ATKINS

A46 Stoneleigh Junction Improvement

Transport Assessment

Warwickshire County Council

December 2017

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1. Introduction

Atkins has been commissioned to prepare a Transport Assessment (TA) to support a planning application for the A46 Stoneleigh Junction Improvement scheme. The proposed scheme provides an upgrade to the existing A46 / Stoneleigh Road Junction by forming a signal controlled standard gyratory roundabout layout. In addition to the upgrade to the A46 Stoneleigh Junction, it is proposed to re-align and expand the Stoneleigh Road / Dalehouse Lane roundabout.

1.1. Background

The A46 Stoneleigh Junction Improvement scheme is a standalone junction improvement which is being provided to address existing issues at the junction and deliver improvements to performance, safety, non-motorised user provision and air quality.

In addition to the benefits provided by the scheme in isolation, the scheme also provides the opportunity to progress a wider A46 Link Road project. The A46 Link Road project is a longer-term aspiration which (following the upgrade to the A46 Stoneleigh Junction) consists of a phase to run from the A46 Stoneleigh Junction to Westwood Heath, which would aim to improve access to University of Warwick and Westwood Heath Business Park. The final phase would link the previous phases infrastructure with either the A45 to the west of Coventry or the A452 in the Balsall Common area.

Detailed design of the A46 Stoneleigh Junction Improvement scheme is ongoing with construction expected to start in 2018, subject to the planning application for which this TA has been produced.

Later phases of the A46 Link Road project are still at the option assessment stage, and would be progressed through design stages following identification of a preferred route and further business case work. These phases therefore cannot be guaranteed to come forward at this time.

1.2. Preapplication Scoping

Scoping discussions were held with highways development control officers from Warwickshire County Council (WCC) during a meeting and subsequent correspondence in August 2017. During the scoping discussions, the study area, assessment methodology and other requirements for the TA were agreed. The resultant Scoping Technical Note summarising these details are included at Appendix A.

1.3. Report Purpose

This TA assesses the standalone junction improvement at Stoneleigh Junction only.

It is recognised that a new route created by the completed A46 Link Road project will have impacts on the wider highway network. Given the standalone nature of the A46 Stoneleigh Junction, and the levels of uncertainty around later phases at this stage, the TA will only consider the impacts of the A46 Stoneleigh Junction. The wider impacts of later phases will be assessed in the TAs prepared for these, as and when they are progressed.

This TA will evaluate the impacts that the proposed junction improvement scheme is likely to have on the local highway network and provision for non-motorised users.

1.4. Report Structure

The TA will be structured as follows:

- **Chapter 2** outlines national and local policies relevant to the development proposals;
- **Chapter 3** reviews the baseline conditions in relation to the existing local area and highway network;
- **Chapter 4** provides details of the proposed scheme;
- **Chapter 5** outlines the modelling used to assess the scheme;

- **Chapter 6** presents the junction capacity assessments; and
- **Chapter 7** summarises and concludes the Transport Assessment.

2. Policy Review

2.1. Introduction

This section of the TA outlines the relevant planning policy and guidance documents for the A46 Stoneleigh Junction Improvement scheme. It reviews and summarises the following documents:

- National Policy
  - National Planning Policy Framework (NPPF)
- Regional Policy
  - WCC Third Local Transport Plan (2011 - 2026)
- Local Policy
  - Warwick District Council Local Plan (2011-2029)
- National Guidance
  - Travel Plans, Transport Assessments and Statements in decision-taking (March 2014)

2.2. National Policy

2.2.1. National Planning Policy Framework (2012)

The National Planning Policy Framework (NPPF) came into force on 27th March 2012. It aims to make the planning system less complex and more accessible, and to promote sustainable growth. NPPF replaces all the previous Planning Policy Statements (PPSs) and Planning Policy Guidance (PPGs), including PPG13 (Transport).

The NPPF sets out the Government's economic, environmental and social planning policies for England. Taken together, these policies articulate the Government's vision of sustainable development, which should be interpreted and applied locally to meet local aspirations.

Section 4 of NPPF covers 'Promoting Sustainable Transport'. Relevant elements of this section are summarised below.

Transport policies have an important role to play in facilitating sustainable development and achieving wider sustainability and health objectives. The Government recognises that different measures will be required in different communities and opportunities to maximise sustainable transport solutions will vary from urban to rural areas. NPPF states that encouragement should be given to schemes which reduce congestion, and therefore greenhouse gas emissions.

Where practical, developments should be designed to give priority to pedestrian and cycle movements, and have high access to quality public transport facilities. Designers should also create safe and secure layouts which minimise conflicts between traffic, cyclists and pedestrians and consider the needs of people with disabilities. If these are taken into consideration, opportunities for the use of sustainable transport modes for the movements of people will be protected and exploited.

NPPF states that planning decisions should take account of whether:

- The opportunities for sustainable transport modes have been taken up depending on the nature and location of the site, to reduce the need for major transport infrastructure;
- Safe and suitable access to the site can be achieved for all people; and
- Improvements can be undertaken within the transport network that cost effectively limit the significant impacts of the development. Development should only be prevented or refused on transport grounds where the residual cumulative impacts of development are severe.

This last point indicates that a refusal of planning permission on transport grounds will only be defendable if there are severe impacts arising from the development.

2.3. Regional Policy

2.3.1. WCC Third Local Transport Plan (2011 – 2026)

The third Warwickshire Local Transport Plan (LTP3) came into effect on 1st April 2011 and it sets out the policies and strategies for the County for the period 2011 to 2026. The plan provides six objectives in relation to transport in the County as follows:

1. To promote greater equality of opportunity for all citizens in order to promote a fairer, more inclusive society;
2. To seek reliable and efficient transport networks which will help promote full employment and a strong, sustainable local and sub-regional economy;
3. To reduce the impact of transport on people and the (built and natural) environment and improve the journey experience of transport users;
4. To improve the safety, security and health of people by reducing the risk of death, injury or illness arising from transport, and by promoting travel modes that are beneficial to health;
5. To encourage integration of transport, both in terms of policy planning and physical interchange of modes;
6. To reduce transport's emissions of carbon dioxide and other greenhouse gases, and address the need to adapt to climate change.

The North-South Corridor Strategy outlines specific problems and opportunities for this area of Warwickshire, which have been developed into a set of three key objectives, as follows:

1. Support the local and sub-regional economy, including the Coventry to Nuneaton Regeneration Zone, the various town and city centres within the corridor, Warwick University and major (re)development sites;
2. Support future housing and employment growth within Nuneaton and Bedworth Borough, Warwick District, Rugby Borough, Coventry City and Hinckley and Bosworth Borough; and
3. Reduce the environment impact of traffic within the corridor and improve local air quality.

The A46 Stoneleigh Junction Improvement scheme is identified as a Strategic Proposal for the corridor. It notes that The A46 Stoneleigh Interchange located between Kenilworth and Coventry and provides the principal access from the trunk road network to Warwick University and the National Agricultural Centre (NAC) at Stoneleigh. The interchange is currently a single overbridge with northern and southern access slip roads leading to simple priority junctions. The junction is currently subject to congestion at peak times, which can cause traffic to queue back on to the main carriageway of the A46.

2.4. Local Policy

2.4.1. Warwick District Local Plan (2011 – 2029)

The Warwick District Local Plan was adopted in 2017, and sets out the long-term spatial vision for how the towns, villages and countryside in the district will develop and change and how this vision will be delivered through a strategy for promoting, distributing and delivering sustainable development.

The Transport Chapter of the Warwick District Local Plan sets out the transport related policies, which are:

TR1 Access and Choice

Development will only be permitted that provides safe, suitable and attractive access routes for pedestrians, cyclists, public transport users, emergency vehicles, delivery vehicles, refuse vehicles and other users of motor vehicles, as appropriate.

Development proposals will be expected to demonstrate that they:

a) are not detrimental to highway safety;
b) are designed to provide suitable access and circulation for a range of transport modes including pedestrians, cyclists, emergency services and public transport services;

c) create safe and secure layouts for motorised vehicles, cyclists, pedestrians and public transport and integrate the access routes into the overall development;
d) where practical, incorporate facilities for charging plug-in and other ultra-low emission vehicles where the development proposals include provision for off street parking and is for one or more dwelling, and;
e) have taken account of the needs of people with disabilities by all modes of transport.

TR2 Traffic Generation
All large-scale developments (both residential and non-residential) that result in the generation of significant traffic movements should be supported by a Transport Assessment, and where necessary a Travel Plan, to demonstrate the practical and effective measures to be taken to avoid the adverse impacts of traffic.

Any development that results in significant negative impacts on the health and wellbeing of people in the area as a result of pollution, noise or vibration caused by traffic generation will not be permitted unless effective mitigation can be achieved.

Any development that results in significant negative impacts on air quality within identified Air Quality Management Areas or on the health and wellbeing of people in the area as a result of pollution should be supported by an air quality assessment and, where necessary, a mitigation plan to demonstrate practical and effective measures to be taken to avoid the adverse impacts.

A Transport Statement may be required for development that has relatively small transport implications in line with the Guidance on Transport Assessments.

All measures required in the policy should take full account of the cumulative impact of all development proposed in this Plan (and any other known developments) on traffic generation and air quality.

2.5. National Guidance

2.5.1. Travel Plans, Transport Assessments and Statements in decision-taking (March 2014)

This guidance provides advice on when Transport Assessments and Transport Statements are required, and what they should contain. It notes that it is important to give appropriate consideration to the cumulative impacts arising from other committed development (i.e. development that is consented or allocated where there is a reasonable degree of certainty will proceed within the next three years). This has informed the future year assessment scenario discussed later in this report.

3. Existing Situation

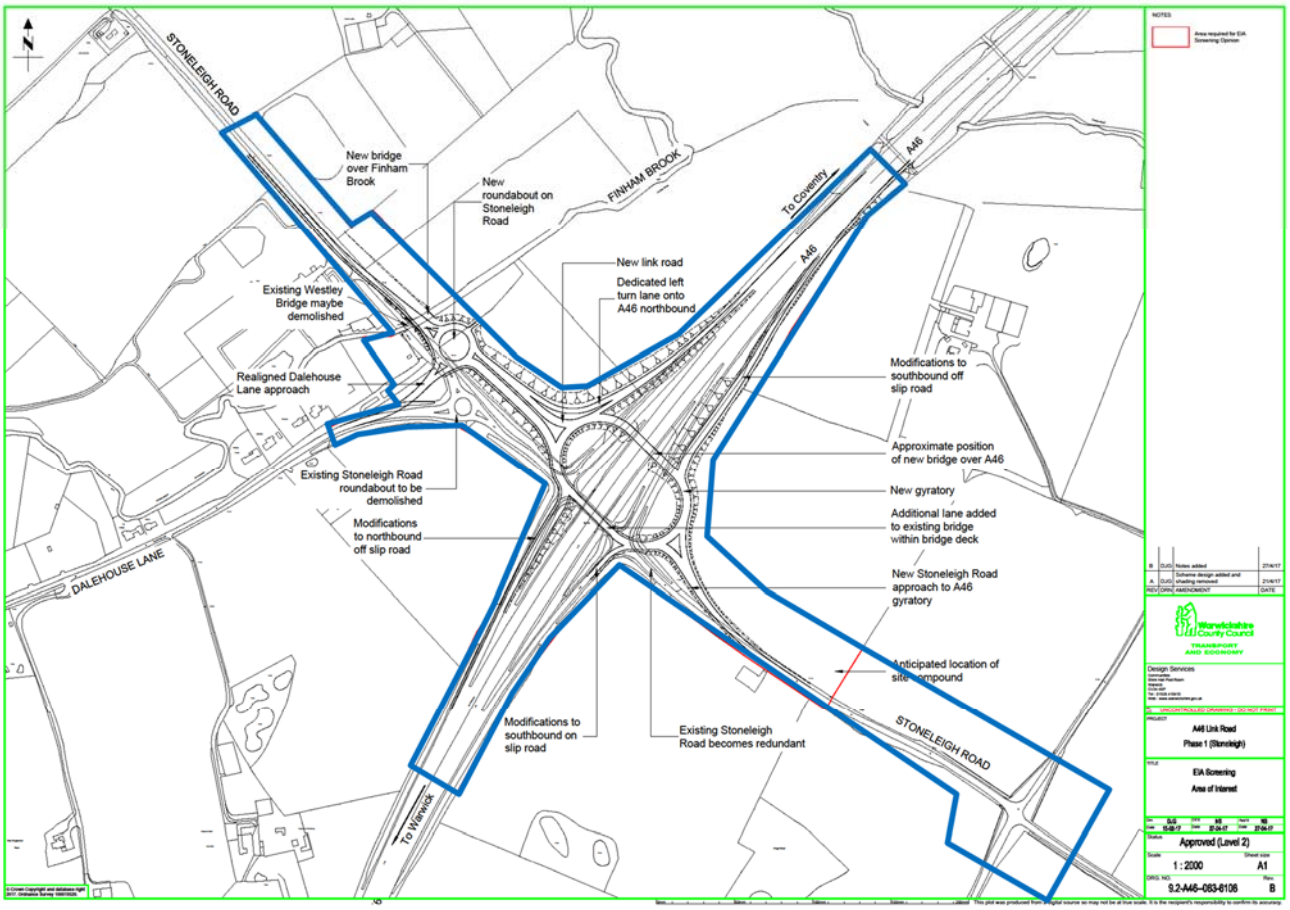
3.1. Introduction

This section of the TA outlines the baseline conditions in the vicinity of the proposed A46 Stoneleigh Junction Improvement scheme, based on the existing transport provision.

3.2. Scheme Area

The scheme area comprises the A46 Stoneleigh Junction and the Stoneleigh Road / Dalehouse Lane Junction. During scoping discussions, it was requested that the TA also included the B4115 / Stoneleigh Road / Birmingham Road junction to the south east of the scheme area. The scheme area is shown in the scheme layout provided by WCC in Figure 3-1 below.

Figure 3-1 Scheme Area



The A46 is a dual carriageway road which forms part of the Strategic Road Network (SRN) and provides connections between Warwick and Coventry. As identified in the WCC Local Transport Plan, The A46 Stoneleigh Junction is located between Kenilworth and Coventry and provides the principal access from the trunk road network to Warwick University and the National Agricultural Centre (NAC) at Stoneleigh.

The interchange is currently a single overbridge with northern and southern access slip roads leading to simple priority junctions. The junction is currently subject to congestion at peak times, which can cause traffic to queue back on to the main carriageway of the A46. There is streetlighting, and limited footway provided on the overbridge only.

To the west of the A46 Stoneleigh Junction, Stoneleigh Road provides access to Dalehouse Lane at a roundabout junction. The junction has streetlighting, but no footway provision. Dalehouse Lane is a single carriageway rural road with no streetlighting or footways, and is subject to a 50mph speed limit on the approach to the roundabout.

To the west of the Stoneleigh Road / Dalehouse Lane roundabout, the Stoneleigh Road provides access to Warwick University. It is a single carriageway road with no streetlighting or footway provision and subject to national speed limits.

To the east of the A46 Stoneleigh Junction, Stoneleigh Road provides access to Stoneleigh village. The road is subject to national speed limits, is unlit and has very limited footway provision. Stoneleigh Road provides access onto the B4115 and Birmingham Road via a priority crossroad junction, with Stoneleigh Road forming one of the minor arms, and the B4115 running north to south as the major arms. The other minor arm, Birmingham Road leads into Stoneleigh Village.

3.3. Sustainable Transport

3.3.1. Pedestrian Access

As summarised above, the local highway network has limited footway provision in the scheme area. The only formal footway provision is across the A46 Stoneleigh Junction overbridge, which is not connected to any other footways to the west. To the east, there is a narrow footpath on the northern side of the carriageway along Stoneleigh Road between the A46 and the B4115. This is unlit and has been largely encroached upon by the verge.

3.3.2. Cycle Access

There are no formal designated off road cycle routes in the scheme area, and the roads within the scheme area are not identified as on road cycle routes. Cyclists using the scheme area currently travel on road, with no provisions to cross roads, aside from the footways on the A46 overbridge.

3.3.3. Public Transport

Several bus routes currently travel through the A46 Stoneleigh Junction and/or the Stoneleigh Road / Dalehouse Lane junction. The Kenilworth Bus Map showing these routes is included in Appendix B. There are no bus stops within the scheme area.

3.4. Personal Injury Accident Analysis

Personal Injury Accident (PIA) data has been obtained from WCC Traffic and Road Safety Team for the latest five year period from 01 January 2012 until the 12 Septemeber 2017. The study area includes the following junctions and links:

- Stoneleigh Road/Dalehouse Lane roundabout;
- Stoneleigh Road between Dalehouse Lane roundabout and A46 Northbound approach/exit junction;
- Stoneleigh Road/A46 Northbound approach/exit junction;
- A46 Northbound approach/exit slip roads;
- Stoneleigh Road/A46 Southbound approach/exit junction;
- A46 Southbound approach/exit slip roads;

3.4.1. Accidents by Year

Accident data for the links and junctions have been collated to assess accident occurrence over time during the five year period. Accidents have been listed in terms of severity, from slight to fatal. These are summarised in Table 3-1 below.

Table 3-1 Total accidents by severity during study period

Year	Fatal	Serious	Slight	Total
2012	0	0	1	1
2013	0	0	0	0
2014	0	1	4	5
2015	0	0	4	4
2016	0	0	2	2
2017 (part year)	0	0	4	4
Total	0	1	15	16

2014 saw the highest number of accidents, with five in total compared to zero in 2013. 2016 saw a reduction in the annual number of accidents with a total of two. No comment is provided for 2017 as annual accident data is incomplete. WCC accident data shows there have been no fatalities across the study area in the five year period, with one serious accident and 15 slight accidents.

3.4.2. Accidents by link/junction

Accident data will be analysed according to the link/junction on which it took place. A summary will be provided outlining any main contributing factors recorded for accidents on that section of road. The full accident data outputs are included in Appendix C.

Stoneleigh Road/Dalehouse Lane roundabout

During the analysis period, two PIAs were recorded on this roundabout. Of the two PIAs, one was classified as serious and one as slight.

The serious accident involved a cyclist losing control on entry to the roundabout. The slight accident was a rear-end collision caused by a vehicle braking suddenly for a vehicle entering the roundabout. Both accidents occurred on the approaches to roundabout, with none on the circulatory. The narratives do not suggest common causes, other than driver error.

Stoneleigh Road between Dalehouse Lane roundabout and A46 Northbound Approach/Exit junction

No accidents are recorded on this section of the study area over the analysis period.

Stoneleigh Road/A46 Northbound approach/exit junction

During the analysis period, five PIAs were recorded on this junction. All the PIAs were slight in severity.

The narrative states that all of the PIAs were caused by drivers from the A46 northbound approach slip road failing to give way to traffic on Stoneleigh Road. Of the recorded PIAs, three were due to a vehicle performing a right hand turn across oncoming traffic. Two of these accidents involved oncoming traffic travelling southeast. The other two PIAs involved vehicles travelling straight over the junction onto the exit slip road. The PIA summary at this location indicates that the majority of recorded accidents involved give way movements and comprised of vehicles moving off from the priority controlled junctions and colliding with oncoming traffic.

A46 Northbound approach/exit slip roads

During the analysis period, two PIAs were recorded on this link. All the PIAs were slight in severity.

The narrative states that both PIAs were due to rear end collisions, caused by a vehicle behind a stationary vehicle failing to stop on the A46 approach. The narrative provides limited details, though one of the accidents involved a learner driver who was hesitant at the top of the slip road.

Stoneleigh Road/A46 Southbound approach/exit junction

During the analysis period, four PIAs were recorded on this junction. All the PIAs were slight in severity.

The narrative states that three of the PIAs were due to drivers from the A46 southbound approach slip road failing to give way to traffic on Stoneleigh Road. One of these accidents also involved a vehicle not negotiating the left-hand turn and crossing into the offside carriageway, colliding with oncoming traffic. The vehicle in question was being chased and was travelling at speed. The other PIA was a result of two vehicles performing a right hand turn simultaneously, one from the A46 approach and the other onto the A46 exit.

A46 Southbound approach/exit slip roads

During the analysis period, two PIAs were recorded on this link. All the PIAs were slight in severity.

The narrative states that both PIAs were due to rear end collisions, caused by a vehicle behind a stationary vehicle failing to stop on the A46 approach. One of the PIAs occurred in wet weather. Both involved one vehicle hitting the rear of a vehicle in a queue (consisting of at least two vehicles), which then caused previously stationary vehicles to collide with the one in front.

3.4.3. Stoneleigh Road / B4115 / Birmingham Road Junction

Accident data for this junction was also provided by WCC. It showed that there were 12 recorded PIAs in the five year period; 2 serious and 10 slight in severity. The accidents are distributed broadly equally across each year of the study period. The accidents involved a variety of movements as well as driver error related causation factors identified in the narratives.

Five of the accidents at this junction involved cyclists, with three of these involving vehicles pulling out from give ways and colliding with the cyclists. Two of the accidents at this junction involved vehicles failing to give way, and two involved vehicles turning right into the minor arms. Whilst a higher than typical proportion of the accidents at this location involved cyclists, the narratives for these suggest that driver error was the common factor.

3.4.4. PIA Summary

Personal Injury Accident (PIA) analysis has been undertaken for the latest five year period. It has identified that a large proportion of the PIAs in the study area involved give way movements and comprised of vehicles moving off from the priority controlled junctions and colliding with oncoming traffic. On the A46 approach/exit slip roads, PIAs mainly involved vehicles colliding with stationary traffic before the junction. These two common causation factors (other than driver error) suggest that the current priority controlled layouts may be a contributing factor for accidents, along with the queues on the slip roads caused by existing congestion.

3.5. Existing Junction Operation

The existing junction layouts have been modelled using standalone junction modelling software to assess current operation. The A46 Stoneleigh Junction and the Stoneleigh Road/Dalehouse Lane junction have been modelled based on existing layouts, using surveyed turning count data.

A46 Stoneleigh Junction

The junction has been modelled using the PICADY module of Junctions 9, with junction geometries taken from OS mapping. Existing flows were calculated using manual classified turning count data from a survey undertaken on 15 March 2017. The results are shown in Table 3-2, with the full outputs contained in Appendix D.

Table 3-2 A46 Stoneleigh Junction – Existing Operation

Arm / Movement	AM PEAK			PM Peak		
	RFC	Delay (S)	Queue (PCU)	RFC	Delay (S)	Queue (PCU)
A46 Northbound Side						
A46 NB offslip / left	1.22	409	58.9	1.38	800	120.5
A46 NB offslip / right	0.28	21	0.4	0.21	19	0.3
Stoneleigh Rd / right onto onslip	0.31	7	1.3	0.32	7	1.2
A46 Southbound Side						
A46 SB offslip / left	0.45	17	0.9	0.62	24	1.7
A46 SB offslip / right	0.86	83	5.1	0.94	117	6.2
Stoneleigh Rd / right onto onslip	0.96	76	16.9	1.26	532	110.1

The results of the modelling show that the junction currently operates above acceptable capacity thresholds, with several arms experiencing long queues and associated delays. The results indicate that queues on the off slips in both directions in both peak hours are likely to extend back onto the mainline A46, in line with the observations noted in the WCC Local Transport Plan.

Consultation material provided by WCC showing peak hour journey times relative to off peak journey times also support these findings, illustrating that the slip roads suffer from peak period congestion. The journey time information is shown in Figure 3-2.

Figure 3-2 Journey time data

Stoneleigh Road / Dalehouse Lane Junction

The junction has been modelled using the ARCADY module of Junctions 9, with junction geometries taken from OS mapping. Lane based analysis was used to reflect the lane markings on the Stoneleigh Road approaches, and the unequal approach flows using these lanes. Existing flows were calculated using manual classified turning count data from a survey undertaken on 23 Feb 2016. The results are shown in Table 3-3, with the full outputs contained in Appendix D.

Table 3-3 Stoneleigh Road / Dalehouse Lane Junction – Existing Operation

Arm / Movement	AM PEAK			PM Peak		
	RFC	Delay (S)	Queue (PCU)	RFC	Delay (S)	Queue (PCU)
Stoneleigh Road (NW)	0.95	81	18.5	0.99	268	74.2
Stoneleigh Road (SE)	0.96	175	72.2	0.91	70	26.0
Dalehouse Lane	0.46	6	1.1	0.23	4	0.4

The results indicate that the junction currently operates above acceptable capacity thresholds in both peak hours, with long queues and delays on the Stoneleigh Road arms. These queues are likely to block back into upstream junctions, causing additional deterioration of performance on the local highway network.

3.6. Baseline Summary

In summary, the baseline conditions have been outlined for the vicinity of the proposed A46 Stoneleigh Junction Improvement scheme, based on the existing transport provision. The local sustainable transport infrastructure has been summarised including existing walking, cycling and public transport provision.

Personal Injury Accident (PIA) analysis has been undertaken for the latest five year period; this identified that a large proportion of the PIAs in the study area involved give way movements and comprised of vehicles moving off from the priority controlled junctions and colliding with oncoming traffic. On the A46 approach/exit slip roads, PIAs mainly involved vehicles colliding with stationary traffic before the junction. These two common

causation factors (other than driver error) suggest that the current priority controlled layouts may be a contributing factor for accidents, along with the queues on the slip roads caused by existing congestion.

The existing junction operation assessment has indicated that both the junctions assessed currently operate above acceptable capacity thresholds, with associated long queues and delays.

4. Proposed Scheme

4.1. Introduction

This section of the TA outlines the proposed A46 Stoneleigh Junction Improvement scheme.

4.2. Scheme Description

The proposed scheme provides an upgrade to the A46 / Stoneleigh Road Junction by forming a signal controlled standard gyratory roundabout layout. This will be achieved by installing a new overbridge to the north east of the existing junction, and realigning all approaches. There are also segregated free flowing lanes proposed between the western approach of Stoneleigh Road and the northbound A46 on-slip.

In addition to the upgrade to the A46 Stoneleigh Junction, it is proposed to re-align and expand the Stoneleigh Road / Dalehouse Lane roundabout.

Shared footway/cycleways are proposed throughout both junctions, as well as signalised toucan crossing points across all on and off slip roads.

The scheme layout is shown in **Drawing 9.2-A46-083-010** included in Appendix E.

4.3. Scheme Benefits

The proposed scheme aims are:

- To reduce congestion and improve reliability of journey times by increasing the capacity of both junctions;
- To improve access to Stoneleigh Park and University of Warwick;
- To help residents of Stoneleigh, Ashow and Kenilworth gain more efficient access to the A46.
- To improve facilities for pedestrians and cyclists.
- To provide an opportunity to bring forward more substantial access improvements to the University of Warwick.
- To reduce accidents and the risk of accidents at the junction, by creating a gyratory system and reducing traffic queueing back on to the A46.
- To improve air quality by reducing the amount of time when vehicles are stationary (when they are at their most polluting).
- To reduce the impact of Heavy Goods Vehicles on local communities in the Stoneleigh and Ashow area, especially associated with High Speed 2 construction.

4.4. High Speed 2

As noted in the scheme benefits, the proposed scheme will aim to reduce the impacts of the construction phase of the High Speed 2 (HS2) railway project which passes through the local area. The proposed improved junction layout, with its associated capacity benefits will help to reduce the temporary impacts of construction traffic on the local highway network in the area.

5. Modelling Approach

5.1. Introduction

The proposed junction improvement scheme has been developed and assessed using the microsimulation traffic modelling software S-Paramics. The results of this microsimulation model have been used in the assessment of the proposed scheme provided in Section 6. This section of the TA outlines the modelling approach.

5.2. Kenilworth and Stoneleigh Wide Area Model

The Kenilworth and Stoneleigh Wide Area (KSWA) model is an S-Paramics model developed by Vectos Microsim for WCC. It has been used to inform the Warwick District Local Plan and the Warwickshire Local Transport Plan, as well as other planned improvements in the area.

It was also noted by WCC that the KSWA had been independently audited and approved by Highways England for use in assessing a nearby proposed development, so can be considered fit for purpose in assessing the operation of the SRN in this location.

The KSWA model provides future year assessment scenarios to assess the proposed junction improvement scheme with the inclusion of forecast local developments and infrastructure schemes.

For this TA, the following scenarios will be assessed for the AM and PM peak hours:

- 2029 Future Year Without Scheme; and
- 2029 Future Year With Phase 1 of A46 Link Road (the A46 Stoneleigh Junction Improvement Scheme).

During scoping discussions with WCC, it was agreed to assess the scheme using demand flows extracted from the model, rather than actual flows. Demand flows represent the number of vehicles wishing to make various trips throughout the model (no. of vehicles wanting to go from origin to destination) rather than actual flows (no. vehicles that actually make the trip which excludes those that are stuck in queues and don't complete the trip).

As such, it was agreed that the form of the junction has little impact on the number of vehicles predicted to go from origin to destination in the model, so the same flows would be used to assess the With and Without scheme scenarios.

6. Junction Capacity Assessment

6.1. Introduction

This section of the TA summarises the results of the future year standalone junction capacity modelling. It is noted that the overall proposed junction improvement scheme, including the interactions between the adjacent junctions has been developed and tested using the KSWA S-Paramics model. The standalone models are provided to give more detailed capacity information on the operation of the proposed scheme.

6.2. 2029 Without Scheme

The standalone junction modelling results for the existing layouts in the future year scenario are shown below. The demand flows used in the models have been extracted from the 2029 KSWA model.

A46 Stoneleigh Junction

The results of the existing junction layout in the future year assessment are shown in Table 6-1, with the full outputs contained in Appendix D.

Table 6-1 A46 Stoneleigh Junction – 2029 Without Scheme

Arm / Movement	AM PEAK			PM Peak		
	RFC	Delay (S)	Queue (PCU)	RFC	Delay (S)	Queue (PCU)
A46 Northbound Side						
A46 NB offslip / left	2.24	3320	483.9	2.21	3101	441.7
A46 NB offslip / right	0.59	40	1.5	0.76	61	3.0
Stoneleigh Rd / right onto onslip	0.77	24	7.5	0.67	16	4.3
A46 Southbound Side						
A46 SB offslip / left	0.74	38	2.9	0.78	42	3.4
A46 SB offslip / right	1.31	470	27.4	1.16	266	15.5
Stoneleigh Rd / right onto onslip	1.22	417	98.9	1.24	465	103.3

The results of the modelling show that the junction in its current form is predicted to operate significantly above acceptable capacity thresholds in the future year. Several arms in both peaks are predicted to experience significantly long queues and associated delays. The results indicate that queues on the off slips in both directions in both peak hours are likely to extend back onto the mainline A46.

Stoneleigh Road / Dalehouse Lane Junction

The results of the existing junction layout in the future year scenario are shown in Table 6-2, with the full outputs contained in Appendix D.

Table 6-2 Stoneleigh Road / Dalehouse Lane Junction – 2029 Without Scheme

Arm / Movement	AM PEAK			PM Peak		
	RFC	Delay (S)	Queue (PCU)	RFC	Delay (S)	Queue (PCU)
Stoneleigh Road (NW)	0.99	231	60.0	1.01	359	100.7
Stoneleigh Road (SE)	0.98	746	25.3	0.95	289	107.8
Dalehouse Lane	0.64	8	2.2	0.22	4	0.4

The results indicate that the junction currently operates above acceptable capacity thresholds in both peak hours, with long queues and delays on the Stoneleigh Road arms. These queues are likely to block back into upstream junctions, causing additional deterioration of performance on the local highway network.

6.3. 2029 With Scheme

The standalone junction modelling results for the proposed scheme layout (shown in Appendix E) in the future year scenario are shown below. The demand flows used in the models have been extracted from the 2029 KSWA model.

A46 Stoneleigh Junction – Proposed Layout

The results of the proposed signal controlled junction layout in the future year assessment are shown in Table 6-3, with the full outputs contained in Appendix F.

Table 6-3 A46 Stoneleigh Junction – 2029 With Scheme

Arm		AM PEAK			PM Peak		
		DoS (%)	Av. Delay (s/PCU)	MMQ (PCU)	DoS (%)	Av. Delay (s/PCU)	MMQ (PCU)
1/1	A46 (N) Ahead Left	55.4%	28.0	4.4	52.8%	25.2	4.5
1/2	A46 (N) Ahead	48.4%	26.5	3.7	38.3%	22.7	3.1
2/1	Stoneleigh Rd (E) Ahead Left	37.6%	3.5	0.3	37.3%	3.5	0.3
2/2	Stoneleigh Rd (E) Ahead	37.4%	3.5	0.3	37.3%	3.5	0.3
3/1	A46 (*S) Left	55.6%	16.1	6.5	55.7%	16.1	6.5
3/2	A46 (*S) Left Ahead	55.6%	16.1	6.5	55.8%	16.1	6.5
4/1	Stoneleigh Rd (W) Left	51.2%	4.0	0.5	43.2%	3.5	0.4
4/2	Stoneleigh Rd (W) Ahead Left	51.2%	4.0	0.5	43.0%	3.5	0.4
4/3	Stoneleigh Rd (W) Ahead	51.2%	4.0	0.5	43.2%	3.5	0.4
7/1	South Circulatory Ahead	32.0%	10.6	1.7	32.2%	14.3	2.3
7/2	South Circulatory Ahead Right	55.4%	15.3	4.5	53.6%	17.4	4.7
8/1	A46 SB onslip ped crossing Ahead	13.3%	3.1	0.8	19.8%	2.6	0.8
8/2	A46 SB onslip ped crossing Ahead	32.1%	1.9	0.3	26.5%	1.7	0.2
11/1	North Circulatory Right Ahead	34.1%	10.8	4.6	40.9%	12.7	5.0
11/2	North Circulatory Right	39.9%	8.4	4.2	34.8%	9.0	3.6
12/1	A46 NB onslip ped crossing Ahead	36.7%	3.9	2.6	31.5%	3.5	2.1
12/2	A46 NB onslip ped crossing Ahead	17.8%	2.9	0.9	12.2%	2.4	0.5
PRC (%) / (Cycle Time)		61.9% / 60s			61.2% / 60s		

The results of the modelling show that the proposed junction is predicted to operate well within acceptable capacity thresholds in the future year. Arms in both peaks are predicted to experience minimal queues and delays, and queues on the circulatory carriageway are not predicted to exceed beyond storage space. The results indicate that queues on the off slips in both directions in both peak hours are not predicted to extend back onto the mainline A46.

Stoneleigh Road / Dalehouse Lane Junction

The results of the proposed junction layout in the future year scenario are shown in Table 6-4, with the full outputs contained in Appendix F. The Stoneleigh Road between the Dalehouse Lane junction and the A46 Stoneleigh Junction has been widened to 2 lanes, allowing vehicles on the eastbound approach to the

Dalehouse Lane to use both lanes (current layout merges back to one lane after roundabout). This change to lane allocation has been captured in the proposed layout modelling.

Table 6-4 Stoneleigh Road / Dalehouse Lane Junction – 2029 With Scheme

Arm / Movement	AM PEAK			PM Peak		
	RFC	Delay (S)	Queue (PCU)	RFC	Delay (S)	Queue (PCU)
Stoneleigh Road (NW)	0.62	10	2.5	0.67	9	2.8
Stoneleigh Road (SE)	0.74	8	3.7	0.71	8	3.2
Dalehouse Lane	0.72	13	3.4	0.22	4	0.4
Spur	-	-	-	-	-	-

The results indicate that the proposed junction is forecast to operate within acceptable capacity thresholds in both peak hours, with minimal queues and delays on all arms.

6.4. Stoneleigh Village Assessment

During scoping discussions, it was agreed to assess the flow differences resulting from the Phase 1 scheme in the Stoneleigh Village.

This assessment involved looking at the relative differences in peak hour link flow coming to/from the Birmingham Road arm of the B4115/Stoneleigh Road/Birmingham Road junction.

As noted in the Modelling Approach section, demand flows were extracted from the KSWA model, which meant that the form of the A46 Stoneleigh Junction has little impact on the number of vehicles predicted to go from origin to destination in the model. This resulted in the same flows being used for the With and Without scheme scenario. As such, the modelling predicts that there is no change in flows at the B4115/Stoneleigh Road/Birmingham Road junction as a result of the proposed junction improvement scheme.

6.5. Road Safety Audit

The proposed scheme has undergone a Stage 1 Road Safety Audit, which is included in Appendix G.

6.6. Additional Assessment

During scoping discussions, it was agreed to investigate locations where the proposed layout may result in changes to visibility splays for minor junctions and accesses. An assessment of the proposed layout has shown that the only access that has been impacted by the proposed scheme is to the garden centre on Stoneleigh Road, with the proposed scheme providing an improved level of visibility compared to the existing.

7. Summary and Conclusion

7.1. Summary

Atkins has been commissioned to prepare a TA for the planning application for the A46 Stoneleigh Junction Improvement scheme.

The baseline conditions have been outlined for the vicinity of the proposed scheme, based on the existing transport provision. The local sustainable transport infrastructure has been summarised including existing walking, cycling and public transport provision.

Personal Injury Accident (PIA) analysis has been undertaken for the latest five year period; this identified that a large proportion of the PIAs in the study area involved give way movements and comprised of vehicles moving off from the priority controlled junctions and colliding with oncoming traffic. On the A46 approach/exit slip roads, PIAs mainly involved vehicles colliding with stationary traffic before the junction. These two common causation factors (other than driver error) suggest that the current priority controlled layouts may be a contributing factor for accidents, along with the queues on the slip roads caused by existing congestion..

The scheme details have been outlined including the reduction in traffic congestion at the A46 Stoneleigh Junction, the improved pedestrian and cycle link provision and mitigation for the temporary impacts of the construction phase of HS2.

An operational assessment has been undertaken to analyse the impact of the scheme in a 2029 future year assessment scenario, using traffic flows extracted from the 2029 Kenilworth and Stoneleigh Wide Area Model. The assessment has demonstrated that the implementation of the A46 Junction Improvement scheme results in junction capacity performance that is significantly better than the without scheme scenario. This is in addition to the other scheme benefits such as the safety implications resulting from the reduced traffic congestion on the A46 slip roads, the improved pedestrian and cyclist provisions, and the improved air quality from reducing the amount of time when vehicles are stationary.

7.2. Conclusion

In conclusion, this TA has evaluated the impact that the proposed scheme is likely to have on the local transport network. It has demonstrated that the inclusion of the A46 Junction Improvement scheme results in performance that is significantly better than the without scheme scenario. It has also demonstrated that the scheme provides improvements to sustainable non-motorised user provisions, improvements to safety from the reduced congestion on the A46 slip roads, and improvements to air quality in the area.

Appendices

Appendix A. Scoping Note

Appendix B. Kenilworth Bus Map

Appendix C. PIA Data

Appendix D. Existing Layout Junction Modelling Outputs

Appendix E. Proposed Scheme Layout

Appendix F. Proposed Scheme Junction Modelling Results

Appendix G. Road Safety Audit

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