrier to improved bus service frequency and reliability in Stafford and are deterring the potential for journeys to be made by sustainable modes. Stafford rail station, which is accessed directly from the A518, has experienced significant passenger growth following improvements to the West Coast Main Line and a new multi-storey car park, resulting in additional traffic volumes. Patronage at the rail station between 2006/07 and 2012/13 has increased by 67% from 1.155 million to 1.928 million passengers.

There is an extensive network of bus services operating in the Stafford urban area with the predominant provider being Arriva Midlands. They focus on serving the town centre which benefits from good connections to a wide range of destinations. However, according to 2011 Census data, bus patronage is relatively low with only around 4% of work journeys made by Stafford residents by bus.

There have been no significant additions to the underlying highway infrastructure in Stafford in the last 35 years. During that time, the majority of traffic has been removed from the town centre enabling several streets to be pedestrianised. On the remainder of the network, it has been possible to accommodate a significant amount of traffic, particularly through the introduction of urban traffic control. However volumes have now reached a level at which unacceptable peak hour delays are occurring, even with the delivery of enhanced sustainable transport measures. The Chamber of Commerce considers that traffic congestion in Stafford impacts on the performance of businesses.

To establish the scale of the congestion problem, an analysis of travelling conditions experienced by road users between September 2012 and August 2013 on key routes in Stafford has been completed for the 8-9 AM peak and 5-6 PM peak using 2012/13 Department for Transport GPS Trafficmaster data.

Delays are calculated by comparing night-time to peak hour journey times. Normalised delay is defined as the delay in seconds expressed as a percentage of free flow travel time. Delays recorded above 100% represent journeys that are more than twice as long during the peak hour compared to free flow travel conditions. The reliability of individual routes has also been assessed and expressed as a % variability of the weekly average travel time in the peak hours. The smaller the % value returned, the

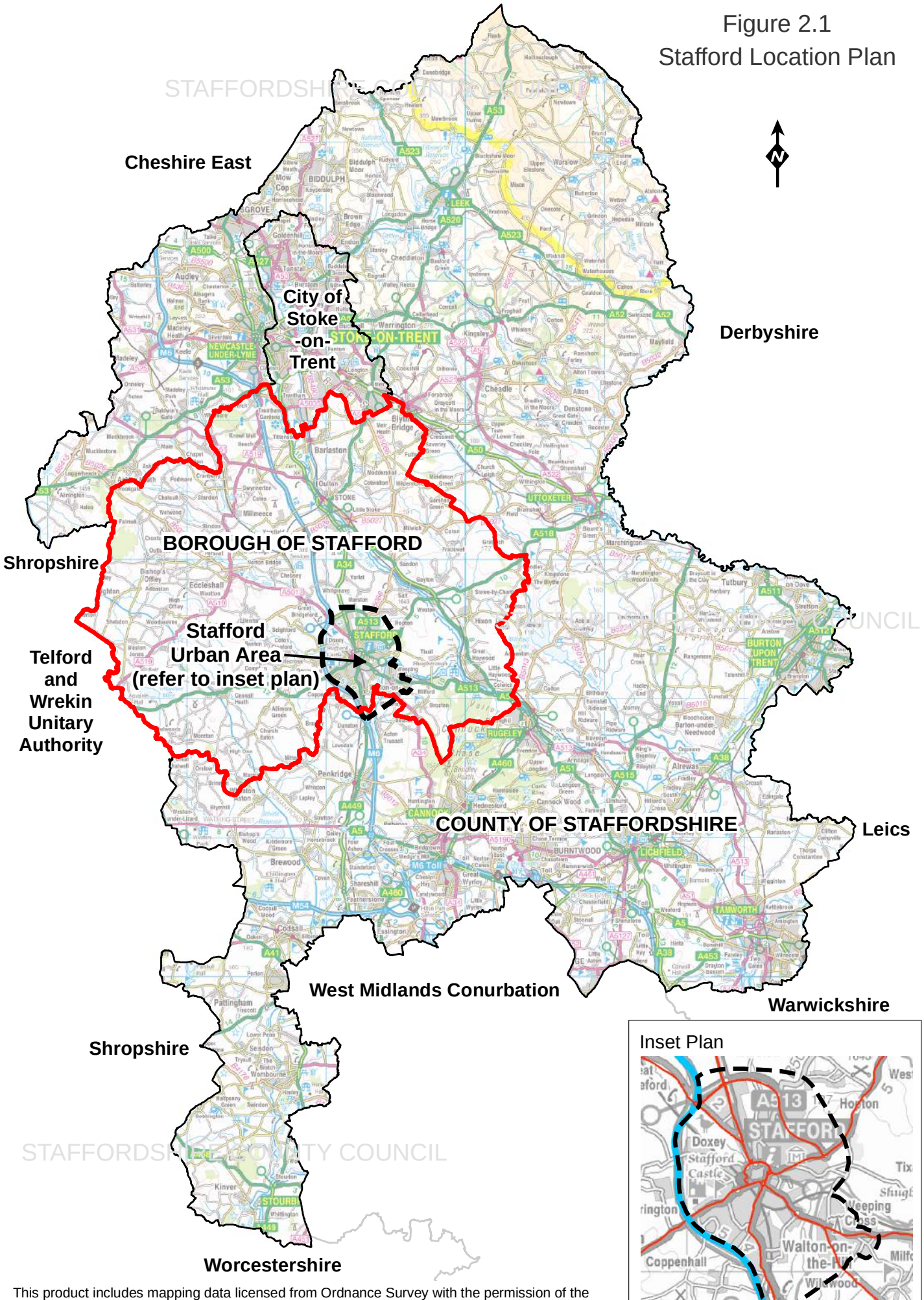
more ‘reliable’ the route is. A heavily congested route can have good journey time reliability if travellers queue consistently. The analysis concludes the following:

- The Newport Road / Station Road corridor is under pressure during the peak hours. Traffic problems tend to be greatest during the AM peak travelling inbound on the Newport Road with delays of 195% during 0830 - 0845. Variability of travel times is also a concern along this route. Delays along Station Road are also related to the significant increase in patronage at the rail station in recent years.
- Both the Cannock Road and Lichfield Road show consistently high average peak hour delays when compared to other routes in Stafford. They experience the largest delays during the PM peak period; 157% and 143% respectively. The Cannock Road experiences delays across three quarters of the AM peak, rising to 169% 0845 – 0900.
- During the AM peak, delays are experienced along Beaconside travelling eastbound towards Weston Road with normalised delay up to 134%. Westbound journeys during the PM peak suffer from reliability issues.
- The Stone Road was the least reliable route in Stafford during the AM peak period (40%). Data for much of the year was affected various development sites and therefore excluded and the remaining data was therefore greatly affected by anomalous results.
- Delays and journey time reliability are a concern on the town centre roads travelling clockwise during the PM peak. Delays of 121% are experienced and reliability is 20%. This route includes Chell Road and Station Road travelling towards Foregate Street.

A more detailed analysis of existing highway conditions in the West of Stafford and the town centre is provided in ‘The Transport Evidence to Support a Western Direction of Growth, Sept 2012’. This can be found at: http://www.staffordbc.gov.uk/live/Documents/Forward%20Planning/LDF/Transport-Evidence-to-support-western-direction-of-growth.pdf and is included as Appendix 2.1.

To define the safety problem, an analysis of existing accident data has been undertaken for the five year period between 2008 and 2012. Within the Stafford urban area there were a total of 957 personal injury accidents. Out of these, 888 were slight, 58 were serious and 11 were fatal. A closer examination of accidents to the West of Stafford and in the town centre reveals that generally accidents are at a level that can be expected. However there are safety concerns along Newport Road, in particular, together with Tenterbanks and Chell Road. At these locations there exists a combination of high levels of traffic and pedestrian/cycling activity that results in conflicts involving vulnerable road users.

Figure 2.1
Stafford Location Plan



2.2 Impact of the Wider Integrated Transport Strategy

The Trafficmaster analysis highlights that congestion is currently experienced in the North and East of Stafford as well as in the West and the town centre. It is therefore essential that the Stafford Western Access Route is delivered as part of a wider package of measures as proposed in the Stafford Borough Integrated Transport Strategy 2013. This includes a Local Distributor Road in the North linking A34 to Sandon Road (north) and an Eastern Distributor Road between Beaconside and St Thomas Lane in the East of Stafford. The Integrated Transport Strategy is provided in Appendix 2.2 and can be found at:
http://www.staffordshire.gov.uk/transport/transportplanning/localtransportplan/2013staffordboroughtransportstrategy.pdf

'The Plan for Stafford Borough: Key Performance Indicators, September 2013' can be found at:
http://www.staffordbc.gov.uk/live/Documents/Programme%20Officer/Programme%20Officer%202013/J17_The_Plan_for_Stafford_Borough_-_Key_Performance_Indicators.pdf and is included as Appendix 2.3. This report identifies the combined level of impact of all proposed highway infrastructure schemes for the North, West and East of Stafford. Overall, the mitigation measures are expected to improve the journeys of 'all trips' within the modelled area as well as the new development trips specifically. However, it is recognised that there are routes that are likely to exceed the key performance criteria, irrespective of the proposed improvements and hence may require further highway improvements and sustainable transport measures. These are summarised as follows:

- A34 Stone Road (between Eccleshall Road and Balfour Grove)
- A34 Lichfield Road (between A449 and Weeping Cross)
- Junctions along the A518 Newport Road (between Kingsway and Bridge Street);
- A449 between M6 J13 and West Way
- A513 Beaconside (between Sandon Road (N) and Sandon Road (S) and between the Technology Park and Weston Road).

Measures to enhance and promote sustainable transport are being delivered in Stafford through the Local Sustainable Transport Fund (LSTF). Evidence provided in the LSTF bid indicates that the package of initiatives will provide benefits to the transport network in terms of reducing congestion and car trips, together with health and air quality benefits. Over the three year lifetime of the LSTF package (to March 2015), it is expected that there will be monetary benefits totalling some £11.6 million, with a benefit to cost ratio estimated to be between 3.53 and 5.57. The Stoke-on-Trent and Staffordshire Local Enterprise Partnership supports the continued delivery of similar packages throughout the funding period of the Strategic Economic Plan, in line with the relevant Integrated Transport Strategy.

2.3 Impact of Stafford Western Access Route

The impact of the Stafford Western Access Route has been re-assessed to inform the 'Economic Case' in Chapter 3 of this business case. The detailed traffic assessment is included in Appendix 3.1 and assesses the scheme in terms of network performance, traffic flows on links, volume to capacity ratios, journey times and routings. This latest

work completed in 2014 concludes that the Stafford Western Access Route (Sections A and B) is forecast to improve the overall performance of the network, reducing overcapacity queued time by 33% and 26% in the 2033 AM and PM peaks respectively.

Figures 2.2 and 2.3 show the change in traffic flows in 2033 with and without the scheme. An increase, shown as red, highlights where flows are expected to increase and green is where they will reduce.

Figure 2.2: Impact of Western Access Route on 2033 AM Peak Hour Traffic Flow

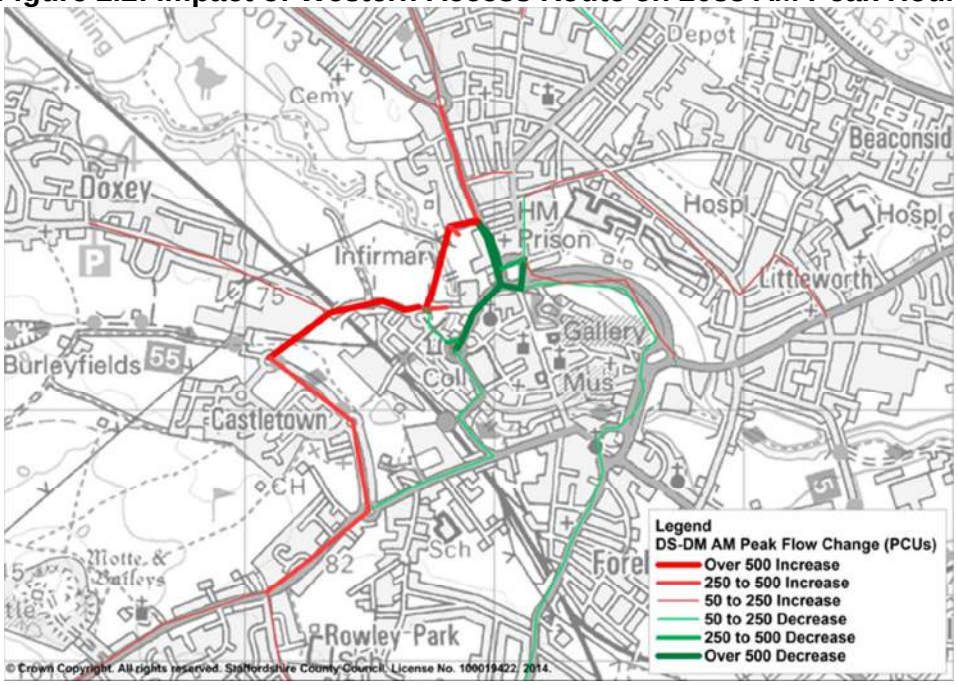
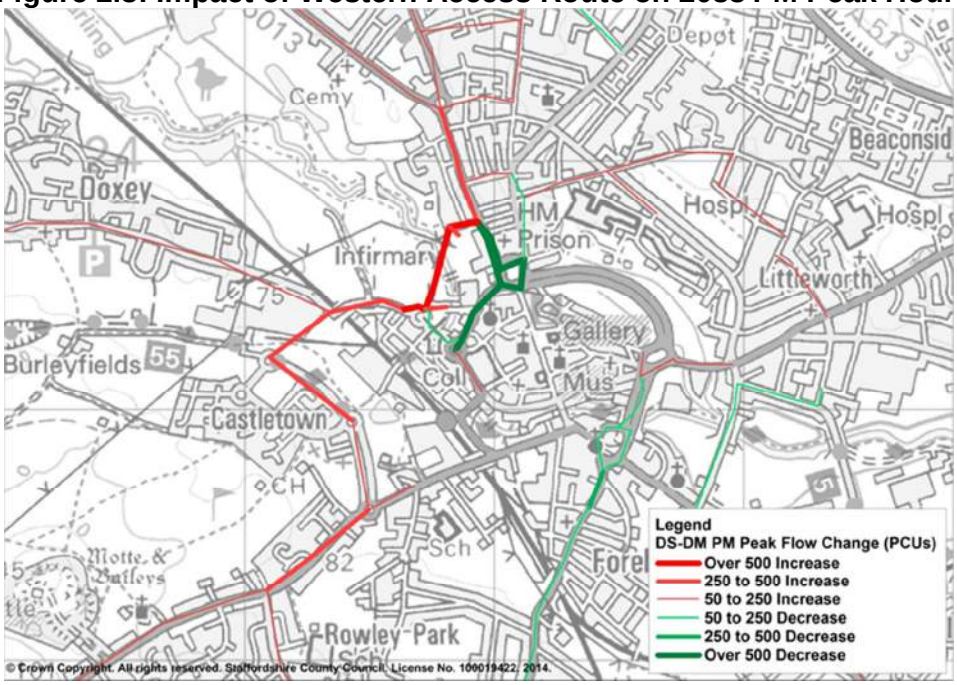


Figure 2.3: Impact of Western Access Route on 2033 PM Peak Hour Traffic Flow



On the key roads to be bypassed, the proposed scheme will result in lower traffic levels in the 2033 do-something scenario than in the 2014 base year. Traffic flows on A518 Chell Road, for example, reduce by 20% and 14% in the AM and PM peaks respectively compared to the base year. The scheme is expected to significantly improve journey times, particularly between the North and West of Stafford.

Increases in traffic along parts of A518 Newport Road, A518 Castle Bank, West Way, A5013 Eccleshall Road, A34 Stone Road and A34 Foregate Street are all examples of where traffic has re-assigned either onto the Western Access Route or less congested routes.

The proposed scheme and the resultant re-assignment of traffic from adjacent roads will result in improved performance at a number of junctions. The greatest improvements are expected at:

- Gaol Square Gyratory in the AM and PM peaks
- A518 Chell Rd/Broad Street in the AM and PM peaks
- A518 Newport Road / A518 Station Road during the AM peak
- A34 Queensway / A34 Lichfield Road / A518 Newport Road in the PM peak

2.4 Key Objectives

The following three key objectives of the Stafford Western Access Route reflect the problems and opportunities identified and the objectives of the Stoke-on-Trent and Staffordshire Local Enterprise Partnership's (LEP) Strategic Economic Plan:

- Provide high quality transport infrastructure required to deliver development in Stafford
- Reduce congestion on routes into and around the town centre which act as a constraint on growth proposals
- Facilitate improved access by sustainable modes between housing growth areas and the town centre

These key objectives have been explained through publicity literature and consultation events with residents and businesses and at meetings with wider stakeholders. The outcome of these consultations is reported in 'The Management Case'.

The extensive evidence base that has been produced to inform this business case gives Staffordshire County Council the confidence that the objectives can be achieved. The delivery of the objectives will be closely monitored through a Monitoring and Evaluation Plan, also detailed in 'The Management Case'.

Staffordshire County Council has delivered a number of similar major highway schemes that have been instrumental in achieving similar objectives to those of the Stafford Western Access Route in terms of relieving congestion and enabling housing and employment growth, for example, I54 Major Investment Site advanced earthworks, Redhill employment site, Rugeley Bypass, Burntwood Bypass, Biddulph Bypass . They have all been delivered as part of wider Integrated Transport Strategies.

2.5 Scheme Options

The Options Assessment Report was produced in March 2010 and follows the Department for Transport's Draft TAG Unit 2.1.2 on Option Development. It demonstrates a clear path from identifying the problems in Stafford to arriving at the preferred solution. The report is provided in Appendix 2.4 and covers the following:

- The need for an intervention including the requirement to accommodate strategic land use options for housing and employment development to achieve the Stafford growth agenda
- Appraisal Summary Tables and initial scheme designs for nine different transport intervention options formulated to relieve town centre transport problems and deliver development growth to 2026. All interventions are compared against a realistic do-minimum option
- The justification for the selection of the Preferred Option and why a credible lower cost alternative is not being taken forward as part of this business case.

Plans showing all options are provided in the Options Assessment Report. The result of the appraisal identifies that Option F (Green) should be taken forward as the Preferred Option. It has the highest Benefit to Cost Ratio and achieves 85% of the intervention objectives. The appraisal also concludes that this option delivers the best operational conditions (lowest degree of congestion) in the AM and PM peak hours and it is expected that any environmental implications can be satisfactorily mitigated.

Major scheme business cases often identify a sustainable transport package as their credible lower cost alternative. The Options Assessment Report provides robust evidence to demonstrate that a non-road building solution is not capable of delivering the objectives of the intervention. A solely sustainable transport option for Stafford was considered in detail in a major scheme business case submitted to the DfT and Department for Communities and Local Government for Community Infrastructure Fund (CIF2) in 2009. With an outturn cost of £4.028m, this option constitutes the lowest cost alternative but cannot be considered 'credible' since it only achieves 50% of the intervention objectives and impacts negatively on highway users, in particular business users, and ultimately the local economy. It cannot, on its own, satisfactorily deliver the Stafford growth agenda in transport terms. However, alongside the Western Access Route, the measures modelled in the CIF2 submission are likely to provide significant benefits. Some of these measures are now being delivered in the East of Stafford through Local Sustainable Transport Funds (LSTF).

The consultation exercise revealed that 48% of consultees favoured a do-nothing scenario and of those who expressed a preference, the preferred route in this business case was by far the most popular option. Staffordshire County Council does not consider doing nothing to be a realistic course of action as Stafford needs an integrated and sustainable transport strategy to deliver the Adopted Local Plan. The 2031 do-minimum traffic situation (modelled for the 2010 business case) is summarised in the Options Assessment Report. It shows that if development takes place with only minimal transport intervention, there will be an unacceptably high level of congestion in the AM and PM peak periods along routes within and to the town centre.

2.6 Scheme Description and Scope of Sections A and B

The scheme that has been appraised as part of this business case is a 7.3 metre wide, two lane, single carriageway road, approximately one kilometre in length between Doxey Road and A34 Foregate Street (including Browning Street junction). It includes footway/cycleways along the route. The road will be street lit to current design standards, minimising light pollution and will be subject to a 30 mph speed limit. The detailed alignment is shown on Figure 2.4. Initial junction designs, taking into account capacity assessment, and long sections are provided in Appendix 2.5.

The scheme (Sections A and B) will tie into a new single carriageway road linking Martin Drive and Doxey Road. This section of road is being funded by developers and is also shown in Figure 2.4 referred to as 'Section C'. Section C is not part of the economic appraisal and is included within the 'do-minimum' scenario.

Section C includes a short length of Doxey Road that will be realigned and a new roundabout provided. From this new junction, the route links through the West of Stafford Strategic Development Location to the existing Martin Drive/Rose Hill junction at Castlefields. Section C crosses rail sidings that are currently owned by Network Rail, but are expected to be decommissioned in 2015

Drawing No. SWAR/MSBC/Fig2.4
Revision A

KEY

- Carriageway
- Footway & paved areas
- Grass Verge
- Existing Public Right of Way
- Existing cycle network
- Proposed cycle network
- Doxey and Tillington Marshes Site of Special Scientific Interest (SSSI)
- Area of existing car park to be developed into wildlife habitat
- Area of destroyed SSSI to be returned
- Extent of viaduct structure

NORTH

Existing signalised junction with Browning Street to be improved to accommodate dedicated left turn on southbound approach and pedestrian facilities

Existing signalised junction with Foregate Street to be widened to accommodate additional lanes. Pedestrian/ Cyclist crossing facilities to be provided.

New traffic signalised junction to replace existing mini-roundabout on Greyfriars Place. Pedestrian/ Cyclist crossing facilities to be provided.

Viaduct between Madford Retail Park & Doxey Road

Doxey Road realigned to provide new roundabout junction with the route. Uncontrolled pedestrian facilities to be provided and subject to detailed design

Minor works to Doxey Road to provide 7.3m carriageway and 3.0m shared footway/ cycleway

Section A (Public Funded)

Section B (Public Funded)

Section C (excluded from Business Case)

Uncontrolled crossing to be provided at new roundabout

Doxey Road to be realigned to join new roundabout on route

Route crosses rail sidings at ground level

Existing bridge over the West Coast Main Line to be retained

Toucan crossing to be provided to link national cycle network

Existing Doxey Road to be retained as a service road for fronting properties. Junction layout at Doxey Road to be developed

Entrance to Sainsbury's Car Park with uncontrolled crossing provided

Existing roundabout at junction of Rose Hill and Martin Drive to be modified to incorporate fourth arm and pedestrian facilities

DOXEY ROAD
ISABEL TRAIL (NCN5)
TIMBERFIELDS ROAD
ROSEWOOD GARDENS
MARTIN DRIVE
A34 FOREGATE STREET
CUT LINE
Doxey & Tillington Marshes Site of Special Scientific Interest
HALFORDS
TENPIN
LIDL
WICKES
SAINSBURYS

Rev	Date	Detail	By
A	Jan 15	General Update	JM

Revisions

Staffordshire County Council

The Built County - Highways
1 Staffordshire Place
C/O Wedgwood Building,
Tipping Street
Stafford, ST16 2DH

Stafford Western Access Route

Figure 2.4

Scheme Layout

Prepared	Produced	Checked	Scale
JM	JM	DRS	1/1250

Grid Reference: E391901 N323764

Date	Size
January 2015	A1

Drawing No.	Revision
SWAR/MSBC/Fig2.4	A

Status

A1

Trim to this line for A1

File Name:- I:\Highways\Major Projects\Powerhouse Central\Stafford Western Access Route\AutoCAD\MSBC\SWAR_MSBC_Fig4-2A RevA - Scheme Layout.dwg
Layout Name:- A1

2.6.1 Scheme Description

Section A: Browning Street

As part of the improvements to the A34, it will be necessary to carry out localised carriageway widening to Grey Friars / Browning Street signal controlled junction, comprising the provision of a new dedicated left turn lane from the A34 into Browning Street. Signal upgrade work is also proposed, including improved pedestrian crossing facilities.

Section A: A34 Foregate Street to Timberfields Road

The A34 existing traffic signal controlled junction will be significantly upgraded. This will involve the widening of Grey Friars Place to provide three lanes out onto A34 Foregate Street and two lanes in from A34 Foregate Street. The signals will be linked to the Stafford urban traffic control system. To the south, the route links through Madford Retail Park to the River Sow. Half of this section of road through the retail park traverses privately owned land with the remainder following existing highway land controlled by the County Council.

Within Madford Retail Park there is an existing mini roundabout junction that will be replaced with a new traffic signal controlled junction linked to the traffic signal controlled junction on the A34. Pedestrian facilities will be provided at this location. Consideration will be given to the provision of new public transport infrastructure to improve access to Madford Retail Park as part of the package of complimentary measures described in Section 2.5.7.

A connecting viaduct, raised on supporting columns, will be constructed over the River Sow, across existing car parks and a lorry park, linking to Doxey Road. Public rights of way alongside the river will be maintained. All public rights of way affected by the scheme are shown on Figure 2.5. Based on detailed discussions with Western Power Distribution, the scheme design does not require a diversion of an existing overhead electricity cable, which runs from the Doxey Marshes across the new access route, in order to provide the minimum safety clearance. However, as detailed design progresses the existing overhead electricity cable may require protection and therefore has been included within the estimated costs.

The design has also been agreed in principle with the Environment Agency in line with a Flood Risk Assessment. This section of the road affects the edge of Doxey and Tillington Marshes Site of Special Scientific Interest (SSSI) however; the section of the SSSI that the route runs across is already damaged, as classified by Natural England, and is currently a car park wholly within the ownership of Stafford Borough Council. Drawing on advice received from Natural England the road construction will be used as an opportunity to restore habitats while improving access and facilities for the community. The scheme design includes compensation for the potential impact of the road on the SSSI; this will be informed through continued engagement with Natural England.

A new roundabout junction with an uncontrolled pedestrian crossing point is proposed on Doxey Road at the entrance to the existing Sainsbury's supermarket. From this new roundabout to Timberfields Road, Doxey Road will be realigned to take the main

carriageway away from existing properties, bringing community benefits. A section of the existing Doxey Road will be utilised as a separate access road serving Castletown properties.

Section B: Timberfields Road to Doxey Road Rail Bridge

Localised realignment of Doxey Road, between Timberfields Road and the railway bridge, will be carried out in accordance with current design standards. As a result of minor carriageway realignment work, the existing Doxey Road/Rosewood Gardens and Doxey Road/Timberfields Road priority junctions will be altered to accommodate modifications to the main carriageway. The existing public rights of way in the vicinity of the Doxey Road/ Timberfields Road will be accommodated by the provision of a safe crossing facility for pedestrians and cyclists.

In the 2010 business case Section B included the re-building of the Doxey Road West Coast Main Line rail bridge and a change of ownership from Network Rail to Staffordshire County Council. The aim of the re-build was the provision of a three metre footway and cycleway on both sides and upgraded vehicle restraints, with the added advantage of enabling the provision of improving horizontal and vertical clearances as desired by Network Rail.

Since 2010 a review of Section B has taken place. Due to the significant cost implications of extending the walking and cycling provision over the bridge on both sides, this element has been removed and any upgrade of rail clearances are not required as part of this scheme. The current scheme now only includes minor works to the existing bridge in order to accommodate a realigned carriageway across the bridge to the south. This will reduce the width of the southern footway to a hard strip with no pedestrian access and create a footway/ cycleway on the north of at least 3m wide (with 7.3m carriageway). Other minor works are expected to include upgraded vehicle restraints. As a result, Network Rail will remain owners of the bridge.

Figure 2.5 : Public Rights of Way and Cycle Networks

Public Rights of Way:

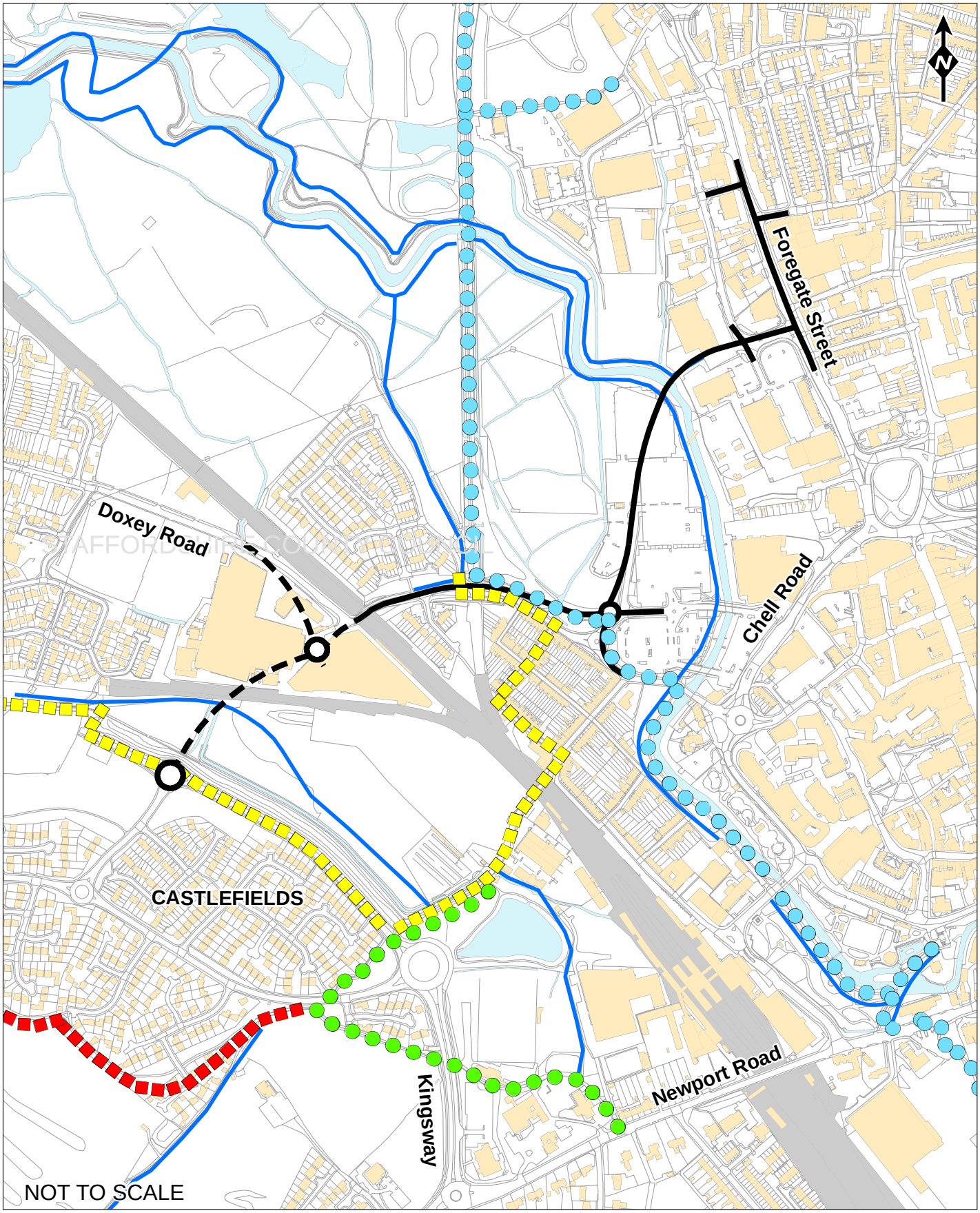
Footpath Bridleway Byway open to all traffic

National Cycle Network:

NCN55 NCN5

Stafford Western Access Route Alignment:

Sections A and B (public funded) Section C (excluded from business case)



2.6.2 Vertical Alignment

The levels for the proposed road will be constructed as near to the existing ground/road levels as possible. However, the carriageway on the new viaduct will be approximately 3 metres above ground level for the majority of its length, principally to ensure that future maintenance of the structure can be undertaken safely, as required by the CDM Regulations 2007, as well as accommodating the requirements of the Environment Agency in terms of flood risk. Long sections of the road are provided in Appendix 2.5.

2.6.3 Drainage

The highway drainage will use gullies and/or combined kerb and drainage units. A system will be provided using Sustainable Drainage (SuDS) techniques and will utilise green/open drainage features where possible. The carriageway will drain through a piped network located within the highway corridor that will, where possible, link into the current highway drainage system. However, there will be a requirement to discharge into one or more of the existing watercourses located adjacent to the scheme, including the River Sow, Doxey Drain, Pan's Drain and Tillington Drain, as shown on Figure 3.11. The requirements for petrol interceptors, silt traps, a secondary containment system have not yet been fully investigated but they will be assessed in accordance with the requirements of the Environmental Impact Assessment to be produced to support the planning application. Any mitigation measures will be identified and provided as necessary.

2.6.4 Landscaping

Figure 3.4 shows the landscaping mitigation measures included in the scheme which are summarised as follows.

Foregate Street to Sainsbury's Roundabout

Extension and enhancements will be provided to Doxey and Tillington Marshes to provide ecological mitigation. Some small areas of wet woodland and scrub will be provided alongside the route to provide low level visual mitigation of the road's support structure, but without restricting views from the road across the marshes. Natural England agrees that landscape mitigation proposals should include some planting on the perimeter of the SSSI for visual mitigation, subject to future details being agreed by stakeholders.

Sainsbury's Roundabout to Doxey Road Rail Bridge

On the northern side of the carriageway wet woodland will be replanted to replace any lost during construction. This will provide mitigation for lost habitat, reduce visual impact of the road and enhance the perceived tranquillity for users of the adjacent countryside.

The new road alignment and new local access road serving existing properties in Castletown provides the opportunity to create new high quality open space provision that will also provide a buffer between the road and residential properties. There will be an opportunity to develop a 'gateway feature', either integrated into the design of the

open space or located on the roundabout. Incorporating a piece of public art, subject to highway safety, could promote community participation in the schemes development.

Semi-ornamental planting will be used on the road embankments to reduce visual and perceived impact. Additional planting is proposed on the open space alongside Spruce Way to filter views of the road.

2.6.5 Highway Design Principles

Junction Designs

Junction designs have been completed based on predicted traffic flows from the SATURN model, and are provided in Appendix 2.5. Standards used from the Design Manual for Roads and Bridges (DMRB) include, TD 9/93 Highway Link Design, TD 16/07 Geometric Design of Roundabouts and TA 90/05 The Geometric Design of Pedestrian, Cycle and Equestrian Routes.

ARCADY software has been used for the assessment of roundabouts. It is able to accurately predict accident rates, capacity and delay (both queuing and geometric) for almost any size of roundabout, ranging from multi-armed grade separated roundabouts to mini-roundabouts in suburban locations. LINSIG software has been used to inform the design of the improvement scheme for both the A34 Grey Friars/Browning Street and A34 Foregate Street junctions.

Highway Geometry

The design of the proposed Stafford Western Access Route will be in accordance with the requirements of the Design Manual for Roads and Bridges, published by the Highways Agency, current during the detail design stage of the scheme.

As a general principle, a design speed of 70A kph, as required by TD 9/93 paragraph 1.8, has been adopted for the scheme. However, the constraints, such as the Site of Special Scientific Interest and existing retail units, and the urban nature of the site has necessitated that the proposed horizontal alignment incorporates relaxations in curve radius below the desirable minimum standards, but they remain within the permitted limits.

The desirable minimum stopping sight distance is achieved throughout the route. The provision of full overtaking sight distance within the scheme has not been possible and is thought undesirable for this essentially urban route.

A 30mph speed limit, imposed by the presence of a road lighting scheme throughout, is considered appropriate because all existing public highways interfacing with the proposed route are subject to speed limits of 30mph.

2.6.6 Maintenance and Construction Proposals

Maintenance Approach

Table 2.1 summarises the expected change in the maintenance regime over the 60 year appraisal period.

Table 2.1: Change in Maintenance Works

Description	Maintenance Work	Frequency
New viaduct over River Sow and on to Doxey Road	The new structure forming the scheme will require regular maintenance	Annual structural inspections, replacing bridge joints years: 10, 20, 30, 40, 50 and 60 after years of opening
Stafford Western Access Route new carriageway	The new section of roads forming the scheme will require regular maintenance	• Surface Dressing: years 7, 14, 27, 34, 47 and 54 after opening • Plane / Resurface Surface Course: years 20 and 60 • Plane / Resurface / Binder Course: year 40
A518 Station Road / Victoria Street / Tenterbanks (existing network)	These roads will be downgraded to 'C' roads requiring less maintenance	• Surface Dressing: years 10, 20, 40, 50 after opening • Plane / Resurface Surface Course: year 30 • Plane / Resurface / Binder Course: year 60

Construction Approach

The anticipated construction period for Sections A and B is April 2016 to December 2017 and Section C (not included within the economic appraisal) is expected to be completed by August 2018 in association with an early phase of new housing. The majority of the new route is 'off line' from the existing highway except for the section that follows the existing Doxey Road and at the intersections with the existing network at Doxey Road, A34 Foregate Street and A34 Grey Friars. This will facilitate separate construction activities to take place without compromising construction efficiency or disruption to the highway network.

Even though the transporting of construction material will be restricted to suitable major routes, there may be implications for the local network during the construction period. The type of construction material used and its transportation will take into account Environment Agency Standards, as appropriate. It is expected that a Site Waste Management Plan will be produced to accompany the Environmental Statement. There are also utility diversion and protection works required that will be co-ordinated with the construction of the scheme.

A34 Grey Friars / Browning Street Junctions

The construction period for the redesign of this junction will be approximately 8 months due to the scope of the scheme and utility works. To limit the duration of construction

and disruption to the highway network, work will take place under lane narrowings and night time (19:30 – 06:30) lane closures.

A34 Foregate Street

The construction period for the Foregate Street junction redesign will be approximately twelve months due to complex utility works. A further complication includes phasing construction to reduce the impact of work on traffic flow while maintaining access to businesses. Construction will only take place under lane narrowings and closures to minimise disruption to the highway network. As with the A34 Grey Friars / Browning Street junction, resurfacing to the A34 Foregate Street will take place under lane closures at night.

Sainsbury's Roundabout

Access to Sainsbury's store and its car parks will be maintained throughout the construction period of the new Doxey Road roundabout. Traffic management and construction phasing will ensure that there are no traffic delays at Broad Eye junction. If construction dictates, and if required, any reduced access to Sainsbury's store and impact on Broad Eye junction will be undertaken off peak and at night.

Doxey Road

Minor modification work to Doxey Road will take place under temporary traffic signals to reduce delay and impact on traffic flow. Construction work will be carried out consecutively and co-ordinated with works undertaken at Sainsbury's roundabout and Doxey Road rail bridge to maintain traffic flow and reduce traffic delay on the wider highway network.

Doxey Road Rail Bridge

Minor work to the carriageway on Doxey Road rail bridge will take place under lane closures that will be controlled by temporary traffic signals for a period of 12 weeks. If possessions are required to complete the works, the programme is flexible enough to ensure that the County Council makes use of isolations already programmed by Network Rail as required to complete the Norton Bridge and Stafford signalling upgrade works currently planned for 2015/16.

The construction of the Stafford Western Access Route will require two traffic management schemes that will impact upon the highway network during peak hours, as shown in Table 2.2.

Table 2.2: Traffic Management Phasing

Traffic Management	Description	Length of Time
1	A34 Foregate Street lane closures on the northbound carriageway and southbound carriageways consecutively	18 weeks for northbound and 20 weeks for southbound carriageway
2	Doxey Road strengthening works - two way temporary lights	6 weeks (during peak hours)

2.6.7 Wider Sustainable Transport Strategy

Staffordshire County Council remains committed to pursuing a wider sustainable transport strategy for Stafford in the period to 2031. Significant measures have been delivered as part of the Local Sustainable Transport Fund package 'Access to Jobs, training and Services in Stafford' to be completed by March 2015. The wider Strategy is provided in Appendix 2.2. It supports proposals contained within the Adopted Plan for Stafford Borough (adopted June 2014).

Constructing additional highway capacity to the west of the town centre will allow the opportunity to provide the complementary sustainable transport measures within and to the town centre that are shown on Figure 2.6. These measures will be part of the wider strategy and will be funded by Integrated Transport block, Local Growth Fund resources, public transport operators and developers.

Enhanced Bus Services

A high frequency bus service will be provided by the developer along the proposed Western Access Route to serve emerging development in the West of Stafford. The scheme will also allow the frequency of bus services for existing residents at Doxey to be increased and improved bus access to the Madford Retail Park on the A34, as well as the town centre. The new service is expected to become commercially viable.

Enhanced Bus Interchange

There are currently a number of small bus interchanges serving Stafford town centre which will all be improved with real time passenger information by 2015. Six key bus services call at an existing interchange adjacent to Gaol Square. Traffic relief at Gaol Square and Chell Road, which is expected to be provided by the Western Access Route, will make it easier for buses to enter and exit this interchange.

An important bus interchange serving the town centre is located on Chell Road. Traffic relief afforded to Chell Road will create the opportunity to increase road space for buses enabling the diversion of all local buses to this location, creating an effective on-street bus interchange, allowing facilities to be extended and safer access to bus stops to be provided for pedestrians. A proposed re-design of the Stafford commercial bus network will route more local services via Chell Road, thereby benefiting from the scheme.

Improved Access to Rail Services

Stafford rail station is located on the A518 close to the town centre and provides passenger services to destinations such as Birmingham, Stoke-on-Trent, Manchester, London and Liverpool. The Western Access Route will provide the opportunity to:

- Reduce congestion and severance on Station Road improving vehicular and pedestrian access to the station
- Facilitate significant levels of housing that will have convenient access by walking, cycling and bus to the rail station

Urban Traffic Control and Bus Priority

Staffordshire County Council will continue to extend the urban traffic control network to make better use of existing highway capacity by linking and co-ordinating the timing of traffic signals to improve the overall operation of junctions. The Stafford transport strategy will also focus on improving bus reliability and journey times on the key radial routes into the town centre. The additional capacity provided by the Western Access Route will make it easier to give buses priority at signal controlled junctions on these routes.

Walking and Cycling Links to the Town Centre

High quality, safe and convenient pedestrian and cycle routes will be constructed as an integral part of the design of the proposed access route and every opportunity will be taken to maximise journey quality. The developers of proposed housing sites in the west will also be required to enhance existing walking and cycling routes to both the rail station and the town centre, including the Millennium Way, which runs along the disused Stafford to Newport rail line, and walking and cycling links through Castletown. The Western Access Route will also afford traffic relief to Chell Road which will allow further pedestrian enhancements to be undertaken in the town.

Traffic Management and Safety Measures

Appropriate traffic management and safety measures will be implemented on the existing local network if considered necessary following post scheme monitoring of the actual impact of changes in traffic flows and speeds. Potential candidates for treatment include Castlefields, West Way, Browning Street, Rowley Street and Gaol Road. Town centre traffic management measures will be reviewed and strengthened following completion of the scheme.

Supporting Sustainable Transport Initiatives

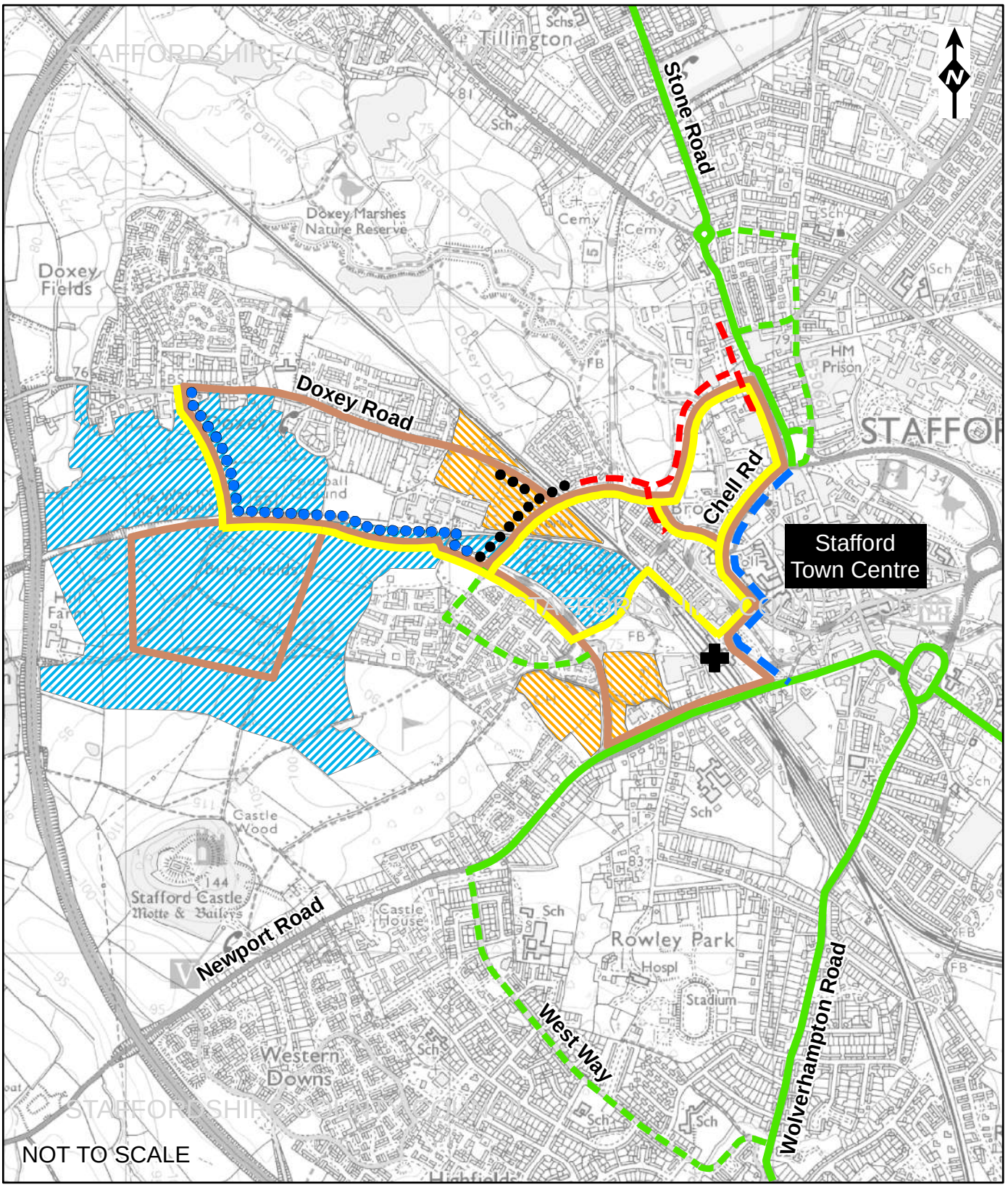
Demand management techniques that are being implemented through the Local Sustainable Transport Fund package will continue to be delivered beyond March 2015, as resources permit. They include, Wheels to Work to enable people to access jobs more easily, the Stafford Bike Bus to support and promote cycling, cycle training, Travel Planning for schools and colleges, smart ticketing for public transport, and bus and rail marketing.

The Strategic Development Locations in Stafford will be developed as Sustainable Urban Extensions with local supermarket, social facilities, school provision appropriate to the scale of the full allocation, conveniently located by walking and cycling. There will also be widespread walking and cycling permeability within development sites.

Figure 2.6

West of Stafford Sustainable Transport Measures

- Sections A and B (public funded)
- Section C (excluded from business case)
- Residential Development Sites
- Mixed Use Development Sites
- Traffic Management / Real Time Bus Passenger Information
- Potential Local Traffic Management
- Enhanced Walking and Cycling Route
- Downgrading of A518 following completion of Western Access Route
- Enhanced Bus Service
- New Access Road
- Rail Station



2.7 Constraints, Dependencies and Stakeholders

There are a number of physical constraints along the line of the route of the proposed scheme that are discussed throughout the business case. These include:

- Environmental constraints related to crossing the functional floodplain and the location of a Site of Special Scientific Interest
- Rail constraints related to the need to completed works to the Doxey Road rail bridge and the disposal of rail siding that cross the route of Section C
- Land ownership constraints related to the need to acquire privately owned land
- Engineering constraints related to utility diversions

Project management constraints, risks and scheme dependencies are discussed in 'The Management Case' and funding constraints are discussed in 'The Financial Case'.

2.8 What would happen if the scheme does not go ahead?

An assessment of what would happen if the Stafford Western Access Route does not go ahead has been completed in 'The Plan for Stafford Borough: Key Performance Indicators, September 2013' (Appendix 2.3). It provides a comparison of delivering land use growth up to 2031 with and without the Western Access Route. 'The Transport Evidence to Support a Western Direction of Growth, Sept 2012' (Appendix 2.1) also makes this comparison for both 2016 and 2031.

This evidence enables us to draw the following conclusions. In 2031 without the scheme, there will be significantly more links and junctions in Stafford that will be over capacity with a volume to capacity ratio (V/C) over 85%. This includes 19 extra junctions in the PM peak and eight in the AM, and 17 links in both the AM and PM peaks. Without the new road, congestion in the West of Stafford and the town centre will be most severe in 2031 in the following locations:

- Newport Road (west of Station Road) eastbound in the AM peak (V/C ratio over 100%)
- Newport Road with queues of around 19 vehicles at the Station Road junction, 17 vehicles at the Tesco junction and 13 at the Bridge Street junction
- Doxey Road (close to Sainsbury's) in both peaks (V/C ratio over 100%)
- Broadeye junction (V/C ratio up to 84%)
- Chell Road southbound (V/C ratio over 100%)

A further assessment (Sections A and B only) has also been completed in 2014 using the revised future year forecast models for 2018 and 2033 produced by Atkins as required to complete the economic appraisal in this business case. The detailed assessment is provided in Appendix 3.1. This latest work concludes that without Sections A and B, the already heavily congested town centre will become further congested. For example, without the completed route, traffic flows on Chell Road are expected to increase by 37% and 33% in the AM and PM peaks respectively between 2007 and 2033.

2.9 Why is the scheme needed now?

Evidence in the Adopted Local Plan (The Plan for Stafford Borough) and provided by developers at the public examination in 2013 indicates that housing and employment growth will be realised in Stafford. Despite the recession there is clear evidence of continued developer activity in Stafford urban area. With regard to housing growth in Stafford Town, to date:

- 538 homes have recently been completed
- 703 homes are under construction
- 1,861 homes have planning permission
- There are pre-application discussions on 3,270 homes

The 'Transport Evidence to Support a Western Direction of Growth' assesses the impact of delivering 400 dwellings in the West of Stafford by 2016 without the delivery of any sections of the Western Access Route. The report concludes that:

- 100 additional dwellings accessing onto the Newport Road will begin to place unacceptable pressure on Station Road and on the Newport Road, particularly at the Station Road / Newport Road junction and near to Tesco and Bridge Street
- No capacity issues will arise from the construction of 300 dwellings off Doxey Road, although there may be significant environmental and community concerns
- 400 additional dwellings will create an adverse effect on Chell Road, Station Road and Tenterbanks

If the route is not progressed in the proposed timescale the delivery of new homes will be delayed and the highway network that serves the retail and service growth that is currently taking place in the town centre will not operate efficiently. This will jeopardise economic prosperity and growth and will hinder the opportunity to maximise sustainable transport access to the town.

2.10 Alignment with Local Objectives

2.10.1 Policy Background

An assessment has been made of the alignment of the Western Access Route with local policy. A summary of the local policy background is as follows:

- A protected road alignment for the Castlefields Link Road and Chell Road Diversion (Option C in the Options Assessment Report (OAR)) was considered for inclusion in the Stafford Borough Council Local Plan 2001. A significant housing allocation at Castlefields was not included in the Local Plan therefore it was not considered appropriate to include the road proposals. There were also concerns about the protected alignment (Option C) in terms of its deliverability and its impact on communities in Castletown.
- A corridor to allow the construction of a new road between Martin Drive and A34 as an alternative to the above was protected by the County Council in March 2008. This route (Option F) was later identified as the preferred option for the SWAR in the 2010 OAR.

- The preferred route has been identified as key infrastructure in the new Local Plan to 2031 'The Plan for Stafford Borough' that was adopted in June 2014.
- The preferred route has been identified as one of three priorities of the Local Transport Body and is a Key Action Area in the Stoke-on-Trent and Staffordshire Local Enterprise Partnership Strategic Economic Plan.
- In July 2014, the Stoke-on-Trent and Staffordshire Local Enterprise Partnership's Growth Deal announced funding for the Stafford Western Access route.

2.10.2 Stoke-on-Trent and Staffordshire Local Enterprise Partnership

The Stoke-on-Trent and Staffordshire Local Enterprise Partnership (LEP) Strategic Economic Plan focuses on the North Staffordshire conurbation, including the City of Stoke-on-Trent and Newcastle-under-Lyme, and the Strategic Centres of Stafford, Burton-on-Trent, Cannock, Tamworth and Lichfield and can be found at: http://www.stokestaffslep.org.uk/wp-content/uploads/2014/04/140404-Stoke-and-Staffs-Economic-Plan-Part-1-Strategy-Website.pdf.

There are five central objectives at the heart of the plan:

1. **A Core City:** rapid, planned growth of the conurbation centred on the city of Stoke-on-Trent which would be a critical economic driver of the area spanning parts of Cheshire as well as Staffordshire, including through the development of a strong, competitive city centre brand offering the full mix of city centre uses.
2. **Connected County:** to build on our central location, excellent external connectivity and existing peri-urban sites to deliver the right blend of further employment sites and supporting infrastructure to drive business growth; encourage inward investment and meet our labour market needs.
3. **Competitive Urban Centres:** to significantly enhance growth opportunities from an attractive and thriving city of Stoke-on-Trent city and other towns across Staffordshire where people are eager to live, work and enjoy themselves
4. **Sector Growth:** ensure globally competitive innovation, investment and enterprise–led expansion in large & small businesses across our priority sectors.
5. **Skilled Workforce:** to develop a modern and flexible skills system enabling all people to up-skill and re-skill to meet the needs of our growth sectors. We will target growth and opportunity. As we boost the competiveness of our businesses, we are determined to ensure local people also benefit. While we reach for the heights of international competitiveness, we will tackle our pockets of poor educational performance, deprivation, decaying urban centres and unattractive housing.

The Western Access Route relates primarily to the objectives of creating Competitive Urban Centres and a Connected County. A priority objective is to develop our local transport networks to provide sustainable connections and unlock housing, town centre and employment growth. Key Action Areas include:

- Delivery of the LTB Priority Schemes: Stafford Western Access Route, Etruria Valley Link Road and Lichfield Southern Bypass
- Enhanced transport links, including sustainable transport investments linking strategic transport routes and residents to key centres

Stoke-on-Trent and Staffordshire Local Enterprise Partnership's Growth Deal, announced in July 2014, will build the new Stafford Western Access Route to ease congestion into Stafford and make further employment and housing sites viable. The Growth Deal will, subject to a satisfactory conclusion of the funding agreement, bring together local, national and private funding as well as new freedoms and flexibilities to focus on the key priority areas as identified in the LEP's Strategic Economic Plan:

- Opening up access to key employment sites identified in the City Deal
- Improving connectivity and easing congestion
- Sector growth and a skilled workforce

The Growth Deal award letter is provided in Appendix 2.6.

2.10.3 Stoke-on-Trent and Staffordshire Local Transport Body (LTB)

The primary role of the Stoke-on-Trent and Staffordshire Local Transport Body has been to advise the LEP Executive Group and Partnership Board on which major transport investments should be prioritised for development and delivery, taking into account the objectives of the Strategic Economic Plan in accordance with the agreed assurance framework.

In 2013, the Stafford Western Access Route went through a full prioritisation process of potential major transport schemes completed by Atkins Consultants acting as the Independent Technical Advisor on behalf of the LTB and LEP. The scheme was assessed in terms of its Strategic, Economic, Management, Commercial and Financial Case. On the basis of this assessment, the Stafford Western Access Route was identified as a priority scheme requiring an updated business case.

New governance arrangements are being put in place by the LEP which will incorporate the function of the LTB.

2.10.4 Staffordshire County Council Strategic Plan for 2014 to 2018

The delivery of the Western Access Route will help to deliver the County Council's vision which is:

'A connected Staffordshire, where everyone has the opportunity to prosper, be healthy and happy'

It will also enable the people of Staffordshire to achieve the County Council's three priority outcomes, in particular the first one:

- Be able to access more good jobs and feel the benefits of economic growth
- Be healthier and more independent
- Feel safer, happier and more supported in and by their community

2.10.5 The Adopted Plan for Stafford Borough (2011-2031)

Stafford Borough Council fully supports the Stafford Western Access Route and a letter of support is provided in Appendix 2.7. Through the Local Plan consultation process

transport was the focus of many concerns, but in particular, congestion and the potential for new housing development to cause further deterioration in highway conditions. There were only three respondents out of 145 to the Local Plan (Publication version) who objected to the Western Access Route.

Provision of the Western Access Route will ensure that the objectives of the Adopted Local Plan 'The Plan for Stafford Borough' can be achieved. The Local Plan identifies the delivery of:

- 10,000 new homes with the following distribution of new provision (excluding completions and commitments):
  - 5,233 in Stafford Town, largely on three Strategic Development Locations
  - 600 in Stone
  - 537 key service villages
  - 216 rest of Borough area
- 160 hectares of employment land with new provision of around 36 hectares in Stafford, 20 hectares in Stone and 15 hectares in the rest of the Borough.

Figure 2.7 gives an indication of how future land use allocations for Stafford Town in the Adopted Local Plan, as shown in Figure 2.8, are expected to be achieved. The housing trajectory demonstrates the potential delivery of housing in Stafford Borough over the Plan period between 2011 and 2031 and how this is split up between the three Strategic Development Locations and additional smaller sites. It has been informed by discussions with agents and landowners of key sites and analysis of historical delivery rates and potential future trends. The Plan for Stafford Borough sets an annual dwelling requirement of 500 dwellings per annum.

Figure 2.7: Housing Trajectory for Stafford Town

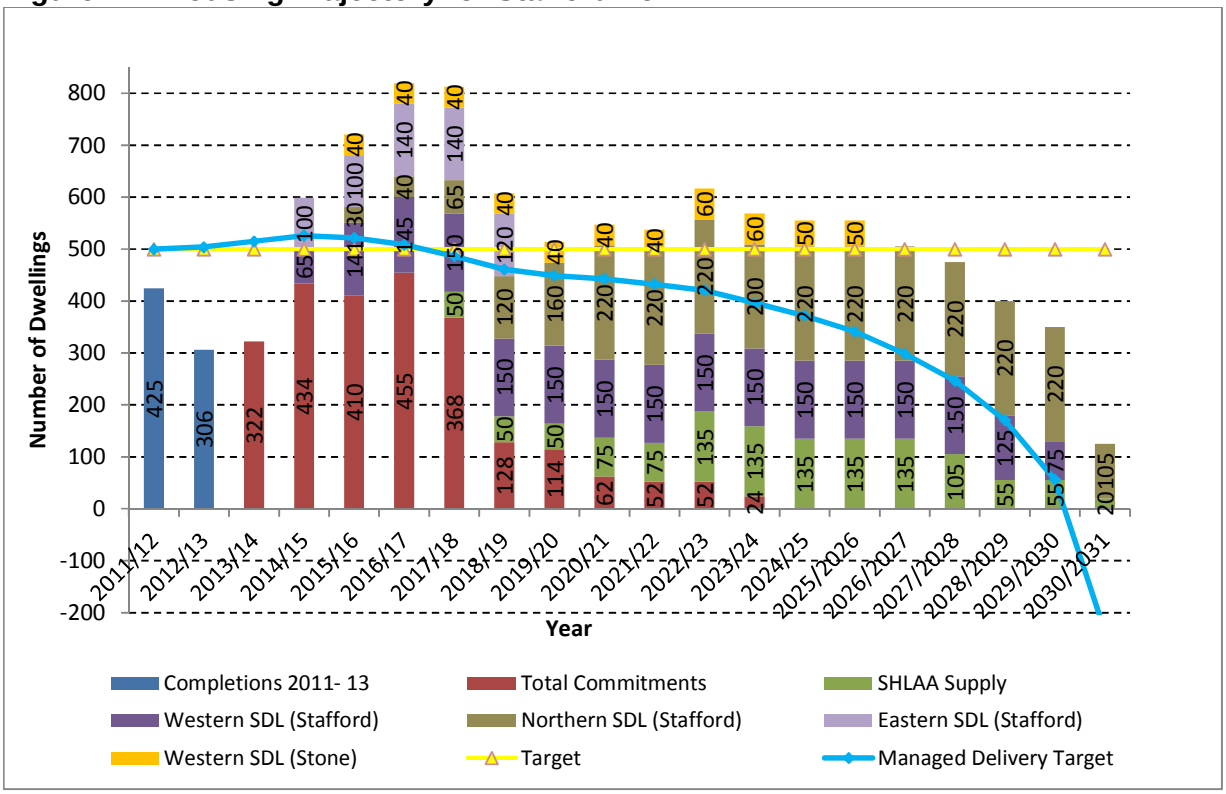


Figure 2.8

Land Use Allocations for Stafford Town

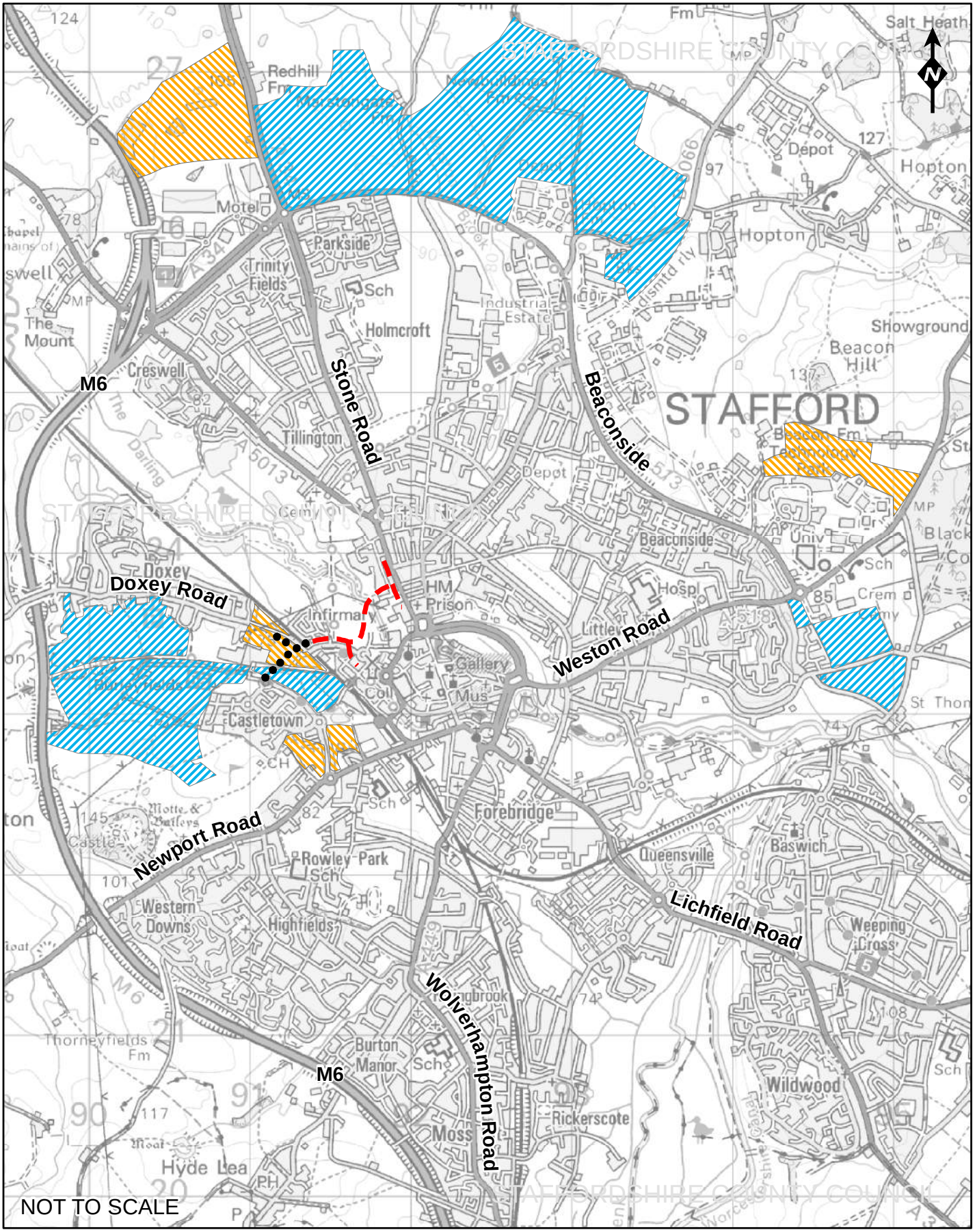
Residential Development Sites

Mixed Use Development Sites

Stafford Western Access Route Alignment

Sections A and B (public funded)

Section C (excluded from business case)



The Plan defines Strategic Development Locations for both housing and employment at Stafford and Stone, including associated infrastructure, services and facilities. The Stafford Western Access Route is required to deliver 'Policy Stafford 1 – Stafford Town' and 'Policy Stafford 3 – West of Stafford'. Appropriate extracts from these Policies are provided as follows:

Policy Stafford 1 – Stafford Town

Housing

Continue to meet the housing requirements for Stafford Town by providing a total of 7,000 new market and affordable homes, as well as additional provision for Ministry of Defence personnel:

ii. Providing a range of development locations for new homes over the Plan period to 2031including for affordable housing. This will include new housing development at the following Strategic Development Locations identified on the Policies Map:
   a. North of Stafford including highway and transport improvements through the Northern Access Improvements
   b. West of Stafford linked to delivery of the Western Access Improvements from Martin Drive to Doxey Road
   c. East of Stafford linked to delivery of the Eastern Access Improvements from Beaconside to St Thomas' Lane

iii. Sites within the urban area of Stafford town will have good accessibility to services and facilities by walking, cycling and public transport;

iv. Strategic Development Locations adjacent to Stafford's urban area will minimise the impact on surrounding landscapes, be fully accessible by public transport with facilities to encourage walking and cycling;

Stafford Town Centre

Strengthen Stafford town centre's role for the Borough to support the County Town of Stafford within the Sustainable Settlement Hierarchy (Spatial Principle SP3) over the Plan period by:

i. Encouraging the development and expansion of the town centre to provide an increase of 14,000 square metres (net) of non-food (comparison) retailing and 3,400 square metres (net) of food (convenience) retailing and improve the level and quality of the offer as well as establish new development opportunities;

ii. Ensuring that there is 45,000 square metres of new office space and commercial premises within Stafford town centre;

iii. Promoting mixed use development on larger development sites, particularly those that are within the town centre, through a phased approach for the major regeneration plan on the following sites:
   a. Kingsmead
   b. Riverside

iv. Strengthening the retail and service function of the primary retail core / shopping area as well as protecting and enhancing its distinctiveness, vitality and viability including the night-time economy;

v. Supporting an enhanced range and diversity of educational, health, cultural and community services and facilities in the town centre;

vi. Improving accessibility to the town centre, particularly by public transport, from the rest of the Borough.

Infrastructure

Strengthen Stafford Town's role as the principal transport hub in Stafford Borough by:

i. Supporting the introduction of better bus services, by increasing service levels, frequency and punctuality of services between Stafford town centre and other parts of the Borough;
ii. Deliver the full Western Access Improvements, the Northern Access Improvements and the Eastern Access Improvements from Beaconside to St Thomas Lane;
iii. Extend existing and create new, cycle and walking paths, as an integral part of new developments in the town;
iv. Improve access to the rail station for all users and secure appropriate levels of parking for both cars and bicycles;
v. Ensuring there is adequate provision for taxis through extending existing or creating new appropriately placed taxi ranks;
vi. Ensure that new developments are capable of providing safe and convenient access by foot, cycle, public and private transport that addresses the needs of all, particularly those with disabilities.

Policy Stafford 3 – West of Stafford

Within the area West of Stafford identified on the Policies Map a sustainable, well designed mixed use development will be delivered by 2031. Any application for development on a part or the whole of the area should be consistent with, a masterplan for the whole Strategic Development Location. The masterplan for the whole site should be produced by all developers involved in the development of the site and agreed by the Council prior to applications being submitted. Any application for a component of the whole site must be accompanied by a specific masterplan which shows the relationship of the application area to the wider Strategic Development Location. The design of the application should not prejudice the delivery or design of the wider Strategic Development Location. Development must deliver the following key requirements:

Housing

i. Delivery of approximately 2,200 new homes with 30% being affordable housing in the context of Policy C2, through a mix of housing types, tenures, sizes and styles with proportions of 2, 3 and 4 bedroomed properties;

Design

iii The development takes place on a 'neighbourhood' approach with the provision of a mix of uses including local retail facilities, public open space, social and physical infrastructure, a primary school, and a community building including provision for a library service and health facilities;

iv New small-scale employment areas providing a total of 5 hectares of new readily available land incorporated into new housing development areas;

Transport

xiii. An access, transport and travel plan strategy for the Strategic Development Location that maximises travel and accessibility by non-car transport modes via safe, attractive and conveniently designed street, pedestrian and cycling connections within the development and to Stafford town centre, nearby existing and new employment areas. The strategy shall identify access points to the site and between the site and the existing settlement. It shall also identify construction access arrangements that do not disrupt existing residents and improvements to transport capacity along the A518 Newport Road and its roundabout;

xiv. Support delivery of the Western Access Improvements and associated transport improvements, specifically providing phase 1 from Martin Drive to Doxey Road;

xv. There will be an interconnected network of streets serving the development producing discernible and distinctive neighbourhoods and places integrated and linked to existing areas, taking into account the existing Rights of Way network.

Infrastructure

xvi. Link from Martin Drive spine road to Doxey Road with potential upgrade to the rail bridge required for the development West of Stafford as part of the Stafford Western Access Improvements together with new or enhanced bus routes as well as cycling & walking links to existing routes to the town centre and other key destinations

xix. A new primary school will be provided and financial contributions to support additional capacity with new provision at existing secondary schools;

xxii. Primary health care provision delivered by increased capacity through master planning.

Developer contributions will be required to provide the strategic infrastructure needed to achieve a comprehensive sustainable development at this Strategic Development Location.

2.10.6 Strategic Development Location to the West of Stafford

The West of Stafford Strategic Development Location (SDL) lies close to the town centre, the rail station and local services such as supermarket provision and schools. At its closest point, the site is 270 metres to the edge of the town centre and 450 metres to the railway station. It lies close to significant existing and planned employment within the town centre.

Landowners and developers within the SDL have been in discussions with Stafford Borough Council and Staffordshire County Council with regard to development in the West since the outset of the local plan process. Issues have been thoroughly assessed through a joint consortium that has been established, working with the Homes and Communities Agency's Advisory Team on Large Applications (ATLAS).

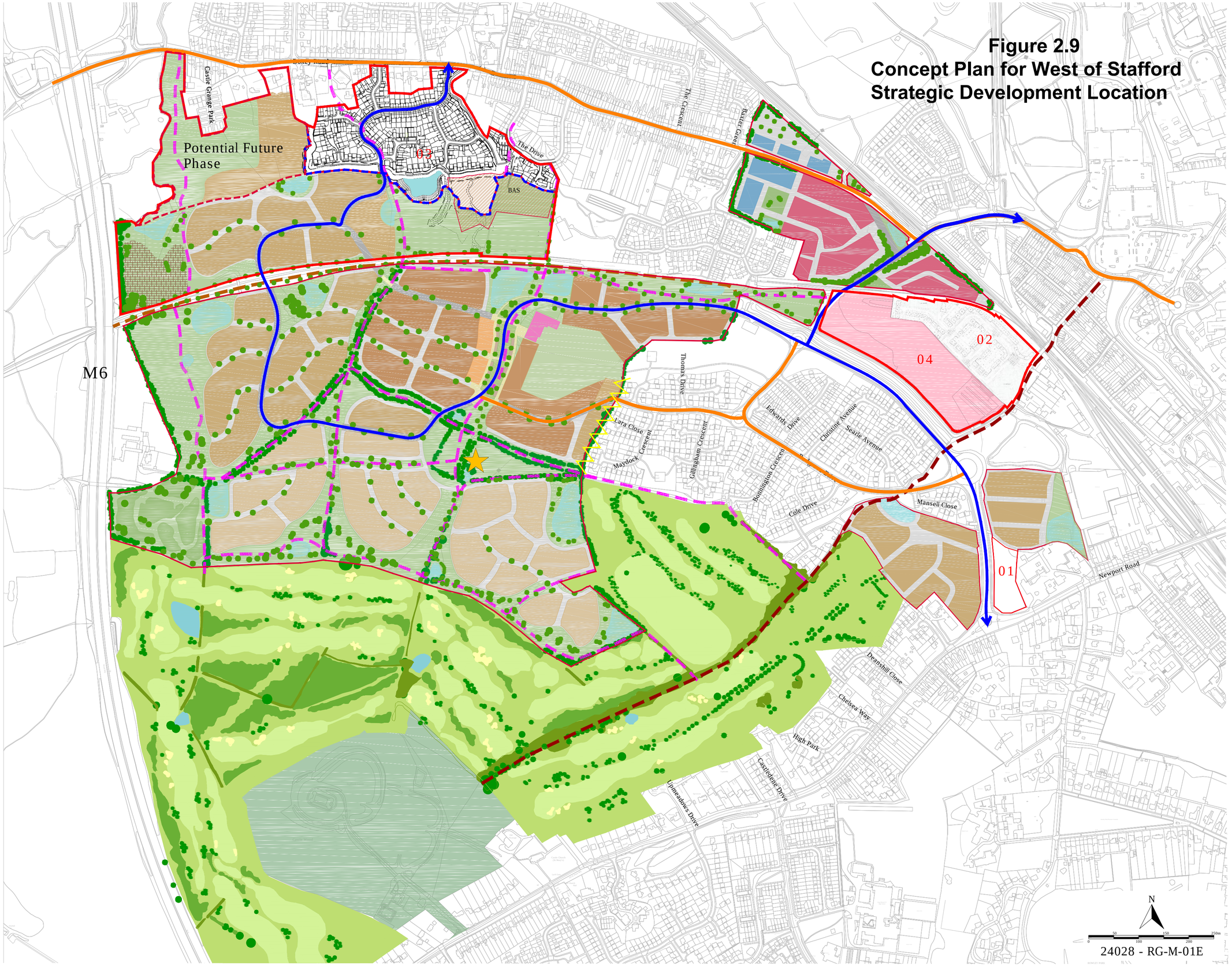
Evidence provided at the Local Plan Independent Examination confirms that these parties are committed to working together to ensure that Section C of the Stafford Western Access Route can be delivered between Martin Drive and Doxey Road. This is confirmed in letters of commitment received from a developer provided in Appendix 6.3.

The Local Plan Housing Trajectory (Figure 2.7) is supported by the developers and it is expected that three UK leading house builders will operate across the site. Taylor Wimpey (UK) Ltd has an option over approximately 69.3 hectares owned by Lord Stafford's estate. Lord Stafford's estate owns a further 7.2 hectares. Bellway Homes has an option over approximately 19.5 hectares owned by Saint Gobain. The other main landowner within the SDL is St. Modwen Properties PLC (7.6 hectares) and there is also a site owned by the Giles family.

As confirmed in 'Policy Stafford 3', the Borough Council considers that the most effective way of achieving a comprehensive development in the West of Stafford is for the various landowners and developers to collaborate in the preparation of a Masterplan (Framework), in light of the extensive work undertaken to date.

Figure 2.9 shows the current concept plan for the development area known as 'Burleyfields' which is informing the basis of the master planning process. A planning application has been received and another one is imminent for the first phase of development, both of which recognise the need for Western Access Route.

Figure 2.9
Concept Plan for West of Stafford Strategic Development Location



- Site Boundary
- Bellway Boundary
- Potential Future Phase Site Boundary
- Residential - Lower Density
- Residential - Medium Density
- Residential - Higher Density
- Mixed Use
- Employment
- Retail/Local Centre
- Primary School Site
- Public Open Space (inc. sport pitches)
- Allotments
- Attenuation Feature
- Golf course
- Processional Route
- Existing and Proposed Pedestrian / Cycle Routes
- The Way for the Millennium
- Primary Routes & Potential Bus Route
- Secondary Routes

- 01 — Public House (Built)
- 02 — Residential Development-St. Modwen (planning consent granted)
- 03 — Proposed Bellway Homes Residential Development
- 04 — St. Modwen Land
- Biodiversity Alert Site (BAS)
- Separation Between New And Existing Properties Provided To Maintain Residential Amenity
- Destination Park

Project
Burley Fields
Stafford

Drawing Title
Illustative Development Concept Plan

Date	Scale	Drawn by	Check by
16.09.14	1 : 5 000@A2	JW	AP

Project No	Drawing No	Revision
24028	RG-M-01	E

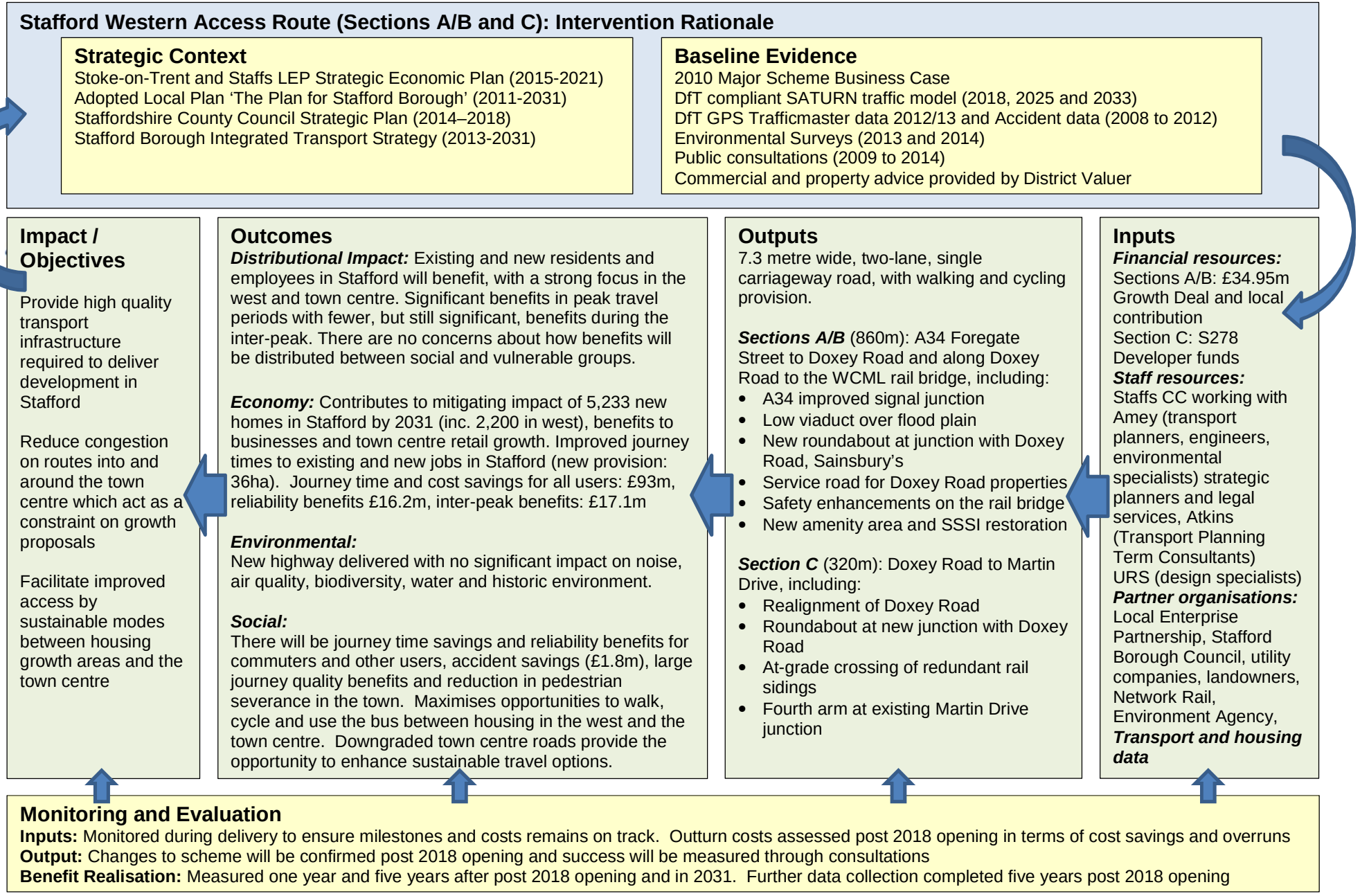
BARTON WILLMORE
Planning ● Master Planning & Urban Design
Architecture ● Landscape Planning & Design ● Project Services
Environmental & Sustainability Assessment ● Graphic Design
bartonwillmore.co.uk
Offices at Reading London Bristol Cambridge Cardiff Ebbsfleet Edinburgh Leeds Manchester Solihull

J:\24000 - 24999\24000 - 24099\24028 - Burleyfields\A4 - Dwgs & Registers\M Planning\24028 - RG-M-01E - Illustrative Development Concept Plan.dwg - 1-5000@A2

2.11 Measures for Success

The Logic Map provided in Figure 2.10 summarises the rationale for the intervention provided in strategic policy documents and baseline evidence, the key actions and the path towards achieving the expected objectives. Success will be achieved by delivering the benefits summarised in the Appraisal Summary Table provided in the 'Economic Case' (Table 3.2), which will deliver the overall scheme objectives. This will in turn help to ensure the delivery of strategic policies in the County Council's Strategic Plan and Stafford Borough Integrated Transport Strategy, Stafford Borough Council's Plan for Stafford Borough (Local Plan) and the Stoke-on-Trent and Staffordshire LEP's Strategic Economic Plan.

Figure 2.10: Logic Map



3. THE ECONOMIC CASE

3.1 Appraisal Specification Summary

The appraisal specification for this business case reflects the scale and severity of the impact of the preferred route as identified in the Options Assessment Report (OAR), provided in Appendix 2.4, and the 2010 business case. The modelling approach has been informed through technical input from Atkins consultants provided in Appendix 3.1.

3.1.1 Modelling and Economic Appraisal Approach

A Stafford SATURN 2007 base year model was developed by consultants Atkins for the 2010 business case. This model has been reviewed by Atkins and is considered robust enough to use for this 2014 economic appraisal for the following reasons:

- The 2007 base year model has been fully validated and validated
- Limited changes in land uses across Stafford would result in the origin/destination travel patterns to be consistent between 2007 and 2013
- Observed flows suggest that there has been around a 4% reduction in demand flow across the study area between 2007 and 2013. This compares to an NTEM (v6.2, July 2011) growth forecast of around 3%
- To address this, the calibrated and validated 2007 model base year matrix has been factored down to a 2013 forecast year as opposed to using the NTEM growth forecasts
- The model forecasts have been pivoted from the adjusted matrix to ensure that the growth in the study area is not overestimated
- Model forecasts are in line with WebTAG and consider the latest forecasts for specific developments across the study area
- The latest WebTAG values of time and vehicle operating costs have been applied in the model assignments and demand model
- Economic assessment has been undertaken using the latest software
- QUADRO impacts of construction have not be considered due to the off-line nature of the scheme
- Sensitivity tests have been undertaken to demonstrate the robustness of the scheme against costs and traffic growth forecasts.

Further details are provided in Appendix 3.1.

3.1.2 Cost and Design Approach

In the 2010 business case, the Quantified Cost Estimate (QCE) for Sections A, B and C was £38.73m (excluding optimism bias of 44%). This consisted of £33.96m for Section A and B and £4.77m for Section C. The QCE included in the Strategic Economic Plan published in March 2014 was £26.3m (excluding optimism bias of 44%). The reduction was the result of value engineering of the construction costs and the removal of the re-building of the Doxey Road West Coast Main Line rail bridge from the scheme.

The Quantified Cost Estimate for Sections A and B in this 2014 business case is £34.954m (excluding optimism bias of 15%). The change in the QCE between the publication of the Strategic Economic Plan and this business case is due to the following:

- The production of an itemised bill of quantities, advised by Amey the contractor
- Detailed engagement with statutory undertakers
- Change in advice from statutory undertaker regarding the need to divert a high voltage overhead power line. The diversion costs are now included in the QCE
- More detailed site investigations and borehole information that suggests that the length of the viaduct needs to be increased
- An updated estimate of the land costs based on the current market and changes in land ownership

Due to the significant level of work that has been completed to inform the business case and the base cost estimate, evidence has been produced to support an optimism bias uplift of 15%, rather than 44%. This evidence is provided in Section 4.3 and Appendix 4.2.

3.1.3 Scope for Proportionality in the Assessment

This business case has made an assessment of 19 out of the 22 potential impacts presented in DfT WebTAG guidance. An assessment has not been provided for 'Options and Non-use Values', 'Regeneration Areas' and 'Wider Impact'. A full assessment has been completed for the scheme's Environmental Impact and the methodology for this assessment has been informed by the statutory environmental bodies (Environment Agency, English Heritage and Natural England).

Distributional Impact Analysis

A screening assessment considered the likely positive and negative impacts on specific vulnerable groups, including children, older people, people with a disability, black and minority ethnic communities, people without access to a car and people on low incomes. The findings are presented in Appendix 3.12 concluding that there is likely to be a distributional impact related to User Benefits, Noise, Air Quality, Accidents, Severance and Affordability. Security and Accessibility impacts have not been assessed.

Options and Non-use Values

Option and non-use values should be assessed if the scheme being appraised includes measures that will substantially change the availability of transport services within the study area (e.g. the opening or closure of a rail service, or the introduction or withdrawal of buses serving a particular rural area). This appraisal is not required for the Stafford Western Access Route as there will not be a substantial change in the availability of transport services within the study area.

Regeneration Areas

Whilst Staffordshire contains a number of areas that are considered to be regeneration areas, this is not true for Stafford itself. The key consideration in making this assessment is the 2014-2020 Assisted Areas Map, recently agreed by the European Commission and designed to drive growth in less advantaged local economies. The metrics used in order to help in the development of the Assisted Areas Map, such as areas with poor skill levels, high unemployment and low population growth, show that there is likely to be strong correlation between Assisted Areas and what may be considered to be regeneration areas.

Within the county there is Assisted Area coverage surrounding Stoke-on-Trent, in South Staffordshire and Cannock Chase as an extension of the Black Country, and a corridor along the A38(T) to enable growth around Burton-upon-Trent and Derby. Whilst pockets of deprivation do exist in and around Stafford, such as within the Highfields & Western Downs ward, it was not considered appropriate to grant the town Assisted Area status due to the relatively small scale of deprivation in comparison to other areas. The high self-containment of Stafford Borough, with around 70% of local residents also working within the area, means that the Stafford Western Access Route is likely to provide most benefit to a relatively confined area. For these reasons, it is therefore not appropriate to consider Stafford as a regeneration area.

Wider Impact

It is confirmed in The Plan for Stafford Borough that the Stafford Western Access Route is an important part of facilitating significant housing, retail and employment growth around the town. However it is not considered that the level and type of benefits to be created by the scheme meets the requirement for an assessment in line with TAG Unit A2.1.

Agglomeration

It is not considered that the Western Access Route will directly improve productivity by bringing firms closer together and closer to large labour markets. Wards within the West of Stafford do not fall within a 'Functional Urban Area' as defined in WebTAG. It is therefore unlikely to have an impact on agglomeration.

Output change in imperfectly competitive markets

The business case is based on AM and PM peak hour models which are dominated by commuting traffic. Typically business use makes up 7% of total flows however, based upon roadside interview surveys, the proportion of business traffic in Stafford tends to be lower than this typical figure. In addition, the 10% uplift to business user benefits, recommended in TAG Unit A2.1, applies to benefits across all modes, not just highway trips. Therefore, in a situation where the overall level of business journeys is low and only the 'highways' element is captured, it would not be appropriate to just assume a 10% uplift. There is no guidance available that can help to justify a lower uplift so on this basis this assessment is not included in the business case.

Tax revenues received by government arising from labour supply impacts

This assessment has not been completed as the overall change in tax revenues and GDP impacts cannot be calculated with and without the scheme for all modes, including public transport. Also, the likely impact of a scheme of this scale and type are expected to be small in terms of UK Government tax receipts.

Tax revenues received by government arising from moves to more or less productive jobs

The Western Access Route is unlikely to have a significant impact on where employment will be located in the area and a Land Use Transport Interaction (LUTU) model is not available. The key objective of the scheme is to unlock significant housing growth rather than the expansion of employment which is why it is not considered necessary to complete this assessment.

3.2 Value for Money Statement

The Economic Case detailed in section 3.5 assesses the impacts and the value for money implications of the 'core' scenario for the Stafford Western Access Route which is seen as the most likely future highway and development growth scenario. This Value for Money Statement provides a summary of the key outputs from this appraisal.

3.2.1 Initial BCR

Over a 60-year project lifetime, there is a total Present Value of Benefits (PVB) of £94.2m, Present Value of Costs (PVC) of £35.34m, generating a Net Present Value (NPV) of £58.89m and Benefit to Cost Ratio (BCR) of 2.67. The scheme therefore represents high value for money based on WebTAG guidance for scheme appraisal.

The majority of PVB will be in the form of travel time savings (£87.4m), which is realistic for a scheme of this nature. Other benefits arise in the form of vehicle operating costs (£6.9m), reduced accidents (£1.7m) and improved air quality (£1.5m). Dis-benefits during construction will be only approximately £0.7m as the scheme will be predominantly constructed off-line. The overall maintenance costs over the 60-year appraisal period will be £0.19m.

3.2.2 Potential to Adjust the BCR

The scheme is expected to improve journey time reliability due to the reduction in congestion in the town centre. Approximately £16.2m of benefits have been identified however these have not been included in the initial PVB for the scheme. This would adjust the BCR to 3.12.

An assessment of potential inter-peak benefits has been completed which provides £17.1m of benefits. As an inter-peak model has not been validated, these benefits have not been used as part of the initial PVB for the scheme. Inclusion of both reliability and inter-peak benefits would adjust the BCR to 3.61.

3.2.3 Qualitative Assessment

The qualitative assessment of Environmental and Social Impacts has not contributed to the BCR but should be given equal weight. The appraisal concludes that there will be benefits to Landscape, Journey Quality and Severance. There will be a neutral impact on the remaining impacts apart from a potential slight adverse impact on the Water Environment and the Historic Environment without appropriate mitigation. There are no concerns about how benefits will be distributed between social and vulnerable groups.

3.2.4 Sensitivity and Scenario Analysis

A sensitivity and scenario analysis has been undertaken around the 'core' scenario, to examine the impact of changes in costs and benefits on the business case for the scheme. These scenario tests also serve as a check on the robustness and stability of the modelling and appraisal framework.

Two cost-based sensitivity tests have been carried out, to test the impact of a 15% reduction and increase in optimism bias. The tests produce a BCR in the range 2.32 to 3.14. The scheme therefore provides high value for money for all cost-based tests.

Three 'demand-side' (traffic growth) scenario tests have been undertaken to test the impact of uncertainty in planning assumptions. The fixed trip matrix test produced a BCR of 3.58 and the low and high growth scenarios deliver BCRs of 1.59 and 3.50 respectively. Whilst the low growth BCR is below 2 it is noted that this would be conservative as it excludes the inter-peak and weekend benefits of the scheme.

3.2.5 Appraisal Summary

Table 3.1 provides a summary of the Value for Money Assessment and the Appraisal Summary Table (AST) in Table 3.2 provides a summary of all the monetised, qualitative and quantitative impacts of the preferred scheme.

Table 3.1: Value for Money Summary

Category	Assessment	Detail
Initial BCR	2.67 (BCR)	Estimated using WebTAG guidance
Potential Adjustment to BCR	3.61 (BCR)	Includes estimates for Reliability Impacts and Inter-Peak Benefits.
Qualitative Assessment	Largely Neutral with some Benefits	Benefits for Landscape, Journey Quality and Severance, with potential Adverse Benefits to the Water Environment. No concerns about distribution of benefits between social and vulnerable groups.
Key Risks, Sensitivities	Medium/High VfM is maintained	Initial BCR includes an Optimism Bias of 15% to reflect level of certainty in the scheme. VfM is maintained when cost and traffic growth sensitivity tests are applied.
VfM Category	High	Based on a combination of the Quantitative and Qualitative assessment, taking into account risks and sensitivities.

TABLE 3.2: APPRAISAL SUMMARY TABLE

Date produced:	January 2015

Contact:	
Name	Nick Dawson
Organisation	SCC
Role	Promoter

Name of scheme:	STAFFORD WESTERN ACCESS ROUTE
Description of scheme:	New highway required to deliver development in Stafford. The road is a 7.3 metre wide, two lane, single carriageway road, approximately 1km in length between Doxey Road and A34 Foregate Street.

Impacts		Summary of key impacts	Assessment					
			Quantitative				Qualitative	Monetary £(NPV)	Distributional 7-pt scale/ vulnerable grp
Economy	Business users & transport providers	The scheme generates large overall benefits for business users from travel time and vehicle operating cost savings. These are slightly offset by the increased delays to business users during construction of the scheme valued at £765,249. Potential additional inter-peak benefits equate to £17.1m for all users.	Value of journey time changes(£000's)	£29,531			-	£32,452,000	Moderate Beneficial
			Net journey time changes (£000's)						
			0 to 2min	2 to 5min	> 5min				
			£7,668	£17,863	£4,000				
	Reliability impact on Business users	The introduction of the new route and the resultant reduction in congestion through the town centre would improve the Business Users reliability through Stafford due to a reduction in flow break-down.	-				-	£5,490,050	
	Regeneration	Stafford has a relatively small scale of deprivation and the scheme is likely to provide most benefit to a relatively confined area. It is therefore not appropriate to consider Stafford as a regeneration area.	Not assessed				-	-	
	Wider Impacts	It is confirmed in The Plan for Stafford Borough that the Stafford Western Access Route is an important part of facilitating significant housing, retail and employment growth around the town. However it is not considered that the level and type of benefits meets the requirement for a wider impact assessment.	Not assessed				-	-	
Environmental	Noise	The assessment has identified a total of 12 people annoyed in the study area, defined as 600m from the new road. The predicted changes in noise level due to the scheme are largely of a "negligible" magnitude of significance, as defined in Table 3.2 of DMRB HD 213/11.	Total population assessed in 2033 = 3,101; people annoyed without scheme = 1,039; people annoyed with scheme = 1051. Net increase of 12 people annoyed in long term with scheme.				-	-£399,648	Slight Adverse
	Air Quality	There is a deterioration in PM_{10} with the scheme in 2018, but over the 60 year appraisal period there is an overall net improvement. There is a reduction in regional emissions for NO_x. The scheme does not result in any exceedances of air quality criteria, and additionally there are no Air Quality Management Areas affected by the scheme. Pollutant concentrations were calculated using the DMRB spreadsheet, and NO_2 concentrations were adjusted following comparison with diffusion tubes in Stafford.	Assessment Score PM_{10}:+32, NO_2: +163, Emissions NO_x: -11 tonnes				-	PM_{10} NPV:£1.54m, NO_x emissions NPV: £0.006m. Total: £1.55m	Slight Adverse
	Greenhouse Gases	The scheme is expected to have a slight adverse impact on non-traded carbon emissions resulting from the difference in fuel consumption between the 'with scheme' and 'without scheme' scenarios for the whole appraisal period. Emissions were calculated using DEFRA's Emission Factor Toolkit v6.0.1 released in July 2014.	Change in non-traded carbon over 60y (CO2e)	527 tonnes			-	-£32,886	
			Change in traded carbon over 60y (CO2e)	0					
	Landscape	A landscaping scheme is proposed. Loss of wet woodland will be compensated by additional planting. Benefits will be gained from a new wildlife habitat adjacent to the SSSI. There will be sensitive landscaping along the route. Planting will include low maintenance native species. There will be no impact on levels of tranquillity in the area.	-				Slight Beneficial	-	
	Townscape	The route diverts traffic away from locally distinctive traditional terraced houses at Castletown. The height of elevated sections will not adversely affect the townscape. The route will have no impact on Foregate & St.George's Conservation Areas. The route will not sever any existing pedestrian movements between existing car parks and the town centre.	-				Neutral	-	
	Historic Environment	There will be a reduction in traffic in the Conservation Area. Impact on the SSSI water meadow and dismantled railway lines is neutral. A slight adverse impact is not ruled out as there is an unknown level of archaeological remains, but the potential is low and mitigation will be delivered if appropriate. No pre-determination archaeological investigations are required.	-				Slight Adverse	-	
	Biodiversity	Mitigation measures have been discussed with Natural England and Wildlife Trust. An area of SSSI will be restored and a wildlife habitat will be created. The route will impinge on a small area of willow carr woodland. The River Sow bridge will cater for otter movement and impact on bats. Disturbed areas will be replanted with native species. A habitat survey will confirm presence of protected species as part of EIA.	-				Neutral	-	
	Water Environment	No impact on Source Protection Zones but does cross floodplains. The road drainage system will manage run-off rates and ensure no discharges into water courses. There will be consultation with Environment Agency, Drainage Board and Natural England to agree working methods. As a detailed hydrological assessment has yet to be finalised, a slight adverse impact on the water environment cannot be ruled out.	-				Slight Adverse		

Social	Commuting and Other users	The scheme generates large overall benefits for commuter and other users from travel time savings as a result of the scheme. These are slightly offset by an increase in vehicle operating cost and delays during the construction of the scheme.	**Value of journey time changes(£000's)** £57,866 **Net journey time changes (£000's)** 0 to 2min: £16,314 / 2 to 5min: £33,555 / > 5min: £7,997	-	£61,127,000	Moderate Beneficial
	Reliability impact on Commuting and Other users	The introduction of the new route and the resultant reduction in congestion through the town centre would improve the Commuting and Other Users reliability through Stafford due to a reduction in flow break-down.	-	-	£10,728,985	
	Physical activity	The additional number of pedestrians and cyclists is expected to be insignificant as a result of new walking and cycling facilities along the access route. However, sustainable complimentary measures are likely to encourage additional walk and cycle journeys.	-	Neutral	-	
	Journey quality	Frustration will be reduced as road layout, geometry, network conditions and ability to make good progress are all better with the new route. Fear of accidents will reduce as the new highway will be built to high design standards and avoids areas of high pedestrian movement.	-	Large Beneficial	-	
	Accidents	The introduction of the scheme is forecast to reduce personal injury accidents across the study area by around 8 across the 60 year appraisal period.	Accident / Casualty Savings (over 60 year appraisal) PIA's = -8, Fatal Casulaties = 1, Serious Casualties = 5, Slight Casualties = -9	-	£1,798,000	Moderate Beneficial
	Security	Existing routes in the town are well lit with CCTV and good informal surveillance. New route will be designed to a high standard as regards security with good informal surveillance as passing through existing residential and retail areas.	-	Neutral	-	-
	Access to services	The scheme does not include any proposed improvements or alterations to bus services. However the new road will facilitate better bus penetration of new housing sites and improve bus access to the town centre, complemented by wider sustainable transport measures.	-	Neutral	-	-
	Affordability	There will be vehicle operating cost (VOC) savings for commuting and other users equating to £6.945m. The majority of residents will experiencing no change in VOCs.	-	Slight Beneficial	-	Moderate Beneficial
	Severance	In total 8,039 pedestrians will benefit, 3,020 pedestrians will experience no change in severance and 85 pedestrians will slightly dis-benefit. At three other locations unquantified pedestrian movements will also experience either an improvement or worsening of severance.	A slight reduction in severance is experienced by over 1,000 people per day.	Large beneficial	-	Moderate Beneficial
	Option and non-use values	This scheme will not create a step change in the service level of a transport mode therefore has not been assessed.	Not assessed	-	-	
Public Accounts	Cost to Broad Transport Budget	The scheme will be publicly funded mainly through the LEP Growth Deal with a local contribution from the County Council to cover the final funding gap. There will be broader maintenance costs of £194,000.	-	-	£35,336,000	
	Indirect Tax Revenues	The scheme leads to reduced vehicle operating costs, as people use the shorter link road route. This feeds through to an overall decrease in indirect tax revenues.	-	-	£2,264,000	

3.3 Traffic Modelling Methodology

3.3.1 2010 Major Scheme Business Case

The original Stafford Transport base year SATURN model was developed by Atkins in 2008 and was used to inform the 2010 major scheme business case. Roadside interview data, car park data and journey time data was collected in 2007, in addition to traffic count data collected between 2004 and 2007. Atkins' Traffic Model Survey Completion Report (November 2007) is provided in Appendix 3.2 and details the processes associated with this data collection. Appendix 3.3 provides the Survey Analysis Note which presents the results of the traffic survey data.

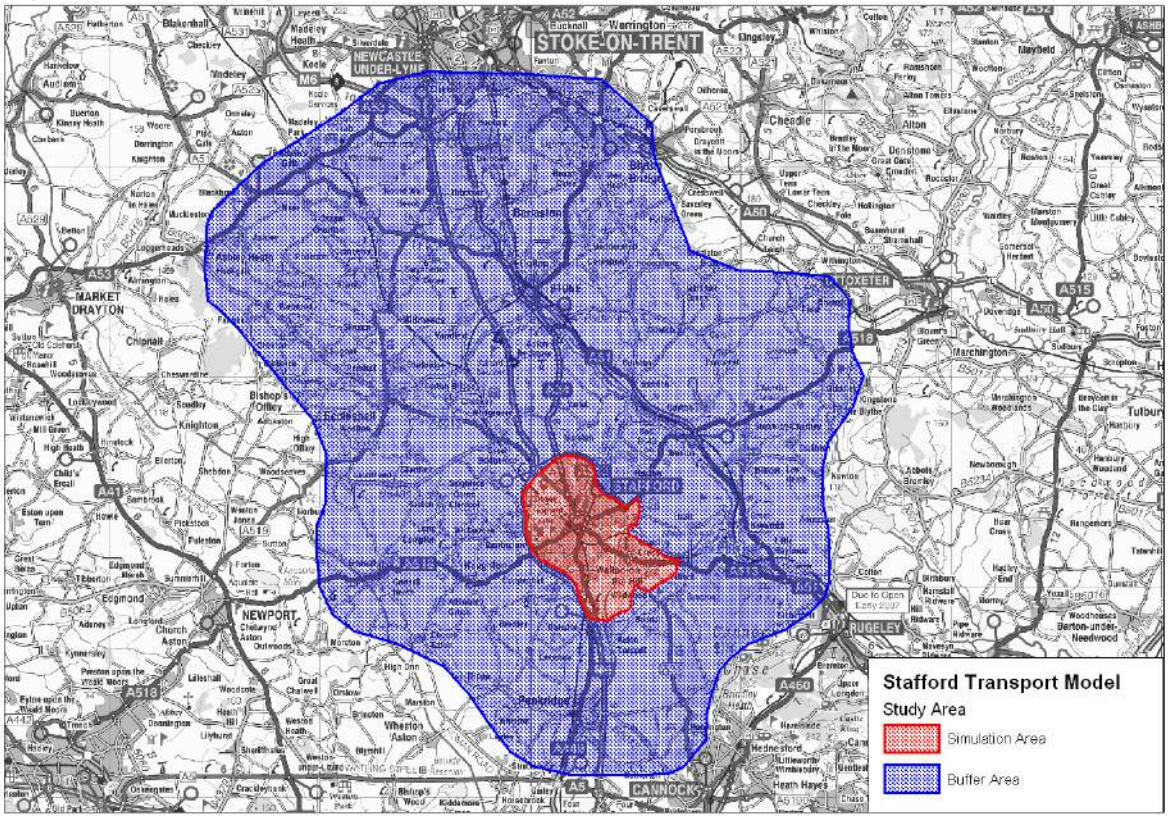
The model represents traffic conditions in the AM peak (0800 to 0900 hours) and PM peak (1700 to 1800 hours). Six vehicle user classes are modelled including car for 'employer's business', 'commuting' and 'other purposes', light goods vehicles and other goods vehicles (class 1 and 2). The journey purpose split derived for the Stafford model correlates well with national averages. There are, however, a higher proportion of car 'commuting' journey purpose trips and a lower proportion of other journey purpose trips by car than the national average.

The model has been calibrated and validated to a 2007 base year for an AM and PM peak hour in line with WebTAG and DMRB guidance in terms of total link flow and HGV link flow calibration and validation, screen line validation and journey time validation.

The geographical extent of the model is shown in Figure 3.1. The modelled study area is sufficiently wide in coverage to allow a detailed analysis of the routing decisions that are likely to be affected by the proposed Stafford Western Access Route, without being so large as to increase the risk of model 'noise' being incorporated into the economic appraisal.

The model was updated in 2009 using the original data to ensure WebTAG compliance for the assessment of the Stafford Western Access Route. The key revision to the model included demand segmentation with generalised costs for both time and distance to enable variable demand modelling using DIADEM. This model was recalibrated and revalidated as detailed in the Local Model Validation Report, prepared by Atkins, dated February 2010 and provided in Appendix 3.4. A Department for Transport Compliance Modelling Note was also produced in September 2009 and is provided in Appendix 3.5.

Figure 3.1: Geographical Extent of Stafford Model



3.3.2 2014 Revised Model Forecasting

In 2014, the suitability of the SATURN model was considered in terms of changes in land use, predicted traffic growth and change in average journey times. As confirmed in the Appraisal Specification Summary in Section 3.1.2, the model is robust enough to use for the production of new future year forecasts to inform this 2014 economic appraisal.

The revised model forecasting was completed in 2014 and the forecasting approach is detailed in Appendix 3.1. The planned opening year of the Stafford Western Access Route is 2018. The economic assessment of the scheme requires a minimum of the opening year and a design year (usually 15 years after opening). DfT guidance suggests that the modelling of an interim year is desirable for assessment purposes, as it provides additional points to further define the benefit curve. Future year models have therefore been developed for 2018, 2025 and 2033.

A 'core' scenario has been developed that includes 'near certain' and 'more than likely' development and highway schemes. In the future year do-minimum and do-something networks, all 'near certain' and 'more than likely' highway schemes have been modelled. Section C of the Western Access Route between Doxey Road and Martin Drive is included in all three forecast networks. 'Near certain' and 'more than likely' development trips have been derived using trip rates obtained from the TRICS database. These trips have been adjusted using TEMPRO factors to ensure that the model does not unduly over predict the level of congestion within Stafford and hence potentially overestimate the benefits of the proposed scheme.

3.4 Economic Appraisal Assumptions

3.4.1 Estimation of Costs

This section describes the methodology for estimating scheme costs, which are subsequently included as inputs to TUBA, and the outturn costs that are presented in the Transport Economic Efficiency (TEE) and Public Accounts tables.

The costs have a price base Q2 2014. Total nominal scheme cost amounts to £33.1million which incorporates risks as identified through a Quantified Cost Risk Assessment. Construction inflation has been added to this 2014 cost, based on the BCIS General Civil Engineering Cost Index.

An assessment of the optimism bias appropriate for this scheme at this stage has been undertaken and is presented in Appendix 4.2. Based on this, an increase of 15% has then been added to the costs, in line with WebTAG guidance Unit A1.2 (Table 8) for a road scheme at Stage 2 (Conditional Approval).

All costs and benefits in the economic assessment have been converted to 2010 prices and values. A factor of 0.94 is applied to convert to 2010 prices, representing the difference between the GDP in 2014 and 2010. Discount rates at 3.5% per annum are applied to convert to present (2010) values. Finally, a factor of 1.19 is applied to convert from factor cost to market prices. The detailed breakdown of this calculation is provided in Appendix 3.6.

The revised costs allowing construction inflation, optimism bias, rebasing and discounting to 2010 prices and values are shown in Table 3.3. The total of £35.1 million is included as the investment cost in the Public Accounts table (Table 3.6).

Table 3.3: Present Value of Scheme Investment Costs (2010 prices and values)

Year	Capital Expenditure, by Year & Component (£m)			
	Construction	**Land**	**Other**	**Total**
2015/16	2.289	3.945	0.629	6.862
2016/17	12.553	1.926	0.725	15.203
2017/18	9.166	0.680	0.546	10.392
2018/19	1.740	0.770	0.175	2.685
Total	25.748	7.321	2.074	35.143

3.4.2 Estimation of Benefits

The calculation of transport user benefits is based on the conventional consumer surplus theory. For the purposes of appraisal, use of the transport system is assumed to be the result of a balanced consideration of pros and cons by each individual decision-maker, subject to all the various constraints which exist. Changes in the transport system give rise to changes in the perceived cost of personal travel and freight movement from certain points of origins to certain destinations. This perceived cost is a broadly defined measure of the inconvenience to the user of moving between two points, and includes changes in:

- Travel time
- User charges – fares, tariffs and tolls
- Vehicle operating costs met by the user

Consumer surplus is defined as the benefit that a consumer enjoys, in excess of the costs perceived. In the simplest case, where time of money costs change, but demand stays the same, the total change in consumer surplus equals:

change in cost * number of travellers $= (P^0 - P^1)*T$

This formula defines Pi as the perceived cost of travel (note that the superscript i is used to denote the scenario - 0 for do-minimum, 1 for do-something), and T is the number of travellers. This is commonly referred to as the fixed demand scenario - where the demand remains fixed in the 'do-minimum' and 'do-something' models. Further information is provided in Appendix 3.1.

Where, as is more usual, demand changes in response to the increase or decrease in travel costs, there is an additional impact on new or lost travellers. With a relatively small change in costs, the convention is to attribute half of the change in costs to the trips lost or gained. This is referred to as the 'rule of half' and is the recommended calculation to apply in variable demand scenarios. The total change in consumer surplus in this scenario is represented by:

(change in cost * do-minimum demand)

+ (half change in costs * change in demand)

$= (P^0-P^1)T^0+½(P^0-P^1)(T^1-T^0)$

$= ½ (T^0+T^1)(P^0-P^1)$

Transport Economic Efficiency Benefits

TUBA is an industry-recognised software package, recommended by DfT for the appraisal of highway and public transport schemes. It is of particular use where variable demand responses have been included in the transport modelling, as TUBA is based on the 'rule of half', which allows for explicit calculation of changes in demand between the 'do-minimum' and 'do-something' scenarios.

TUBA (v1.9.4) has been used to estimate the Transport Economic Efficiency (TEE) benefits. This includes estimation of benefits relating to travel times, vehicle operating costs, user charges, indirect tax and private sector revenues, all of which contribute to the Present Value of Benefits (PVB) for the scheme proposals, as presented in the TEE table. TUBA also calculates the Present Value of Costs (PVC), based on the scheme investment and maintenance data.

Travel Time Savings

Travel time savings are calculated using the 'rule of half' applied to generalised time skims from the SATURN highway model. Since parking costs are not included in the Stafford Transport model, generalised time equates solely to in-vehicle time. Travel times in the traffic model are represented in seconds. These are converted to vehicle hours and annualised for each modelled period, so that annual AM and PM peak travel time savings can be calculated. Annual time savings are calculated for each modelled year. Benefits for non-modelled years are calculated via linear interpolation between modelled years, and flat-line extrapolation beyond the final modelled year. However, the impact of discounting on estimated benefits means that the benefits 'curve' declines toward the end of the project lifetime.

Default economic assumptions have been applied, as contained in the TUBA software and based on guidance contained in the DfT's TAG DataBook (May 2014).

Derivation of Annualisation Factors

The Stafford SATURN model is based on 'peak hour' highway assignments so annualisation factors have been adopted to convert hourly benefits to annual benefits, as shown in Table 3.4.

Table 3.4: Annualisation Factors

Peak Hour	User Class	Annualisation Factor
AM Peak (08.00-09.00)	Cars (UC1, UC2, UC3)	657
	LGVs (UC4)	654
	HGVs (UC5,UC6)	746
PM Peak (17.00-18.00)	Cars (UC1, UC2, UC3)	659
	LGVs (UC4)	733
	HGVs (UC5,UC6)	783

These factors are based on counts at 11 roadside interview sites conducted during data collection in 2007. The factors have been calculated by examining the relationship between the peak hour (0800-0900 and 1700-1800) and the peak period (0700-1000 and 1600-1900). This provides the expansion factor from a one hour peak to a three hour peak period. This is then multiplied by 253, the number of typical peak days in a year. This analysis was conducted separately for cars, LGVs and HGVs to give three individual factors to use across the user classes in the model.

It is noted that annualisation based on traffic flows, as described above, can overestimate benefits as there is not a linear relationship between delays and traffic flows. However, given that the benefits for the inter-peak, weekend and overnight time periods have not been included in the cost benefit analysis, it is considered that the assessment is robust.

Vehicle Operating Cost Savings

Vehicle operating costs are calculated for both fuel and non-fuel elements of the journey, based on formulae set out in the DfT's TAG DataBook (May 2014). The 'rule of half' formula is applied as for travel times, but with vehicle operating costs being based

on distance travelled (vehicle-kilometres) and average vehicle speeds. All assumptions relating to fuel costs, duty and vehicle efficiency are those contained in the default TUBA economics file and the same annualisation factors as defined in Table 3.4 are applied.

Implications for Indirect Tax Revenues

Indirect tax revenues are generated through fuel duty and any other charges incurred by transport users (e.g. tolls) and providers (e.g. public transport revenues). In this instance, with no road tolls and no public transport, the only impact on indirect tax revenues is through changes in fuel-related vehicle operating costs.

Estimation of Accident Benefits

The whole of the SATURN network has been modelled using COBALT, to ensure that the impact on accident numbers is represented across the full study area. COBALT (parameters file v2014.2) is the industry-recognised software for this type of analysis. There is, therefore, full consistency with the future year forecasts of demand generated by the SATURN model. Modelled flows have been converted from passenger car units (PCUs) into vehicles for input into COBALT.

Each link in the network has been assigned an accident rate. For the key strategic links a local accident rate has been calculated using five years of observed personal injury accident data and modelled 2007 flows. The observed data used to calculate accident rates only includes personal injury accidents, as damage-only accidents are not reported to the same extent and would not give an accurate representation. For more minor roads COBALT default accident rates are used, which ensures that the accident rates are not skewed by limited flow information on minor roads. The accident rate is calculated by dividing the number of accidents by the number of vehicle kilometres travelled. These rates are then used to forecast the number of accidents in the future based on changes in traffic volumes.

COBALT presents results in the form of changes in the number of personal injury accidents and disaggregates this further by severity of injury: fatal, serious and slight. A monetised value is assigned to the accidents, so that total accident costs can be calculated for the situation before and after the implementation of the Stafford Western Access Route. Accident costs are summed across the same 60-year project lifetime as used in the calculation of TEE benefits, and discounted back to the 2010 base year. The difference between the discounted 60-year accident costs represents the accident benefits related to the scheme.

Estimation of Costs during Construction and Maintenance

Transport users incur additional costs when the highway network is undergoing construction and/or maintenance works. There are four costs associated with these works: delay (value of time), vehicle operating costs, carbon emissions and accidents. Due to the nature of the works required to implement the Western Access Route, the best software package available to assess the dis-benefits associated with construction is the TUBA suite.

The construction of the Stafford Western Access Route will require two traffic management phases as shown in Table 2.2 in the 'Strategic Case' which will impact upon the highway network during peak hours. These traffic management schemes have been modelled using the 2018 do-minimum model and the economic impacts assessed using TUBA. For the A34 Foregate Street lane closures, the northbound and southbound closures have been modelled to occur at the same time to provide a robust assessment. It is proposed, in reality, to undertake these closures consecutively.

The Stafford Western Access Route will have an impact on maintenance costs on affected roads and structures. Table 2.1 in the 'Strategic Case' summarises the change in maintenance works over the 60 year appraisal period. The Stafford Western Access Route will not have an impact on maintenance delays as the scheme consists of new roads.

Estimation of Journey Reliability Benefits

Reliability is defined as a variation in journey times that transport users are unable to predict. Hence, reliability is confined to random effects, arising from either variability in recurrent congestion at the same period each day – Day to Day Variability (DTDV) - or variability in non-recurrent congestion such as incidents. It excludes predictable variation relating to varying levels of demand by time of day, day of week, and seasonal effects that travellers are assumed to be aware of. Measurements of the monetised journey time reliability benefits from a scheme proposal should be based solely on the unpredictable variation, because of the extra costs incurred by travellers.

The reliability analysis has applied guidance on urban road reliability as set out in WebTAG A1.3. This uses a forecast of the improvement in standard deviations of journey time based upon journey distance and time in the do-minimum and do-something scenarios. Reliability benefits have been assessed across the modelled area for all origin-destination pairs, and monetised using a process equivalent to the TUBA calculation of user time benefits. The value per unit improvement in reliability is measured as being equivalent to 80% of the user's respective value of time, which differs by journey purpose.

This reliability assessment captures only variations (both positive and negative) for highway users. Any additional impacts on reliability of public transport movements have not been captured.

Estimation of Inter-Peak Benefits

A test has been undertaken to determine the potential benefits during the inter-peak period and the impact these benefits could have on the overall Benefit to Cost Ratio. As an inter-peak model has not been validated, it has not been included in the initial benefits.

The level of traffic occurring during the inter-peak relative to the two peak hours has been ascertained by considering count data from local sites. The relationship between the inter-peak and the sum of the AM and PM peaks was calculated for these sites in both count directions to produce an adjustment factor. This analysis shows that for Stafford the following relationship exists between the inter-peak and the AM and PM peaks:

$$IP = \frac{(AM + PM)}{2.59}$$

Deriving the inter-peak matrices from the sum of the AM and PM peak matrices ensured that there is no direction bias as would be expected in the two commuting peak hours. User class proportions for the inter-peak have been based on national averages in the WebTAG Data book (May 2014).

3.5 Economic Impact

The economic assessment is for the 'core' scenario under variable demand conditions. The 'core' scenario is seen as the most likely future highway and development growth scenario. The results are based on an assumption that the scheme leads to changes in travel costs and that this in turn leads to changes in the level of demand. The assessment therefore allows for induced demand and for the release of trips that, in the 'do-minimum' are suppressed due to prohibitive journey costs.

All benefits and costs have been assessed over a 60-year project lifetime then discounted back to a common base year (2010). Discount rates of 3.5% and 3.0% have been applied to benefits and costs for years 1-30 and 31-60 respectively.

3.5.1 Transport Economic Efficiency (TEE)

Table 3.5 presents the TEE benefits. The scheme produces substantial benefits amounting to £93.6 million. These benefits are generated by travel time savings, which amount to £87.4 million, combined with vehicle operating cost benefits of £6.9 million. The scheme will provide a shorter route for many trips providing both time savings and lower vehicle operating costs. The reduced congestion in the town centre resulting from the scheme will also provide time savings for traffic not directly using the new roads.

Benefits generated during the inter-peak, weekend and overnight time periods are not included. Benefits to public transport are also not included even though public transport would benefit from the reduced congestion in the town centre. The PVB derived, therefore, may be considered conservative.

Table 3.5: TEE Table for the Core Scenario

Economic Efficiency of the Transport System (TEE)

Non-business: Commuting	**ALL MODES**		**ROAD**	**BUS and COACH**	**RAIL**	**OTHER**
User benefits	**TOTAL**		**Private Cars and LGVs**	**Passengers**	**Passengers**	
Travel time	27,455		27,455			
Vehicle operating costs	1,336		1,336			
User charges	0		0			
During Construction & Maintenance	-234		0			
NET NON-BUSINESS BENEFITS: COMMUTING	28,557	*(1a)*	28,791			

Non-business: Other	**ALL MODES**		**ROAD**	**BUS and COACH**	**RAIL**	**OTHER**
User benefits	**TOTAL**		**Private Cars and LGVs**	**Passengers**	**Passengers**	
Travel time	30,411		30,411			
Vehicle operating costs	2,425		2,425			
User charges	0		0			
During Construction & Maintenance	-266		-266			
NET NON-BUSINESS BENEFITS: OTHER	32,570	*(1b)*	32,570			

Business							
User benefits			**Goods Vehicles**	**Business Cars & LGVs**	**Passengers**	**Freight**	**Passengers**
Travel time	29,533		15,345	14,188			
Vehicle operating costs	3,184		2,530	654			
User charges	0		0	0			
During Construction & Maintenance	-265		0	0			
Subtotal	32,452	*(2)*	17,875	14,842			

Private sector provider impacts			**Freight**	**Passengers**
Revenue	0			
Operating costs				
Investment costs				
Grant/subsidy				
Subtotal	0	*(3)*		
Other business impacts				
Developer contributions		*(4)*		
NET BUSINESS IMPACT	32,452	*(5) = (2) + (3) + (4)*		

TOTAL		
Present Value of Transport Economic Efficiency Benefits (TEE)	93,579	*(6) = (1a) + (1b) + (5)*

Notes: Benefits appear as positive numbers, while costs appear as negative numbers.
All entries are discounted present values, in 2010 prices and values

3.5.2 Public Accounts

Table 3.6 presents the Public Accounts. Investment costs are expected to be paid by the Stoke-on-Trent and Staffordshire Local Enterprise Partnership, through the Growth Deal, and Staffordshire County Council, so it has been assumed that all costs are attributable to the local authority with no central government costs.

The scheme investment costs amount to £35.1 million. In addition the cost of maintenance compared to the do-minimum will result in an additional cost of £0.19 million. There is a reduction of indirect tax revenues amounting to £2.3 million across the 60-year project lifetime due to the expected reduction in vehicle operating costs.

Table 3.6: Public Accounts

Public Accounts

Local Government Funding	ALL MODES TOTAL		ROAD INFRASTRUCTURE	BUS and COACH	RAIL	OTHER
Revenue						
Operating Costs	194		194			
Investment Costs	35,142		35,142			
Developer and Other Contributions						
Grant/Subsidy Payments						
NET IMPACT	35,336	*(7)*				
Central Government Funding: Transport						
Revenue						
Operating costs						
Investment Costs			-			
Developer and Other Contributions						
Grant/Subsidy Payments						
NET IMPACT	0	*(8)*				
Central Government Funding: Non-Transport						
Indirect Tax Revenues	2,264	*(9)*	2,264			
TOTALS						
Broad Transport Budget	35,336	*(10) = (7) + (8)*				
Wider Public Finances	2,264	*(11) = (9)*				

Notes: Costs appear as positive numbers, while revenues and 'Developer and Other Contributions' appear as negative numbers.
All entries are discounted present values in 2010 prices and values.

3.5.3 Analysis of Monetised Costs and Benefits

Table 3.7 presents the Analysis of Monetised Costs and Benefits from TUBA. Benefits relating to accidents and carbon emissions are added to the present value of TEE benefits to produce an overall PVB of over £94.2 million. When combined with the PVC of £35.3 million, this results in a NPV of £58.9 million and a benefit-cost ratio of 2.67. The scheme therefore represents high value for money, based on DfT guidance (i.e. a BCR of greater than 2.0).

Table 3.7:

Analysis of Monetised Costs and Benefits

Noise	- 400	*(12)*
Local Air Quality	1,547	*(13)*
Greenhouse Gases	- 33	*(14)*
Journey Ambience		*(15)*
Accidents	1,798	*(16)*
Economic Efficiency: Consumer Users (Commuting)	28,557	*(1a)*
Economic Efficiency: Consumer Users (Other)	32,570	*(1b)*
Economic Efficiency: Business Users and Providers	32,452	*(5)*
Wider Public Finances (Indirect Taxation Revenues)	-2,264	*- (11) - sign changed from PA table, as PA table represents costs, not benefits*
Option Values		*(17)*
Present Value of Benefits (see notes) (PVB)	94,228	*(PVB) = (12) + (13) + (14) + (15) + (16) + (1a) + (1b) + (5) + (17) - (11)*
Broad Transport Budget	35,336	*(10)*
Present Value of Costs (see notes) (PVC)	35,336	*(PVC) = (10)*
OVERALL IMPACTS		
Net Present Value (NPV)	58,892	NPV=PVB-PVC
Benefit to Cost Ratio (BCR)	2.67	BCR=PVB/PVC

Note : This table includes costs and benefits which are regularly or occasionally presented in monetised form in transport appraisals, together with some where monetisation is in prospect. There may also be other significant costs and benefits, some of which cannot be presented in monetised form. Where this is the case, the analysis presented above does NOT provide a good measure of value for money and should not be used as the sole basis for decisions.

3.5.4 Construction and Maintenance Delays

The construction of the scheme means road users will experience some delay during parts of the construction period, although proposed phasing aims to offset the impact of these delays as much as possible. The impact of traffic management during construction works at A34 Foregate Street and Doxey Road has been assessed using SATURN and TUBA. Table 3.8 presents the user time and vehicle operating cost dis-benefits arising from delays during construction. The costs are provided in 2010 prices and values.

Table 3.8: Dis-benefits from Delays during Construction (User Time andVOC's)

Construction	Duration	Nature of Traffic Management	Cost of Traffic Delays (2010)
A34 Foregate Street lane closures on the northbound carriageway and southbound carriageways consecutively	18 weeks for northbound and 20 weeks for southbound carriageway	Lane closures on the northbound carriageway and southbound carriageways consecutively	£745,769
Doxey Road strengthening works	6 weeks (during peak hours)	two way temporary signals	£19,500
Total			**£765,249**

It is noted that the delays associated with the construction of the scheme will result in indirect taxation benefits for the government and these equate to £40,731 over the 60 year appraisal period (2010 values and prices).

The scheme will have an impact on maintenance costs for affected roads and structures. Table 3.9 presents the maintenance dis-benefits over the 60 year appraisal period for the scheme. All costs and benefits are provided in 2010 values and prices.

Table 3.9: Maintenance Dis-benefits (over the 60 years)

Description	Maintenance Work	Cost (2010)
Stafford Western Access Route	The new section of roads forming the scheme will require regular maintenance	£250,000
A5187 Station Road / Victoria Street/Tenterbanks	These roads will be downgraded to 'C' roads requiring less maintenance	- £56,000
Total		**£194,000**

3.5.5 Reliability Impact (Business Users)

The journey time reliability benefits analysis identifies approximately £16.2m benefits due to the scheme with £5.49m of these benefits generated for business users. It should be noted that these benefits are not included in the scheme PVB or within the TEE table. Table 3.10 shows how the BCR for the scheme would increase with the inclusion of all reliability benefits.

Table 3.10 Reliability Benefits

Economic Summary Statistic	Core Scenario	Core Scenario with Reliability Benefits
PVB	£94.23M	£110.43M
PVC	£35.34M	£35.34M
NPV	£58.89M	£75.09M
BCR	2.67	3.12
VfM Assessment	High	High

3.5.6 Inter-Peak Benefits

The inter-peak assessment gives a PVB of £17.1m. As an inter-peak model has not been validated, it has not been used as part of the cost benefit analysis. Figure 3.2 shows how this compares to the benefits obtained for the AM and PM peaks.

Table 3.11 shows how the BCR for the scheme would increase with the inclusion of the inter-peak benefits. It highlights that with the inter-peak benefits the overall BCR for the scheme would increase from 2.67 to around 3.15 and if reliability benefits are also added, the BCR would increase to 3.61. This further demonstrates that the results presented in this report may be considered conservative and that the full economic benefits would be higher.

Figure 3.2 also shows that similar benefits are obtained during the AM and PM peaks.

Figure 3.2: Benefits (PVB) Disaggregated by Time Period

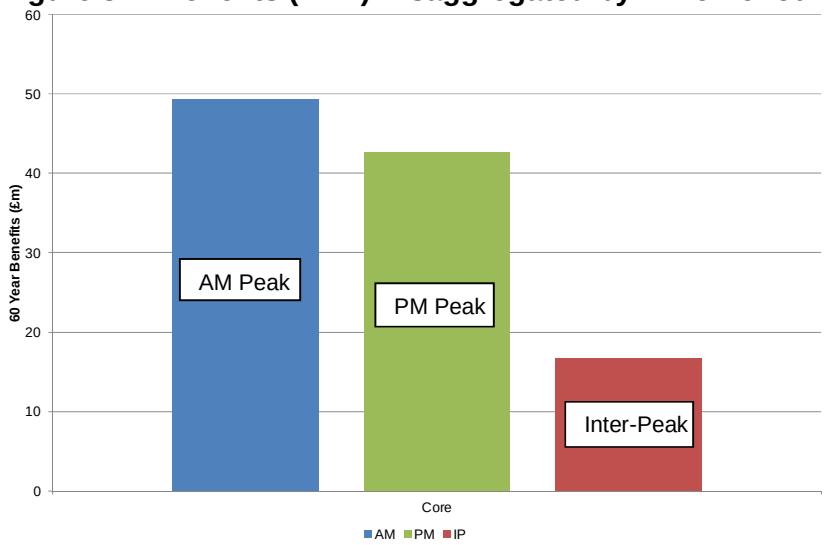


Table 3.11: Inter-Peak Benefits

Economic Summary Statistic	Core Scenario	Core Scenario with Inter-Peak Benefits	Core Scenario with Inter-Peak and Reliability Benefits
PVB	£94.23M	£111.33M	£127.53m
PVC	£35.34M	£35.34M	£35.34m
NPV	£58.89M	£75.99M	£92.19M
BCR	2.67	3.15	3.61
Value for Money	High	High	High

3.5.7 Sensitivity and Scenario Analysis

A range of sensitivity and scenario analyses have been undertaken to test the robustness of the modelling and appraisal framework, and to confirm the strength of the business case for the scheme. Given that there are no 'reasonably foreseeable' highway schemes and only one 'reasonably foreseeable' development, no land-use sensitivity test has been undertaken. In general, all development is already included in the 'core' scenario and identified as 'near certain' and 'more than likely'.

Cost-Based Sensitivity Analysis

WebTAG guidance requires sensitivity tests to be carried out on the optimism bias which is assumed to be 15%. Tests have been carried out increasing and reducing the optimism bias by 15% giving optimism biases of 30% and 0% respectively. The tests assume TEE benefits (travel time and vehicle operating cost savings) from the 'core' scenario, so no further modelling was required. Instead, changes are made directly to the TEE table.

Table 3.12 summarises the results of this analysis and the changes feed through to a BCR lying in the range 2.32 to 3.14. The scheme therefore provides high value for money, based on WebTAG guidance, for all cost-based tests, even with a 15% increase in optimism bias.

Table 3.12: 'Cost-Based' Sensitivity Analysis

Economic Statistic	Core Scenario	30% Optimism Bias	0% Optimism Bias
PVB	£94.20M	£94.20	£94.20M
PVC	£35.34M	£40.64M	£30.04M
NPV	£58.86M	£53.56M	£64.16M
BCR	2.67	2.32	3.14
VfM Assessment	High	High	High

Demand-Side (Traffic Growth) Sensitivity Analysis

The following three 'demand-side' scenario tests feed through to changes in travel costs and, consequently, TEE benefits.

- Core scenario under 'fixed trip matrix' conditions (where demand for travel remains fixed)
- Core scenario with low traffic growth (based on WebTAG Unit M4)
- Core scenario with high traffic growth (based on WebTAG Unit M4)

The full network statistics for the low and high traffic growth sensitivity tests are included in Appendix 3.1. Full TEE tables for all three scenarios are provided in Appendix 3.7.

As shown in Table 3.13, the three scenarios result in BCRs lying in the range 1.59 to 3.58. It can be observed that there are greater benefits for those scenarios with higher levels of traffic, as would be expected. For the low growth scenario, there is reduced congestion in the town centre resulting in reduced benefits and a 'low' value for money scheme rating.

Table 3.13: Demand-Side (Traffic Growth) Sensitivity Analysis

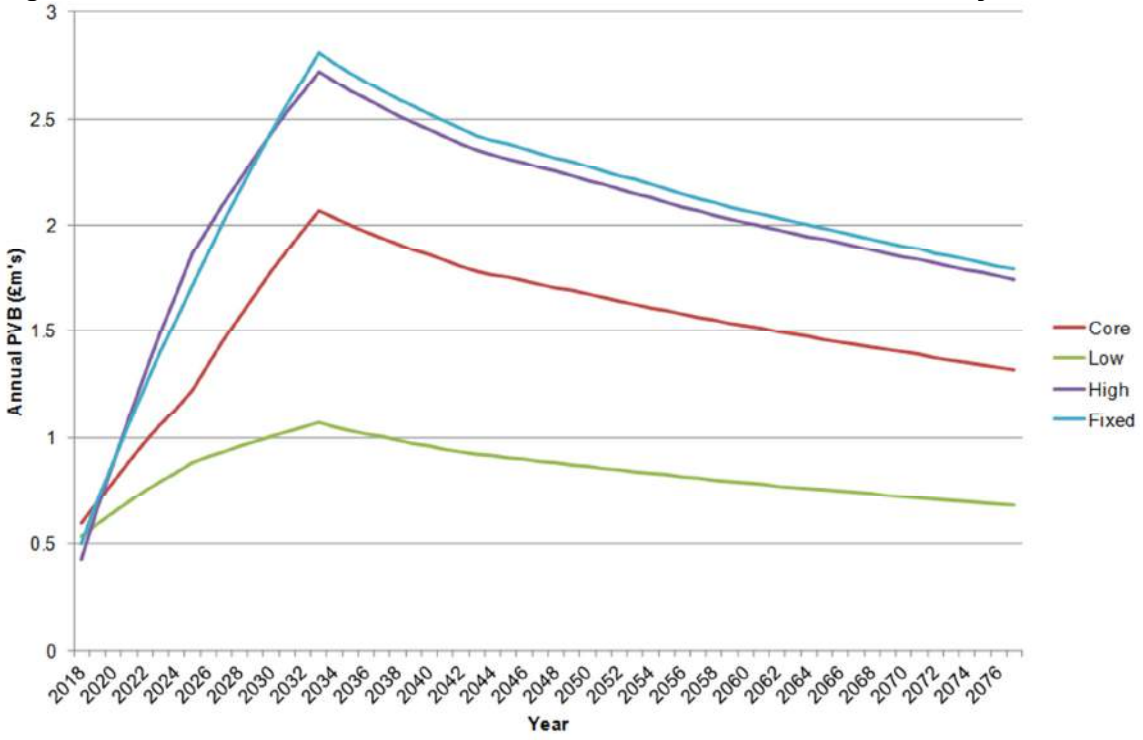
Economic Statistic	Core Scenario	Fixed Trip Matrix	Low Growth	High Growth
PVB	£94.2M	£126.4M	£56.0M	£123.6M
PVC	£35.3M	£35.3M	£35.3M	£35.3M
NPV	£58.9M	£91.1M	£20.7M	£88.3M
BCR	2.67	3.58	1.59	3.50
VfM Assessment	High	High	Low	High

Figure 3.3 presents a comparison of the benefits profiles for the 'core' scenario and each of the three scenario tests. The profile over time is similar across all scenarios, particularly between the 'core' scenario, the fixed matrix and high growth. The fixed matrix assessment shows the highest level of benefit for all years with a much steeper benefits curve than the 'core' scenario. At the other end of the scale, the low growth scenario shows a much flatter profile of benefits between 2018 and 2033. The identical shape of the benefits curve on the decline from 2033 is to be expected. Without any further modelled years between 2033 and the end of the project lifetime at 2077, all scenarios are subject to the same rate of discounting, merely applied to a different starting point on the curve.

Figure 3.3 also shows how benefits are distributed over time. The PVB rises through the early years of the project lifetime, with benefits increasing up to the final modelled year of 2033. This increase is plausible as the network will become more congested in future years, offering greater potential for congestion relief (and monetised benefits) for the proposed scheme.

The annual PVB declines between 2033 and 2077 because TUBA assumes a flat benefits profile beyond the final modelled year, but the impact of discounting (beyond any increase in value of time) means the annual benefit falls. This still means there are benefits, but of a lower value.

Figure 3.3: 60-Year Benefits Profiles for Core Scenario and Sensitivity Tests

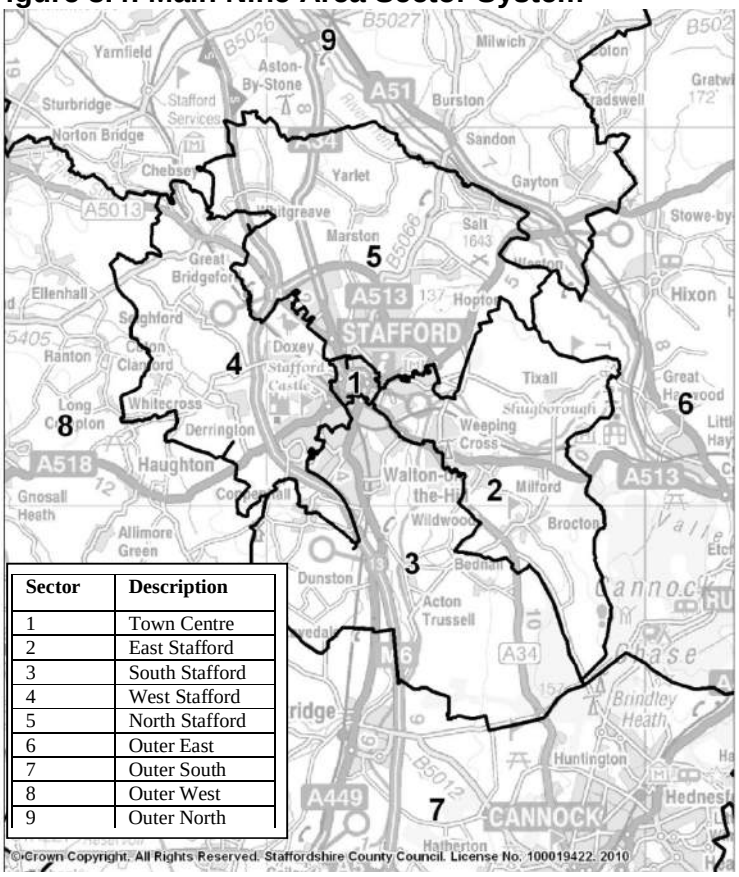


3.5.8 Spatial Distribution of Benefits

Sector analysis provides an important check on the ability of the model to produce plausible forecasts of future year travel demand. It also shows the extent to which model 'noise' is potentially having an impact on the results produced by TUBA. This is usually identified by spurious-looking benefits or dis-benefits for movements across the study area that we would not expect to be affected by the scheme (e.g. external-external movements that do not pass through or close to the scheme).

A nine sector analysis has been undertaken to gain a better understanding of the journeys that are generating the greatest benefits, as shown in Figure 3.4.

Figure 3.4: Main Nine Area Sector System



Sector	Description
1	Town Centre
2	East Stafford
3	South Stafford
4	West Stafford
5	North Stafford
6	Outer East
7	Outer South
8	Outer West
9	Outer North

Sector Analysis Results

The transport models used to assess the Stafford Western Access Route are relatively small, so model 'noise' is unlikely to be a major concern. The matrices presented in Tables 3.14 to 3.16 present the sector benefits (total PVB) for 2018, 2025 and 2033 respectively for the combined AM and PM peak modelled time periods.

All sectors provide benefits in all years, demonstrating that the improvements are positive for trips to and from each of the nine sectors. By reducing town centre congestion, trips from all other sectors are likely to benefit. However, it can be observed that the majority of benefits accrue from trips to and from sectors 1, 4 and 5, as would be expected. This is due to the fact the scheme adds additional highway capacity between the west and north of Stafford town centre, therefore, it should benefit the town centre (1), west (4) and north (5).

Trips to the town centre (sector 1) contribute 23%, 17% and 17% of the benefits in 2018, 2025 and 2033 forecast years respectively. Trips from the western sector (4) benefit the most from the scheme contributing 43% of the benefits in 2033. Trips to sector 5 also act as expected peaking at 19% of the benefits in 2033.

The greatest individual benefits come between sectors 4 and 5 (and vice-versa). This is to be expected as this corresponds to west-north and north-west movements while the new highway connects these two areas.

Table 3.14: Sector Benefits (Total PVB, 2018, Core Scenario)

PVB (£'000s)	1	2	3	4	5	6	7	8	9	Total	Percentage
1	5	5	8	11	3	4	8	6	-6	44	7%
2	6	2	4	1	-1	1	1	0	1	15	2%
3	14	4	5	5	5	4	1	2	1	42	7%
4	21	5	15	19	35	11	6	6	30	148	25%
5	21	3	8	34	2	7	7	13	1	95	16%
6	8	4	5	7	4	2	3	7	1	40	7%
7	17	2	2	1	6	2	0	0	16	48	8%
8	16	2	2	5	11	8	1	1	9	53	9%
9	30	5	6	39	4	4	5	9	5	107	18%
Total	136	31	54	122	69	44	32	45	57	591	100%
Percentage	23%	5%	9%	21%	12%	7%	5%	8%	10%	100%	

Table 3.15: Sector Benefits (Total PVB, 2025, Core Scenario)

PVB (£'000s)	1	2	3	4	5	6	7	8	9	Total	Percentage
1	13	4	8	36	29	9	10	21	8	139	11%
2	9	1	3	6	0	1	1	2	2	26	2%
3	15	3	7	11	9	8	0	4	2	58	5%
4	60	15	45	38	143	53	26	14	80	473	39%
5	41	5	13	83	-1	4	5	25	0	174	14%
6	9	2	7	35	3	4	2	12	3	76	6%
7	12	2	1	4	6	2	0	0	1	28	2%
8	22	4	6	7	25	22	3	3	12	104	9%
9	30	6	6	69	2	7	4	12	6	141	12%
Total	211	41	95	289	217	110	50	93	114	1219	100%
Percentage	17%	3%	8%	24%	18%	9%	4%	8%	9%	100%	

Table 3.16: Sector Benefits (Total PVB, 2033, Core Scenario)

PVB (£'000s)	1	2	3	4	5	6	7	8	9	Total	Percentage
1	22	14	16	52	56	28	27	28	16	260	13%
2	13	0	1	12	-4	0	0	5	-4	22	1%
3	23	4	15	22	20	17	6	10	3	119	6%
4	114	34	92	59	265	109	67	20	137	897	43%
5	63	5	13	119	3	11	7	32	-4	248	12%
6	31	5	14	58	10	10	7	18	6	157	8%
7	13	0	1	5	-2	-1	0	0	-20	-4	0%
8	34	9	10	9	41	40	7	5	16	170	8%
9	46	9	7	92	5	10	8	13	7	197	10%
Total	358	80	169	428	394	223	129	131	156	2067	100%
Percentage	17%	4%	8%	21%	19%	11%	6%	6%	8%	100%	

For the detailed TUBA assessment of benefits, the transport model zones have been grouped into 44 sectors representing geographic areas as shown in Table 3.17 and Figure 3.5. The majority of these, within Stafford have been based on Super Output Areas, whereas outside of Stafford, broad sectors have been used. This increased sectoring inside of Stafford reflects the fact that the impact of the scheme should be more localised.

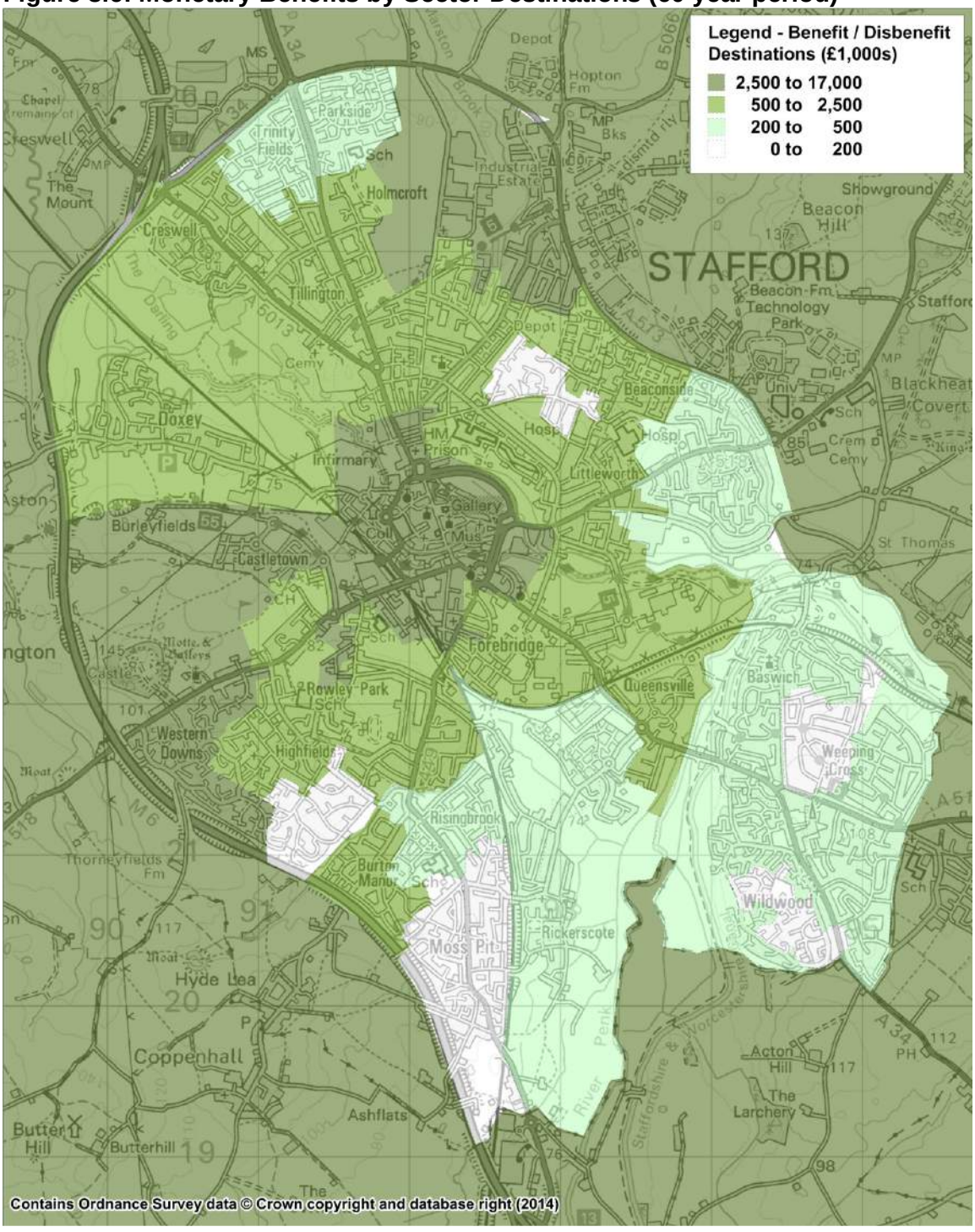
Table 3.17: Sectors Defined for the SWAR Study Area

Name	Sector	Name	Sector
Forebridge	1, 4, 16	Manor	19, 25, 26, 27
Littleworth	2, 3, 14, 15	Weeping Cross	23, 24, 39, 40
Rowley	5, 6, 20	Highfields / Western Downs	28, 29, 30, 31
Tillington	7, 32, 33	Baswich	36, 37, 38
Holmcroft	8, 21, 34, 35	West	41
Common	9, 10, 22	South	42
Coton	11, 12, 13	East	43
Penkside	17, 18	North	44

Figure 3.5: Detailed Sector System

To understand where the benefits lie geographically, the detailed sector diagram has been used to produce a benefit diagram by destination sector as seen in Figure 3.6. The benefits shown are for the combined AM and PM peaks over the 60 year appraisal period. It demonstrates that benefits are seen for all sectors with a particularly strong focus in the town centre and west. The north of Stafford also achieves significant benefits with only the southern sectors producing a lower level of benefits as expected.

Figure 3.6: Monetary Benefits by Sector Destinations (60 year period)



3.6 Environmental Impact

The Environmental Impact assessment produced for this business case will form the basis for the more detailed Environmental Statement to be completed as part of the planning process. The formal Environmental Impact Assessment process is underway and a scoping report was completed in April 2014 and is provided in Appendix 3.8.

3.6.1 Noise

The noise assessment has been undertaken following the methodology of TAG Unit A3. An estimation of the population annoyed with and without the scheme has been assessed together with a monetary valuation of the predicted noise changes.

For freely flowing traffic in the long term, a difference of around 3 dB in noise level is required before there is a statistically significant change in the average assessment of noise nuisance; however for short term changes (e.g. on scheme opening) a change of 1 dB may be significant.

Detailed noise modelling has been undertaken to establish the likely noise changes at residential receptors within 600 metres of the scheme in the opening year of 2018 and future assessment year 15 years after opening in 2033. Properties in the wider area likely to experience noise changes have also been identified. Noisemap Server Edition environmental noise mapping software calculates in direct accordance with the methodology of the DoT/Welsh office document Calculation of Road Traffic Noise. The main inputs to the model include:

- Three dimensional ground contour data
- Ground type (i.e. significant areas of hard or soft ground and/or water)
- Buildings (assumed 7m height)
- Three dimensional road alignments (existing and proposed)
- Detailed traffic data

The three dimensional ground contour data was obtained from Intermap Mapping Data - Digital Terrain Model. Building outlines, ground type and existing road alignments were obtained from Ordnance Survey Mastermap data. The proposed route was modelled using a three dimensional AutoCAD® model of the road provided by Staffordshire County Council.

Existing roads were assumed to be at local ground level as determined from the supplied digital terrain model; with the exception of the bridge over the West Coast Main Line (WCML) on Doxey Road which was modelled using height information provided for the “with scheme” three dimensional drawings.

Noise levels were calculated at selected receptor points at a height of 4m above local ground datum (approximately equivalent to first floor level). Night-time noise levels were derived from the 18 hour daytime traffic flows using Method 3 of the TRL report “Converting the UK traffic noise index LA10,18h to EU noise indices for noise mapping”.

The locations of existing residential properties within 600m of the scheme were identified using The National Land and Property Gazetteer (NLPG) address data. Non-residential addresses were excluded from the assessment. Additional prediction points representative of the proposed new housing associated with the developments in Table 3.18 were added to the Noisemap model. No additional building outlines were added to represent the committed development, since the details of these are not known at this stage.

Table 3.18: Committed Development

Development	Assumed number of properties within 600m of scheme (opening year)	Assumed number of properties within 600m of scheme (future year)
H22- A Stafford West SDL Castlefields, Burleyfields (Taylor Wimpey)	70	254
H22-B Land either side of Kingsway (Taylor Wimpey)	180	180
H23 Stafford West SDL St Gobain (Bellway)	0	150
H24 Stafford West SDL (St Modwens)	0	80

Traffic data for the noise model has been provided from the SATURN model for the 'with scheme' and 'without scheme' scenarios in the opening year (2018) and the future assessment year (2033). As required by the CRTN methodology, the data includes 18 hour annual average weekday traffic (AAWT) flows, percentage heavy vehicles and average daily traffic speeds.

The national average household occupancy of 2.4 people per household (2011 Census) has been assumed in the assessment. This has been multiplied by the number of properties to estimate the population exposed within each noise band. The total number of ground floor properties assessed within 600 metres of the route was 2,687 in the opening year (2018) and 3,101 in the 15th year after opening (2033).

Assessment Results

Overall a dis-benefit in terms of noise of £399,648 (2010 values and prices) has been calculated for the 60 year appraisal period. This has been included in the TEE table for the scheme. The noise predictions for the future assessment year indicate that the scheme would only give rise to a net increase of 12 people highly annoyed by noise compared to the do-minimum situation.

The implementation of the scheme is predicted to result in neutral impacts at the vast majority of receptors in both the opening and future forecast years. In the opening year (2018) a small number of properties situated near to the scheme around Timberfield Road, Rosewood Gardens and North Castle Street are predicted to experience increases in noise of greater than 1 dB $L_{Aeq,18hr}$. This is due to a combination of increases in traffic on Doxey Road coupled with contributions from new road segments.

Where Doxey Road is moving away from sensitive receptors, decreases in noise of greater than 1 dB $L_{Aeq,18hr}$ are expected at the closest receptors.
Further away from the scheme, but still within the 600 metre calculation area, properties around Martin Drive, Kingsway and Rowley Street are also predicted to experience increases in noise of over 1 dB $L_{Aeq,18hr}$ in 2018. Changes in roadside noise levels outside the 600 metre calculation area are predicted to be generally neutral, however, small increases of 1 dB $L_{Aeq,18hr}$ in roadside noise levels are predicted around Friars Road, Austin Friars and Park Street in the opening year. There are approximately 219 properties within 50 metres of these three roads.

Increases in traffic on these roads will be due to potential changes in the re-routing of traffic that is making use of freed up capacity on other roads created by delivering the Western Access Route, resulting in an increase in traffic flows of over 25% which is significant in terms of noise. However the flows on Friars Road, Austin Friars, Park Street and Rowley Street have not been individually validated during the traffic model development which may mean that the level of traffic could potentially be over-represented.

In 2033, only a small number of properties (predominantly around Martin Drive) are predicted to experience increases in noise of greater than 3 dB $L_{Aeq,18hr}$ with the scheme when compared with the opening year do-minimum situation.

The population annoyed in the long term in each scenario and the net present value of the scheme is provided in Table 3.19 together with other key impacts resulting from the scheme. The TAG worksheets are provided in Appendix 3.9.

Table 3.19: Summary of Key Impacts

Summary of Key Impacts	**Quantitative Assessment**	**Monetary £NPV (60 years)**
Noise increases are expected at some receptors due to traffic increases on Doxey Road coupled with contributions from new road segments. Where Doxey Road is moving away from sensitive receptors, decreases in noise are expected at the closest receptors. Increases in traffic flows on Martin Drive and Kingsway also give rise to noise increases in these locations. 81 receptors are predicted to exceed the relevant threshold of the noise insulation regulations in 2033. 449 receptors are predicted to be exposed to night noise levels over 55 dB Lnight in 2033 with the scheme, compared with 399 without the scheme.	Estimated number of people annoyed without-scheme in 2033 = **1039** Estimated number of people annoyed with-scheme in 2033 = **1051** Net increase of **12** people annoyed in long term with the scheme in 2033.	**-£399,648**

Table 3.19 makes reference to the number of receptors predicted to be exposed above the relevant threshold (68 dB $L_{A10,18hr}$) of the Noise Insulation Regulations in 2033 as

required by TAG Unit A3. This is not indicative of the likely numbers of noise insulation qualifiers as it gives no indication of whether they will meet the other criteria of the Regulations such as proximity to the new or altered route and 1 dB increase in noise directly as a result of the new or altered route.

A more detailed assessment will be undertaken to assess the eligibility of properties for insulation or grants by taking into account noise contributions from new and altered sections of road as well as the location of noise-sensitive windows in each of the dwellings.

3.6.2 Air Quality

The Western Access Route has been assessed in general accordance with WebTAG and Highways Agency Design Manual for Roads and Bridges Volume 11 section 3, part 1, HA207/07 Air Quality, revision May 2007. The Air Quality Worksheet is provided in Appendix 3.9.

Daily average traffic flows, the proportion of heavy duty vehicles (HDVs), daily average, am and pm peak vehicle speeds, and road link lengths were used for the opening year (2018) and the two future years 2025 and 2033, for both the do-minimum and do-something scenarios. All traffic associated with development committed in the future years 2018, 2025 and 2033 was included within the traffic data. All roads were classed as 'type B' roads (urban roads) for the calculation of pollutant concentrations, and 'urban (not London)', for the calculation of emissions.

Criteria in DMRB HA207/07 Air Quality is based on a difference in one or more of the following parameters between the do-minimum and do-something scheme scenarios in the opening year:

- Road centreline alignment change by 5 metres or more; or
- Annual average daily traffic (AADT) flows change by 1,000 vehicles or more; or
- HDV flows change by 200 AADT or more; or
- Daily average speed change by 10 kilometres per hour (kph) or more; or
- Peak speed change by 20 kph or more.

Local Air Quality Assessment

This assessment gives a quantitative indication of whether the scheme would lead to an overall improvement or deterioration in air quality at properties. Pollutant concentrations decrease with increasing distance from the road, so concentrations were calculated at 20 metres, 70 metres, 115 metres and 175 metres from the road centre, on each road link in the network.

The concentrations were estimated using the DMRB air quality screening tool and the total annual mean NO_2 was calculated from the modelled road NO_x and background NO_2 using the latest revised 'NO_x to NO_2 conversion spreadsheet' Version 4.1 available from the tools on the Defra UK-AIR website.

The number of properties in 50 metre bands from the centre of each road link was counted out to a distance of 200 metres for the do-minimum and do-something

scenarios and then multiplied by the pollutant concentration calculated for that band. This was carried out for each of the four bands and the results added together to give a total for each scenario. In order to provide a consistent approach, properties were counted against the closest road in the affected road network. In order to account for housing which is committed in 2018 and 2025 but not yet built, it was assumed that the housing was in the nearest band to the road, i.e. within 50 metres of the closest affected road link, a conservative approach.

The do-minimum value was deducted from the do-something value for each affected road link. The overall assessment score was calculated by summing values over all road links, with an improvement (decrease in concentrations) having a negative value and a deterioration (increase in concentrations) having a positive value.

NLPG data obtained from Stafford Borough Council was used to determine the location and the number of residential properties within 200m of the affected road network. For each property, the dataset contains a unique identifier, national grid reference, and postal address. The data also contains a field for classification type, which can be used to screen the data to remove commercial addresses.

Comparison of Modelled and Monitored Data

In order to ensure confidence in the estimated results, concentrations were compared with monitored concentrations in the base year. There were two representative diffusion tube monitoring sites in Stafford with measured concentrations in 2013, just outside the affected road network. The measured concentrations were compared with those estimated using the DMRB and the results are presented in Table 3.20.

The initial comparison showed that the modelled NO_2 concentrations were within 25% of those monitored, indicating that the model had acceptable performance in accordance with DEFRA's local air quality management (LAQM) technical guidance. However, as the model was slightly underestimating in both cases, the total NO_2 concentrations were adjusted by a factor of 1.1, derived following the method given in DEFRA's LAQM technical guidance. This ensured that the modelled results were within 10% of the monitored concentrations as shown in Table 3.21. Modelled NO_2 concentrations in 2018 were therefore also adjusted by a factor of 1.1. PM_{10} concentrations were not adjusted as there was no monitoring data available to enable a comparison with the modelled data.

Table 3.20: Comparison of NO_2 Concentrations at Diffusion Tube Sites in Stafford

Diffusion Tube Site	NO_x Road Increment*	NO_2 background	Total NO_2 Modelled**	Monitored NO_2	% Difference (Modelled NO_2 – Monitored NO_2)/ Monitored NO_2	Monitored NO_2/ Modelled NO_2
DT22	11.3	16.4	22.1	26	-15.2	1.18
DT29	24.6	16.1	28.0	30	-6.8	1.07
Average Factor						1.1
*Estimated using DMRB **Calculated from DEFRA's NO_x to NO_2 Calculator v4.1						

Table 3.21: Comparison of Adjusted NO_2 Concentrations at Diffusion Tube Sites in Stafford

Diffusion Tube Site	Total NO_2 Modelled (Unadjusted)	Total NO_2 Modelled (Adjusted)	Monitored NO_2	% Difference (Adjusted Modelled NO_2 – Monitored NO_2)/ Monitored NO_2
DT22	22.1	24.6	26	-5.6
DT29	28.0	31.1	30	+3.8

Local Air Quality Results

The local air quality assessment results are summarised in Table 3.22. The assessment years looked at for NO_2 and PM_{10} are in line with WebTAG guidance.

There were not expected to be any exceedances of the annual average NO_2 or PM_{10} annual mean criteria at 20 metres from the road centreline at any location, in either the do-minimum or do-something scenarios in the opening year (2018). Additionally there are no Air Quality Management Areas affected by the scheme.

The assessment showed that there is expected to be a slight overall deterioration in exposure to NO_2 and PM_{10} with the scheme in 2018, as indicated by the positive assessment scores.

By 2025, there is expected to be a slight overall improvement in exposure to PM_{10} with the scheme, as indicated by the negative assessment score, although the number of properties with a deterioration is higher than those with an improvement. This can happen where there is a large decrease in pollutant concentrations. There may be more properties with a deterioration, but the deterioration may only be very small in each case eg. 0.01 ug/m3.

Table 3.22: Results of the Local Air Quality Assessment

Pollutant	Assessment Score (No. properties x concentration per band)	No. Properties with Improvement	No. Properties with No Change	No. Properties with Deterioration
NO_2 (2018)	+163.26	762	0	2517
PM_{10} (2018)	+32.04	762	0	2517
PM_{10} (2025)	-548.78	1394	0	1966
A positive assessment score indicates an overall deterioration in local air quality, while a negative assessment score indicates an overall improvement.				

Regional Air Quality Results

The regional air quality assessment considers emissions rather than concentrations at properties as emissions of air pollutants can travel further and can have longer term effects.

The same affected road network was used for regional air quality as for the local air quality assessment. Emissions of NO_x were calculated for the opening year and future year 2025, both with and without the scheme. The emissions were calculated using the

latest emission factors available from DEFRA's emissions factors toolkit (EFT) v6.0.1, released in July 2014, rather than using the emission factors inbuilt into the DMRB air quality screening tool which was last updated in 2007. Results were presented as the change in mass emissions of NO_x in tonnes per year.

Results from the regional air pollution assessment are presented in Table 3.23. Emissions of NO_x from the roads in the affected road network are shown for the do-minimum and do-something scenarios in the opening year 2018 and future year 2025. A decrease in emissions of NO_x is expected as a result of the scheme in both 2018 and 2025.

Table 3.23: Results of the Regional Air Pollution Assessment

Year	Scenario	NO_x Emissions (Tonnes per Year)
2018	Do-Minimum	14.7
	Do-Something	14.0
	Change	-0.7
2025	Do-Minimum	8.75
	Do-Something	8.61
	Change	-0.14

Economic Valuation of Air Pollution

Air quality impacts have been valued in line with TAG guidance which considers an appraisal period of 60 years and are summarised in Table 3.24. The valuation is undertaken for PM_{10} concentrations calculated in the local air quality assessment and NO_x emissions, calculated in the regional air pollution assessment.

There were no areas where the NO_2 limit value was expected to be exceeded, as determined by reviewing roadside concentrations given in DEFRA's Pollution Climate Mapping (PCM) model, hence the damage cost approach was followed rather than the marginal abatement cost (MAC) approach. Damage costs for NO_x emissions are reported in £ per tonne, while PM_{10} values are £ per household per 1 µg/m^3. The costs are derived from analysis by the Inter Departmental Group on Costs and Benefits (Air Quality) (IGCB(A)) of the typical health impacts arising from changes in air pollution. The values calculated for each of the 60 years of the appraisal period were discounted at standard HM Treasury rates to give a present value for that particular year. This was then summed over the appraisal period, to give the net present value (NPV) of the change in air quality.

The quantitative assessment shows a slight overall increase in PM_{10} concentrations with the scheme in 2018, but in 2025 there is a slightly larger overall decrease in concentrations. Over the 60 year appraisal period there is an overall net improvement. The assessment shows a reduction in regional emissions for NOx creating positive benefits over the 60 year period.

Table 3.24: Summary Results of the Air Quality Valuation

Criterion	Quantitative Assessment (2018)	Net Present Value of Change over 60 year Appraisal Period (2018 – 2077)	Total Value of Change in Air Quality
PM_{10} Concentrations	+32*	+£1,540,705	+£1,547,366
NO_x Emissions	-11 tonnes**	+£6,662	
A positive net present value indicates an overall benefit with the scheme, while a negative net present value indicates an overall adverse effect			

* net deterioration for opening year (number of properties x concentration per band)
** change in NO_x emissions over 60 year appraisal period

3.6.3 Greenhouse Gases

For consistency the same affected road network was used for the greenhouse gas assessment as for the local and regional air quality assessments.

Emissions were calculated using the latest emission factors available from the DEFRA Emissions Factors Toolkit (EFT) v6.0.1. Emissions of carbon dioxide were calculated for 2018, 2025 and 2033 for both the do-minimum and do-something scenarios. The EFT only provides emission factors up to 2030, so these were used to calculate the emissions in 2033. Emissions were linearly interpolated for the interim years. Post 2033, emissions were assumed to remain the same with no growth in traffic.

The results of the assessment were expressed as a set of mass emissions (tonnes of pollutant per year) for each year of the 60 year appraisal period. The difference in emissions, expressed in tonnes of carbon dioxide per annum, between the do-something and do-minimum scenario was calculated for each year. Monetary values are then applied to the changes in greenhouse gas emissions according to guidance by the Department for Energy and Climate Change (DECC). The value per tonne of CO^2 emissions was applied to the difference in emissions in each year. This value was then discounted at standard HM Treasure Rates and summated to give the NPV of the change in non-traded CO^2 emissions over the 60 year appraisal period using the TAG Greenhouse Gases Workbook (See Appendix 3.9).

Table 3.25 presents the change in estimated emissions of carbon dioxide in the do-something scenario when compared to the do-minimum scenario in the opening year 2018 and over the whole 60 year appraisal period. It also presents the net present value of the change in CO^2 emissions as a result of the scheme. Overall the scheme is expected to have an adverse effect resulting in an increase in CO^2 emissions and a negative net present value.

Table 3.25: Estimated Change in Emissions of Carbon Dioxide (Tonnes) and the Associated Net Present Value

Opening Year (2018)	Appraisal Period (2018 – 2077)	
Change in CO_2 Emissions (Tonnes)	**Change in CO_2 Emissions**	**Net Present Value of Change in CO_2 Emissions**
-210	+527 tonnes	-£32,886

3.6.4 Landscape

The policy objective is to maintain the current high quality of landscape in this area of Stafford, with an emphasis on ensuring development blends in unobtrusively. The area is already influenced by development but its impact is currently well contained by characteristic vegetation on the urban fringe. The characteristics of the landscape are highlighted in Figure 3.7 and the worksheet is provided in Appendix 3.9.

The section of the route north of Doxey Road is adjacent to an area of low lying marshland subdivided by watercourses and sparse areas of scrub and damp woodland. The scheme will result in the loss of wet woodland but this will be compensated by additional planting provided to enhance the landscape to give a slight beneficial impact. The side slopes of the Western Access Route will be sensitively landscaped throughout. The planting will be carried out using appropriate native species, which will also be chosen to ensure they are low maintenance.

The area includes a network of paths for informal recreation which contribute towards the cultural aspects of the landscape. The scheme includes proposals for extending the wildlife habitat adjacent to the Doxey and Tillington Marshes SSSI and providing a gateway to Doxey Marshes which is managed by Staffordshire Wildlife Trust. This will provide moderate benefits. The scheme will not affect levels of tranquillity in the area. There is currently a sense of separation from urban surroundings but with intrusion from local road and railway lines.

3.6.5 Townscape

The route passes through a variety of different land uses comprising industrial, commercial, residential and car parking. The different areas are of varying quality; the most valuable being the traditional, historic areas. Figure 3.8 highlights the points of interest in terms of townscape. The TAG worksheet is provided in Appendix 3.9.

To the north of the West Coast Main Line and Doxey Road is an area of modern housing fronted with three-storey town house style residential units which is largely unaffected by the proposals in townscape terms. However, Castletown is an area of locally distinctive traditional terraced houses having a traditional high density grid iron pattern. The route will have no impact on existing and remnant railway structures along Doxey Road.

The proposed position of the new Doxey Road/ Sainsbury's entrance roundabout moves traffic away from the edge of Castletown thus reducing any physical impact on this area. The remaining section of road will be used as a 'service road' to properties currently fronting Doxey Road; this will leave an area of land, between the new road and the existing, which can be suitably landscaped and planted. The new roundabout junction will substantially remove a copse of trees that has positive townscape value, at present, serving to mark the extant entrance and the transition between tight urban form and the more open car parking and Doxey Marshes areas. Replacement planting would be an advantage.

The northern section of the route passes through an area of open surface parking. However it will not sever any existing pedestrian movements between these facilities

and the town centre. It is not considered that the height of the elevated sections of carriageway on the viaduct will adversely affect the townscape assessment if appropriate design features are implemented, including appropriate surface treatment of the viaduct sides and pillars.

Madford Retail Park is located at the northern edge of the route and is now outside the boundary of Foregate & St.George's Conservation Area, following the rationalisation of the western edge of Character Area 1 of the conservation area. The access route will have no impact on this area in terms of townscape, as the type of buildings located here are common to town centres.

3.6.6 Historic Environment

The only designated feature along the course of the route is Foregate and St. George's Conservation Area which is dominated by a mixture of nineteenth and twentieth century development and is shown on Figure 3.8. The twentieth century retail park development has already had a negative impact on the character of the Conservation Area, however elements do survive including the old Stafford Infirmary building, terraced housing and factory buildings. It is considered that there will be a neutral impact as traffic flows provided by the SATURN model show a reduction in traffic in both the AM and PM peaks along Foregate Street adjacent to these surviving buildings.

The route clips the edge of a series of well-preserved 19th century water meadows which are located within the boundary of Doxey and Tillington Marshes Site of Special Scientific Interest (SSSI). The water meadows survive in good condition although along the majority of the proposed route all earthworks have been removed. The impact of the route on the water meadow is therefore neutral.

There will also be a neutral impact on the Stafford to Uttoxeter and Stafford to Wellington dismantled railway lines which are bisected by the access route. Although the lines have influenced the wider development of the town in this area, they now only survive in a relatively poor condition.

It is possible that palaeoenvironmental remains are present within the impacted area which results in a potentially negative impact on anything that may be present along the route. However, no palaeoenvironmental work has been conducted in this area to test the potential condition of surviving remains. The Historic Environmental Records (HER) suggests that there is low potential for archaeological remains to be associated with palaeoenvironmental remains. It is considered that there will be minimal direct impact; however there is the potential for indirect impacts in terms of changes to the water table in the SSSI. A slight adverse assessment has therefore been made of the impact on the Historic Environment because of this unknown level of remains and their importance.

Appropriate archaeological mitigation will be implemented at relevant stages within the project. The form and scale of the mitigation response will be determined at detailed design stage in consultation with Staffordshire County Council's Principal Archaeologist. Taking into consideration the low potential for archaeological remains across the length of the route, it is considered that no pre-determination archaeological investigations would be appropriate in this instance. The worksheet is provided in Appendix 3.9.

Figure 3.7
Landscape Constraints and Mitigation

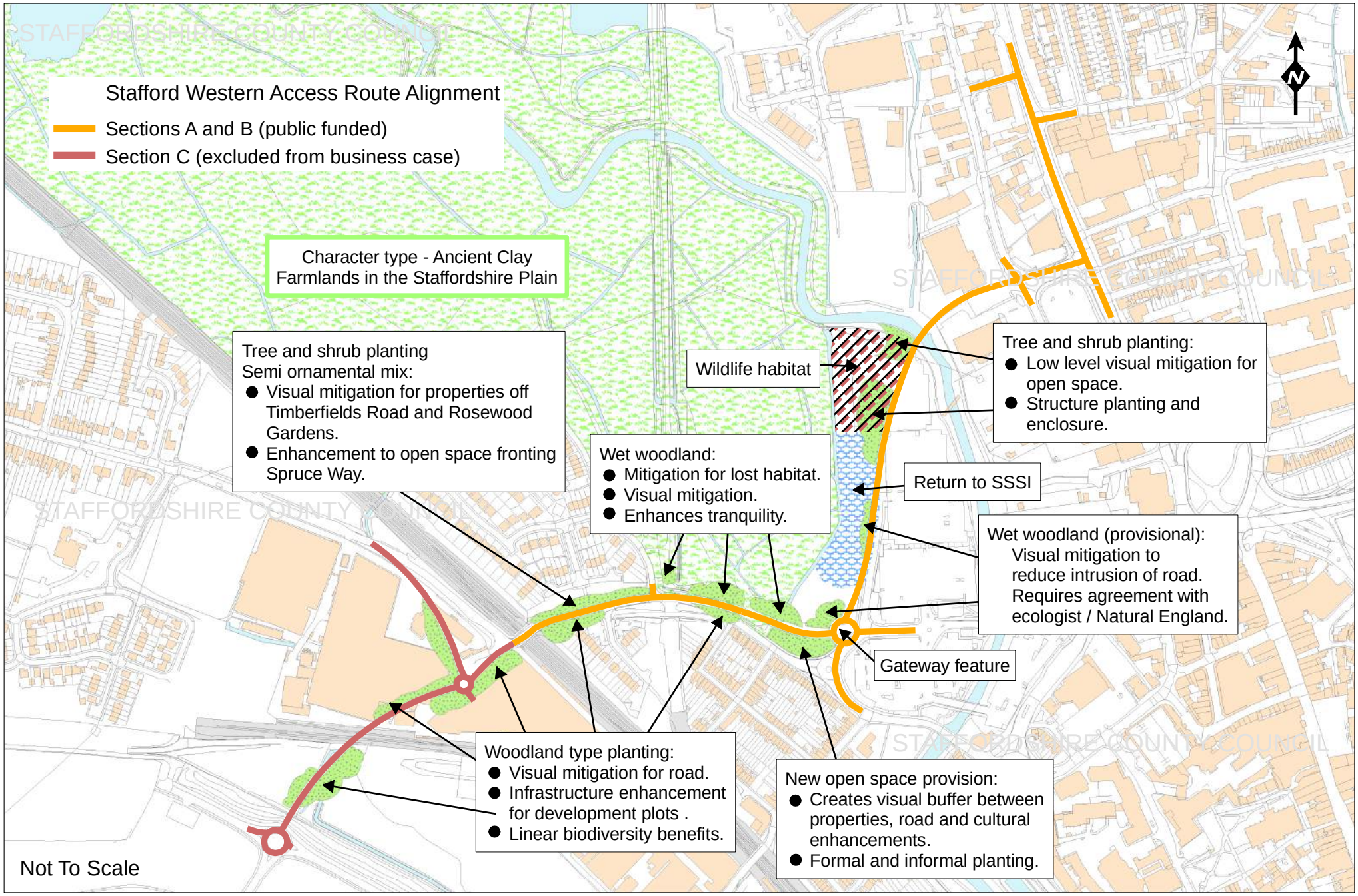
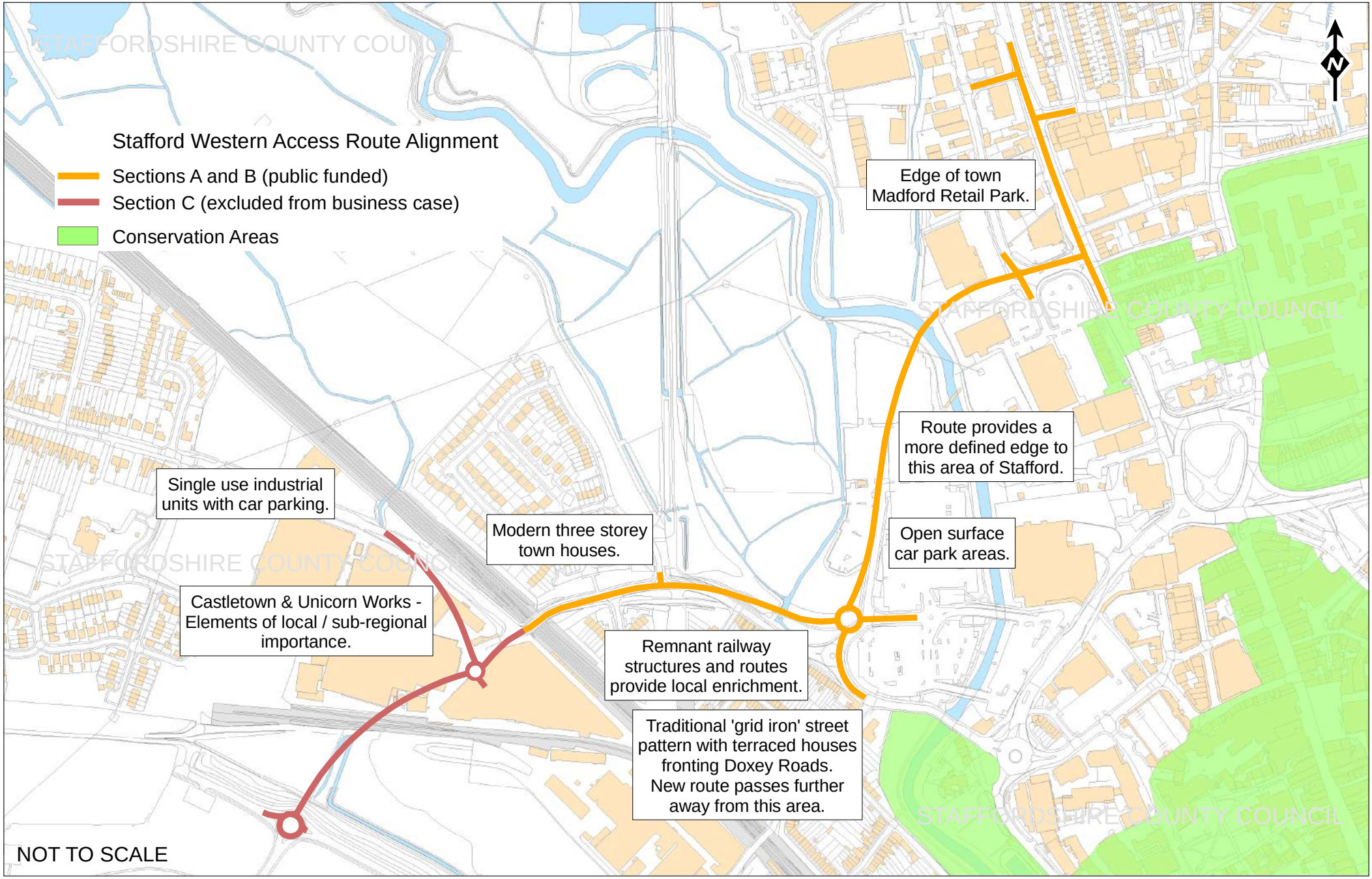


Figure 3.8
Townscape and Heritage Constraints



3.6.7 Biodiversity

Biodiversity is an important consideration for this scheme and an outline of the environmental constraints and mitigation opportunities is shown in Figure 3.9. The Site of Special Scientific Interest (SSSI) is within the River Sow floodplain and supports a wide range of protected and rare species. The site is of ornithological importance all year round and has special significance for the number of breeding snipe *Gallinago gallinago*. Work is ongoing with Natural England to minimise any potential impacts on biodiversity and mitigation measures have already been agreed. Consultations will also continue with the Environment Agency and Staffordshire Wildlife Trust who manage the SSSI. Works will take account of the Water Level Management Plan for the SSSI.

The road passes through an area of wet woodland and swamp on the edge of the SSSI and an area of SSSI classified as destroyed as it is currently in use as a service road and car park. The area immediately to the west of the alignment will be provided in compensation for the small area affected as an area of SSSI restoration. The scheme has therefore been assessed as neutral in terms of its impact on the SSSI.

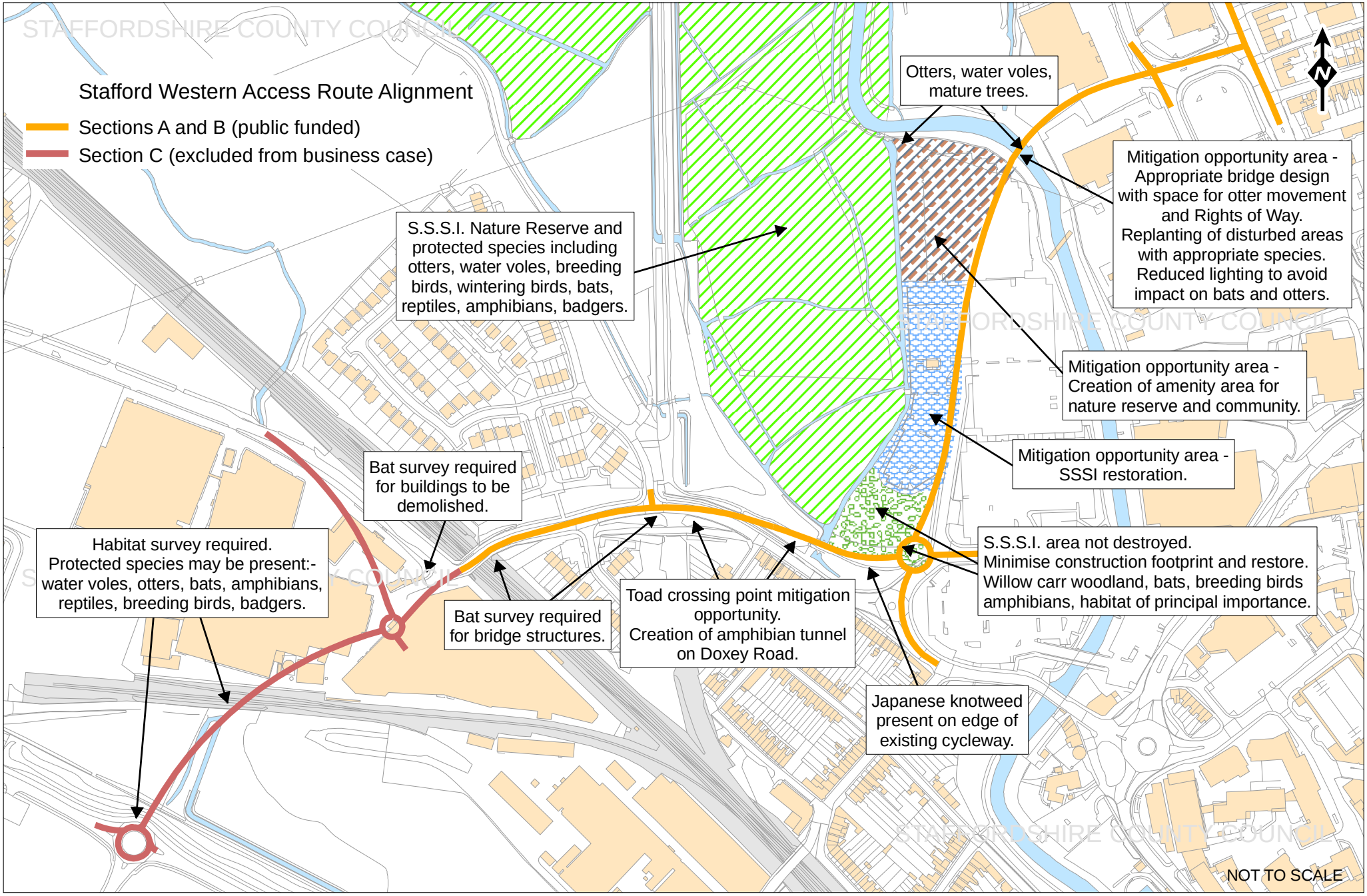
The new roundabout on Doxey Road at the entrance to Sainsbury's will impinge on an area of willow carr woodland within the SSSI which is a habitat of principle importance (UK Biodiversity Strategy). A number of species may be present, particularly bats, birds and amphibians. Surveys will assess presence and inform mitigation which will be included in the scheme. Beyond this woodland is an area of SSSI swamp habitat which will be protected through minimisation of the construction footprint and any necessary restoration. The Doxey Road area of the scheme will also require consideration of a species of principal importance: common toad, a large population of which has an established point of crossing. There is the potential of bats utilising disused railway structures and other structures affected or adjacent to the road. Surveys will inform mitigation for these species.

The impact of the route on the River Sow has been assessed as slight adverse/ neutral. The river has high biodiversity value due to the presence of water voles, otters, bats and mature trees. The design of the bridge will include space for otter movement and careful design of the associated lighting will reduce the impact on both bats and otters. Mitigation will include the replanting of any disturbed areas with native species.

The worksheet is provided in Appendix 3.9.

Figure 3.9

Biodiversity Constraints and Mitigation



3.6.8 Water Environment

The preferred route passes through land that has a 1 in 100 or greater annual probability of river flooding (flood zone 3) and between a 1 in 100 and 1 in 1,000 annual probability of river flooding (flood zone 2). The flood zones are shown on Figure 3.10 and the location of the road in relation to watercourses is shown on Figure 3.11. The route crosses Doxey Drain, Pan's Drain and the River Sow and Table 3.26 classifies the importance of the relevant water receptors and features.

Table 3.26: Water Environment Receptors and Importance

Water Environment Feature	Importance
River Sow	Medium
Doxey Drain	Medium
Pan's Drain	Medium
Tillington Drain (not crossed by the road)	Medium
Doxey and Tillington Marshes SSSI	Very high
Groundwater	Low
Flood Risk	High

Staffordshire County Council will work closely with the Environment Agency, the Sow and Penk Internal Drainage Board and Natural England to agree working methods. The Environment Agency response to the road proposal is provided in Appendix 3.10. They consider the Western Access Route to be classified as essential infrastructure as defined in the National Planning Policy Framework Technical Guidance. In order for the road proposal to be acceptable to the Environment Agency, it will:

- Provide wider sustainable benefits to the community that outweigh flood risk
- Be built on previously developed land (at least 80% of the route will be constructed across PDL and existing highway)
- Not increase flood risk elsewhere, and wherever possible, will reduce flood risk overall

A detailed Hydrological Assessment, Flood Risk Assessment and a Contaminated Land Preliminary Risk Assessment are being completed to inform the Environmental Impact Assessment and the Planning Application. Although water quality and flood mitigation measures are already included in the scheme design, additional mitigation measures may be identified as part of these further assessments to ensure that the final design for the scheme will have a neutral impact. These investigations will primarily focus on road drainage proposals, the construction methodology of the viaduct, further assessment of the connectivity of the shallow groundwater and the sensitive water environment of the SSSI.

Based on existing evidence, the impact of the scheme on the River Sow is considered to be insignificant in terms of flow regime and of low significance in terms of quality and flood risk. The quality of water and change of flood impact are unlikely to be altered for the drains and the SSSI. The effect on groundwater flow and quality is also expected to be of low significance due to the unimportant nature of the groundwater as a resource. However, due to the fact that detailed assessments have not yet been completed the Western Access Route has currently been given a WebTAG assessment

of slight adverse which is considered to be the worst case scenario. The worksheet is provided in Appendix 3.9.

Surface Water Quality

Without the necessary mitigation measures, the route has the potential to negatively impact on water quality through the introduction of pollutants during the construction process and suspended solids in runoff which could then discharge to local watercourses. The implementation of good working practices and mitigation measures will ensure pollution is limited, leading to an impact of low significance on water quality. Before commencing any construction work the Environment Agency's Pollution Prevention Guidance note 5 will be referred to.

During the operation of the road, the impact on suspended solids and contaminants on the surface watercourses as a result of vehicle movements would be mitigated by the proposed road drainage scheme and as such the resultant impact is determined to be insignificant. With a suitable road drainage scheme in place no road discharges should be made to the SSSI which is primarily located up-gradient of the scheme. Water quality of receiving watercourses will not diminish in line with the European Water Framework Directive. Sustainable Drainage (SuDS) techniques will be used where appropriate and green/open drainage features will be used where possible.

River Flow, Runoff and Flood Risk

The Flood Risk Assessment is being completed and will comply with the National Planning Policy Framework (Section 10) and the accompanying Technical Guidance. The Sequential Test will be applied by Stafford Borough Council, based on the Strategic Flood Risk Assessment for the district. This will confirm that there is no reasonable alternative but to develop in the floodplain.

There is the potential for increased infiltration as a result of the construction process and therefore a reduction in runoff to the surrounding watercourses. However, as there is connectivity between the shallow groundwater aquifer and the watercourses, there is unlikely to be a reduction in the base flow to the watercourses. Therefore, the short term impact of construction on the surface water flow is considered to be insignificant.

Agreement with the Environment Agency and Natural England will be required in relation to the method of construction of the foundations of the viaduct adjacent to the SSSI to minimise impacts. Appropriate mitigation measures will be required to avoid the potential for a significant adverse impact on the water table and surrounding water surface features. This is possible where pumping of groundwater levels is required and water is discharged to local watercourses, potentially increasing flood risk. Such impacts during construction should be both temporary and reversible provided that appropriate management and mitigation measures are employed.

Once operational, the potential impact of the access route in terms of flood risk is deemed to be of low significance due to the following:

- Increasing the volume and speed of runoff where permeable ground material has been replaced with impermeable road surface, potentially increases local flood risk within adjacent watercourses. However the implementation of the road's drainage system would control runoff to prevent an increase in flooding.

- The supporting columns of the viaduct which are located within the floodplain will be designed to ensure that they do not impact on flood flow paths particularly for the management of the SSSI.

Groundwater Quality

Reference to the 1:50,000 scale geological map Sheet 139 (Stafford) indicates that the site is located on Triassic Mercia Mudstone which is designated a 'Non Aquifer' by the Environment Agency. It predominantly has lower permeability layers which may store and yield limited amounts of groundwater. Superficial Alluvium and Glaciofluvial deposits are indicated for the site which are designated as 'Minor-Aquifers' by the Environment Agency. They have permeable layers capable of supporting local water supplies and can form the base flow to rivers. With the implementation of the road drainage network the impact of the scheme in terms of groundwater quality is likely to be insignificant.

During construction, spillages of contaminants on permeable ground could directly impact on groundwater quality. However, due to the likely connectivity between the shallow groundwater and river base flow the impact of such discharges in the short term is considered to have low significance. This will be reduced to insignificant with appropriate management and mitigation measures. The SSSI is predominantly located up groundwater gradient of the scheme however the connectivity between the shallow groundwater and the SSSI suggests there could be a low significance for this area.

As part of the planning application, a Preliminary Risk Assessment will be carried out identifying the potential for contamination and possible risks to 'Controlled Waters' receptors (the underlying Minor Aquifers, watercourses and the SSSI). This will include an assessment of the likely sources and pathways of contaminants and the risks posed to 'Controlled Waters' and the potential options for breaking the source-pathway-receptor linkage.

Groundwater Flow

The geology suggests connectivity between the shallow groundwater and the surface watercourses. Mitigation measures will be implemented to reduce the impact on groundwater flow if pumping is required for constructing the viaduct foundations. However, the impact on the minor aquifer would be insignificant due to its low level of importance. Appropriate mitigation measures will ensure the impact on the SSSI is of low significance as a result of the connectivity between the shallow groundwater and the SSSI.

There is the potential for increased infiltration into the shallow aquifer as a result of the construction process which has the potential to increase groundwater flow. However this is likely to have an insignificant impact. It is likely that the long-term implication on groundwater flow in the area of the SSSI will be of low significance resulting from the permanent placement of the viaduct foundations, due to the permeable nature of the Glaciofluvial Deposits.

Figure 3.10
Flood Zones

Environment Agency Flood Zones 1 in 100

Environment Agency Flood Zones 1 in 1000

Stafford Western Access Route Alignment

Sections A and B (public funded)

Section C (excluded from business case)

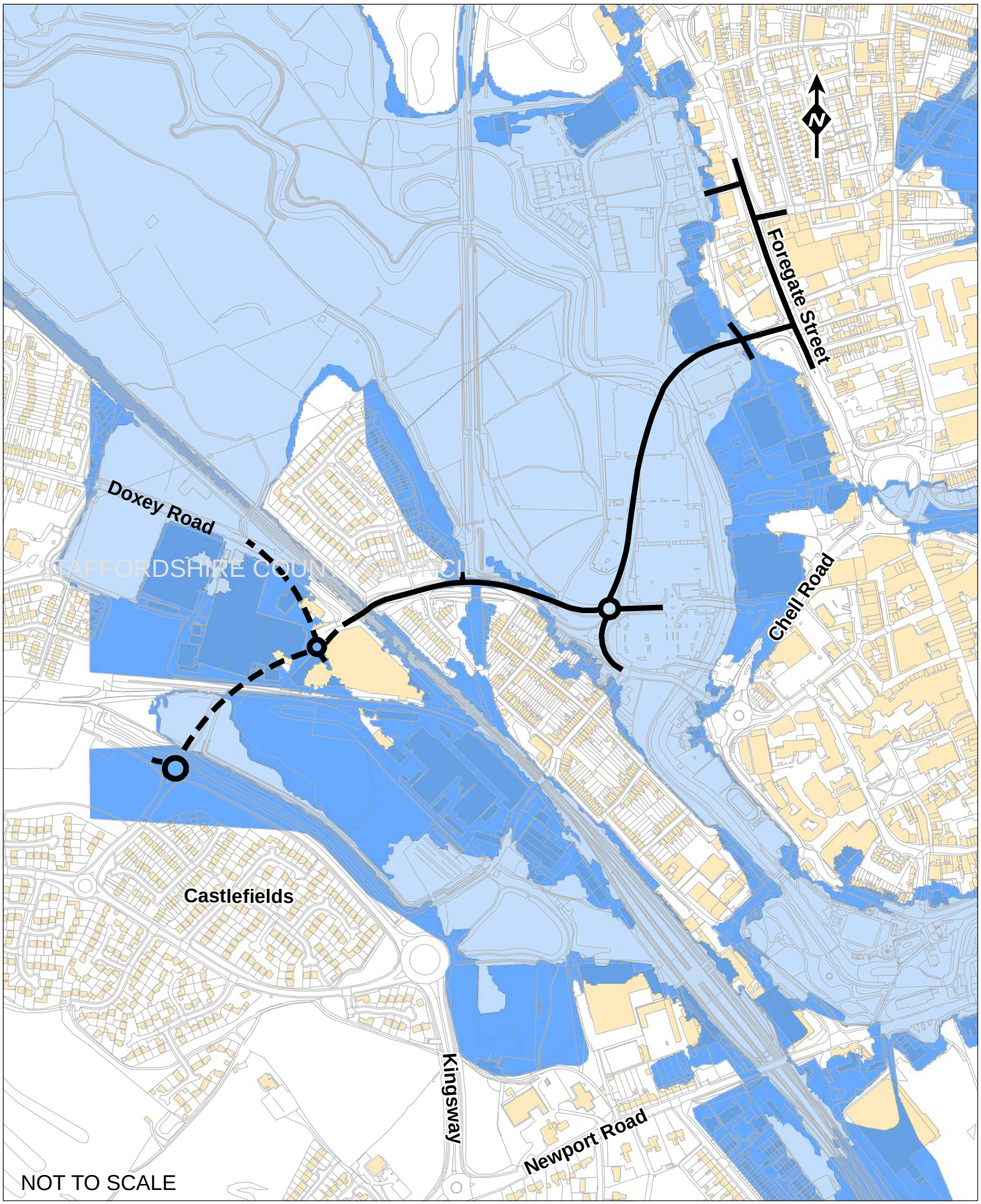
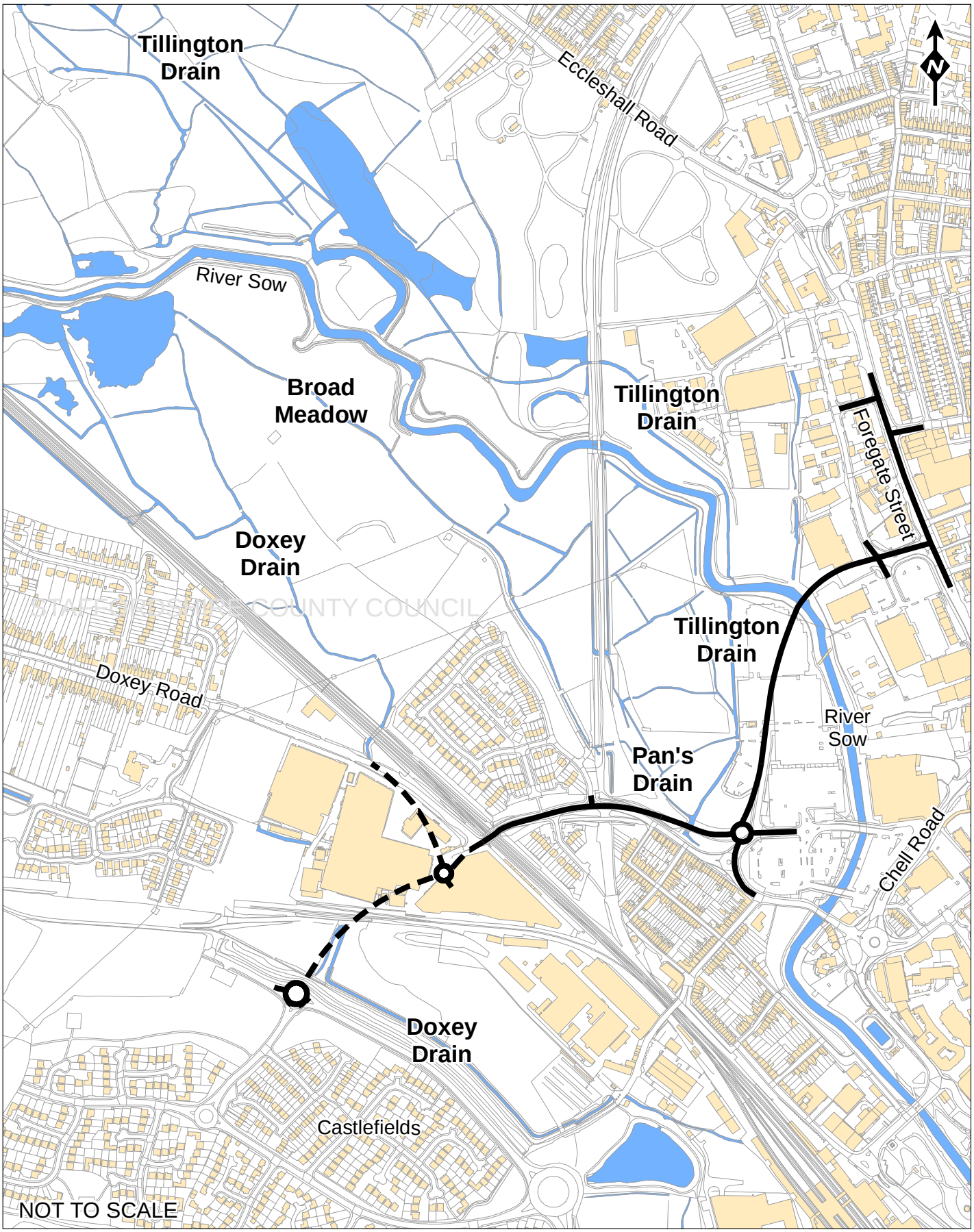


Figure 3.11
Local Watercourses

Stafford Western Access Route Alignment

Sections A and B (public funded) — — — Section C (excluded from business case)



3.7 Social Impact

3.7.1 Commuting and Other User Benefits

The scheme generates large overall benefits for commuters and other users from travel time savings as a result of the new road. These are slightly offset by an increase in vehicle operating cost and delays during the construction of the scheme.

Table 3.5 in the Economic Impact chapter presents the Transport Economic Efficiency (TEE) benefits. Out of the benefits amounting to £93.6 million over the 60-year project lifetime, £61.127m is attributable to benefits for commuters and other users. This is a sensible proportion as, whilst business users have a higher value of time, consumer users form a significantly higher proportion of total road users. These benefits are generated by travel time and vehicle operating cost savings as the scheme will provide a shorter route for many trips. The reduced congestion in the town centre resulting from the scheme will also provide time savings for traffic not directly using the new road.

3.7.2 Reliability Impact (Commuting and Other Users)

The journey time reliability benefits analysis identifies approximately £16.2m benefits due to the scheme with £10.73m generated for commuters and other users. It should be noted, however, that these benefits are not included in the scheme PVB or within the TEE table.

3.7.3 Physical Activity

The impact of the scheme on health and physical activity as a result of changes in walking and cycling has been assessed. Walking and cycling facilities will be provided along the Stafford Western Access Route that will take travellers to the western edge of the town centre and directly to facilities such as employment, retail and education. The scheme provides an alternative route for walkers and cyclists that will have a similar travel time to existing routes. Additional pedestrians and cyclists may therefore be encouraged by this increase in available facilities. When Section C is constructed, the scheme will also provide a more direct and attractive walking and cycling route for school children between Doxey and the catchment area high school at Highfields, although any potential physical fitness benefits have not been measured.

The extent of existing walking and cycling journeys has been estimated utilising origin and destination data by mode from the Castlefields Travel Survey conducted in 2009 (see Appendix 3.11 for details). The Castlefields area of Stafford is located adjacent to the Western Access Route and is geographically most similar to potential housing development in the area.

All households on the Castlefields estate were surveyed which involved sending out 402 questionnaires. Overall 131 survey forms were returned giving a response rate of 33%. The main part of the survey was a single day travel diary which allowed respondents to complete the details of up to eight journeys. Information required included the origin and destination, mode of travel and journey purpose. Mapping the

location of trip ends enabled consideration of the number of journeys likely to benefit from the Stafford Western Access Route.

Applying the methodology provided in TAG Unit 3.14.1 to forecast changes in the numbers of cyclists results in a negligible change. However, as the existing modal share for cyclists is very small, the data available was not considered sufficient to give statistical confidence in the results. Therefore it is reasonable to assume no change in the number of cyclists. The existing number of pedestrians travelling from this area to the town centre is quite large and there is no local data to suggest that this level will increase.

The additional number of pedestrians and cyclists expected as a result of the new walking and cycling facility along the access route has therefore been assessed to be insignificant in terms of increasing physical activity. However, the sustainable complimentary measure detailed in Section 2.5.7 will also improve walking and cycling facilities for residents. They have not been included as part of this assessment but are likely to encourage additional walk and cycle journeys.

3.7.4 Journey Quality

The quality of a journey including traveller care, travellers' view and traveller stress has been assessed. Traveller care is subdivided into cleanliness, facilities, information and environment. Cleanliness and facilities are not applicable to this scheme as they relate to the provision of lay-bys, toilets and service areas. Environment is applicable to public transport schemes as it encompasses issues such as overcrowding and temperature. Existing highway and public transport routes through Stafford town centre have good quality information including directional signs and general travel information, and this will be maintained on the Western Access Route. In terms of route uncertainty, the impact of the Western Access Route will be neutral. Signage will be provided on the new route to a quality that is comparable with existing routes.

The views available to travellers along routes through Stafford town centre typically contain a mixture of housing and business properties, some of which have locally distinctive architecture. Part of the existing route passes Victoria Park, but overall the views are intermittent because of the town centre buildings. The proposed route will take walkers, cyclists and car drivers past the edge of Doxey and Tillington Marshes SSSI on an elevated road surface, providing open views across the marshes where there is a wide variety of birds. These views are not currently experienced by travellers.

Frustration experienced by travellers includes the layout and condition of the road and an ability to make good progress. Without the scheme, travellers in Stafford will experience congestion in future years which will reduce their ability to make good progress. Implementation of the proposed scheme will help to alleviate this, reducing traveller frustration. The layout and geometry of existing routes in Stafford is good quality and this will be maintained along the Western Access Route. With the construction of Section C, there will also be benefits for school children walking and cycling between Doxey and the catchment area for the high school at Highfields.

Fear of potential accidents is a possibility on the existing routes in Stafford town centre because of the large pedestrian movements in some areas. The proposed route avoids these areas of potential conflict reducing the fear of accidents for travellers.

Overall, the implementation of the scheme will provide increased journey quality and as the number of users per week day could be around 20,000, the overall assessment score is large beneficial. The worksheet is provided in Appendix 3.9.

3.7.5 Accidents

Figure 3.12 shows the location of all accidents occurring over the five year period between January 2008 and December 2012 across the area covered by the model. Closer investigation of this highlights the number and severity of Personal Injury Accidents (PIAs) as shown in Table 3.27.

Table 3.27: Personal Injury Accidents

Year	Fatal	Serious	Slight	Total
2008	3	18	207	228
2009	4	10	176	190
2010	1	9	176	186
2011	3	11	168	182
2012	0	10	161	171
Average per Year	2.2	11.6	177.6	191.4

Table 3.28 presents the modelled accidents calculated by COBALT for the 60 year appraisal period and the overall difference in the number of accidents / casualties between the do-minimum and do-something scenarios.

Table 3.28: Modelled Accidents in 60 Year Appraisal Period

Scenario	PIAs	Casualties by Severity		
		Fatal	Serious	Slight
Do-Minimum (a)	35,951	554	4411	49,411
Do-Something (b)	35,959	553	4406	49,420
Difference (a) – (b)	-8	1	5	-9

The net benefits created by the scheme are small. Improvements are predicted to occur on the alternative routes to Western Access Route where trips are re-assigning onto the new road. This reduction largely occurs in the town centre on roads including Chell Road and A34 Foregate Street. Dis-benefits occur on the new sections of highway in addition to the section of Doxey Road used as part of the new route. Other dis-benefits are seen on A518 Newport Road, west of the scheme, and the A34 north of the scheme, as traffic is now channelled onto these roads to access the new road. The County Council will monitor the routes that may be adversely affected and will remediate as appropriate as part of an ongoing commitment to improving road safety. The spatial distribution of accident benefits are shown in Figure 3.13.

The change in number of accidents / casualties, and in the severity of injuries, has been converted into a monetary value based on the accident rates and values set out in COBALT. The cost of accidents in the 'Do-Minimum' and 'Do-Something' scenarios

amount to £2,206 million and £2,204 million respectively, generating an accident 'benefit' of £1.798 million over the 60-year project lifetime.

Figure 3.12: Five Year Accident Locations

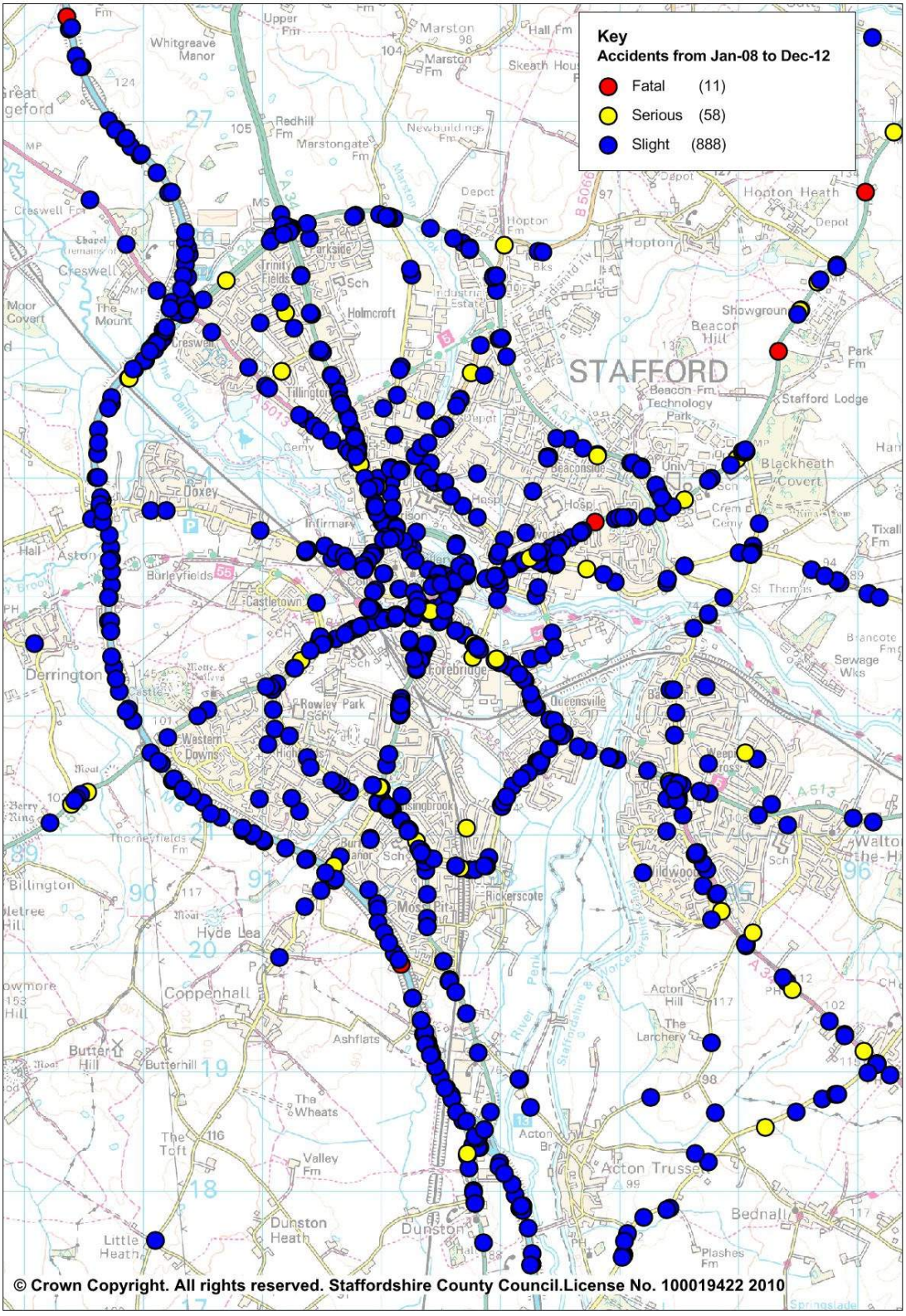
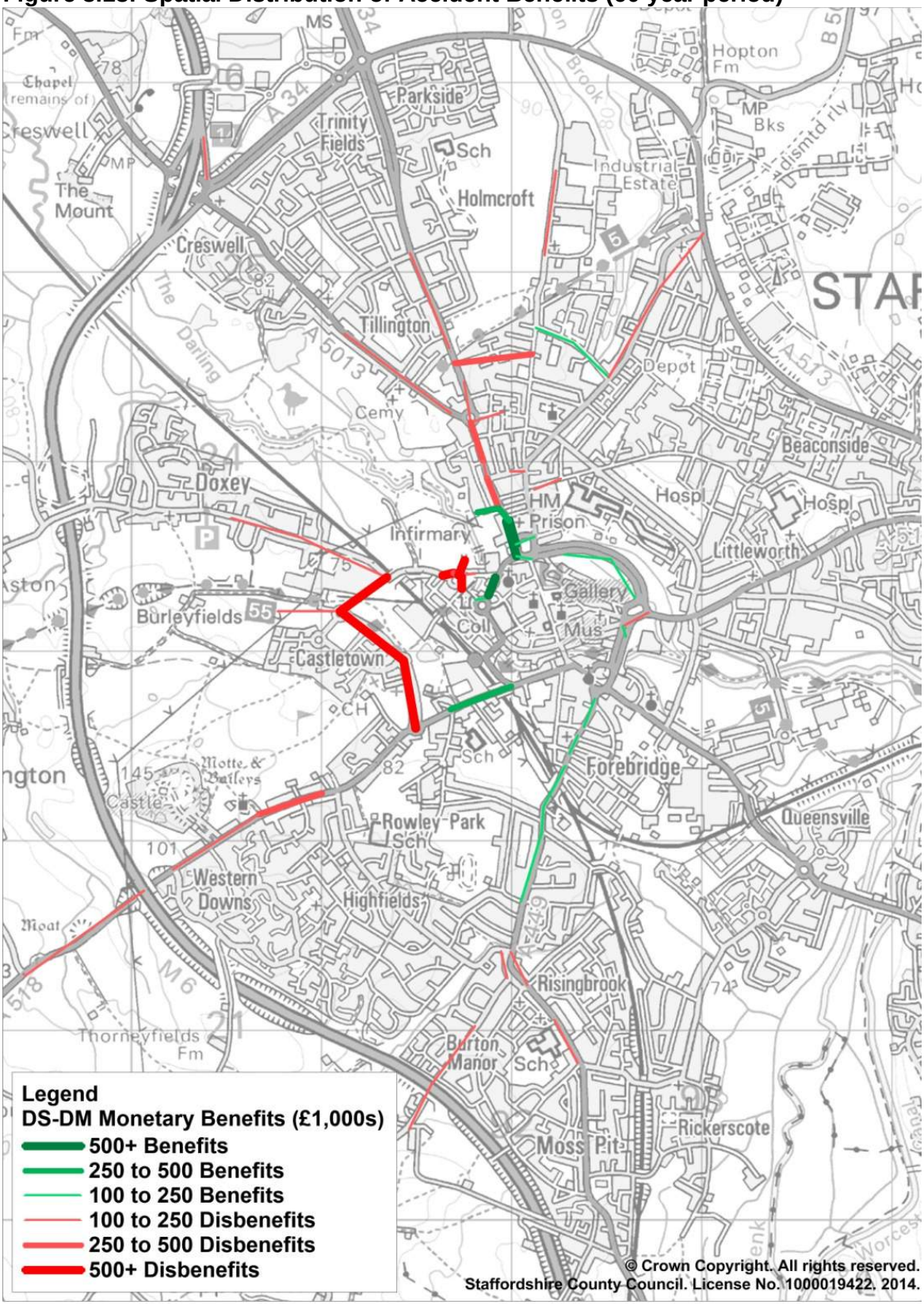


Figure 3.13: Spatial Distribution of Accident Benefits (60 year period)



3.7.6 Security

The degree of change in levels of security for road users, public transport passengers and freight, combined with the number of travellers affected has been assessed. It is concluded that the impact of the scheme on security will be neutral for the following reasons:

- There will be no change in formal surveillance with the scheme in place as Stafford town centre already has a high level of CCTV operated by Staffordshire County Council and Stafford Borough Council.
- The existing routes in the town centre have good visibility and are assessed as moderate in terms of informal surveillance as they are overlooked by residential and business properties. Current levels of informal surveillance will be maintained as parts of the new access route will also be overlooked by residential development and public car parks.
- There is currently a moderate level of landscaping creating concealed areas in the town centre and this will also be the case along the proposed access route.
- Lighting and visibility is currently high within the town centre and the scheme will also be designed to a high standard. Existing pedestrian and cycling facilities in the town are also well lit and designed for visibility and there are no underpasses where personal security may be an issue. There will be shared footway/ cycleways along the new route which will also be designed to a high standard in terms of visibility and lighting.

The worksheet is provided in Appendix 3.9.

3.7.7 Access to Services

Access to services considers the range of opportunities and choices people have in connecting with jobs, services and friends and family. The scheme does not include changes in services, routing or timings of current public transport services. The scheme will provide a connection between the A518 Newport Road, new homes in the West of Stafford Strategic Development Location and the Doxey Road. This will facilitate better bus penetration of the new housing development and access to more town centre locations including Chell Road and the rail station. This will help to ensure accessibility for residents of the new housing without access to a car.

3.7.8 Personal Affordability

The Western Access Route will create journey time and vehicle operating cost savings for commuting and other users through reduced congestion for both private vehicle and public transport users. The level of saving is defined in the Economic Appraisal in Section 3.5. The scheme will not reduce travel alternatives for those with income levels that preclude car ownership and use. There will be no change in parking charges, road user charges, public transport fares and concessions.

The analysis completed for the distributional impact assessment in Section 3.8.7 shows that only around 3% of the population within the impact area experience a dis-benefit as a result of the scheme and only 12% of residents experience a benefit, with the

majority of residents experiencing no change. The overall assessment is therefore considered to be slight beneficial.

3.7.9 Severance

Community severance is defined as the separation of residents from facilities and services they use within their community caused by substantial changes in transport infrastructure or by changes in traffic flows. Where pedestrian count data is available 12 hour two way flows are provided below.

There is a high pedestrian movement across Chell Road which provides access between Sainsbury's and car parks and the town centre. There is a signal controlled crossing which causes pedestrians a slight level of severance due to the wait to cross. Pedestrian flows at this point are high; a count showed that 6,263 people crossed the road. Traffic flows will be significantly reduced along Chell Road with the scheme in place, allowing the existing crossing to be operated more frequently thereby reducing severance.

There is also a high pedestrian movement across Station Road (2415 people) which provides access between Stafford Rail Station and the town centre. Pedestrians use a signal controlled crossing that involves slight severance due to waiting to cross. Traffic flows will reduce at this point with the scheme in place providing an opportunity to increase the operation of the pedestrian crossing thereby reducing severance.

At present pedestrians walking into the town centre along the Doxey Road by the rail bridge can make their journey without needing to cross a road for much of their journey. The scheme joins the Doxey Road at this location and will create slight severance for 85 pedestrians that currently walk along the south side of the Doxey Road. The majority of Doxey Road pedestrians walk along the northern side of the road (419) and will be unaffected.

There are no pedestrian crossing facilities on the Doxey Road between the rail bridge and Sainsbury's roundabout. The traffic flow and visibility combine to cause pedestrians slight delay in crossing the road. As part of the scheme pedestrian and cycle crossing facilities will be provided which will reduce severance.

The route will pass through Madford Retail Park causing pedestrian severance, although pedestrian movement is currently low at the location of the road. This will create slight severance.

Traffic flow will increase through two junctions on the A34 Foregate Street; the junction with Grey Friars Place and the junction with Browning Street. Signalised pedestrian crossing facilities are currently provided at both junctions. Wait times for pedestrians result in slight delay currently. The same level of pedestrian operation will continue to be provided at the Grey Friars Place junction with the scheme in place causing a neutral impact for 1693 pedestrians. At the Browning Street junction it is expected that the same overall levels of delay will be experienced 908 by pedestrians but the pedestrian provision will operate differently.

At the junction of the A518 Newport Road and West Way traffic flow will increase when the scheme opens. Pedestrians currently walk with flow at this junction which will result in an increase in severance because of the additional flow. The situation will be reviewed to identify if additional pedestrian facilities may be required in the future.

The overall assessment is large beneficial as a slight reduction in severance is experienced by over 1,000 people per day. In total 8,039 pedestrians will benefit, 3,020 pedestrians will experience no change in severance and 85 pedestrians will slightly dis-benefit. At three other locations unquantified pedestrian movements will also experience either an improvement or worsening of severance. The TAG worksheet is provided in Appendix 3.9.

3.8 Distributional Impact Appraisal

Distributional impacts relate to the extent to which there are differences in the way impacts affect different groups in society. The appraisal has been undertaken in accordance with WebTAG guidance, Unit A4.1 (Social Impact Appraisal) and A4.2 (Distributional Impact Appraisal), published by DfT in January 2014. The Distributional Impacts Output Summary and Matrix Worksheets are provided in Appendix 3.9.

3.8.1 User Benefits

The appraisal identifies whether user benefits are distributed evenly across vulnerable groups over a 60 year appraisal period. It takes into account the Economic Impact assessment provided in Section 3.5, but covers the smaller impact area of Stafford, Stoke-on-Trent, Cannock, Uttoxeter, Burton-on-Trent, Lichfield and Rugeley and focuses on just home-based trips within this area. The benefits have been presented per population head.

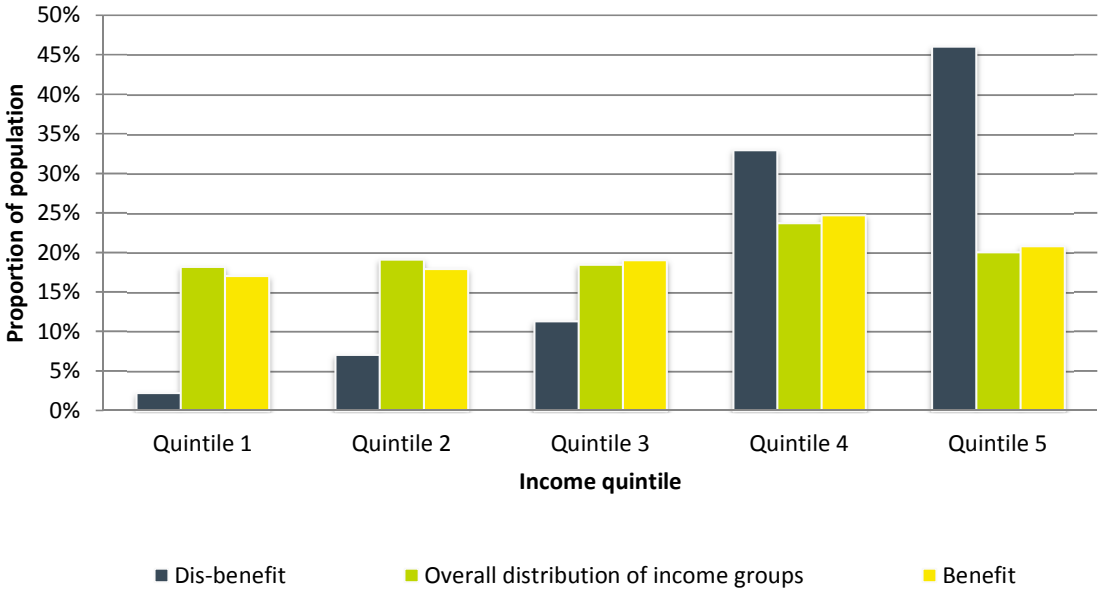
Table 3.29 identifies the number of residents in the impact area within each income deprivation group that are likely to experience benefits or dis-benefits. The income deprivation data is taken from the Indices of Deprivation (2010) Income Domain at Lower Super Output Area (LSOA) level. In general, benefits tend to be evenly split between the income quintiles. However, those living in the least deprived income quintile 5 experience a slightly higher proportion of dis-benefits overall than the other quintile groups.

Table 3.29: Distribution of User Benefits by Income Quintiles

Income Quintile	Residents - Number (%)			
	Benefit	**No Change**	**Dis-benefit**	**Total in Impact Area**
1 – 20% Most Deprived	140,815 (64.2%)	78,194 (35.7%)	289 (0.1%)	219,298 (18.3%)
2	147,993 (64.3%)	81,340 (35.3%)	884 (0.4%)	230,217 (19.2%)
3	156,797 (70.5%)	64,073 (28.8%)	1,423 (0.6%)	222,293 (18.5%)
4	204,221 (71.4%)	77,696 (27.2%)	4,096 (1.4%)	286,013 (23.9%)
5 – 20% Least Deprived	171,389 (71.1%)	63,996 (26.5%)	5,717 (2.4%)	241,102 (20.1%)

A proportionate distribution of benefits as a result of the proposed scheme should see the benefits and dis-benefits mirror the overall distribution of population proportions within each income group. This is represented in Figure 3.14 which shows that the distribution of benefits is broadly in line with the expected distribution for all quintile groups. However the dis-benefits, although small, are disproportionately spread across the income quintiles, with a lower than expected proportion of residents in the most deprived income quintiles experiencing dis-benefits and a higher than expected proportion in the least deprived income quintiles.

Figure 3.14: Distribution of User Benefits by Income Quintile



An assessment has also been carried out to determine whether the value of these benefits and dis-benefits are equally distributed across the five income quintiles. Overall the net value of benefits from the scheme, for this assessment, is approximately £43.6 million over the 60 year appraisal period. The Worksheets provided in Appendix 3.9 provide the results of this assessment and the outcome is summarised as follows:

- Income quintiles 1 and 4 are scored as slight beneficial as the value of user benefits experienced is considerably smaller compared to the proportion of the population in each group (i.e. 5% smaller)
- Income quintiles 2 and 3 are scored as moderate beneficial as the value of user benefits experienced is in line with the proportion of the population in each group (i.e. within +/-5%)
- Income quintile 5 is scored as large beneficial as the value of user benefits experienced is considerably more compared to the proportion of the population of the group overall (i.e. 5% greater)

As there are overall net benefits for all quintile groups, the overall impact on user benefits is beneficial. Taking into account the number of residents in each group that are likely to experience a user benefit or dis-benefit and how the value of these benefits is distributed, the overall distributional impact appraisal has been assessed as **moderate beneficial.**

3.8.2 Noise

The impact area has been defined in the Noise Assessment in Section 3.6.1 as 600 metres from the route and covers a population of 6,449. It is a 2018 assessment rather than a 60 year appraisal and includes planned future developments. Analysis of the demographic profile of areas likely to be affected by noise has been completed using the Indices of Deprivation 2010 Income Domain, proportions of children under 16 years of age from Census 2011 data and the location of schools.

Appendix 3.13 includes a plan that shows only a relatively high proportion of children aged under-16 only at the north-eastern edge of the route and to the east of the town centre. At the same time, analysis shows a lower proportion of children (13.1%) aged under-16 within impact area compared with proportions for Staffordshire (18.1%) and England (18.9%). St. Patrick's Catholic Primary School and John Wheeldon Primary School are within the 600m noise impact area however the properties within closest proximity to these schools are expected to experience no change in noise levels. Appendix 3.13 also includes a plan that shows that the scheme is neither within the 20% most or least deprived LSOA.

Table 3.30 confirms that, in 2018, the vast majority of people are not expected to experience a change in noise levels. Out of those that may be affected, slightly more are likely to experience a deterioration than an improvement. It shows that there are no properties within quintiles 1 and 4 that are expected to experience a change in noise levels, but there are net dis-benefits expected for quintiles 3 and 5 and benefits for quintile 2.

Table 3.30: Distribution of Noise Impacts across Income Quintiles

Income Quintile	**Noise Impact 2018**		
	Deterioration	**No Change**	**Improvement**
1 - most deprived	0	0	0
2	166	2,394	284
3	88	1,684	0
4	0	358	0
5 - least deprived	322	1,006	149
Total Population Affected (600m)	575	5,441	433

Based on the evidence provided in Table 3.30 and the fact that there will be no significant impact on schools and children, the overall distributional impact appraisal for noise is considered to be **slight adverse.** Further details on this assessment are provided in the Worksheets in Appendix 3.9.

3.8.3 Air Quality

This assessment focuses on the distributional impact of changes in nitrogen dioxide (NO_2) and particulate matter (PM_{10}) on residential properties in the opening year of 2018, including planned development. The impact area has been defined in the Air Quality Assessment in Section 3.6.2 which is a 200m buffer around links with a change of +/-10% in traffic flows. Analysis of the demographic profile of the area likely to be affected has been undertaken using the Indices of Deprivation 2010 Income Domain,

the proportions of children under 16 years of age (Census 2011) and location of schools.

The proportion of under-16s within the impact area is 12.5% which is lower than the proportion within a 1km buffer area of the scheme (16%), for Staffordshire (18%) and for England (19%). There are no schools located within the 200m buffer.

Table 3.31 shows that the properties within income quintile 2 receive the highest proportion of deterioration in air quality and also the highest proportion of improvement. There are no properties in quintiles 1 and 4 affected by air quality and there are more properties experiencing an increase in NO_2 and PM_{10} than a decrease within income quintiles 2, 3 and 5.

Table 3.31: Distribution of Air Quality Impacts across Income Quintiles

Income Quintile	2018 Air Quality Impact (NO_2 and PM_{10})		
	Deterioration	**No Change**	**Improvement**
1 - most deprived	0	0	0
2	1,252	0	383
3	894	0	234
4	0	0	0
5 - least deprived	371	0	145
Total Residential Properties	**2,517**	**0**	**762**

The distributional impact of air quality has been given a score equating to **slight adverse.** This takes into account that overall there are expected to be net dis-benefits with respect to air quality in 2018 but, at the same time, there are no schools and children significantly affected. It should however be recognised that the Air Quality Assessment in Section 3.6.2 predicts an overall reduction of $PM_{10\ in}$ and there is expected to be positive benefits for both PM_{10} and NOx in the 60 year appraisal period.

The Worksheet in Appendix 3.9 shows how the distribution of 2018 'winners' and 'losers' in Table 3.31 compares to the overall distribution of population proportions within each income group in the impact area.

3.8.4 Accidents

The impact area for this assessment is based on all links in the modelled network within a 1km boundary of the scheme that experience a change in traffic flow of +/- 10%. Each link has been classified according to the rate of change of the number of accidents taking into account the Accident Assessment in Section 3.7.4.

There are several potential vulnerable groups particularly affected by accidents including children and younger people, young males (particularly as drivers) and older people as well vulnerable road users such as pedestrians, cyclists and motorcyclists. There is also evidence that people living in more deprived areas are more vulnerable to accidents on the highway network. Plans provided in Appendix 3.13 highlight where there are the highest percentages of these vulnerable groups within the impact area.

Department for Transport STATS 19 data provides the number of casualties by age, gender and type of road user and deprivation score which is presented in Table 3.32. It

highlights that the proportion of pedestrian and cycle casualties is higher within the impact area than the national rate. Casualties for other vulnerable groups are generally in line with the national rate. There are significantly lower levels of casualties amongst those in the most deprived areas in the impact area compared to the national rate.

Table 3.32: Distribution of Accident Casualties (2009 – 2013)

	All Casualties (national rate)		All Casualties (1km impact area)	
	Number	% of all casualties	Number	%
Vulnerable Users				
Pedestrians	128,181	12.6%	62	18.5%
Cyclists	95,050	9.4%	45	13.4%
Motorcyclists	101,805	10.0%	38	11.3%
Male drivers aged 16-25	111,032	10.9%	38	11.3%
Vulnerable Groups				
Under 16	92,705	9.1%	34	10.1%
People aged 75+	34,819	3.4%	15	4.5%
Deprivation				
20% Most deprived LSOAs in UK	183,694	18.1%	24	7.2%

Overall, accident savings are expected to be very small and the majority of roads are expected to experience no change in accidents. This is the conclusion of the Accident Assessment in Section 3.7.5. At the same time, Table 3.33 identifies that there will be slight net benefits for pedestrians, cyclists, young male drivers, people aged under-16 and people living in the most deprived areas. Conversely, there will be slight net dis-benefits for motorcyclists and people aged 75+. It is particularly relevant that there are accident savings for pedestrians and cyclists as rates for these vulnerable users appear to be generally higher than expected in the impact area.

Table 3.33: Distribution of Accident Savings

Casualty Type	Benefit		Dis-benefit	
	Number	%	Number	%
Vulnerable User				
Pedestrians	8	20.0%	6	13.6%
Cyclists	12	30.0%	3	6.8%
Motorcyclists	6	15.0%	7	15.9%
Male drivers aged 16-25	7	17.5%	3	6.8%
Vulnerable Groups				
People aged under 16	6	15.0%	1	2.3%
People aged 75+	0	0.0%	4	9.1%
Deprivation				
20% Most deprived LSOAs in UK	5	12.5%	3	6.8%

Based on the fact that reduced accident rates will benefit the majority of vulnerable users and that pedestrians and cyclists, in particular, are expected to experience benefits, it is considered that the distributional impact of accidents should be scored as **moderate beneficial**.

3.8.5 Severance

An appraisal has been completed based on the likely proportion of vulnerable groups at the eight locations identified in the Severance Assessment in Section 3.7.9. This includes three shopping/town centre locations, and residential areas at two locations on the A34, two on Doxey Road and one on West Way. It also reflects the pedestrian improvements to be implemented as part of the scheme.

The vulnerable groups identified in Table 3.34 are particularly susceptible to the effects of severance and Appendix 3.13 includes plans showing where there are considered to be high proportions of these groups within a 1km buffer of the scheme. Table 3.34 shows that the percentage of no car households in the 1km buffer area is higher than the county and national rates, whilst the proportions for all other vulnerable groups are similar to county and national levels.

Table 3.34: Distribution of Vulnerable Groups affected by Severance

Vulnerable Group	% in 1km Buffer	% Staffordshire	% England
Older People (Aged 70+)	6.9%	7.9%	7.7%
Children (Under-16)	16.1%	18.1%	18.9%
No Car Households	30.4%	21.0%	25.8%
Disability Living Allowance Claimants	8.5%	9.6%	7.8%

The assessment concludes that there is expected to be reduced severance for all vulnerable users at the three shopping/town centre locations where there are high pedestrian movements. This significantly outweighs any potential severance created at the other five locations where there are likely to be higher proportions of the vulnerable users listed in Table 3.34 (in particular no car households). These other five locations have also been measured as having lower levels of pedestrian activity compared to the shopping/town centre locations. Thus overall, the distributional impact for severance has been given a score equating to **moderate beneficial**.

3.8.6 Personal Affordability

The appraisal identifies whether affordability benefits, in terms of Vehicle Operating Costs for commuters and other trips (excluding business trips), are distributed evenly across vulnerable groups over a 60 year appraisal period. The impact area and the groups relevant to the Personal Affordability Assessment are the same as used for the User Benefit Assessment in Section 3.8.2.

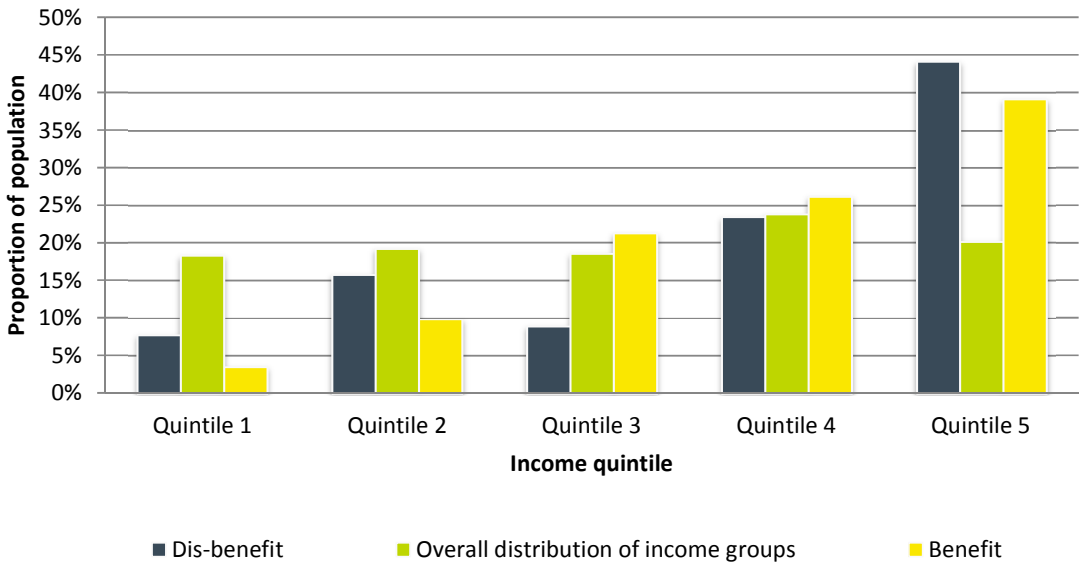
Table 3.35 shows that the vast majority of residents do not experience a change in affordability. It also indicates that out of the residents that do experience a change, the least deprived income quintile 5 experiences the highest proportion of both benefit and dis-benefits compared to the other quintile groups.

Table 3.35: Distribution of Affordability by Income Quintiles

Income Quintile	Residents - Number (%)			
	Benefit	**No Change**	**Dis-benefit**	**Total in Impact Area**
1 – Most Deprived	5,271 (2.4%)	210,947 (96.2%)	3,080 (1.4%)	219,298 (18.3%)
2	14,681 (6.4%)	209,243 (90.9%)	6,292 (2.7%)	230,217 (19.2%)
3	31,594 (14.2%)	187,147 (84.2%)	3,552 (1.6%)	222,293 (18.5%)
4	38,998 (13.6%)	237,630 (83.1%)	9,385 (3.3%)	286,013 (23.9%)
5 – Least Deprived	58,254 (24.2%)	165,260 (68.5%)	17,588 (7.3%)	241,102 (20.1%)
Total Population	148,799 (12.4%)	1,010,227 (84.3%)	39,898 (3.3%)	1,198,924

A proportionate distribution of benefits as a result of the proposed scheme should see the benefits and dis-benefits mirror the overall distribution of population proportions within each income group. This is presented in Figure 3.15 which shows that the level of benefits and dis-benefits are lower than the expected proportion for residents in quintiles 1 and 3, and much higher than expected for quintile 5. For quintile 2, benefits are lower than expected and for quintile 3 the dis-benefits are lower than expected. Benefits and dis-benefits are in line with the expected proportion for quintile 4.

Figure 3.15: Distribution of Affordability Benefits by Income Quintile



An assessment has been carried out to determine whether the value of these benefits and dis-benefits are equally distributed across the five income quintiles. Overall, the net value of benefits from the scheme, for this assessment, is approximately £2.2 million over the 60 year appraisal period. The Worksheet provided in Appendix 3.9 provides the results of this assessment and the outcome is summarised as follows:

- Income quintiles 1 and 4 are scored as slight beneficial as the value of affordability benefits experienced is considerably smaller compared to the proportion of the population in each group (i.e. 5% smaller)
- Income quintiles 2 and 3 are scored as moderate beneficial as the value of affordability benefits experienced is in line with the proportion of the population in each group (i.e. within +/-5%)
- Income quintile 5 is scored as large beneficial as the value of affordability benefits experienced is considerably more compared to the proportion of the population of the group overall (i.e. 5% greater)

As there are overall net benefits for all quintile groups, the overall impact on affordability is beneficial. Taking into account the number of residents in each group that are likely to experience a change in affordability and how the value of benefits are distributed, the overall distributional impact appraisal has been assessed as **moderate beneficial.**

4. THE FINANCIAL CASE

4.1 Introduction

The cost of implementing the scheme and incremental costs of maintaining and operating it have been estimated in accordance with WebTAG Unit A1-2: Scheme Costs. The costs have been subject to value engineering and have undergone critical assessment both internally and externally. The County Council is now confident that the scheme is based on a robust cost estimate that will be refreshed as detail design progresses through the approval stages. The Quantified Cost Estimate for the scheme is £34,954,000, including inflation. The risks and costs to the County Council have been considered by the authority's Section 151 Officer and the signed declaration is included Appendix 4.1.

4.2 Stoke-on-Trent and Staffordshire's Growth Deal

In the Growth Deal announcement in July 2014 (see Appendix 2.6) the LEP secured at total of £13.6m of funding confirmed for 2015/16 and £14.1m confirmed for 2016/17 to 2021. There has also been a provisional award of a further £34m for projects starting in 2016 and beyond. The LEP will be expected to deliver all projects with this award, including the Stafford Western Access Route. Funds will be disbursed to the LEP quarterly in advance with any changes to projects agreed each quarter.

Out of this Growth Deal, the Government has committed to investing £16.1m in the Western Access Route and there is also a Local Growth Fund pre-commitment of £8.2m. This total sum of £24.3m for the Western Access Route is based on the 2010 business case which was the latest information available at the time of submitting the Strategic Economic Plan. Since then the business case for the scheme has progressed substantially, resulting in costs that are more robust and accurate. Although the cost of the scheme has increased to £34.95m, this is in the light of further detailed design, ground investigation works, stakeholder engagement, early contractor involvement, a quantified risk assessment, a review of optimism bias and new inflation forecasts. Construction costs have increased mainly due to the need to extend the viaduct and the potential diversion of a high voltage overhead power line.

Staffordshire County Council will therefore work with the LEP and Government to manage expenditure within the overall Growth Deal settlement available and will increase the County Council's local contribution as necessary, as agreed by the S151 Officer. Through detailed design and value engineering the overall cost will be aligned to the final agreed budget provision.

4.3 Optimism Bias

Stafford Western Access Route is a Standard Civil Engineering project that does not require special design considerations. In 2010, a business case was submitted to the Department for Transport for Programme Entry. Due to the early stage in the development of the scheme an optimism bias uplift of 44% was applied.

Since 2010 further significant technical work, drawing on the previous business case, has been carried out on scheme feasibility and design, involving collaborative working

with the County Council's Infrastructure+ partners, Amey. Detailed engagement has taken place with all identified stakeholders and there is now a greater understanding around risks and uncertainties. By way of examples, significant investigations have been undertaken around ground conditions, statutory undertaker costs and environment issues. The need to rebuild Doxey Road rail bridge (which had both significant cost and risk) has been de-scoped from the original design and replaced with minor improvement works. This has all contributed to a more robust and accurate scheme cost.

Table 7 in TAG Unit A1-2 (Jan 2014) states that there are three stages of scheme development with the following optimism bias uplifts:

Stage 1: Programme Entry	44%
Stage 2: Conditional Approval	15%
Stage 3: Full Approval	3%

TAG Unit A1.2 also states in paragraph 3.5.7 that the allowance for optimism bias should be largest at the initial stage of life of a transport project (e.g. Strategic Outline Business Case); to decrease in a more detailed business case (e.g. Outline Business Case); and smallest in the presence of a fully detailed business case (e.g. Full Business Case).

As a project develops, the DfT expects the scheme cost estimate to be refined based on better quality data. As risk analysis improves as a scheme develops, it is expected that the risk-adjusted scheme cost estimate will become more certain while the applicable level of optimism bias will decrease.

The Stafford Western Access Route is theoretically only at Stage 1 (Programme Entry) however due to the extensive work that has been carried out since 2010, it is believed that the 2014 business case can be considered as an Outline Business Case, in line with 'The Transport Business Cases' published by the Department for Transport in January 2013. An adjustment has therefore been made to the optimism bias based on the approach provided in Supplementary Green Book Guidance published in April 2013. This guidance sets out the contributory factors to the upper bound optimism bias of 44% and the justification for adjustment.

Appendix 4.2 justifies the degree to which each of the contributory factors is considered to be mitigated for the Stafford Western Access Route. The resultant capital expenditure optimism bias is calculated as follows:

(100% - 66.5%) * 44 = 14.74%

Based on this analysis, 66.5% of the causes of optimism bias have been mitigated. This leaves an amended optimism bias factor of 14.75% for the scheme. For the purpose of scheme appraisal, the County Council is adopting the use of 15% optimism bias for consistency with DfT guidance. This is the recommended level for Stage 2 transport proposals.

4.4 Independent Cost Review

Faithful+Gould were commissioned to provide an independent review of the cost estimate for the Stafford Western Access Route, excluding a review of quantities. The review is provided in Appendix 4.3. The purpose of this review was to:

- Identify if the rates and assumptions that have been used in the cost estimate are appropriate
- Identify any omissions or exclusions which should be included in the cost estimate
- Provide a professional view as to whether the cost estimate is fit for purpose (taking into account the current level of scheme design and development)

A number of issues were raised in relation to some of the unit rates, areas of uncertainty and items that had not been included within the scheme cost. In response to Faithful+Gould's comments Staffordshire County Council revised some of the unit rate assumptions, included items which had been omitted and provided satisfactory responses to a number of the queries raised. Based upon these changes and clarification, Faithful+Gould are of the opinion that the current cost estimate for the Stafford Western Access Route is suitable for use in the business case.

4.5 Base Cost Estimate

A detailed cost estimate has been prepared based on the current proposed alignment shown on Figure 2.4. The breakdown of the base cost is provided in Tables 4.1 and 4.2 and a further cost breakdown of the engineering works can be provided. Prices have a 2014 (Q1) cost base. These costs take into account modelling of a three-point cost range reflecting the minimum, most likely and worst case construction costs completed by Faithful+Gould as detailed in 6.6.1.

Table 4.1: 2014 Base Cost Estimate

Element of Base Cost	**Cost Estimate £'000s**
Construction Cost	23,682
Land Acquisition Cost & Compensation	6,805
Eligible Preparation Costs	945
Supervision Cost	1,000
Total	**32,432**

Table 4.2: Breakdown of Construction Cost Estimate

Element of Base Construction Cost	**Cost Estimate £'000s**
Construction Cost	18,682
Temporary Works	500
Bridge Improvement Works	350
Environmental Mitigation	750
Utility diversion costs	3,400
Total	**23,682**

4.6 Preparatory Costs

Eligible preparatory costs are associated with detailed design, procurement and the preparation of business case submissions for Conditional and Full Approval. They are broken down in Table 4.3.

Table 4.3: Breakdown of Eligible Preparatory Cost Estimate

Element of Eligible Preparatory Cost	Cost Estimate £'000s
Environmental/Landscapes Design	50
Site Investigation	20
Engineering Scheme Design	600
Utility Liaison and diversion design fees	50
Network Rail Fees	100
Statutory Liaison	10
Consultation	35
Planning Application Preparation	20
Transport Modelling	30
Finalising Business Case	30
Total	**945**

The County Council has already committed financial resources associated with the preparation of the Major Scheme Business Case and Environmental Impact Assessment. In addition, the County Council has incurred costs for ground investigation work and on-going detailed design. The costs provided in Table 4.3 are additional to current expenditure.

In line with government guidance, the non-eligible preparatory costs have been assumed to comprise:

- Costs of publication and publicity for applications and orders
- Planning application fees
- Preparation of evidence and presentation at public inquiry
- Land acquisition fees and procedures

4.7 Maintenance Costs

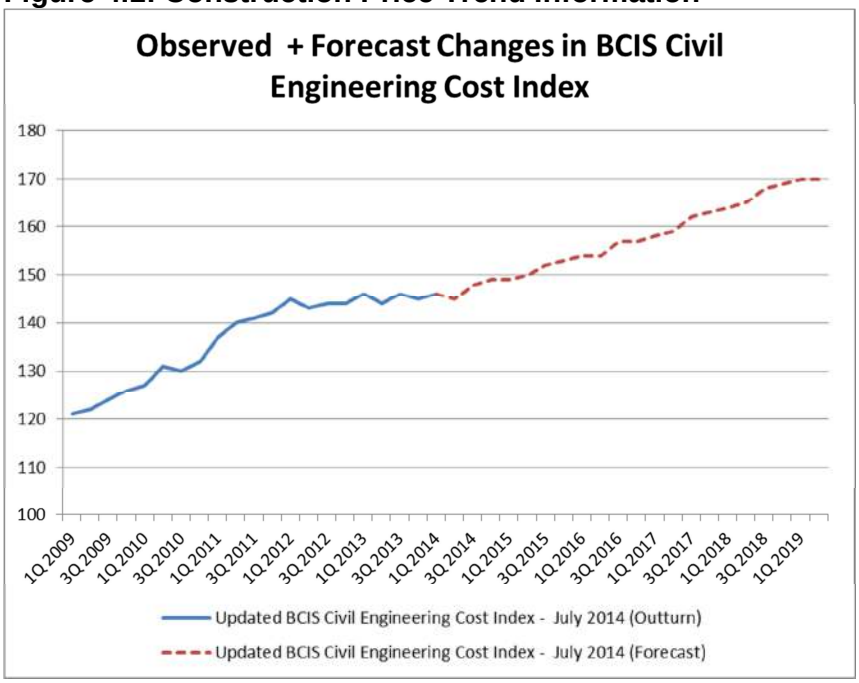
Ongoing maintenance costs will be met by the County Council. A lifecycle plan has been completed for the scheme and the town centre route that will be downgraded from an 'A' road once bypassed, in terms of surface dressing and plane/resurface surface/binder course maintenance. The 60 year maintenance costs for the new viaduct are estimated to total £194,000.

4.8 Inflation Assumptions

In the 2010 business case 0% inflation was assumed due to the impact of the recession. The outturn picture shows that prices never actually reached as low as was forecast in 2010 and in fact they are now increasing faster than assumed four years ago.

The inflation assumption for this 2014 business case has taken into account the latest construction price trend information from the Building Cost Information Service, specifically General Civil Engineering Cost Index. Figure 4.1 shows that from where we are now to the point at which construction commences, there is expected to be an increase in construction costs which needs to be taken into account in the scheme costs and economic appraisal.

Figure 4.1: Construction Price Trend Information



Based on this information, the outturn cost estimate is provided in Table 4.4.

Table 4.4: Outturn cost estimate

Financial Year	Outturn Factor	2014 (Q1) Cost Base + Risk Layer	Forecast Inflation (£'000s)	Outturn Total (£'000s)
2015/16	1.027	8,350	228	8,578
2016/17	1.054	16,205	882	17,087
2017/18	1.088	7,860	695	8,555
2018/19	1.129	650	84	734
Total		**33,065**	**1,889**	**34,954**

4.9 Quantified Cost Estimate (QCE)

The Quantified Cost Estimate consists of the most likely base cost, risk allowance and an assumption regarding inflation. The risk allowance has been assumed to be the P50 Mean Risk Value that has been calculated through a Quantified Cost and Risk Assessment (QCRA). The P50 and P80 risk values are reported in this QCRA in Appendix 4.4 and further details regarding the risk assessment is provided in 'The Management Case'. As explained in Section 6.6, the risk layer is relatively low as many of the risks originally identified in the 2010 business case have now been

incorporated directly into the significantly increased base cost. The breakdown of the Quantified Cost Estimate is provided in Table 4.5.

Table 4.5: Summary of Quantified Cost Estimate

Element	Cost Estimate £'000s
Base Cost	32,432
Quantified Risk Assessment	633
Inflation	1,889
Total	**34,954**

4.10 Funding Profile

The funding profile is provided in Table 4.6. Construction costs in 2016/17 and 17/18 include the QCRA P50 Risk Layer 16/17 &17/18.

Table 4.6: Outturn Funding Profile (including inflation)

Financial Year	Construction Costs (£'000s)	Land Costs (£'000s)	Other Costs (£'000s)	Total Outturn (£'000s)
2015/16	2,861	4,931	786	8,578
2016/17	15,553	849	685	17,087
2017/18	7,380	653	522	8,555
2018/19	0	678	56	734
Total	**25,794***	**7,111**	**2,049**	**34,954**

*Includes utility diversion costs

5. COMMERCIAL CASE

5.1 Output Based Specification

The Stafford Western Access Route (Sections A and B) is a 7.3 metre wide, two lane, single carriageway road, approximately one kilometre in length between Doxey Road and A34 Foregate Street (including Browning Street junction). It includes footway/cycleways along the route. The road will be street lit to current design standards, minimising light pollution and will be subject to a 30 mph speed limit. Sections A and B will tie into Section C, a new single carriageway road linking Martin Drive and Doxey Road being promoted by developers. The detailed output based specification in the form of an activities schedule can be provided.

The full scope of the project is described in 'The Strategic Case' and the detailed alignment is shown on Figure 2.4.

5.2 Procurement Strategy

Staffordshire County Council presently has two procurement options established for the delivery of major projects, as outlined below. At the time of writing, the preferred delivery option is to use our Infrastructure+ public/private partnership with Amey; however, because our partnership is still developing, the County Council retains the option to deliver the scheme through the Midlands Highway Alliance (MHA) framework. The County Council is confident that both options represent a modern approach to procurement that will provide value for money. In fact, in June 2014 Staffordshire County Council won NEC Employer of the Year following a nomination by Balfour Beatty who is on the MHA framework.

Section C will be delivered through an agreement with developers under Section 278 of the Highways Act 1980. The agreement allows the developer to execute works that the County Council are authorised to carry out and ensures that the works are compliant with the County Council's design standards and specification.

5.2.1 Preferred Delivery Option

Building on a previous successful ten year record of delivery with a private sector partner, Staffordshire County Council chose Amey in March 2014 as its new strategic partner of choice for Infrastructure+, following a rigorous and highly competitive twelve month procurement process. Further details on this process are provided in Appendix 5.1. This innovative partnership has been specifically designed to build capacity, add value and ensure we can deliver major projects such as the Stafford Western Access Route in the most efficient manner. The contractor is involved at the earliest possible opportunity through co-location, with designers and specialists working alongside the on-site delivery teams.

The partnership will provide an end-to-end approach from scheme inception to construction and the Stafford Western Access Route scheme has already benefited from this collaborative working with Amey providing construction advice and contributing to the construction aspects of the cost estimate. Our integrated approach ensures cost and time predictability generating associated savings in each of these

areas. The partnership is closely monitored using performance measures based on Staffordshire's key outcomes that include, innovation, partnering and value for money. The partnership will demonstrate value for money by monitoring and reporting efficiencies, and using actual costs from previous schemes to develop target costs to ensure continuous improvement. Notwithstanding this, the delivery of major projects through Infrastructure+ is not contractually guaranteed and unsatisfactory performance will have an impact on the volume of future work delivered through it.

5.2.2 Reserve Option

Staffordshire County Council was influential in the formation and development of the Midlands Highway Alliance and in recent years has been the major user of the Medium Schemes Framework 1 (MSF1) to deliver its Major Infrastructure Projects. The MHA is a collaborative framework between twenty one Local Authorities and five Contractors with common goals; to work collaboratively, derive efficiency savings and minimise procurement costs. Following the success of this framework, the Midlands Highway Alliance launched its successor in June 2014; Medium Schemes Framework 2 (MSF2). The key development in respect of the Stafford Western Access Route is that the upper limit of construction value has been increased from £12m to £25m. This enables the scheme to be delivered through this framework as construction costs (excluding utility diversions) are forecast to be under £25m.

Staffordshire County Council has successfully delivered fourteen schemes through MSF1 following its launch in 2010; these include i54 South Staffordshire (£24m), Redhill Employment Park (£7m), A5 Vicarage Road (£2m), A518 Beacon Business Park (£1.8m) and Rocester and Denstone Junction Improvements (£3.3m). The MHA framework offers three procurement options;

1. Direct call off (short process)
2. Direct call off (long process)
3. Mini competition

Options 1 & 2 involve the use of the framework's model schemes as a basis for appointing a contractor. Given the scheme design includes a viaduct structure, neither of these options can be used as similar structures are not present in the model schemes; therefore, Option 3 would be the preferred procurement route to appoint a contractor. This would not be a lengthy process and would not result in a delay to the start of construction.

The tender assessment is based on a 50/50 cost / quality ratio. The quality scores are held by the framework manager and are updated upon completion of each contract; therefore, contractors are incentivised to perform well in each of the 10 quality criteria so that their opportunities for future work are not adversely affected. Evidently, the contractor is required to submit prices that represent value for money due to the competitive nature of the process.

5.3 Contract Arrangements

Whichever procurement route is adopted the construction contract will be awarded under the 'New Engineering Contract Third Edition' (NEC3) suite, utilising the 'Engineering and Construction Contract (ECC), Option C – Target Cost with Priced

Activity Schedule'. The current construction programme indicates a contract length of 88 weeks. This form of contract encourages a partnering approach to the delivery of the contract and ensures that risk is allocated to the party that is best placed to manage it. The Quantified Cost Risk Assessment (QCRA) has been completed with this in mind and incorporates all client risks associated with this form of contract such as adverse weather and unforeseen ground conditions. The risks managed by the contractor have been priced within the construction cost estimate. These risks will be reviewed at contract award stage through a risk workshop and a shared risk register produced to allocate ownership and determine the value of the residual risks to be included within the target cost.

Staffordshire County Council has appointed a Project Manager to oversee the planning and design aspects of the scheme; this includes early contractor involvement and development of the target cost. The Project Manager will then assume the role, and associated responsibilities of, 'Project Manager' under the NEC form of contract described above and will retain responsibility for the scheme through to the end of the maintenance period. The construction contract will be managed in accordance with Staffordshire County Council's Contract Management Manual. The contract data will define the works information for the contract that will include scheme drawings and the specification, this is a scheme specific specification based on Staffordshire County Council's base specification for highways works. Changes to the works information will be authorised by the Project Manager and named 'Supervisor' in accordance with the Contract Management Manual; changes instructed with a value greater than £100k will be referred to the Project Board (see Figure 6.1 Governance Structure).

6. THE MANAGEMENT CASE

6.1 Introduction

Staffordshire County Council approval for the full preferred Stafford Western Access Route (Sections A, B and C) was provided by Cabinet in May 2010 (Appendix 6.1). The County Council is the client for the full scheme (Sections A, B and C) as it will be owned and maintained by the County Council in its role as local highway authority. The full scheme is needed by Stafford Borough Council to deliver their Adopted Local Plan and by Stoke-on-Trent and Staffordshire Local Enterprise Partnership who consider that it is a priority for the delivery of their Strategic Economic Plan.

Section C is required by the developers of the West of Stafford to serve their development site. On its own, it is an access road required to serve 2,200 new homes and is excluded from the economic appraisal. It will be privately funded but will be delivered by the County Council through an agreement with the developers under Section 278 of the Highways Act 1980.

Staffordshire County Council is confident that the full scheme is deliverable and its feasibility and practicality is demonstrated with a Project Plan and a governance structure that allocates clear roles and responsibilities for the delivery and management of all three sections. The cost estimates are realistic and robust for Sections A and B supported by detailed design, stakeholder engagement and risk management.

Over recent years the County Council has successfully delivered the following major highway schemes that have been instrumental in relieving existing congestion and enabling housing and employment growth. They have also been delivered on time and on budget.

- I54 Major Investment Site advanced earthworks
- Redhill Employment site
- Rugeley Bypass
- Burntwood Bypass
- Biddulph Bypass

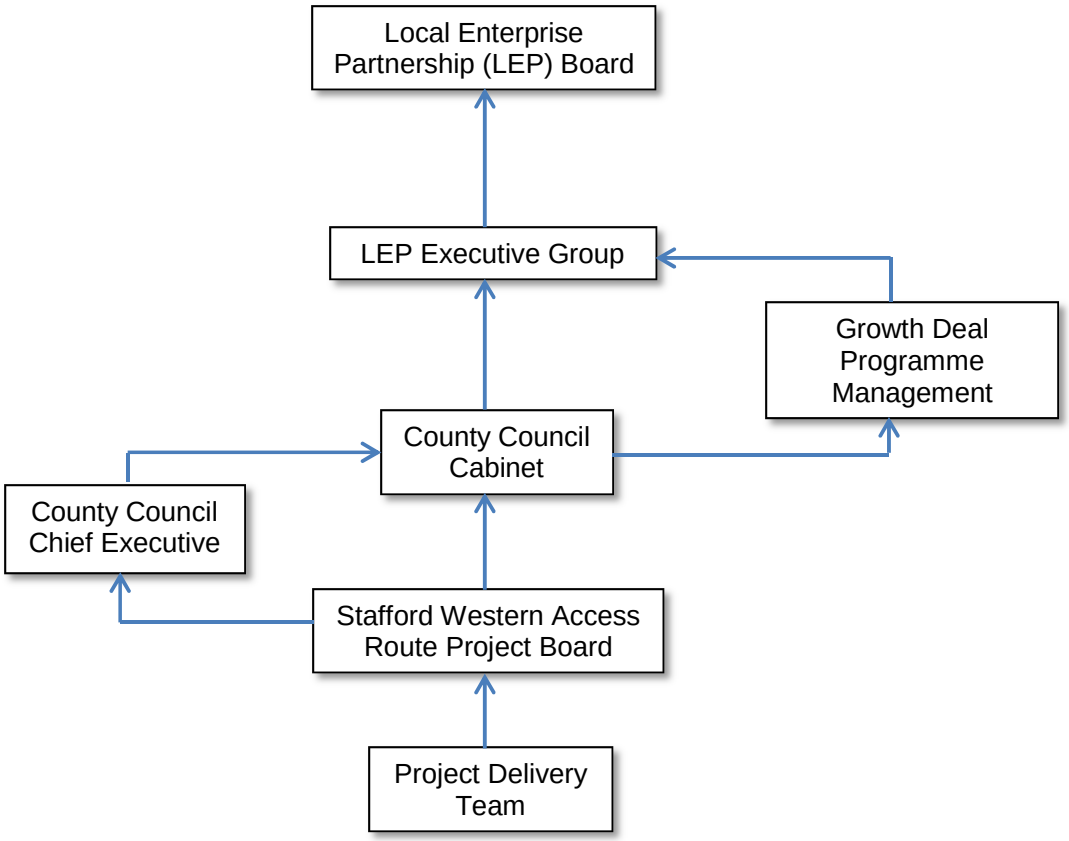
To help facilitate the delivery of the full scheme (A, B and C) within the proposed timescale, planning permission for all three sections will be sought during 2015 by the County Council. At this stage, the detailed design for Section C will be progressed, and the Environmental Impact Assessment and Side Road Orders will be completed. It is expected that the land required for Section C will be assembled by the developers however a parallel CPO process will also be progressed by the County Council to help ensure delivery. This will also be the case for Sections A and B. Staffordshire County Council will assist in the process of decommissioning the rail sidings as required to deliver Section C. County Council staff resources required to help push forward Section C will be funded separately to this business case.

The outputs and outcomes of the scheme will be monitored one year and five years after opening. A monitoring and evaluation framework has been identified in section 6.9 to explain how this process will be completed and managed to help ensure that all benefits are realised.

6.2 Governance

The governance for the full Stafford Western Access Route has evolved since the 2010 business case due to the formation of the Stoke-on-Trent and Staffordshire Local Enterprise Partnership in 2011. The governance structure is set out in Figure 6.1 and sections 6.2.1 to 6.2.3 explain the role of each group, membership and the reporting arrangements.

Figure 6.1: Governance Structure



6.2.1 Stoke-on-Trent and Staffordshire Local Enterprise Partnership

Governance arrangements have been put in place by the LEP Executive Board. They allow the LEP to hold delivery partners to account for progress against project milestones and budgets on a monthly basis. This will include a management group to oversee the delivery of the Strategic Economic Plan. The LEP will hold ultimate accountability and decision making on funding allocations.

A clear decision-making line to the LEP, the funding body for the Western Access Route, is shown in the governance structure. The County Council Chief Executive and the Leader of the County Council Cabinet both sit on the LEP Board and the County Council's Economic Partnerships Manager, the secretary to the LEP, will ensure that reports on progress and delivery are made at Board meetings and to the Executive Group.

6.2.2 Staffordshire County Council

Council Structure

The Cabinet system makes the major decisions about Council services and infrastructure and Cabinet normally meets monthly. Its role is to lead in the preparation of the Council's policies and budget, to lead the community planning process and the attainment of best value. The Cabinet is made up of the Leader who is chosen by the County Council from the majority party, currently Conservative, and up to nine other Councillors chosen by the Leader.

Each Cabinet Member has an individual area of responsibility also known as his/her portfolio. Councillor Mark Winnington, currently the Cabinet Member for Economy and Infrastructure will help to ensure delivery of the Western Access Route, together with Councillor Mark Deaville, the current Cabinet Support Member for Transport and the Connected County. Key decisions, related to statutory processes will be approved by the Cabinet and Councillor Winnington will have delegated powers to deal with day-to-day issues and decisions. Councillor Winnington will have a link to the LEP and the Cabinet Leader sits on the LEP Board.

Project Board

The Project Delivery Team will present regular reports to the Project Board that will be chaired by the Senior Responsible Officer, James Bailey, Commissioner for Highways and the Built County. Councillor Winnington, the Cabinet Member, will be a member of the Project Board to ensure that decisions made are reported to the LEP via the Cabinet Leader. The Board will also be attended by the Place Finance Manager in a project assurance role and Clive Thomson, Commissioner for Transport and the Connected County, who is responsible for transport policy and strategy and the production of the business case. The Board will meet at key milestones in the project. It will have responsibility for:

- Authorising the commencement of stages in the project
- Approving any significant changes to the delivery programme
- Making decisions on fundamental elements of project delivery including financial control and consultations.
- Overall management of the risks of the project
- Achievement of the project outputs and outcomes

Project Delivery Team

The Project Delivery Team will be the officer group responsible to the Project Board and the Project Manager will chair the team. Amey have early contractor involvement (ECI) facilitated though the Infrastructure+ contract and they are also expected to be awarded the construction contract under the 'New Engineering Contract Third Edition' (NEC3) suite. It is expected that the same Project Manager, employed by the County Council, will be in place at both the ECI and construction stages to ensure a smooth transition between delivery stages. There are a number of skilled and professionally qualified specialists on the team who are experienced in the delivery of major projects such as this. The team includes:

- County Council 'Project Manager'
- Amey highway engineers
- Amey and County Council engineers specialising in structures, lighting, traffic signals and network management
- County Council environmental specialists covering flood risk, landscape, biodiversity, the historic environment and rights of way
- Atkins, the County Council's Term Consultants, providing additional independent specialist advice as required, including business case preparation, traffic modelling, risk analysis and noise and air quality appraisals
- URS consultants providing additional design and environmental advice as required
- County Council strategic planners responsible for submitting the Regulation 3 planning application
- Stafford Borough Council officers advising on Local Plan and Development Control issues
- County Council Legal Services responsible for land acquisition and the District Valuer advising on land negotiations
- County Council principal accountant

The Project Delivery Team will meet each month to consider all aspects of the project and members will be invited as required. It will be responsible for:

- Reporting progress to the Project Board
- Resolving all detailed day-to-day project issues
- Ensuring key milestones and timescales are met in accordance with the Project Plan
- Ensuring quality control procedures are adopted

6.3 Project Plan

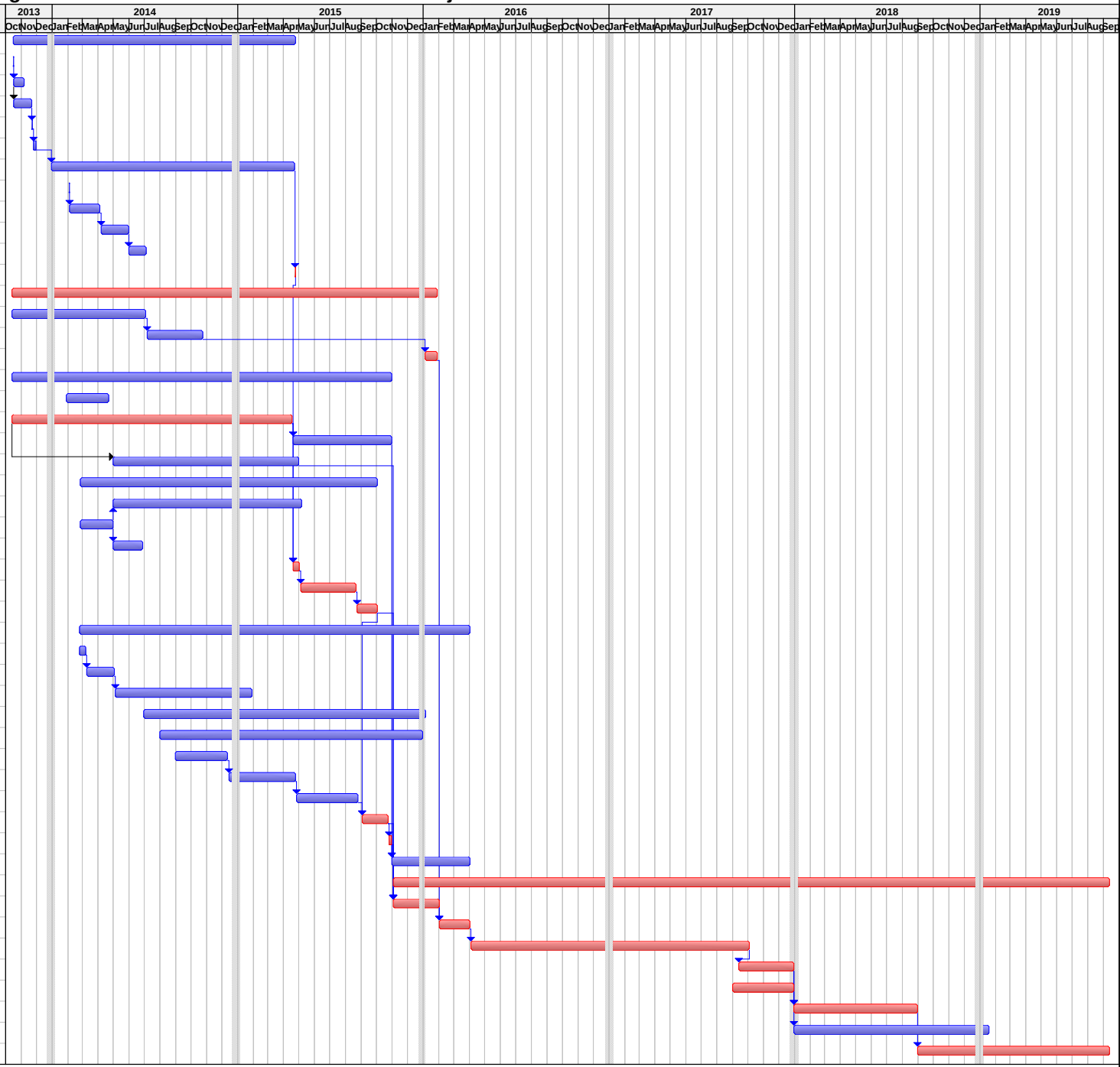
An overall Project Plan has been developed and is provided in Figure 6.2. It covers each key stage of the project and the critical path. The tasks that have a critical end date that affect the delivery timescale are highlighted on the Project Plan. The use of an existing partnering construction contract has helped to shorten the Project Plan by avoiding the need for lengthy tendering processes. The plan will be reviewed and updated on a regular basis and will be considered at monthly Project Delivery Team meetings.

The Project Manager as chair of the Project Delivery Team will have overall responsibility for delivering the tasks required to achieve key milestones. Key milestones, timescales and tasks are summarised in Table 6.1.

Figure 6.2 - Stafford Western Access Route Project Plan

November 14

ID	Name	Dur	Start	Finish
1	**Environmental Impact Assessment Work (Sections A, B & C)**	**378d**	**16 Oct 13**	**25 Apr 15**
2	Meeting to discuss EIA	1d	16 Oct 13	17 Oct 13
3	Discussions with SCC Environment Team	15d	17 Oct 13	07 Nov 13
4	Establish EIA process obtain cost estimate	26d	17 Oct 13	22 Nov 13
5	Appoint preferred consultant	1d	22 Nov 13	23 Nov 13
6	Lead-in	5d	25 Nov 13	30 Nov 13
7	Undertake on site EIA survey work and produce ES (Sections A, B & C)	328d	06 Jan 14	23 Apr 15
8	Complete Phase One Habitat survey	1d	03 Feb 14	04 Feb 14
9	Update Scoping Report (Sections A, B & C)	44d	04 Feb 14	05 Apr 14
10	EIA Scoping Opinion for Section A, B and C	40d	07 Apr 14	31 May 14
11	Review Scoping Report Comments	25d	02 Jun 14	05 Jul 14
12	Receive EIA from URS	1d	24 Apr 15	25 Apr 15
13	**Major Scheme Business Case**	**570d**	**14 Oct 13**	**29 Jan 16**
14	Revew Major Schemes Business Case	179d	14 Oct 13	04 Jul 14
15	Programme entry with outline business case	79d	07 Jul 14	24 Oct 14
16	Confirmation of Final Approval of business case (Section A & B)	18d	05 Jan 16	29 Jan 16
17	**Detailed Design**	**515d**	**14 Oct 13**	**31 Oct 15**
18	Carry out site investigation	59d	29 Jan 14	22 Apr 14
19	Detailed design (Roads and Bridges)	375d	14 Oct 13	18 Apr 15
20	Refine Detailed Design	140d	20 Apr 15	31 Oct 15
21	Determine Procurement Approach & Early Contractor Involvement	251d	01 May 14	01 May 15
22	**Planning Application and Consent**	**409d**	**25 Feb 14**	**03 Oct 15**
23	Preparation of Planning Application	255d	01 May 14	07 May 15
24	Preparation of planning pre-application	47d	25 Feb 14	01 May 14
25	Planning Pre-application Consultation Period (Sections A, B & C)	42d	01 May 14	28 Jun 14
26	Submit Planning Application	10d	20 Apr 15	02 May 15
27	Planning application determination period	79d	05 May 15	22 Aug 15
28	Planning Consent (Sections A, B & C)	30d	24 Aug 15	03 Oct 15
29	**Land acquisition, CPO and Line Orders (Section A, B & C)**	**531d**	**24 Feb 14**	**02 Apr 16**
30	Appoint specialist advisors	10d	24 Feb 14	08 Mar 14
31	Land search and title ownership	40d	10 Mar 14	03 May 14
32	Negotiations and dialogue (Sections A & B)	183d	05 May 14	29 Jan 15
33	Parallel CPO process	378d	30 Jun 14	06 Jan 16
34	Network Rail siding disposal process (Section C)	353d	01 Aug 14	23 Dec 15
35	Preparation and publication of Orders	74d	01 Sep 14	12 Dec 14
36	Preparation and completion of potential Orders Public Inquiry	85d	15 Dec 14	25 Apr 15
37	Inspectors report	87d	27 Apr 15	26 Aug 15
38	Orders confirmed	37d	03 Sep 15	24 Oct 15
39	Review scheme design and cost	5d	26 Oct 15	31 Oct 15
40	Review scheme cost and design refinement	101d	02 Nov 15	02 Apr 16
41	**Scheme Delivery**	**969d**	**03 Nov 15**	**13 Sep 19**
42	Construction lead-in and planning (Section A & B)	56d	03 Nov 15	02 Feb 16
43	Construction mobilisation	44d	02 Feb 16	02 Apr 16
44	Section A - A34 to Doxey Road	382d	04 Apr 16	04 Oct 17
45	Section B - Doxey Road	73d	13 Sep 17	23 Dec 17
46	Complete Section 278 Agreement (Section C)	81d	01 Sep 17	23 Dec 17
47	Section C - Doxey Road to Martin Drive (excluded from business case)	169d	08 Jan 18	31 Aug 18
48	Maintenance period (Sections A & B)	260d	08 Jan 18	19 Jan 19
49	Maintenance period (Section C)	260d	31 Aug 18	13 Sep 19



Critical Normal

Table 6.1: Key Milestones, Timescales and Main Tasks

OCG Gateway	Stage	Key Milestone	Timescale	Tasks / Work streams
Gateway 1 and 2	1	Programme Entry with Outline Business Case for Sections A and B	March to Oct 2014	• Adopted Local Plan • Successful business case • LEP decision to ring-fence LGF funding, subject to satisfactory progress • Confirm Amey as contractor for ECI • Stakeholder consultations • Detailed design of A and B
	2	Planning Consent (A, B and C)	April 2014 to Nov 2015	• EIA scoping opinion including phase one habitat survey • Planning pre-application consultations • Finalise detailed design A, B and C, including Stage 1 and 2 Road Safety Audits • Complete environmental surveys and full EIA • Submit planning application to Staffordshire County Council • Full public and stakeholder consultations
	3	Side Road Orders Confirmed (A, B, C)	Oct 2014 to Nov 2015	• Finalise detailed design • Public consultation
	4	Land Acquisition via negotiation or CPO (A, B and C)	Feb 2014 to April 2016	• Finalised detailed design • Successful agreement and negotiation by District Valuer • Parallel CPO process • Potential CPO public inquiry
Gateway 3	5	Confirmation of Final Approval of business case (A and B)	Jan 2016	• Final investment decision for A and B • Successful final business case
	6	Construction Period of Sections A and B	April 2016 to Jan 2018	• Construction Contract agreed • Agree traffic management requirements • Stakeholder involvement • Stage 3 Road Safety Audit
Gateway 4	7	Construction Period of Section C (excluded from business case)	Jan to Aug 2018	• S278 agreement to deliver this section • SCC to confirm contractor • Stakeholder involvement • Stage 3 Road Safety Audit • Agree traffic management requirements • Disposal of rail sidings
Gateway 5	8	Post-scheme Opening Evaluation (A, B and C)	2019 and 2023	• Deliver Monitoring and Evaluation Plan • Data collection • Stakeholder and public consultations • Stage 4 Road Safety Audit

6.4 Key Project Dependencies

The scheme programme is reliant on achieving the following key dependencies:

6.4.1 Planning Consent

Planning permission for the scheme is required in 2015 to achieve the timescales in the Project Plan. The County Council has previous experience in securing planning permission for road schemes and is confident that the tasks that this is dependent on can be achieved, as listed in Table 6.1. The following tasks have been completed or are already underway:

- The proposal is supported in the Adopted Local Plan
- Pre-application consultations have taken place and raised no unforeseen issues
- The Environmental Impact Assessment scoping report has been completed and the full assessment is scheduled to be completed early in 2015
- Detailed scheme design has been completed to inform this business case

6.4.2 Delivery of Section C

The realisation of the full benefits is dependent on the funding and construction of Section C between Doxey Road, through the West of Stafford development site to Martin Drive, Castlefields. The following tasks have been completed or are proposed to help ensure Section C is completed by 2018:

- The West of Stafford housing proposals are included in the Adopted Local Plan
- A letter of commitment from the major landowner is provided in Appendix 6.3 of this business case
- Pre-application discussions are taking place with house builders in the West of Stafford and planning applications for a first phase of development is imminent
- Network Rail expects to dispose of the rail siding by 2016
- The planning application for Section C is being progressed by the County Council
- A parallel Compulsory Purchase Order process may be progressed by the County Council

6.4.3 Land Acquisition

Appendix 6.2 identifies the location of the land that needs to be acquired to complete Sections A and B of the scheme and the affected landowners. The landowners are listed below and have been contacted as part of the consultation process.

- Stafford Borough Council
- Canada Life Ltd land leased to Tenpin Ltd
- Friends Life Ltd land leased to Lidl Ltd
- Stafford & Rural Homes
- Taylor Wimpey (UK) Ltd

As outlined in the scheme description and scope, the scheme will link into a developer led route between Doxey Road and Martin Drive, Castlefields (Section C).

Confirmation has been received from Taylor Wimpey (UK) Ltd / Lord Stafford's estate committing them to both delivering land within their control together with a substantial financial contribution to enable the delivery of the road (See Appendix 6.3). The landowners affected by Section C comprise:

- Taylor Wimpey (UK) Ltd / Lord Stafford's estate
- Network Rail
- Saint Gobain
- St Modwen Properties PLC

The feasibility of acquiring the land to deliver the scheme has been considered in detail by independent property specialists for the public sector who have estimated the cost of land for Sections A and B and have provided valuable advice regarding planning and legal issues. The strategy for acquiring land was agreed by County Council Cabinet in November 2014 and the report is provided in Appendix 6.4. For all sections, it is the intention to operate a parallel process to secure the land needed, as follows:

1. The starting point will be to acquire all the land and rights by negotiation and agreement. This is invariably quicker and less complicated than seeking to acquire the land compulsorily.

2. At the same time, make Compulsory Purchase Orders (CPOs) covering all the land to be acquired, under Part XII of the Highways Act 1980 and the Acquisition of Land Act 1981, to ensure that any land that cannot be acquired by agreement can be acquired compulsorily.

If land is secured for Section C through a CPO, the County Council could be liable to pay compensation to the affected landowners should this be awarded by a future ruling of the Lands Chamber. Prior to starting the process for Section C, a legal agreement will be secured which indemnifies the County Council against all associated costs in securing the land through the CPO process. If a legal agreement is not put in place, the County Council will only use CPO powers for Sections A and B.

Where businesses are affected, assistance will be given to identify sites for relocation. No dwellings are required to deliver the route. The need for a CPO public inquiry has been included in the Project Plan in Figure 6.2.

6.4.4 Network Rail

The Doxey Road WCML rail bridge is currently owned and maintained by Network Rail, albeit it carries an adopted publicly maintained road. No bridge replacement or structural maintenance work will be required to the bridge as it has been assessed as having a 40 tonne capacity and Network Rail will remain owners of the bridge upon completion of the scheme. It is therefore not expected that the level of works to the bridge will require the completion of Network Rail's template Over Bridge Agreement. A formal consultation response with Network Rail is provided in Appendix 6.5 and further email correspondence can be provided.

Bridge engineers will minimise the need for use of possessions and isolations to complete minor works to the bridge. However, if they are needed, the programme of

works is flexible enough to ensure that the County Council makes use of isolations already programmed by Network Rail as required to complete the Norton Bridge and Stafford signalling upgrade works currently planned for 2015. If Network Rail raises any concerns regarding the changes proposed to footway and cycleway provision, it is likely that the narrow footways on either side would remain in place.

Section C crosses rail sidings that are currently owned by Network Rail. Network Rail's Stafford re-signalling project team is proposing to take the sidings out of use and decommissioning and recovery is due to be undertaken in August 2015. The sidings are realistically expected to become redundant and recovered by December 2015 and will then be released for disposal. The County Council, as transport authority, and working in collaboration with the developers, will start the process with Network Rail to decommission the sidings. This will assist the developers with assembling the land required for Section C.

6.5 Assurance and Approvals

Project assurance and approvals are the main responsibility of the Project Board supported by the Project Delivery Team who will also ensure the quality of the work carried out. The scheme will be managed in line with the eight stages in Table 6.1 and the Project Board will sign off each of these stages and give the go/no go decision to start the following stage.

6.5.1 Gateway Review Process

It is not expected that the gross cost of the Western Access Route will be greater than £50 million therefore an external Office of Government Commerce (OGC) Gateway Review will not be carried out. However, a project review process similar to OGC is being completed that incorporates Reviews at the necessary stages in Table 6.1. The review process aligns to the OGC in the following way:

- *OGC Gateway 0: Strategic Assessment:* This was undertaken as part of the Local Transport Body prioritisation process (see 'The Strategic Case')
- *OGC Gateway 1: Business Case:* An Independent Review and a Report to the LEP will be undertaken to confirm that the scheme has an approved business case
- *OGC Gateway 2: Delivery Strategy:* The Commercial and Management Cases of this business case fulfil this function and will be subject to an Independent Review
- *OGC Gateway 3: Investment Decision:* An Independent Review and a Report to the LEP will take place to confirm Final Approval for funding and contract price
- *OGC gateway 4: Readiness for Service:* This review will confirm that the full scheme is ready for service, prior to handover and sign-off
- *OGC Gateway 5: Operation Review and Benefits Realisation:* The Monitoring and Evaluation Plan will be reviewed

6.5.2 Project Management Systems

A robust Project Management System has been established using guidance provided by the Project Management Handbook for Local Authorities. The County Council follows the principles set out in 'PRINCE2' and uses 'CS PROJECT Professional' to produce the Project Plan which is regularly updated and monitored to ensure critical

path activities and the eight stages of the project are achieved. CS PROJECT helps to ensure that necessary resources are in place to deliver the scheme.

The County Council will use 'Systems Applications and Projects' (SAP) for financial monitoring, with quarterly financial reviews carried out as standard practice. A system of change management control will be put in place with all variations over a threshold amount reported to the Project Board for approval. During the construction phase measures will be put in place to incentivise the contractor to manage costs downwards and achieve value for money, and cost outturn certainty.

6.5.3 Quality Control

All aspects of the project will follow quality control procedures in line with County Council objectives and standards, in accordance with the eight principles of the ISO 9001 quality management system. Advisors/consultants and contractors will also have the appropriate ISO accreditation. The Project Delivery Team will adopt best practice at all stages of the project and the correct quality controls, processes and reporting. The following controls will be put in place:

- Junction designs and highway geometry will be in accordance with the requirements of the Design Manual for Roads and Bridges, published by the Highways Agency. Local departures will be recorded and justified, and reviewed by a chartered engineer independent of the scheme.
- Independent Stage 1 and 2 Road Safety Audits (RSAs) will be carried out to inform the planning application. A Stage 3 RSA will be completed when the scheme is open and a Stage 4 RSA will be completed as part of the Monitoring and Evaluation Plan.
- Any works to Doxey Road rail bridge will be carried out in line with Network Rail's Basic Asset Protection Agreement.
- Environmental mitigation will be carried out in line with Town and Country Planning (Environmental Impact Assessment) Regulations 2011

6.6 Risk Assessment and Management

6.6.1 Risk Assessment

The first Quantified Risk Assessment (QRA) workshop completed for the Stafford Western Access Route took place on 8th March 2010 facilitated by Faithful+Gould (F&G) to ensure that all key risks are identified and costed. During 2010, reviews of the base estimate and the risks and the financial assessments of their impacts were completed and the outputs from these meetings were taken into account in the risk assessment. There were 44 risks finally modelled out of a potential 93.

In line with latest guidance a Quantified Cost and Risk Assessment (QCRA) has now been completed to take account of both risks and cost uncertainty. A second workshop took place on 6th May 2014, again facilitated by F&G, to:

- Review the existing risks for validity
- For those that are still valid, review and update the probability and impact assessment, post mitigation only

- Update mitigation actions and owners
- Identify new risks, assess probability and impact, post mitigation only and provide mitigation actions

The workshop concluded that 14 risks should remain open, two of which are only applicable to Section C and therefore outside the scope of the revised 2014 business case economic appraisal. Many of the items that were previously identified as risks were not actual 'risks' but areas of cost uncertainty.

A further review of the risk register was held on 9th June 2014 and a subsequent update of the cost model was conducted. To reflect any uncertainties in the scheme base cost, a three-point cost range was taken into account in the modelling, reflecting the minimum, most likely and worst case construction costs. The final QCRA therefore reflects the cost model and risk register, not just the risk register. This is provided in Appendix 4.4.

The evaluation was conducted using Latin Hypercube analysis, using Primavera Risk Analysis and the five outstanding risks that emerged, post mitigation were:

- There may be unidentified services
- Further site investigations at the detailed design stage may reveal that the ground is contaminated requiring the disposal of hazardous landfill
- During construction, contaminated land may be discovered that was not identified as part of site investigation
- There may be exceptionally adverse weather (greater than a 1:10 event)
- There may be changes to the way that groundwater flows affecting flood compensation requirements

The net result of the QCRA exercise is that the size of the risk layer has reduced significantly from the 2010 QRA. However, this is more than offset by the increase in the base cost of the scheme now that many of the previously identified risk items are now explicitly included within the base cost.

6.6.2 Risk Management Plan

The Risk Management Plan will be critical to the successful delivery of the Western Access Route and will be developed throughout the life of the project. The measures that will be carried out during the delivery of the scheme to manage the five outstanding risks in section 6.6.1 are as follows:

- Thorough and ongoing site and ground investigations
- Continued dialogue with statutory undertakers and with all consultees
- Regular and extensive advice through early contractor involvement arrangements
- Scheme commencement in the summer months to minimise flooding issues
- Early completion of full hydrological assessment

The Risk Register will be maintained and reviewed regularly throughout the project and revised as necessary as part of Project Delivery Team meetings and reported to the Project Board. The risks will be owned and managed in line with the County Council's Corporate Risk Management Policy. Going forward, risk workshops will be held as

necessary to review the project risks and opportunities. These workshops will include representatives from both the design and delivery teams to instigate discussions from the perspective of both designers and construction experts. The workshops will review existing risks, their owner and the proposed mitigation measures to ensure that they remain current. They will identify new risks that have arisen, practicable mitigation measures, and allocate the most appropriate owner. Risks that have the greatest impact on delivery will be closely monitored and managed.

Outside of the formal risk workshops, the County Council, under the Infrastructure+ contract has, and will continue to, obtain regular advice on all construction aspects of the scheme. This allows greater understanding of construction risk and how these are managed and/or mitigated. The construction and scheme costs have been independently reviewed to provide further assurance.

A risk workshop will be held to coincide with the development of the target cost. This will primarily review the risks owned by the contractor to determine the risk allowance to be included within the target cost. The risks owned by the County Council will remain in the risk register as the mitigation measures require input from the contractor; however, the cost of the residual risk is accounted for outside of the target cost. During the construction phase, risk reduction meetings will be held on a weekly basis as a platform to review and update the construction risk register.
In the event that a risk occurs, it will be managed by determining the most cost effective solution. This may include re-programming the works, reviewing the construction technique or modifying the design. The County Council is adept at reacting to common employer risks such as adverse weather, unchartered services and unforeseen ground conditions. This has been demonstrated on recent schemes that have been delivered.

The recent i54 South Staffordshire scheme involved a significant earthworks element to construct the new motorway embankments. Adverse weather conditions, to the extent that the risk was owned by the County Council, were experienced that caused the site won engineering fill to fall outside of the specification. At the point that the risk was notified, a meeting was organised between the County Council and Contractors site teams to discuss the best way forward. The team worked in collaboration to identify a number of possible scenarios and the additional costs associated with each. The chosen option was to re-programme the earthworks element of the scheme so that was no longer a critical activity and investigate modifying the material to bring it within the limits of the specification. If the material had not sufficiently dried naturally by the point in time that the earthworks became critical once more, the material was modified to ensure that works could continue. The cost of modifying the material was significantly less than the cost of the standing time i.e. the site staff, welfare facilities and plant.

A further illustration of the County Council's ability to manage risks that occur is the resolution of an unchartered communications cable during construction of the A34 junction improvement to serve the Redhill Employment Park. The site team isolated the area of work and re-phased the works to continue in another area. It was unclear who was responsible for the cable and the site team drew on their experience and that of their contacts in the statutory undertaker industry to assist in identifying the owner. Following this, a diversion of the apparatus was designed and programmed to be carried out without causing a delay to the works.

6.7 Communication Plan and Stakeholder Management

The business case document has been available on Staffordshire County Council's dedicated web page for the Stafford Western Access Route since 2010. The 2014 updated version will replace this. A Communications Log was developed in 2010 to manage and record the interaction with all consultees, including date of contact, issues raised and action taken. It is a 'live' document that is being regularly updated as the scheme progresses. The latest version of the Communication Plan is included in Appendix 6.6 and the Communication Log can be made available.

6.7.1 Public Consultation

During December 2009 and January 2010 Staffordshire County Council carried out a consultation exercise to explain to local residents and stakeholders the options for improving transport infrastructure in Stafford to help accommodate likely forecast traffic growth. Four possible road alignments to the West of Stafford were suggested and consultees were invited to express their views about the proposed alternative solutions. The outcome of the consultation process informed the choice of the final nine intervention options that were assessed in the Options Assessment Report (Appendix 2.4) and the decision regarding which option should be taken forward as the preferred route. The overall consultation results are summarised in Appendix 6.7.

Formal political approval for the preferred option was achieved in May 2010. A letter of support from the Member of Parliament for Stafford Constituency is also provided in Appendix 6.8. Following the 2013 local elections, the new local councillors have been consulted and have indicated their support.

Further information events took place in October / November 2014 with the local MP, Castletown and Castlefields Residents' Associations together with a two day exhibition in the town centre. The exhibition was attended by at least 110 residents mainly from the West of Stafford and 71 written comments were received. There was overall support for the scheme, although there were concerns raised mainly related to traffic levels around Foregate Street, along Martin Drive and in Doxey, and walking and cycling provision. A response to these concerns is provided in Appendix 6.9.

6.7.2 Statutory Consultation

Staffordshire County Council has been fully engaged with the Borough Council in statutory consultations on The Plan for Stafford Borough (the Local Plan). The Planning Inspector concluded in June 2014 that the Borough Council met the legal requirements of the Duty to Co-operate in terms of maximising the effectiveness of the plan-making process and actively co-operating and engaging with the relevant bodies on an ongoing basis.

The Stafford Western Access Route was considered as part of the Borough Council's public consultation events in September and October 2011 on the Draft Publication version to seek views on the development strategy, key infrastructure, locations for strategic growth and revised core policy wording. Overall, transport was the focus of many of the 1,000 comments that were received and the key issue that was discussed with County Council staff by the 600 people attending exhibitions. The main transport

comments received during the exhibitions included: congestion and the potential for conditions to deteriorate as new development comes on stream and the need for better public transport as well as cycle and pedestrian routes.

The Publication (pre-submission) version of the Local Plan was consulted on during January and February 2013 to seek representations on soundness and legal compliance. There were only three respondents out of 145 to this version of the Local Plan who objected to the Western Access Route.

Stafford Borough Council submitted The Plan for Stafford Borough to the Secretary of State on 20th August 2013 in accordance with Regulation 22 of The Town and Country Planning (Local Planning) (England) Regulations 2012. As part of the Independent Examination of the Plan, hearing sessions took place between 23rd October 2013 and 1st November 2013. The County Council presented evidence on the Western Access Route at hearings on the Development Strategy, West of Stafford and Infrastructure.

The Inspector issued his Final Report on 11th June 2014. The Inspector's Report concludes that The Plan for Stafford Borough is legally compliant and provides an appropriate basis to guide future development across the Stafford Borough area until 2031, subject to a number of modifications being made to the Local Plan. These modifications have been made and the Local Plan was adopted on 19th June 2014.

The planning application for the Western Access Route will be submitted for consideration to Staffordshire County Council in pursuance of powers under the Town and Country Planning Act 1990. Statutory consultations are taking place on the Western Access Route to inform the planning application and Environmental Statement. Planning pre-application consultations were completed in June 2014 and the responses received indicated that there were no major objections at this stage.

A Scoping Opinion has been completed in line with Town and Country Planning (Environmental Impact Assessment) Regulations 2011. The outcome is provided in Appendix 3.8, including a list of consultees. All key topics listed in the Regulations will be assessed. The Environment Agency raised no concerns regarding the scope of the EIA and the following advice was provided by other external consultees:

- Natural England provided advice on landscape and visual impact, impact on the adjacent SSSI in terms of biodiversity and air pollution, habitat protection, protection of rights of way and climate change
- Staffordshire Wildlife Trust stressed the importance of wildlife and geodiversity
- Public Health England requires an assessment of land contamination but considers that there is a 'low likelihood' of potential land contamination issues impacting on groundwaters. They also anticipate that UK Air Quality Standards will not be exceeded

Advice was also provided by Staffordshire County Council's Environmental Advice Team including the Principle Landscape Officer, Principle Forestry Officer, Principle Ecologist, Principle Archaeologist and Principle Rights of Way Officer.

6.7.3 Stakeholder Management

In addition to the stakeholder responses to the Environmental Impact Assessment Scoping Opinion, correspondence has been received from key environmental stakeholders and as provided in Appendix 3.10. There will be continued close liaison with these stakeholders in order to ensure that issues are satisfactorily addressed and appropriately mitigated.

Network Rail is supportive of the Strategic Development Location to the West of Stafford and the proposed Stafford Western Access Route and will continue to assist the project where possible. Network Rail's Asset Protection Engineer will provide advice and assistance to ensure that any works do not prejudice the railway, subject to completion of Network Rail's Basic Asset Protection Agreement (See Appendix 6.5). The key stakeholders and their interests are summarised in Table 6.2.

Table 6.2: Key Stakeholders and their Interests

Key Stakeholders	Interest	Letter of Support
Network Rail	A Basic Assets Protection Agreement has been set up between Network Rail and Staffordshire County Council. If necessary, works to the Doxey Road rail bridge will be undertaken during existing isolations and possessions already planned by Network Rail. Rail sidings in Section C will be made available.	✓
Stafford Borough Council	Key partner in the delivery of key infrastructure required to deliver the Adopted Local Plan. They will make the necessary land available to construct the road and will be consulted on the planning application.	✓
Environment Agency	They have been consulted on the business case and will ensure the environmental implications are fully understood during completion of the Environmental Impact Assessment. They have a particular interest in flood mitigation.	✓
Natural England	They have been consulted on the business case and will ensure the environmental implications are fully understood during completion of the Environmental Impact Assessment.	✓
English Heritage	They have considered the scheme and conclude that there are no significant issues.	✓
Staffordshire Wildlife Trust	They manage the Doxey Marshes and the SSSI and will be consulted on all aspects affecting this area and the delivery of appropriate mitigation and enhancement.	**x**
Local Councillors	The Cabinet Member for Economy and Infrastructure is fully engaged and local councillors will continue to be consulted about the detailed design.	✓ (Cabinet Report)
Local MP	The MP for Stafford, J Lefroy, is supportive and fully engaged through regular updates.	✓
Highways Agency	The proposal does not have a material impact on trunk roads or motorways.	**x**

Landowners	Negotiations with effected landowners have started and will continue through the scheme development. A parallel CPO process will be carried out to ensure land is acquired. Land is expected to be assembled for Section C.	✓ (Taylor Wimpey (UK) Ltd)
Utility companies	Ongoing consultation will take place during the development of the scheme to reduce potential risks that have been identified in the risk register.	**x**

6.8 Benefits Realisation

The key objectives of the Stafford Western Access Route that need to be realised are as follows:

- Provide high quality transport infrastructure required to deliver development in Stafford
- Reduce congestion on routes into and around the town centre which act as a constraint on growth proposals
- Facilitate improved access by sustainable modes between housing growth areas and the town centre

These will be achieved by delivering the benefits summarised in the Appraisal Summary Table in the Economic Case (Table 3.2) and in the Logic Map (Figure 2.10) included in the Strategic Case. These Cases also explain which sectors of the population will be impacted the most by achieving these benefits.

The overall responsibility for achieving them will fall to the County Council supported by the key stakeholders listed in Table 6.2. Current base line measures and forecast outcomes/benefits are provided in both the Strategic Case and Economic Case. Target dates for realising the benefits will be finalised in the Monitoring and Evaluation Plan.

Benefit Realisation proposals are already being implemented and will be further developed as the scheme progresses and reported to the Project Board in a Benefit Realisation Plan. It will include a varied range of policy and physical measures, including the following:

- The scheme has been included as policy in:
  - Stafford Borough Council's Adopted Local Plan
  - The Stoke-on-Trent and Staffordshire Growth Deal agreed with Government to deliver the Strategic Economic Plan
- Necessary governance arrangements have been put in place to manage scheme delivery and allocate responsibilities
- Key stakeholders will be engaged throughout the delivery process
- Help from the County Council to drive forward the delivery of Section C by securing planning permission and progressing a parallel CPO process
- As well as the physical delivery of the scheme, practical measures such as new direction signage will be provided to ensure that the route is used as planned
- Complementary sustainable travel promotion will be completed and funded through Local Sustainable Transport Funds

6.9 Monitoring and Evaluation Framework

A Monitoring and Evaluation Framework has been developed for the Stafford Western Access Route. The County Council will report on a standard set of measures in line with Department for Transport's guidance on a Monitoring and Evaluation Framework for Local Authority Major Schemes, September 2012.

A final Monitoring and Evaluation Plan will be reported to the Project Board and submitted to the Stoke-on-Trent and Staffordshire LEP prior to final approval for the scheme which is currently expected to be in January 2016. The cost of delivering monitoring and evaluation requirements will be reported to the LEP and resources will be set aside to undertake the tasks.

The Monitoring and Evaluation Plan will be published on the website for the purpose of local accountability and transparency. It will include:

- Scheme background and context
- Scheme objectives and outcomes (and logic map)
- Data collection methods (sample size, mode and frequency of data collection. Include map showing spatial coverage of data collection)
- Resourcing and governance (who will be responsible for delivering the monitoring and quality assurance)
- Delivery plan (timeframe for data collection and reporting findings)
- Dissemination plan (communication of findings to stakeholders)
- A plan for assessing Benefits Realisation

Two monitoring and evaluation reports will be published following data collection one year after opening in 2019, once traffic flows have settled down, and five years after opening in 2023. Baseline data will be collected during 2015 and 2017, before scheme opening. A large volume of traffic data is routinely collected by the County Council which will be utilised where possible to minimise data collection requirements and to ensure evaluation is consistent with ongoing monitoring processes. The quality of the data will be assessed prior to its use. Any new traffic data techniques that emerge will also be made use of as appropriate.

The LEP is also committed to monitor progress on delivering the Growth Deal. The LEP will:

- Ensure implementation and demonstrate success by tracking progress against milestones and agreed core metrics and outcomes in line with a Growth Deal monitoring and evaluation framework
- Communicate the ongoing outputs and outcomes of the Growth Deal to the local community and stakeholders by publishing the Growth Deal and reporting regularly, and publicly, on their progress to implement the strategy

6.9.1 Scheme Build

The evaluation of the scheme build process will be led by the Project Manager and will be reported in the first monitoring and evaluation report. It will include:

- A measure of whether the key milestones in Table 6.1 were met on time and on budget and an explanation of any variability compared to forecasts presented in the business case
- Lessons learnt with regard to stakeholder management
- A report on the effectiveness of managing risks

6.9.2 Delivered Scheme

The first monitoring and evaluation report will assess the final outputs in comparison to the proposals in the business case. This will be led by the Project Manager. A full description of the scheme outputs will be provided and an explanation of any scheme changes, why they were required and what effect they had on costs and delivery timescales.

An Independent Stage 4 Road Safety Audit will also be completed using 12 month and 36 month accident data from the time the scheme became operational. Remedial work will be arranged quickly if any serious problems are identified. The assessment will also take into account observations during any site visits undertaken.

6.9.3 Outturn Costs

Outturn costs will be published in the first report. A comparison will be made with the costs presented in the business case and cost savings and overruns will be identified and explained. This will be completed by the County Council's principle accountant and the Project Manager. Any additional outturn maintenance and operating costs will be identified in the second report.

6.9.4 Monitoring of Benefits Realisation

Department for Transport advice requires that benefits in terms of travel demand, travel times, reliability, carbon and impact on the economy should be included as standard measures within monitoring and evaluation reports. Target dates for achieving these benefits will be finalised in the Monitoring and Evaluation Plan.

Travel Data

Travel data will be collected one year and five years after opening to enable the following to be measured on key routes in Stafford. This data will be compared to the evidence provided in the business case:

- Peak hour traffic flows on key routes including Newport Road, Foregate Street, Chell Road, Station Road and Doxey Road
- Peak hour journey times on the routes assessed in the Traffic Assessment Report in Appendix 3.1
- An assessment of peak hour delays and reliability on key routes. This is currently calculated using Department for Transport GPS Trafficmaster data
- Traffic volume and speed characteristics will be used as appropriate to assess the change in greenhouse gas emissions as a result of the scheme
- Accident data will be regularly reviewed and any potential issues will be reported

Sustainable Transport

Constructing the Western Access Route will allow the opportunity to provide complementary sustainable transport measures within and to the town centre as part of the wider Transport Strategy for Stafford. The monitoring and evaluation reports will therefore report, where possible, on the growth in use of walking, cycling and public transport. It will focus on reporting the outcome of consultation exercises and customer satisfaction surveys and will also make use of available data from public transport operators and the completion of pedestrian and cycling counts as appropriate. A baseline will also be established prior to the start of construction. Further details will be provided in the Monitoring and Evaluation Plan.

Impact on the Economy

Stafford Borough Council will produce Annual Monitoring Reports to support the Adopted Local Plan. Within these reports, key performance indicators and targets will be used to monitor the effectiveness of policies in terms of delivering the spatial vision and strategic objectives of the Local Plan. It will subsequently inform any change to policies or additional actions considered to be required. The following relevant indicators listed in Appendix E of the Local Plan, will be measured for the town centre and development sites facilitated by the delivery of the Western Access Route:

- Net number of new houses delivered annually
- Amount of additional employment floor space by type
- Amount of floor space for retail, leisure, office with the town centre
- Number of planning permissions granted for major developments with secured Travel Plan

For more information please contact:

Connectivity Strategy
Transport and the Connected County
Staffordshire County Council
No. 1 Staffordshire Place
Stafford
ST16 2LP

Tel: 0300 111 8000
Email: transport.planning@staffordshire.gov.uk

If you would like this document in another language or format (e.g. large text), please contact us on 0300 111 8000 or email transport.planning@staffordshire.gov.uk