Local Plan Technical Report

2018/2019 Infrastructure Delivery Plan Appendices

Part 10: Transport – Hertfordshire County Council

Appendices 31 to 38

St Albans City & District Council

Appendix 31: Further Transport Evidence Base Work – Task 4 Report Part 2: Hertfordshire County Council COMET – AECOM COMET St Albans Progress Meeting 2 (June 2017)

COMET St Albans Enhancement

Progress meeting 2

23 June 2017

AECOM

This Presentation

– Introduction

– Realism Test Results (Stage 2c)

– 2031 Do Minimum Results (Stage 3)

– Actions / Timescales / Invoicing

– Task 6

Introduction

Context

- Hertfordshire County Council (HCC) commissioned AECOM to develop a strategic countywide multi-modal model, COMET
  - A first version, with Base Year 2014, was delivered in February 2016

- The first enhancement of the model was undertaken in the second half of 2016. Changes were undertaken to the Prior Matrix (overall) and in particular to calibration and validation of model in Watford and its vicinity, as this area was included in the Growth and Transport Plan (GTP) work due in 2016/17.

- The enhancement work also included (where possible) updates to the official modelling standards. This resulted in COMET V2.

- SADC commissioned AECOM in Autumn 2016 to use COMET V2 to aid the development of its Detailed Local Plan.

- The updated 2014 Base Model for this study including changes in St Albans and Harpenden was delivered in Spring 2017.

Context

- SADC highlighted the following:
  - The current task objectives are “to review the performance of the COMET model in the St Albans District area, collect new data and enhance the model as necessary”.
  - In addition, this work will be followed by Task 6 (out of the current scope) which will use the enhanced COMET V3 “to test the implications of Local Plan growth and adequacy of identified mitigation measures”.
  - Task 5, the preliminary design of schemes to be tested in Task 6, is currently being progressed by AECOMs Highways Team.

- The overall objective for this COMET model enhancement work is to:
  - Have a good representation of St Albans and Harpenden areas to test the cumulative growth from the Local Plan alongside broad, strategic-level interventions in St Albans District; and
  - Be able to demonstrate the scale and location of the impacts from both Local Plan growth and potential strategic schemes.

Realism Tests (Stage 2c)

Realism Tests (Stage 2c)

- The updated highway and public transport models (from Stages 2a and 2b) were used to run standard sensitivity tests i.e. +10% increase in rail fare, public transport journey times, highway journey times or fuel costs.

- The Variable Demand Model (VDM) produced for each 'realism test' new demand matrices. Global changes to the demand compared to the updated Base Year model were used to estimate elasticity factors.

- These factors were compared to the expected standards set out by the Department for Transport (DfT)'s WebTAG advice, unit M2, Variable Demand Modelling.

- The primary realism tests require that car fuel cost and public transport fare elasticities lie within specified bands . Car fuel cost elasticity tests are required in all cases where a highway model is used. Public transport fare elasticity tests are required in all cases where changes in public transport generalised costs, including changes in fares, are modelled. Car journey time elasticity tests are also required.

Realism Test 1: Fuel Cost

The car fuel cost elasticity required is the percentage change in car vehicle-kms with the percentage change in fuel cost.

10% increase in car fuel cost
Sensitivity in range -0.25 to -0.35

Segment	AM	IP	PM	OP	Annl
Commuting	-0.139	-0.109	-0.133	-0.177	**-0.136**
Business	-0.170	-0.194	-0.176	-0.189	**-0.183**
Other	-0.377	-0.406	-0.378	-0.359	**-0.388**
All Pers Annl	**-0.277**	**-0.347**	**-0.276**	**-0.301**	**-0.318**
LGV	0.015	0.007	0.018	-0.014	0.000
HGV	0.006	0.001	0.012	-0.021	-0.004

Trip Distance Elasticity

Realism Test 2: Public Transport Fare

The public transport fare elasticity required is the percentage change in public transport trips by all public transport modes with respect to the percentage changes in public transport fares.

10% increase in PT fares
Sensitivity in range -0.20 to -0.90

Segment	AM	IP	PM	OP	Annl
Commuting	-0.458	-0.448	-0.456	-0.460	**-0.457**
Business	-0.504	-0.479	-0.389	-0.466	**-0.459**
Other	-0.525	-0.426	-0.607	-0.548	**-0.487**
All Pers Annl	**-0.484**	**-0.431**	**-0.509**	**-0.490**	**-0.466**

Trip Elasticity

Realism Test 3: Car Journey Time

The car journey time elasticity required is the change in car trips with respect to the change in journey time.

10% increase in car journey times
Sensitivity in range 0.00 to -2.00

Segment	AM	IP	PM	OP	Annl
Commuting	-0.169	-0.010	-0.187	-0.091	**-0.110**
Business	-0.043	-0.004	-0.175	-0.154	**-0.066**
Other	-0.144	-0.110	-0.164	-0.122	**-0.127**
All Pers Annl	**-0.144**	**-0.091**	**-0.170**	**-0.118**	**-0.114**
LGV	0.000	0.000	0.000	0.000	0.000
HGV	0.000	0.000	0.000	0.000	0.000

Trip Elasticity

2031 DM Scenario (Stage 3)

2031 DM Scenario - Context

The 2031 Do Minimum Scenario (Stage 3) aims to test the impacts of St Albans District planning assumptions for a Forecast Year 2031 without the introduction of any potential mitigation schemes. The purpose of this test is to identify the impact of growth to enable potential hotspots and additional locations of traffic congestion to be identified.

It is understood that the 2031 Do-Minimum scenario will only consider:

– The planning data as provided by HCC to AECOM in October 2016:

– Unconstrained Local Plan growth in all Hertfordshire districts including St Albans

– NTEM v7 assumptions will apply directly outside Hertfordshire

– The schemes included in the 2031 Reference Case / Do Minimum Scenarios

2031 DM Scenario – Highways Schemes

Scheme	District
A10 Turnford Interchange (improvements to allow access to proposed Brookfield development site)	Broxbourne
West Hoddesdon (High Leigh) development access onto A10 link	Broxbourne
West Hoddesdon Junction improvements	Broxbourne
Park Plaza Access	Broxbourne
Swallowdale Lane/ Three Cherry Trees Lane Junction Signalisation	Dacorum
A414 Breakspear Way / Maylands Lane Reallocation	Dacorum
Breakspear Way / Green Lane Junction Improvement - Trial signalisation on M1 arm	Dacorum
Western Hemel Hempstead – Development site access onto Long Chaulden (priority junction with dedicated RT lane in)	Dacorum
Western Hemel Hempstead – Development site Secondary site access onto The Avenue (extension of existing spur)	Dacorum
Marchmont Farm Access	Dacorum
Water End HGV ban	Dacorum
A120 Little Hadham Bypass	East Hertfordshire
A602 Ware to Stevenage Corridor Strategy Stage 1	East Hertfordshire
Bishop's Stortford North Development, Access onto Hadham Road	East Hertfordshire
Bishop's Stortford North Development, new access onto A120 and Spine Road connecting with Rye Street	East Hertfordshire
Bishop's Stortford North (ASR 5) access to Rye Street	East Hertfordshire
A120 / B1383 capacity improvements (Bishop's Stortford North mitigation measure)	East Hertfordshire
A120 / A1250 Tesco roundabout capacity improvements (Bishop's Stortford North mitigation measure)	East Hertfordshire
Gilston development access	East Hertfordshire
A10 Amwell Roundabout Bus Lane Removal	East Hertfordshire
Bishop's Stortford Goods Yard – bus link from London Road	East Hertfordshire
Land North and East of Ware Spine Road	East Hertfordshire
Borehamwood - Station Road/Theobald St/Allum Lane junction signalisation	Hertsmere
Borehamwood - Elstree Way Corridor	Hertsmere
New link road connecting North Baldock development to North Road and Royston Road	North Hertfordshire
A414 Colney Heath Longabout signalisation	St Albans
Radlett Railfreight (spine road and associated junction improvements)	St Albans
Oaklands development site access	St Albans
North Harpenden development access	St Albans
Woodside Road Roundabout	Three Rivers
Uxbridge Road/Long Ln Roundabout	Three Rivers
Watford Health Campus Link (Thomas Sawyer Way)	Watford
Hospital access road	Watford
A1(M) junction 6 pinch point scheme ramp metering	Welwyn Hatfield
West of Hatfield (Stanborough - HAT1) development access	Welwyn Hatfield
Symondshyde development access	Welwyn Hatfield
Birchall development access	Welwyn Hatfield
A1(M) junction 6 - 8 Smart motorway	Welwyn Hatfield / Stevenage / North Hertfordshire

In total, 38 highways schemes included in Hertfordshire in the 2031 DM scenario. All schemes are expected to proceed.

4 in St Albans District:

- A414 Colney Heath Longabout Signalisation
- Radlett Railfreight
- Oaklands development access
- North Harpenden development access

2031 DM Scenario – Highways Schemes

Scheme	Area
A5 - M1 link	Central Bedfordshire
M11 J8 short term capacity improvements	Uttlesford (Essex)
M25 J23-25 Permanent use of Hard Shoulder	Hertfordshire / London Borough of Enfield
Widening of M25 J25-27	Essex / London Borough of Enfield
M25 Junction 25 Enhancement (Highways England RIS scheme)	London Borough of Enfield
A414 / London Road Enterprise Zone New Access & Link Road	Harlow (Essex)
A414 / Clocktower Junction Capacity Upgrade	Harlow (Essex)
A414 First Avenue / Gilden Way Junction Upgrade	Harlow (Essex)
A414 Cambridge Road (Gates) Upgrade - including widening to 4 lanes of Edinburgh Way;	Harlow (Essex)
A414 Edinburgh Way / East Road Signal Junction Improvement	Harlow (Essex)
Cambridge Road - new access into River Way	Harlow (Essex)
New junction on M11 (J7a) with associated link to & rbt on B183 Gilden Way; localised widening of Gilden Way	Epping Forest (Essex)
A1 Biggleswade Junction improvements - capacity improvements and dedicated left turn	Biggleswade (Central Bedfordshire)
Luton Town Centre Bypass	Luton
Luton London Road Grade Separated Junction	Luton

In total, 15 highways schemes included outside Hertfordshire in the 2031 DM scenario. All schemes are expected to proceed.

2031 DM Scenario – Public Transport Schemes

The only new public transport scheme in Hertfordshire to be added during the creation of the forecast network was the Croxley Rail link. This consists of the closure of Watford Metropolitan line station, the creation of a new rail link between Croxley and Watford Junction through Watford High Street, the creation of two new stations at Ascot Road and Watford Vicarage Road, and running 4-6 trains per hour in each direction along the new route.

In addition to this scheme, timetable changes/frequency increases were implemented on the following rail services:

– Hertford East to/from Liverpool St (frequency increase)

– Thameslink/Great Northern (timetable changes)

No changes to the future year bus network were made.

Outside Hertfordshire, a light rail scheme was added that links Luton Airport Parkway station to Luton airport.

2031 DM Scenario – Dwelling Assumptions in Hertfordshire

District	2031 HCC Dwellings (Do-Minimum)
Broxbourne	6,997
Dacorum	9,566
East Hertfordshire	16,594
Hertsmere	4,426
North Hertfordshire	15,969
St Albans	7,809
Stevenage	7,856
Three Rivers	2,517
Watford	7,937
Welwyn Hatfield	11,538

These DM figures represent an increase of approximately 20,000 additional dwellings compared to NTEM 2031 projections

2031 DM Scenario – Employment Assumptions in Hertfordshire

District	2031 HCC Jobs
Broxbourne	7,458
Dacorum	4,782
East Hertfordshire	4,123
Hertsmere	4,258
North Hertfordshire	10,575
St Albans	13,968
Stevenage	11,254
Three Rivers	6,627
Watford	12,686
Welwyn Hatfield	16,613

These DM figures represent an increase of approximately 43,000 additional jobs compared to NTEM 2031 projections

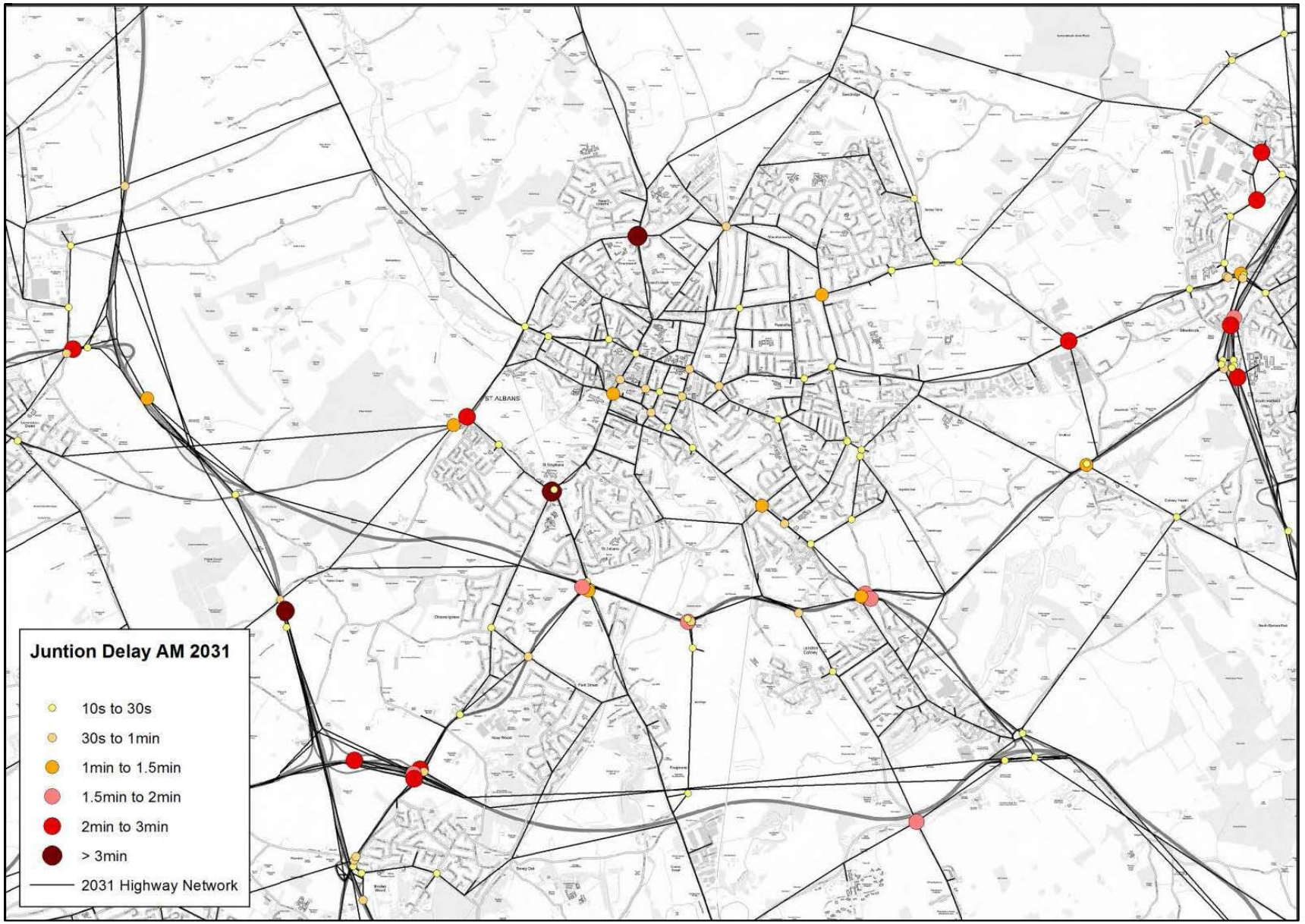
2031 DM Scenario – Dwellings, Employment and Population growth outside Hertfordshire

	2014-2021	2021-2026	2026-2031
Dwellings	6.43%	3.84%	3.53%
Employment	4.76%	1.48%	1.23%
Population	4.56%	2.96%	2.51%

The availability of planning data outside Hertfordshire is limited. Consequently, growth in terms of housing, employment and population in the rest of Great Britain outside Hertfordshire was derived directly from NTEM v7. The annual growth rates are provided by 5 year intervals in the table above. It is worth noting that these growth figures are likely to be lower than growth being proposed through the Local Plan process in these areas.

2014 AM Junction Delays – St Albans

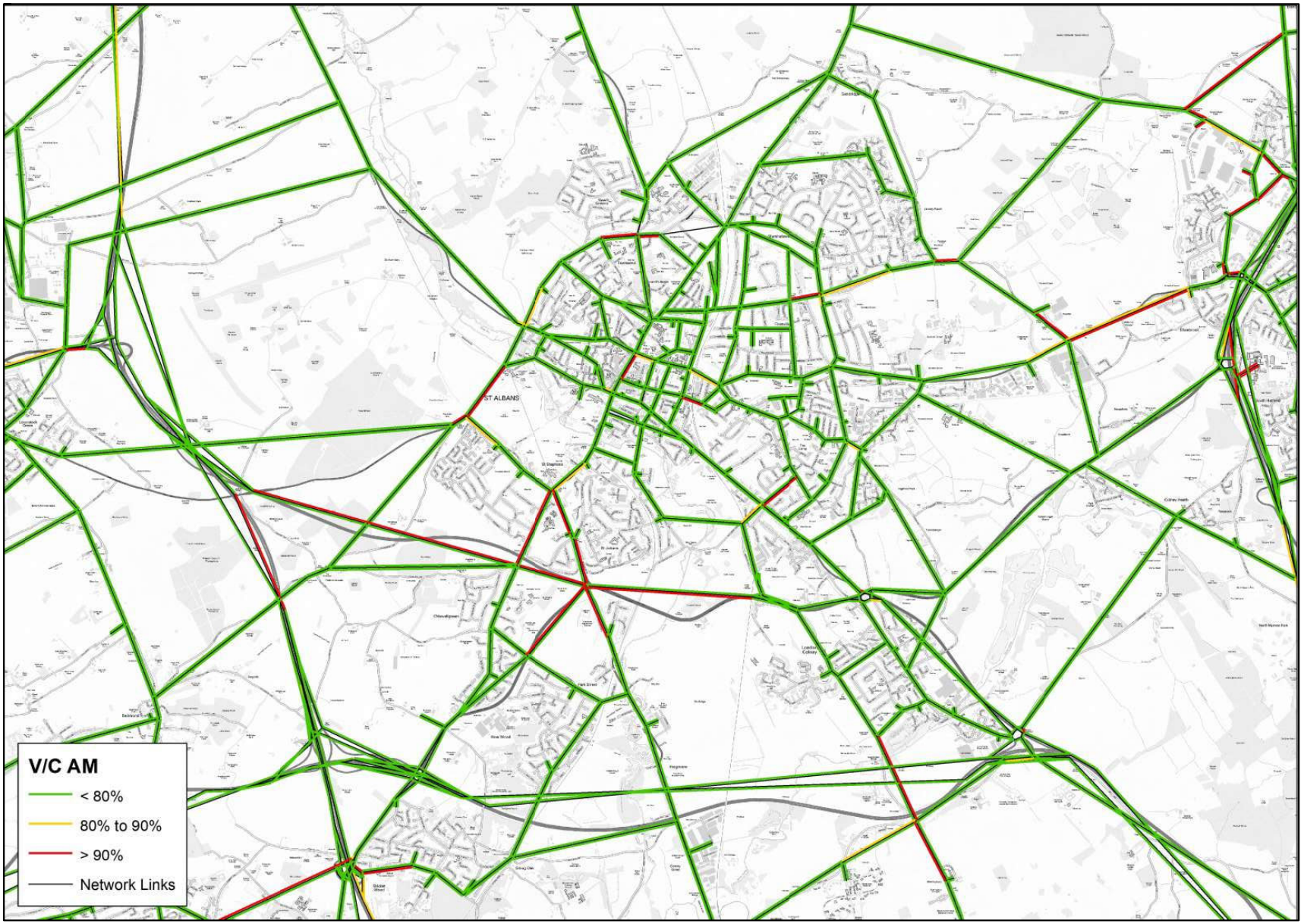
2031 AM Junction Delays – St Albans



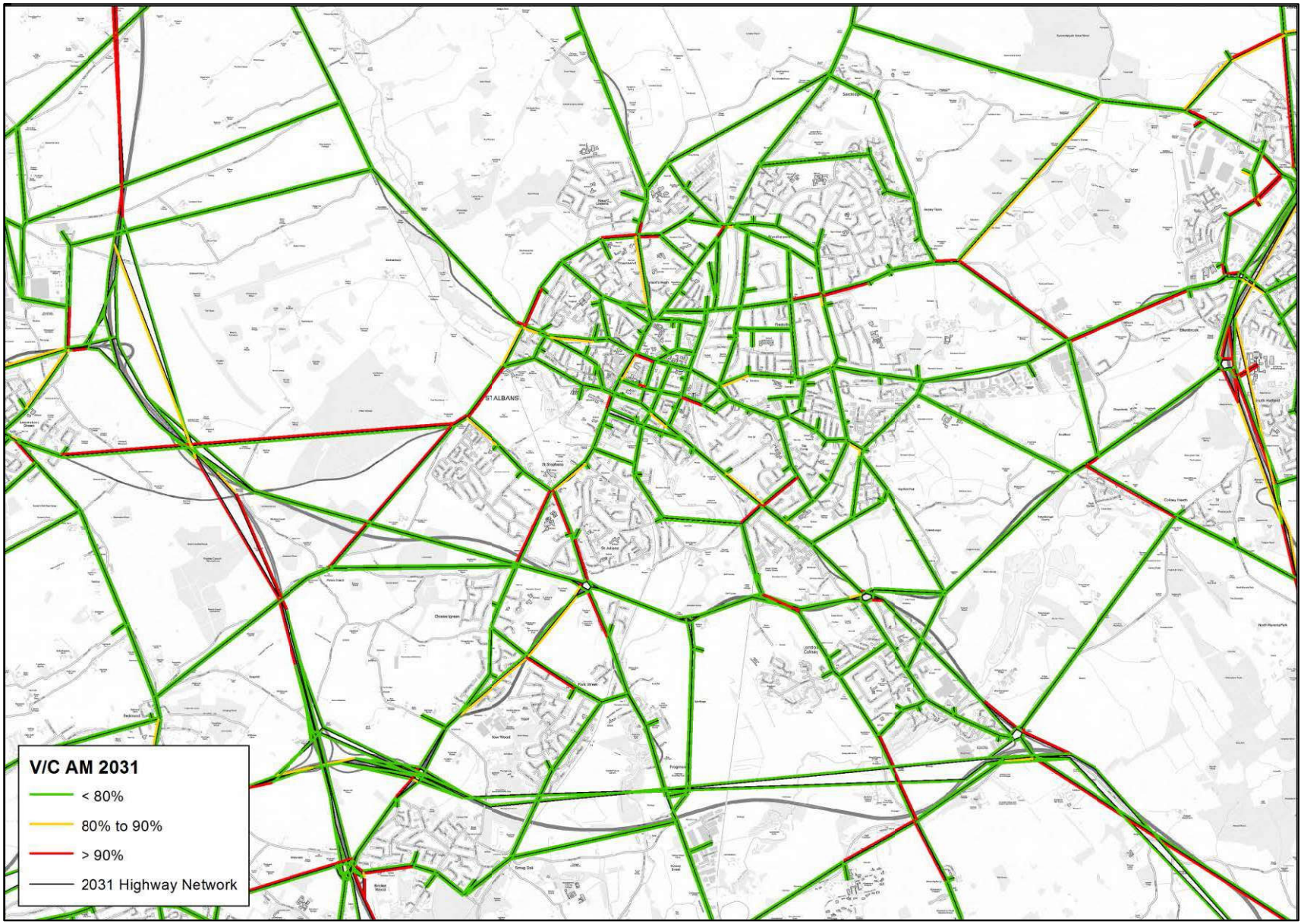
2014-31 AM Junction Delay Difference – St Albans

2014-31 AM Junction Delay and Flow Difference – St Albans

2014 AM Congestion – St Albans

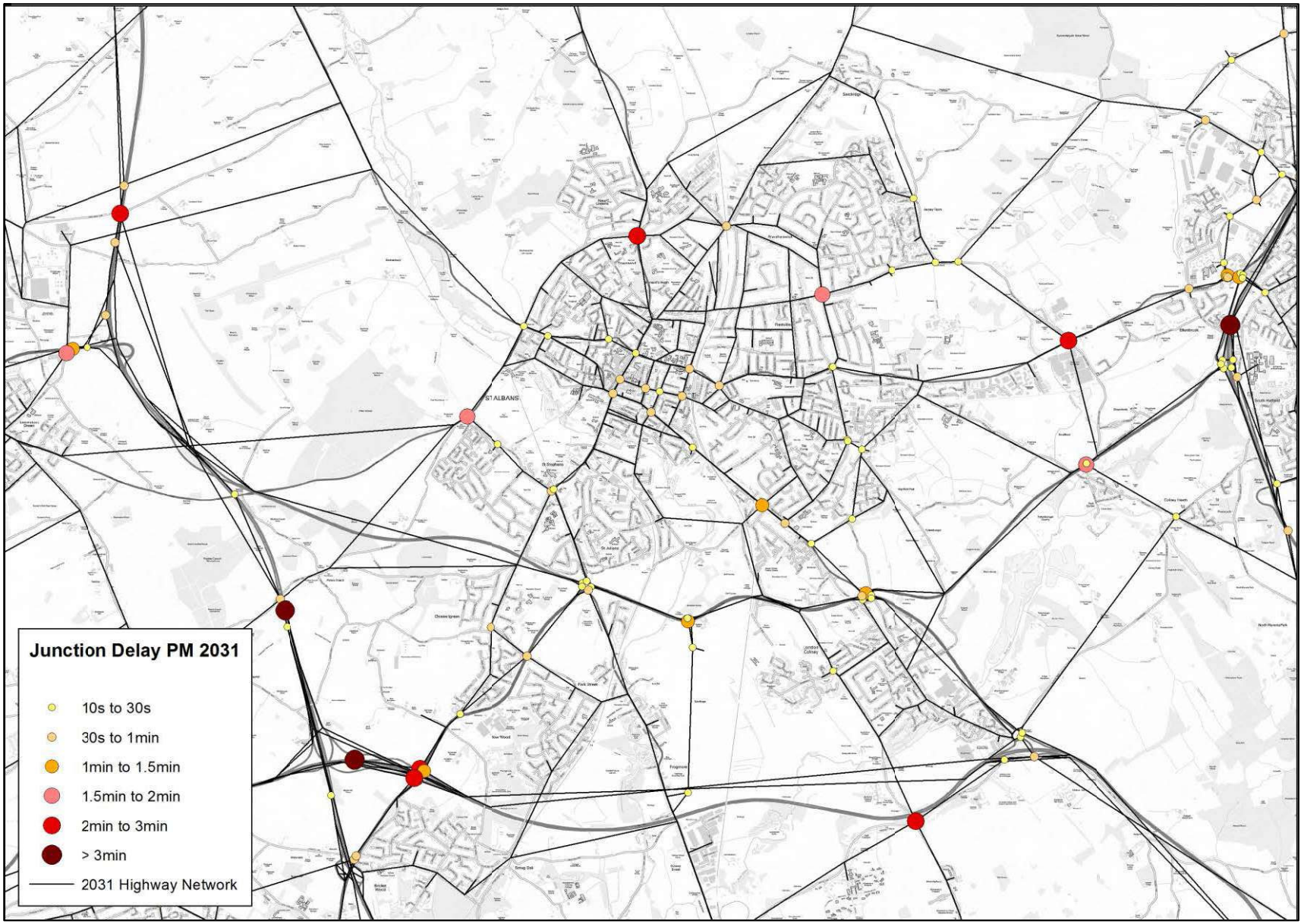


2031 AM Congestion – St Albans



2014 PM Junction Delays – St Albans

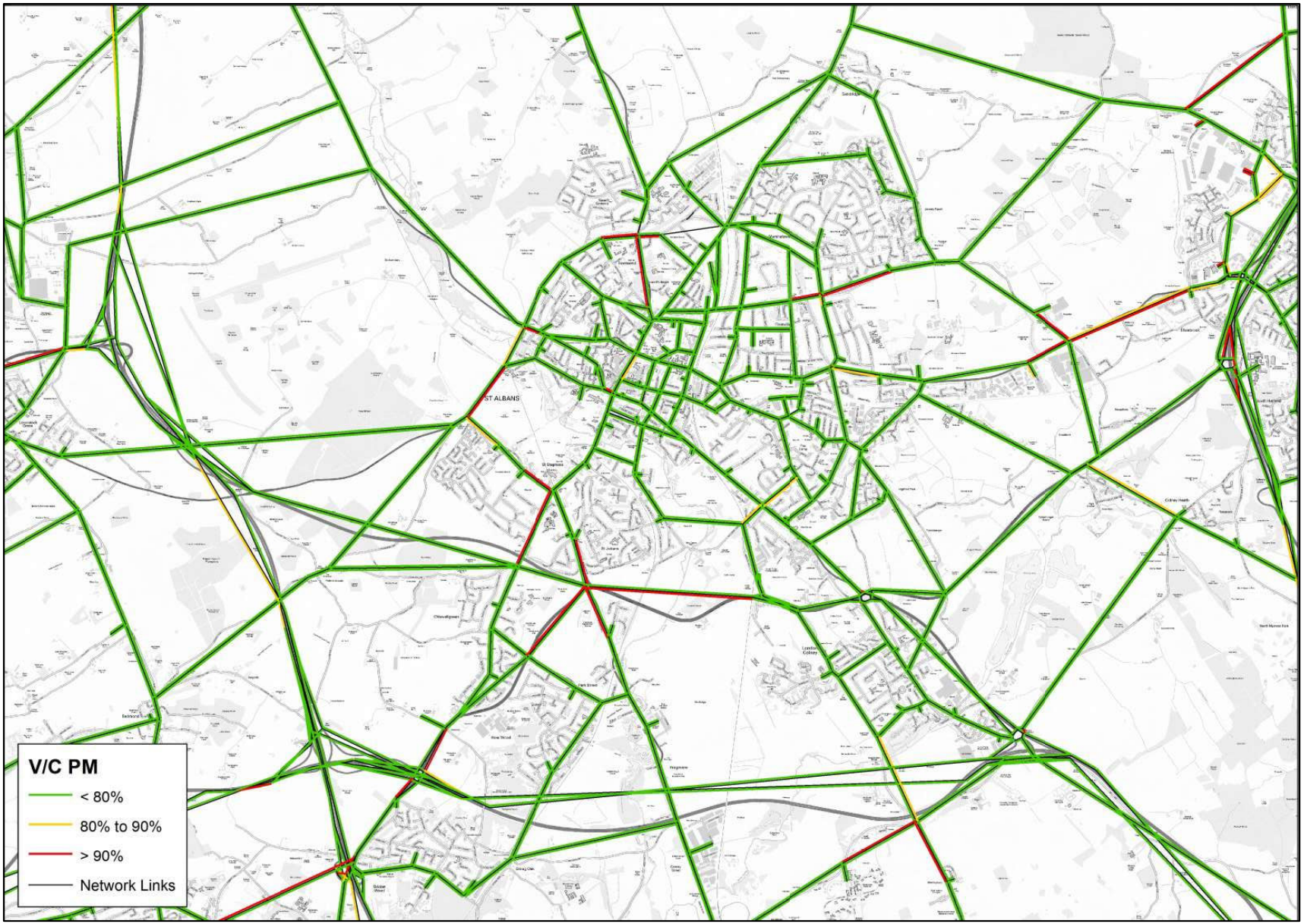
2031 PM Junction Delays – St Albans



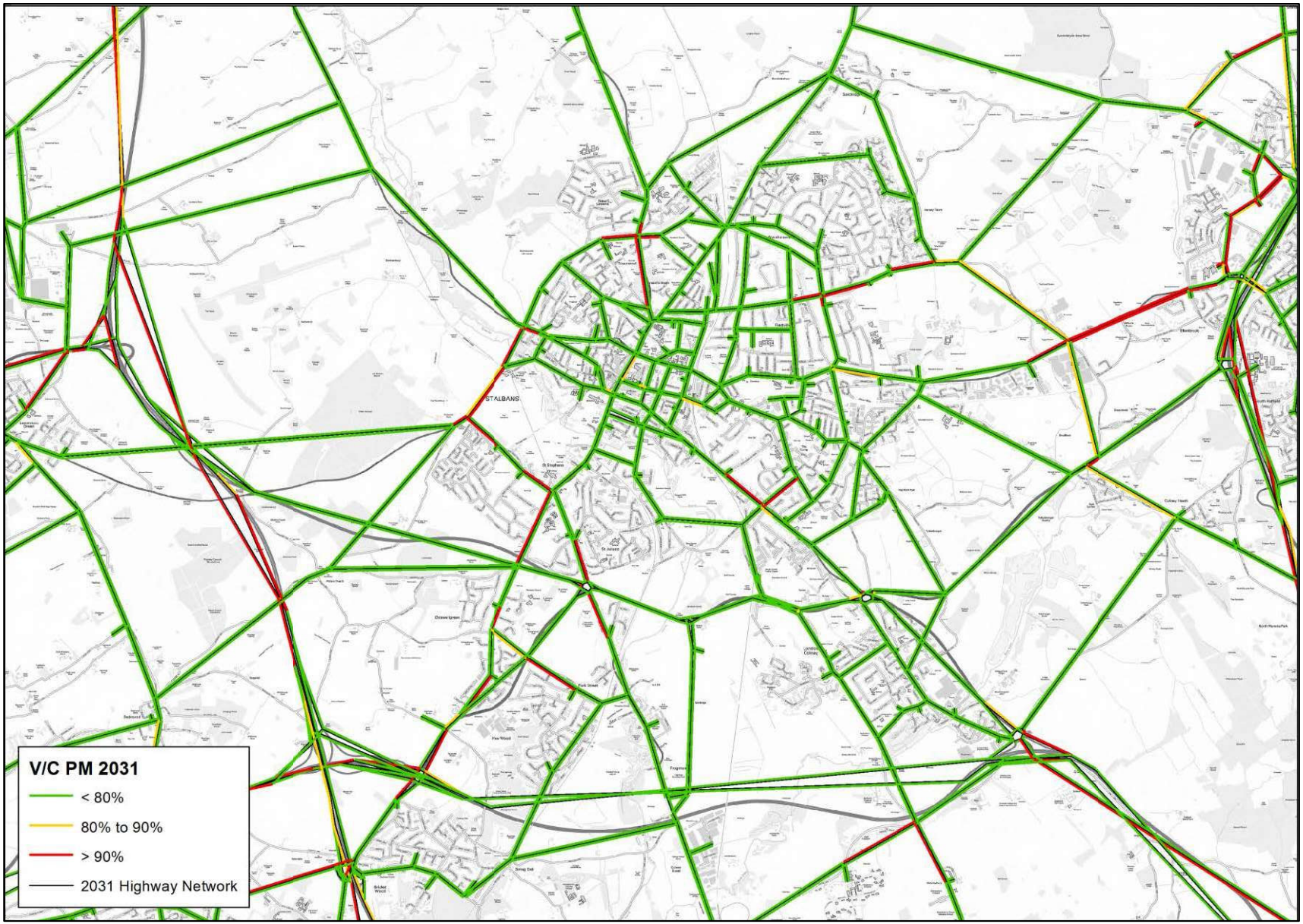
2014-31 PM Junction Delay Differences – St Albans

2014-31 PM Junction Delay and Flow Differences – St Albans

2014 PM Congestion – St Albans



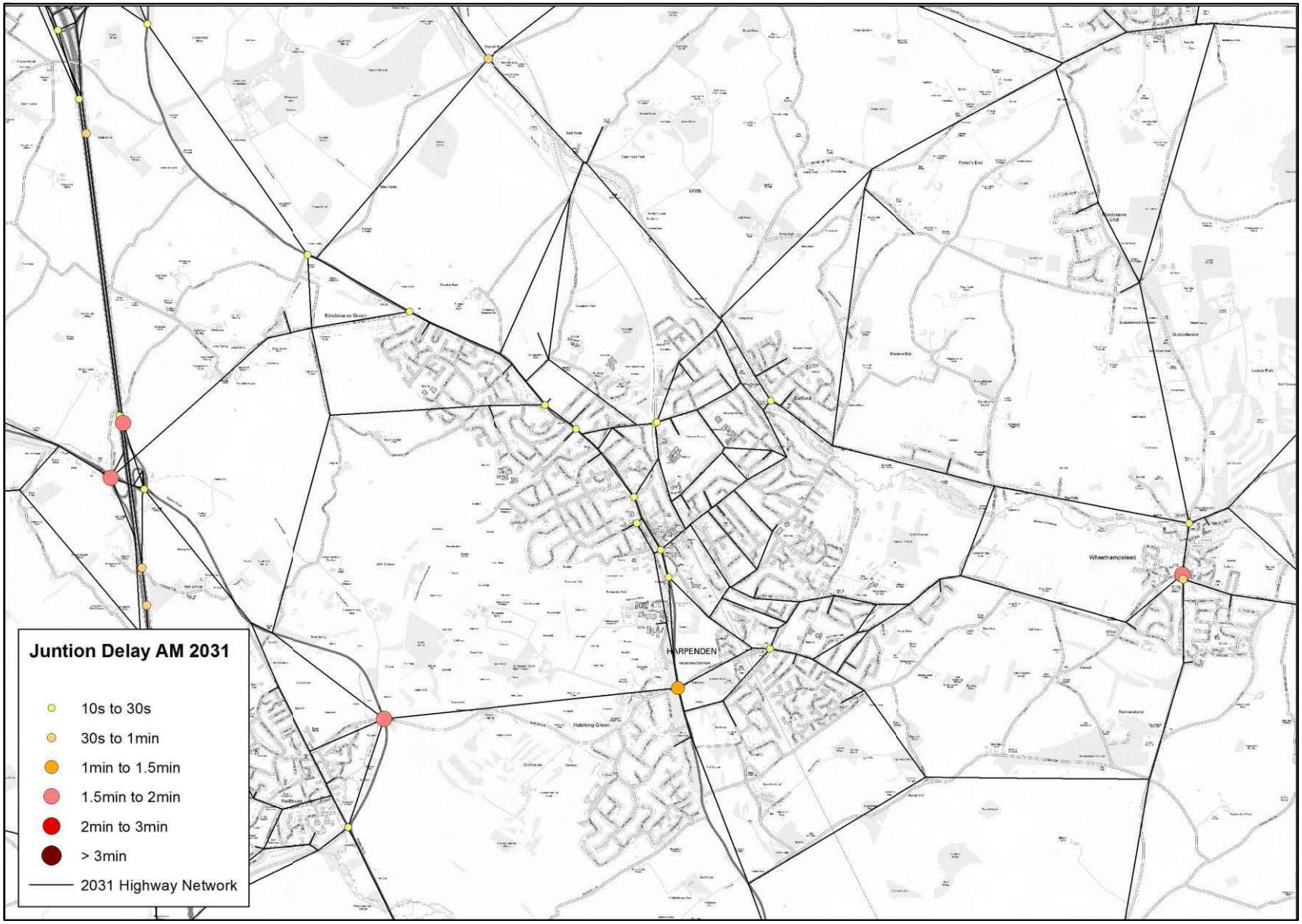
2031 PM Congestion – St Albans



2014 AM Junction Delays - Harpenden

AECOM

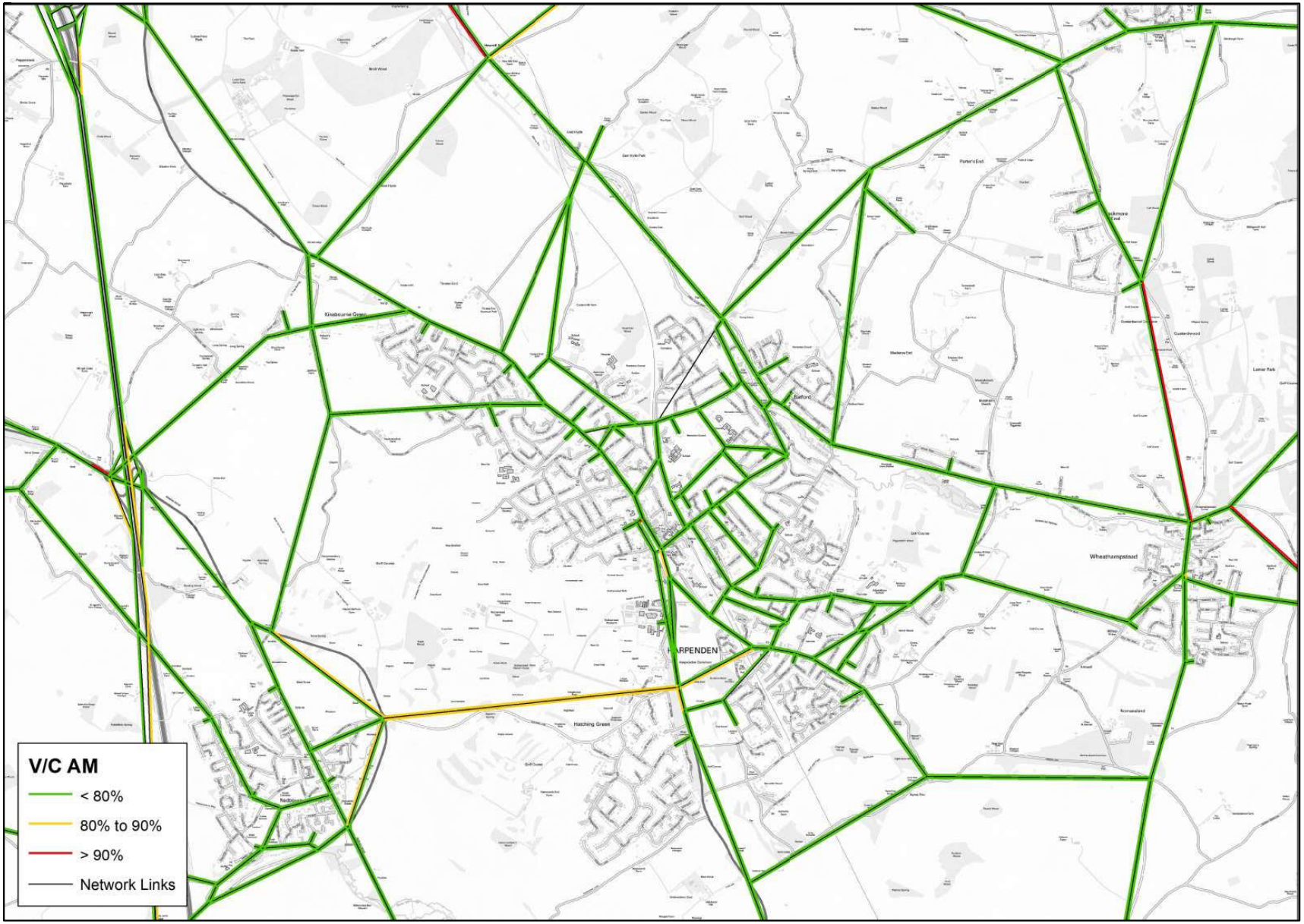
2031 AM Junction Delays - Harpenden



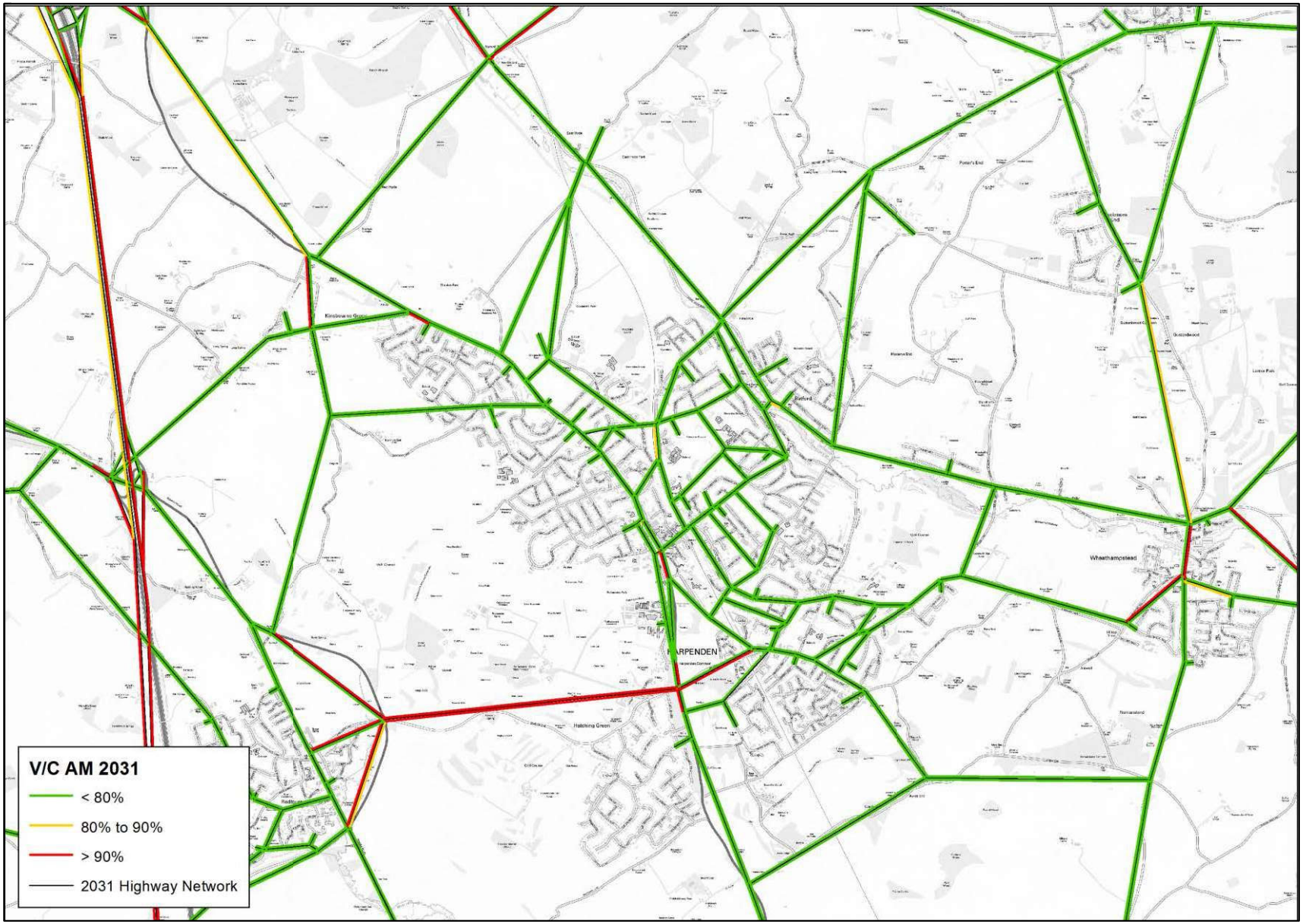
2014-31 AM Junction Delay Differences - Harpenden

2014-31 AM Junction Delay and Flow Differences - Harpenden

2014 AM Link Stress - Harpenden



2031 AM Link Stress - Harpenden



2014 PM Junction Delays - Harpenden

AECOM

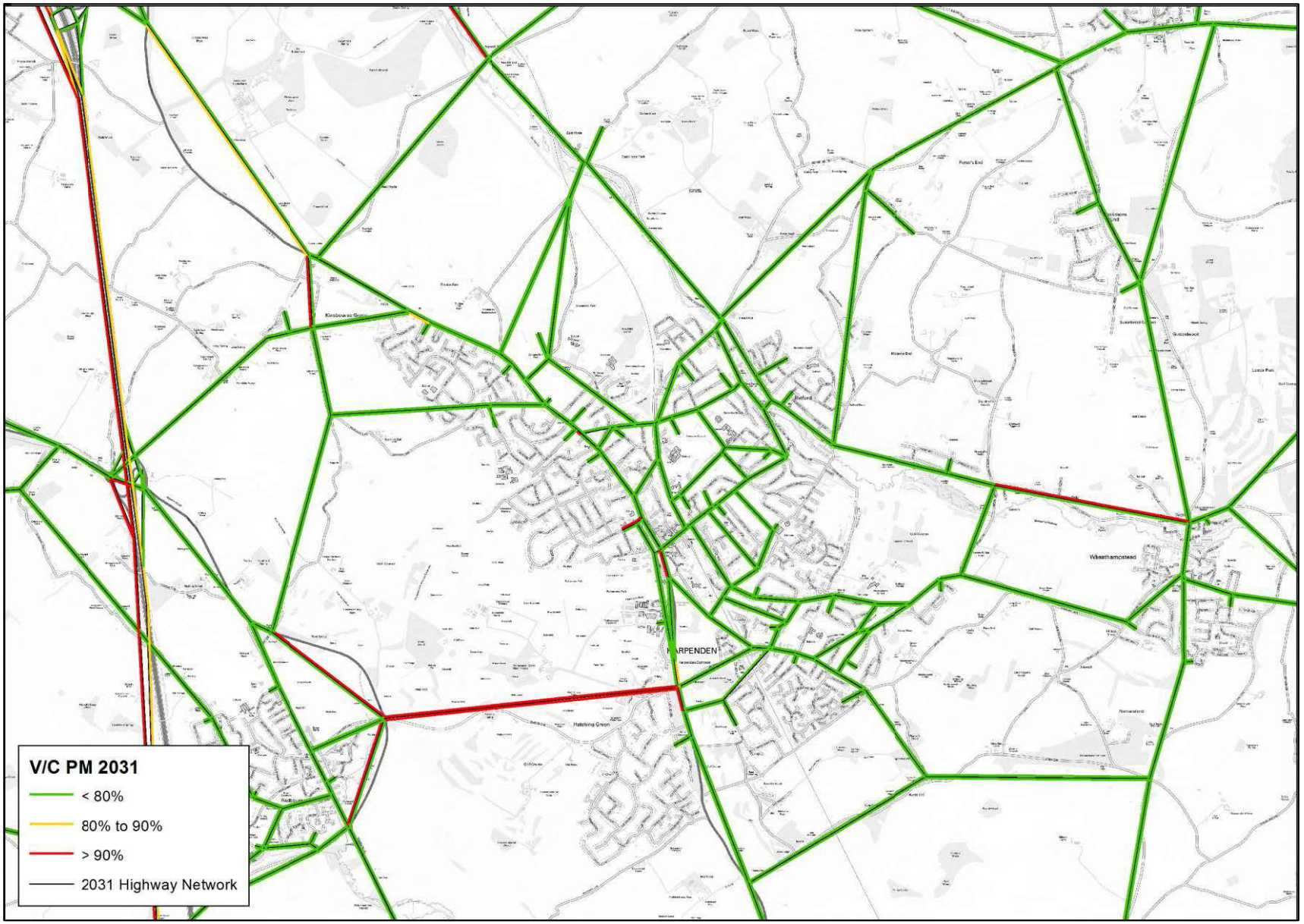
2031 PM Junction Delays - Harpenden

2014-31 PM Junction Delay Differences - Harpenden

2014-31 PM Junction Delay and Flow Differences - Harpenden

2014 PM Link Stress - Harpenden

2031 PM Link Stress - Harpenden



2031 Impact Summary

- 2031 DM Scenario highlights the increased delay at junctions and congestion expected on all routes into St Albans. Key delays on the “ring road” are impacting route choice and flows.
- Impacts in Harpenden not as large but smaller delays start to occur at most junctions along A1081 Luton Road
- Highlights the possible need to consider east-west movements into St Albans/Harpenden from Hemel and Redbourn
- The impact of congestion on the A1 may induce rat running in eastern St Albans
- Congestion at the Wheathampstead Roundabout and links from Redbourn should be monitored

Appendix 32: Further Transport Evidence Base Work – Task 5: SADC Scheme Proformas AECOM (2017)

Junction	**A414/A1081 London Colney Roundabout**
Reference	**Site 2**
Location	The A414/A1081 junction is a five arm roundabout located to the south of St Albans, just to the north of London Colney. The roundabout consists of five signalised arms connecting A414 Orbital Road East and West, A1081 North and South and London Colney High Street. The junction forms a significant part of the local strategic network and provides links westbound on the A414 towards the M25 at Junction 21a near Watford and the M1 at Junction 8 near Hemel Hempstead. Eastbound links on the A414 provide access the A1 (M) at junction 3 near Hatfield. To the south, the A1081 provides a link to the M25 at Junction 22 and also leads to large industrial developments.

Description of Problem

The roundabout already manages large traffic volumes and often experiences significant delays during the peak hours. The A414 eastbound and westbound tends to carry the majority of the traffic flows, but large volumes also use the A1081 into St Albans and towards the M25 at Junction 22.

The Hertfordshire County Council's (HCC) existing 2014 Base Year and 2031 Forecast Year COMET models (version 3, March 2017) have been used to identify areas of pressure on the highway network. COMET Base Year model highlighted that Site 2 has a junction delay of 1-2.5 minutes in AM Peak and 2.5-5 minutes in PM Peak and has been identified as a congestion hotspot in previous studies.

The COMET 2031 Forecast Year model indicated increases in delays by approximately 1–1.5 minutes around the junction for every vehicle at the traffic signals in both the AM and PM peak. This delay is based on a do-minimum network and can be ascertained from these delays that the current layout would not provide sufficient capacity.

It is also noted that the A414 east-west route attracts a significant volume of strategic route traffic in Hertfordshire. Therefore, improvements have been sought to reduce delays associated with the future increase in flow by improving the capacity of the junction.

Constraints:

The existing highway boundary limits the scope to which the existing junction can be widened and/or modified. The existing footbridge on the eastern side of the junction spans the A414 and would be expensive to demolish and reconstruct. The existing five arms at the junction would need to be retained and provide the same level of access for all existing turning movements.

Currently, work is being undertaken on the A414 Strategy. Liaison with HCC would be required to ensure future designs do not conflict between this strategy and the proposal put forward within this pro forma.

Design Improvement Feasibility Details

Three options have been considered for this junction: Upgrading the existing traffic signals, providing a flyover / under and modifying the roundabout to a 'hamburger' layout. Based on projected design flows it is unlikely that modifications to the existing signals would provide sufficient long term capacity and the cost of the flyover / under layout would be prohibitively expensive and complex to construct. The flyover / under is considered to be efficient in the long term to increase the capacity of the junction but due to very high construction costs this option has been ruled out and the option deemed to be most appropriate for further analysis is the 'hamburger' layout roundabout design.

The hamburger layout design is anticipated to increase junction capacity by enabling a higher east / west flow on the A414. However, there is a potential detrimental effect that could be caused by the turning traffic for the A1081 that would prevent the layout being used efficiently by east / west traffic. In addition, the layout is complex and will be unusual for both local and longer distance vehicular users. Gantry signs have been incorporated into the design to indicate which lane traffic will need to approach the junction, with right turning traffic required to use the nearside lanes.

The design has been designed in accordance with DMRB 86/03 – Layout of Large Signal Controlled Junctions. However, it is noted that the design standard recommends that this type of layout is not used for junction in excess of four arms and with over four lane entries. A departure from standard would be required to permit this layout to progress for preliminary design.

A414 Eastbound and Westbound Traffic Lanes

The existing layout would be modified to provide two ahead lanes for the A414 only in the offside lanes and the other traffic entering the junction would be guided to the nearside lanes, for both left and right turning traffic. The existing traffic lanes would be widened to accommodate the revised A414 ahead movement through the central island. The existing central island would be modified to introduce two lanes in each direction with a central reserve between the opposing traffic lanes.

The existing splitter islands on both approaches would be enlarged to provide the approach deflection for traffic entering the junction and clarity for the turning movements. The exits would be modified to accommodate the ahead A414 movement through the central roundabout island and the merging traffic from the A1081 and London Colney High Street.

A1081 from Junction 22 of M25

The layout from the A1081 would remain largely unaffected by the proposed modifications.

A1081 from St Albans

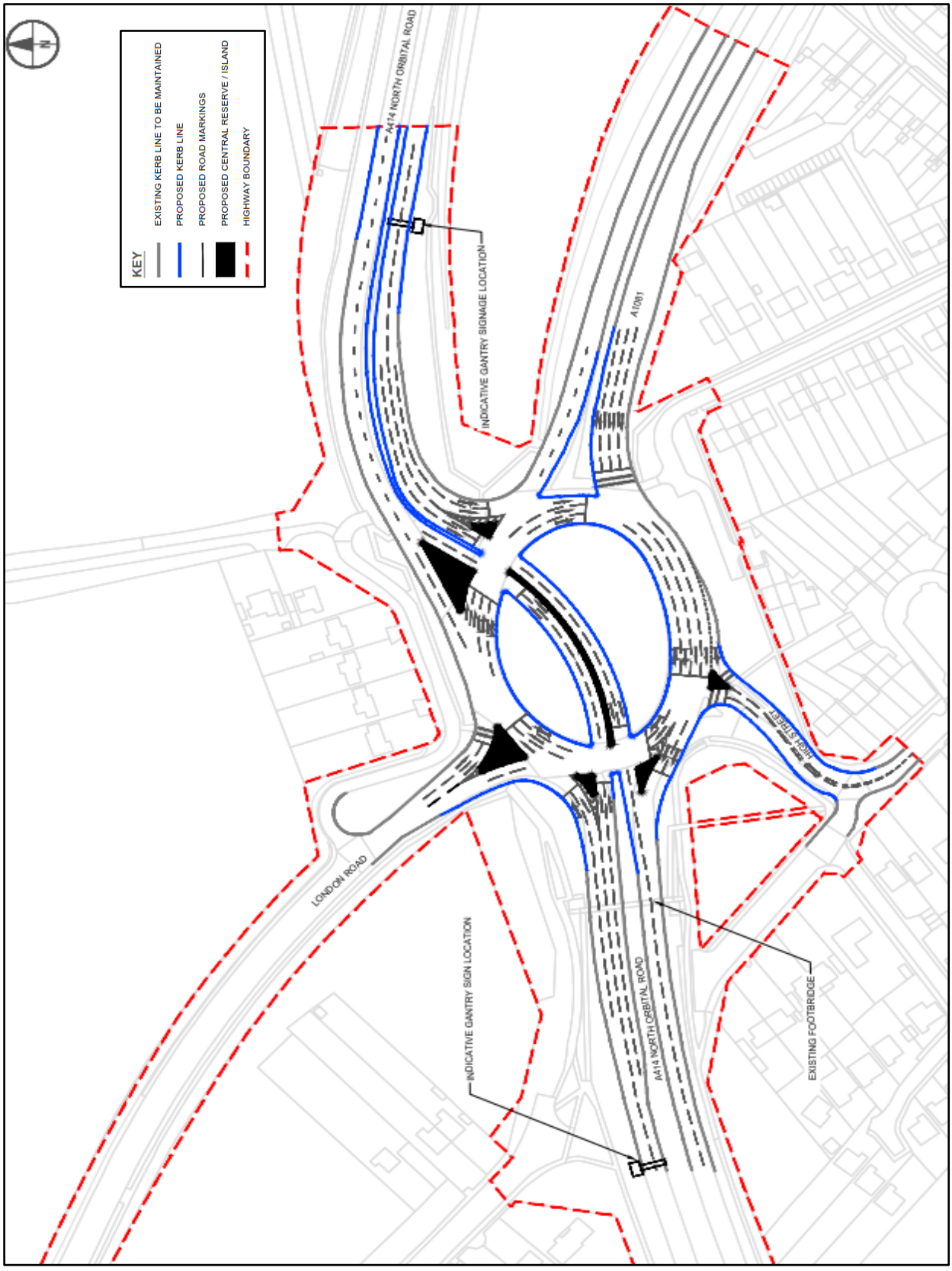
The layout from the A1081 would remain largely unaffected by the proposed modifications but with the provision of a modified splitter island.

London Colney High Street

The layout would require new carriageway construction to re-align the approach to the junction and a lengthened two lane approach from the High Street.

Design Improvement Plans

Outline Design:



Extract of the feasibility drawing no. 60534762-SADC-DWG-SITE 2 REV 1 (Refer to Appendix A for complete drawing)

Outline Cost Analysis

Basis of Order of Magnitude Estimate:

Site 2: A414-A1081 Roundabout/60534762-SADC-DWG-SITE 2- REV 1

Assumptions:

1. Everything within the existing and new kerb lines will be broken out to 600mm depth
2. Allowed for laying new and diverting existing storm drainage only. We have assumed there are no foul drainage requirements on the site
3. No allowance for works to existing pedestrian footbridge
4. The proposed Central Reservations are built up as per a typical bitumenous footpath construction
5. Assumed pedestrian crossings to London Road and High Street only
6. Assumed dimensions of proposed guardrail, lights, traffic lights, VRS barrier & posts, signage in the absense of any detailed drawings

Exclusions:

1. Any works or costs associated with landscaping
2. The demolition of any existing structures
3. Any works beyond the boundary line or before the end of the existing kerbs as shown on the drawing
4. Inflation beyond 2Q 2017
5. Professional fees
6. Planning and development control costs
7. Value added Tax

Works Element	Estimated Cost		Notes
Construction Cost	£	6,160,000	
Allowances for Preliminaries	£	1,232,000	20% of construction items
Allowances for Traffic Management (TM)	£	1,540,000	25% of construction items
Allowances for Scheme Design	£	893,200	10% of construction items (including Prelims and TM)
Allowances for Utilities / Electricals	£	1,232,000	20% of construction items
Sub-Total for allowances and construction items	£	11,057,200	
Optimism Bias	£	4,865,168	44% of sub-total
Cost for Delivery	**£**	**15,922,368**	

Junction	**B651 St Albans Road / Sandridge Road / Marshalswick Lane / Beech Road signals (King William Junction)**
Reference	**Site 6**
Location	The junction of Sandridge Road, Beech Road, Marshalswick Lane and St Albans Road, is a staggered four arm traffic signal controlled junction, to the north of St. Albans. All approaches to the junction have a speed limit of 30mph. The B651 St Albans Road is the main road from Wheathampstead and Sandridge towards central St Albans, whilst the B651 Sandridge Road is a major road to central St Albans from Marshalswick and Bernard's Heath. Beech Road and Marshalswick Lane form part of a ring road around suburban St Albans, and provide a corridor that enables traffic from Harpenden, Redbourn and Hemel Hempstead to access Marshalswick and Jersey Farm in the north east of St Albans.

Description of Problem

The junction currently experiences large volumes of traffic and often experiences delays.

The Hertfordshire County Council's (HCC) existing 2014 Base Year and 2031 Forecast Year COMET models (version 3, March 2017) have been used to identify areas of pressure on the highway network. COMET Base Year model highlighted that Site 6 has an average junction delay of 1 minute in the both peaks and has been identified as a congestion hotspot in previous studies.

The COMET 2031 forecast year model indicated an average delay of up to 1.5 minutes in both peaks. It can be ascertained from these delays that the current layout would not provide sufficient capacity.

Therefore, improvements have been sought to reduce delays associated with the future increase in flow by improving the capacity of the junction.

Constraints:

The existing bridge that allows the railway to run below the junction limits the scope to which the junction can be widened and/or modified. In addition to the railway, the highway boundary limits the extent to which modifications can be made. There are numerous buildings surrounding the junction including residential and commercial properties, King William IV public house, a petrol station and a warehouse.

Design Improvement Feasibility Details

Three mitigation options have been considered at this junction: banning a right-turn movement from Beech Road to Sandridge Road, providing a double roundabout and upgrading the existing traffic signals.

The concept of banning a right turn movement has been considered as a method of improving junction capacity as it would remove a signal stage from the overall signal cycle. The right turn from Beech Road to a Sandridge Road was selected as this has the lowest volume of right turning vehicles (refer to table 1 below) and would have the least volume of displaced traffic. In reviewing the existing signal staging information it has been determined that banning this movement also would not remove the stage from the signal cycle, as the right turn movement from Marshalswick Lane to St Albans Road also operates under the same stage. To remove this stage from the signal cycle would also require the banning of this additional right turn movement. This is likely to attract concerns from the local community over displaced traffic from the banned manoeuvres and likely to be deemed not acceptable by local residents. It is therefore considered unlikely that the option would gain approval for construction.

A double roundabout has been considered as another option but this is likely to remove the existing pedestrian facilities and would be complicated to model using the current known traffic flow data and the COMET model and as such has not been progressed.

In reviewing the HCC Traffic signal feasibility report dated February 2011, it recommended to provide an opposed right turn movement from Marshalswick Lane and Beech Road along with a new staggered crossing at Beech Road (these proposals provided the best outcome during modelling). It appears that the recommended upgrade has already been implemented and this represents the optimum layout of the current traffic signal. In reviewing the current layout, it shows the junction is already operating under only 4 stages with one being pedestrian only stage. The junction is also operated by MOVA signals therefore no further improvements are proposed at this junction. The drawing has been produced showing the existing layout of the junction with no further proposals for improvement.

Traffic counts were undertaken in November 2010 and provide more information on the movement of vehicles. Refer to table 1 for the data extracted from the feasibility report by Hertfordshire County Council.

Table 1:

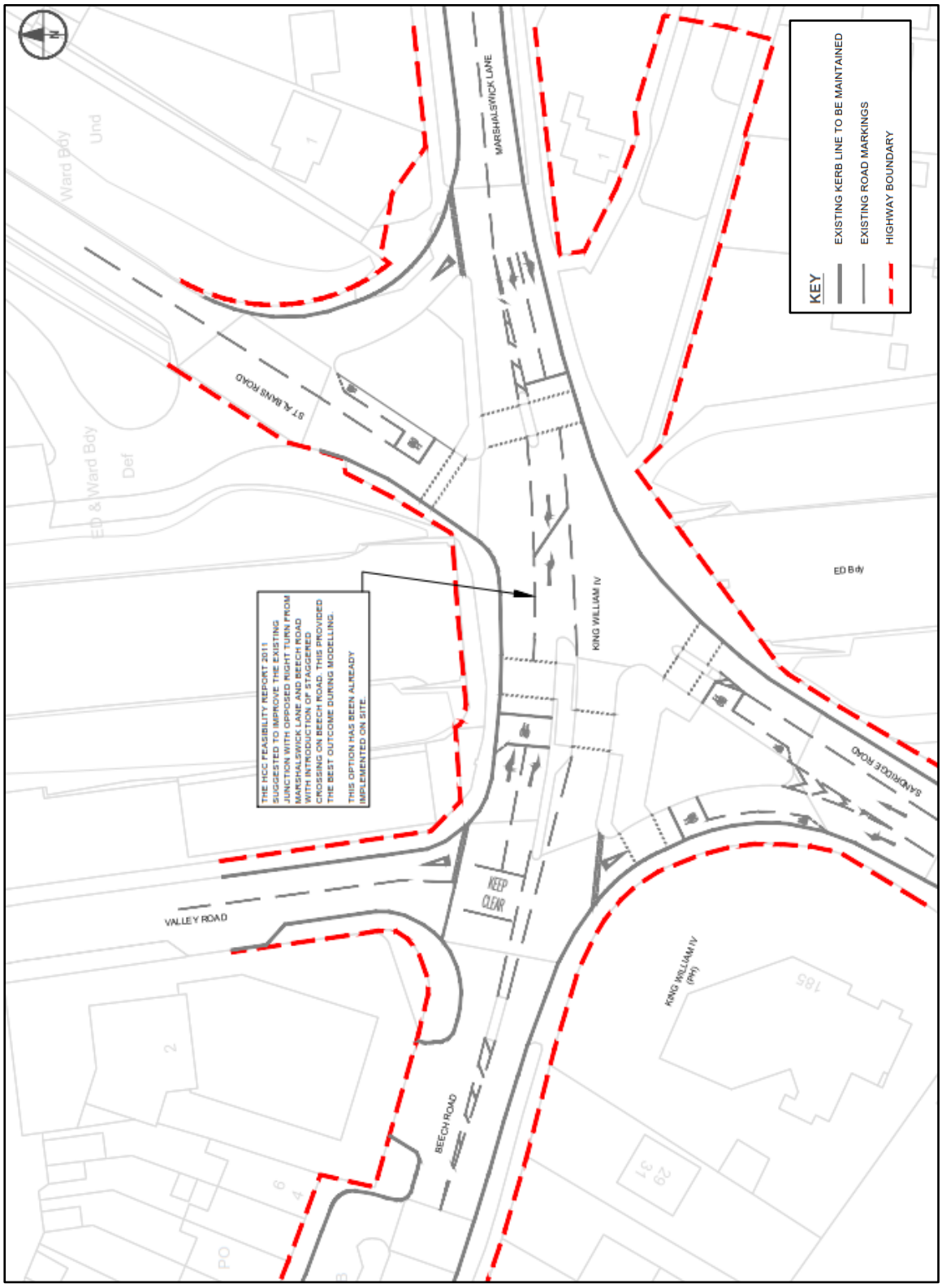
Location (From)	Location (To)	Data (Number of vehicles)	
		AM Peak 08:00-09:00	PM Peak 17:00-18:00
St Albans Road	Marshalswick Lane	114	124
St Albans Road	Sandridge Road	309	262
St Albans Road (Right turn)	Beech Road	210	150
Marshalswick Lane	Sandridge Road	106	74
Marshalswick Lane	Beech Road	473	45
Marshalswick Lane (Right turn)*	St Albans Road	48	103
Sandridge Road	Beech Road	87	66
Sandridge Road	St Albans Road	162	306
Sandridge Road (Right turn)	Marshalswick Lane	125	111
Beech Road	St Albans Road	106	194
Beech Road	Marshalswick Lane	417	407
Beech Road (Right turn)*	Sandridge Road	44	37

**Highlighted right turn movements considered for right turn ban.*

Following review of all three mitigation options, no works has been proposed at this junction due to the reasons stated for each option considered above.

Design Improvement Plans

Outline Design:



Extract of the feasibility drawing no. 60534762-SADC-DWG-SITE 6 REV 1 (Refer to Appendix A for complete drawing)

Outline Cost Analysis
No mitigation proposed.

Junction	**A1081 Harpenden Road / Beech Road / Batchwood Drive (Ancient Briton Junction)**
Reference	**Site 7**
Location	The Ancient Briton junction is a four arm signalised junction, in a suburban area, north of central St Albans. A1081 Harpenden Road provides the main link between central St Albans and Harpenden and joins links to connect with A405 Orbital Road towards the M1 or M25. Batchwood Drive/Beech Road forms part of a ring road around suburban St Albans, and provides a corridor that enables traffic from Harpenden, Redbourn Road and Hemel Hempstead to access the North East of St Albans.

Description of Problem

The junction currently experiences large traffic flows with extensive queues forming on all approach arms. The queue on the A1081 southbound can already extend to a mile. It is evident that conditions at the junction will worsen in future years, even without any additional development- related traffic increase.

The Hertfordshire County Council's (HCC) existing 2014 Base Year and 2031 Forecast Year COMET models (version 3, March 2017) have been used to identify areas of pressure on the highway network. COMET Base Year model highlighted that Site 7 has an average junction delay of 3.0 minutes in the AM peak, whilst the junction experiences an average delay of 2.0 minutes in the PM peak. The model also demonstrated this junction being one of the worst performing junctions and identified as a congestion hotspot.

The congestion in the 2031 Forecast Year model highlighted that Site 7 has an average junction delay of 3.5 minutes on all approaches during the AM peak. During the PM peak, an average delay of 3.0 minutes exists.

Therefore, improvements have been sought to reduce delays associated with the future increase in flow by improving the capacity of the junction.

Constraints:

The existing highway boundary limits the scope to which the existing junction can be widened and/or modified. Also, difficult to expand due to the close proximity of nearby buildings.

Google Maps show BT cabinets and other utilities covers at the proposed site. The mitigation option proposed requires relocation of the cabinets and other covers which might prove very expensive. Therefore further C2, C3, and C4 enquiries will be required to confirm the extents of any statutory utility diversion works and GPR is also recommended to identify the exact location and depth of the underground services.

Design Improvement Feasibility Details

Two options have been considered for this junction: a right turn ban from Harpenden Road Southbound onto Batchwood Drive and to widen Batchwood Drive to enable a separate right turn lane.

The initial concept of banning a right turn movement from Harpenden Road to Batchwood Drive has been rejected. It is thought that it would not be acceptable by local residents and would be unlikely to achieve approval due to concerns over where the displaced traffic would migrate to. It is therefore considered unlikely that the option would gain approval for construction. Altering traffic routes was considered for the displaced traffic but it would likely require some form of traffic calming measures on the local road network to mitigate against the increased traffic flow.

It was therefore decided not to proceed with this option, and considered the separate right turn lane on Batchwood Drive turning into Harpenden Road to be most appropriate to carry out further analysis. This option was considered to improve the operational efficiency of the junction, therefore increasing capacity and reducing delays experienced by motorists.

Batchwood Drive

The alignment of the Batchwood Drive approach is proposed to be altered through localised widening to enable a separate right turn lane to be provided. The inclusion of the right turn lane will allow both the Beech Road and Batchwood Drive approaches to run in the same stage and thereby reducing the number of stages at the junction from 5 to 4, maximising the green time given to each approach at the junction.

The initial design proposed required some land take from the registered common land to facilitate the widening on Batchwood Drive, providing wider lane widths and a smoother radius for larger vehicles turning left from Harpenden Road Northbound onto Batchwood Drive, but after the further investigations, St Albans District Council has confirmed the land belongs to Althorp Estate and is therefore privately owned. The proposal has been redesigned to keep within the highway boundary but this has meant that minimum lane widths and turning radii have been used.

Beech Road

The layout from Beech Road would remain largely unaffected by the proposed modifications.

Harpenden Road Northbound

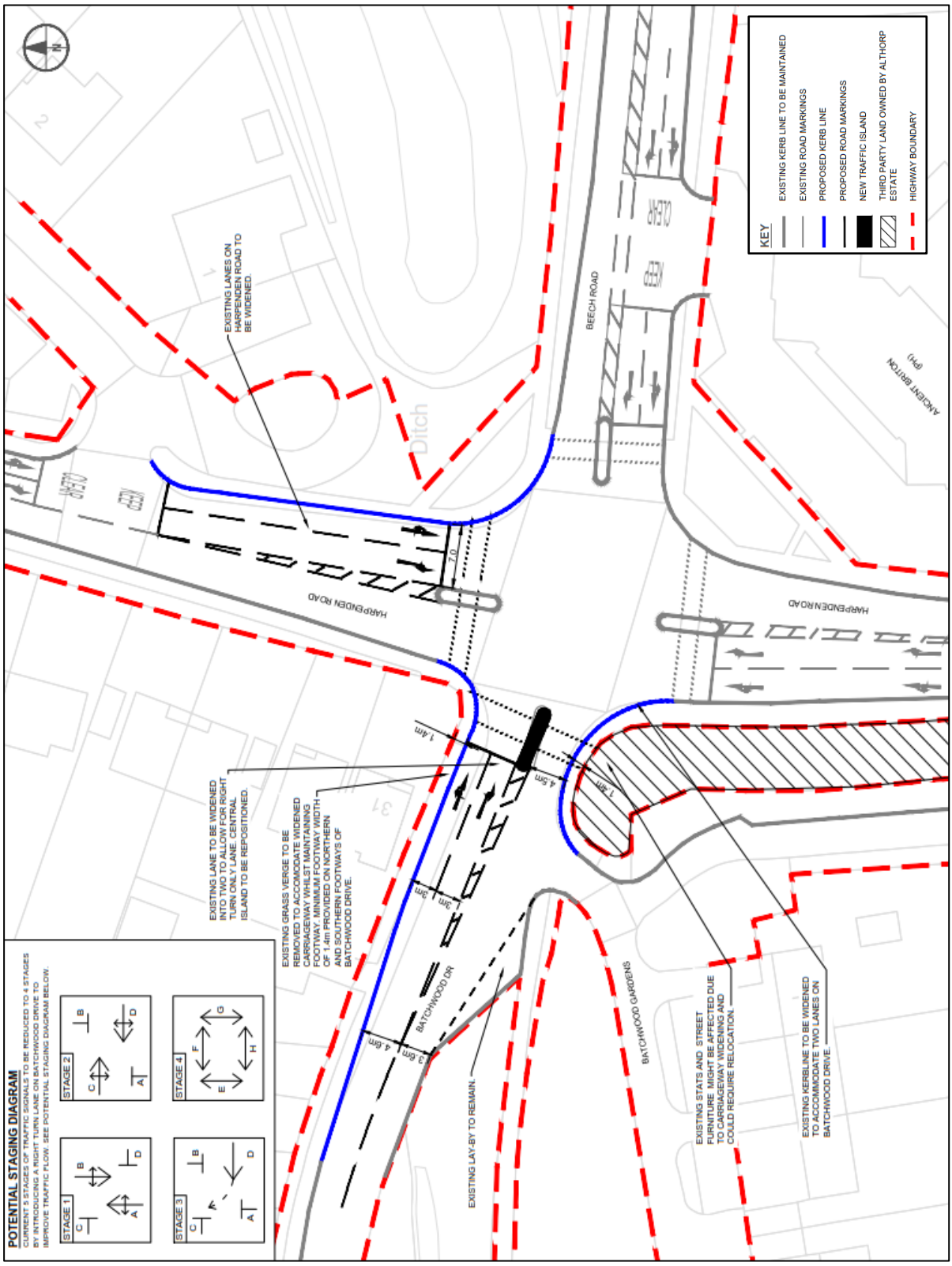
The layout from Harpenden Road northbound would remain largely unaffected by the proposed modifications. However the alignment of the nearside kerb from the stop line is proposed to be altered to accommodate the widening on Batchwood Drive.

Harpenden Road Southbound

The two lanes approaching the junction are proposed to be widened to 3.5m each to improve the layout of the junction and capacity of the traffic flow for vehicles travelling southbound. It is ensured that sufficient width has been provided for the footway, with re-aligned kerb, due to the use by St Albans Girls School. A width of 1.4m is shown in the outline design.

Design Improvement Plans

Outline Design:



Extract of the feasibility drawing no. 60534762-SADC-DWG-SITE 7 REV 1 (Refer to Appendix A for complete drawing)

Outline Cost Analysis

Basis of Order of Magnitude Estimate:

Site 7: A1081 Harpenden Rd/Beech Rd/ Batchwood Drive (Ancient Briton)/60534762-SADC-DWG-SITE 7-REV 1

Assumptions:

1. Everything within the existing and new kerb lines will be broken out to 600mm depth
2. There are to be no works to Harpenden Rd south and Beech Rd
3. Allowed for laying new and diverting existing storm drainage only. We have assumed there are no foul drainage requirements on the site
4. The proposed Central Reservations are built up as per a typical bituminous footpath construction
5. Assumed requirement for crossings to all Batchwood Drive and Harpenden Rd north
6. Dimensions of proposed guardrail, lights, traffic lights and signage are assumed in the absence of detailed drawings

Exclusions:

1. Any works or costs associated with landscaping
2. The demolition of any existing structures
3. Any works beyond the boundary line or works to estates leading off of Batchwood Drive and Harpenden Rd
4. Inflation beyond 2Q 2017
5. Professional fees
6. Planning and development control costs
7. Value added Tax

Works Element	Estimated Cost		Notes
Construction Cost	£	397,000	
Allowances for Preliminaries	£	79,400	20% of construction items
Allowances for Traffic Management (TM)	£	99,250	25% of construction items
Allowances for Scheme Design	£	57,565	10% of construction items (including Prelims and TM)
Allowances for Utilities / Electricals	£	79,400	20% of construction items
Sub-Total for allowances and construction items	£	712,615	
Optimism Bias	£	313,551	44% of sub-total
Cost for Delivery	**£**	**1,026,166**	

Junction	A5183 Redbourn Road / A4147 Bluehouse Hill / Batchwood Drive roundabout
Reference	Site 8
Location	The site is a four arm roundabout, with a dual lane entry on each arm, located to the west of St Albans. It consists of the following roads: A5183 Redbourn Road, A1583 Verulam Road, Batchwood Drive and A4147 Bluehouse Hill (Hemel Hempstead Road). The north-east arm of the roundabout is Batchwood Drive, towards Townsend and the A1081 Harpenden Road. A4147 Bluehouse Hill (Hemel Hempstead Road) is on the south-west arm and provides a primary link to Hemel Hempstead. The eastern arm is the A5183 Verulam Road which leads to central St Albans, whilst the A5183 Redbourn Road is on the western arm of the roundabout, leading to Redbourn.

Description of Problem
The roundabout has high number of vehicles travelling to and from of Hemel Hempstead and St Albans. There are significant movements from A4147 Bluehouse Hill travelling south east into A5183 Verulam Road and A5183 Verulam Road travelling north east into Batchwood drive. It is evident that conditions at the roundabout will worsen in future years, even without any additional development- related traffic increase. The Hertfordshire County Council's (HCC) existing 2014 Base Year and 2031 Forecast Year COMET models (version 3, March 2017) have been used to identify areas of pressure on the highway network. COMET Base Year model highlighted that Site 8 has an average junction delay of 0.5 minute in the both AM & PM peak periods and has been identified as a congestion hotspot in previous studies. The COMET 2031 forecast year model indicated similar delay of 0.5 minute on the approach arms in the AM peak for inbound traffic and the PM peak for outbound traffic. There is a reduction in flows on A4147 due to delays at surrounding junctions. Therefore, improvements have been sought to reduce delays associated with the future increase in flow by improving the capacity of the junction. **Constraints:** The existing highway boundary limits the scope to which the existing junction can be widened and/or modified. Google maps show the presence of many existing utilities within the extents of the proposed site. Implementing the mitigation option proposed may require the relocation and diversion of existing services which could potentially add significant costs to the scheme.

Design Improvement Feasibility Details

A number of options have been considered at this junction: providing segregated left turn lane from A5183 Verulam Road to A4147 Bluehouse Hill, increasing flare lengths and entry widths of the existing two lane entries and widening to three lane entries.

The segregated left turn option was considered but, as no turning count data is available, it is difficult to determine the best approaches to implement this proposal on. Whilst the left turn from A5183 onto A4147 towards Hemel Hempstead was indicated to have a likely benefit from this option, the turning count data is necessary to meet DMRB requirements and a departure from standard may be required for delivery of this option. A general widening of the approach arms and increase in flare length was also considered as a mitigation measure to be implemented at this site. It may provide a general upgrade to the capacity across the whole roundabout and seek to reduce the delays but this would be minimal against the level of intervention and construction required to deliver. Widening the existing two lane entries to three lanes is considered as the most appropriate mitigation, where significant improvements to capacity can be gained.

A5183 Verulam Road

The existing non-physical deflection island is proposed to be maintained, but relocated to accommodate for the additional proposed lane. This is in the form of road markings and separates the new dedicated left turn lane from the other straight ahead and straight ahead and right turn lanes. This aims to increase the capacity for the left turners on this approach. The central reservation has also been altered, in line with the general roundabout widening.

A417 & Batchwood Drive

The entries on both approaches are proposed to be widened from two lanes to three in order to accommodate an increase in capacity at the roundabout. A left turn arrow marking is proposed in the nearside lane whilst the central and offside lanes will be marked with an ahead arrow and an ahead and right turn arrow respectively.

A5183 Redbourn Road

The entry of this approach has been widened from two lanes to three to increase the capacity at the roundabout and reduce the delay experienced by motorists. A physical subsidiary deflection island is proposed at this approach to mitigate against the reduction in deflection resulting from the increase in the number of lanes. The nearside lane will be marked with a left turn arrow and separated from the other entry lanes by means of the island. The central and offside lanes will be marked with an ahead arrow and an ahead and right turn arrow respectively.

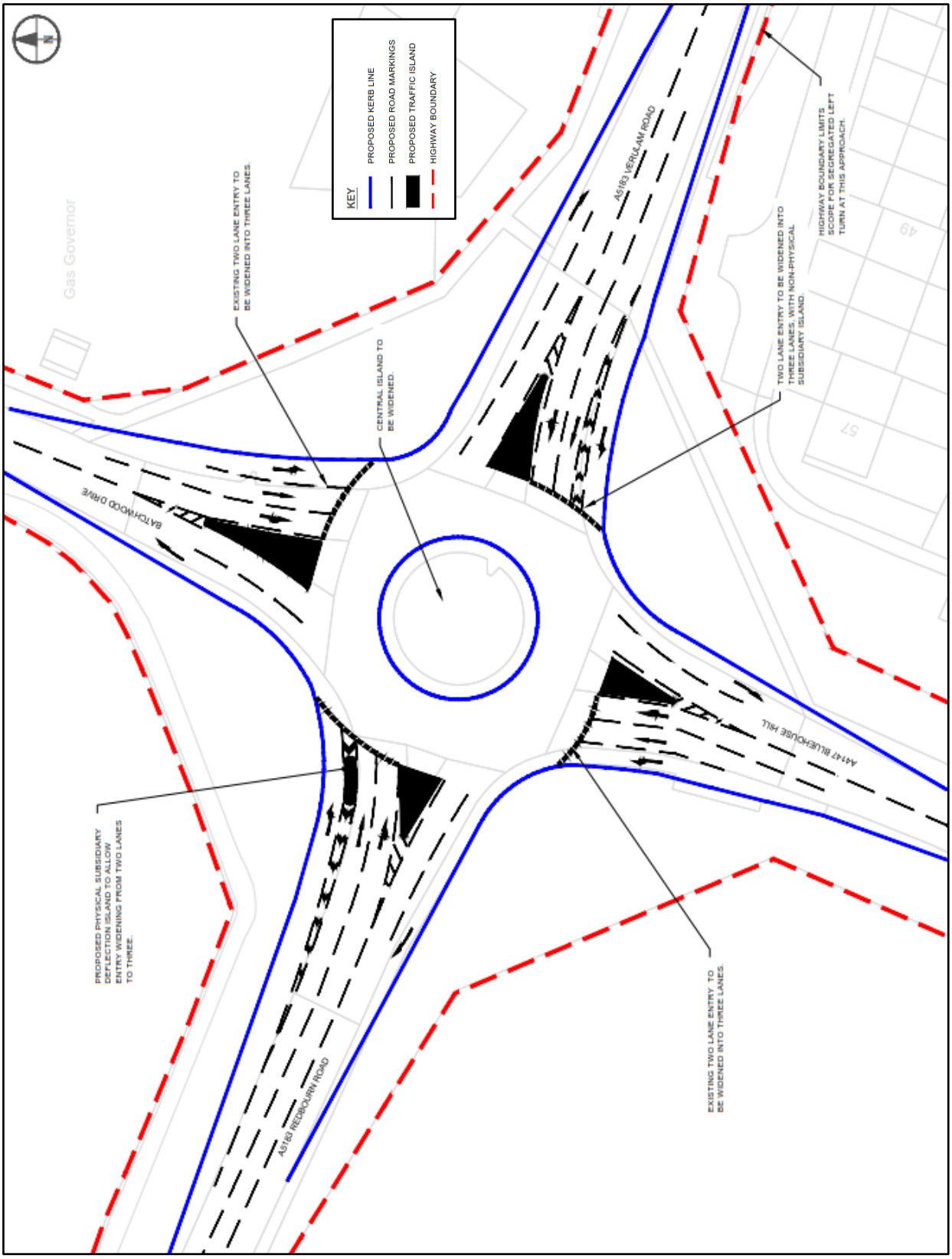
The central island is proposed to be widened in order for deflection and circulatory carriageway width requirements set out in DMRB TD16/07 to be met.

The exits of all approaches are proposed to merge from two lanes to one as the number of entry lanes has been increased.

There is also a long term aspiration from HCC to provide an off carriageway cycle link from St Albans to Redbourn via Redbourn Road. This should be considered at the later design stages should this aspiration continue to exist.

Design Improvement Plans

Outline Design:



Extract of the feasibility drawing no. 60534762-SADC-DWG-SITE 8 REV 1 (Refer to Appendix A for complete drawing)

Outline Cost Analysis

Basis of Order of Magnitude Estimate:

Site 8: A5183 Redbourn Road/A4147 Bluehouse Hill/Batchwood Drive Roundabout/60534762-SADC-DWG-SITE 8-REV 1

Assumptions:

1. Everything within the existing and new kerb lines will be broken out to 600mm depth
2. Allowed for laying new and diverting existing storm drainage only. We have assumed there are no foul drainage requirements on the site
3. The proposed Central Reservations are built up as per a typical bituminous footpath construction
4. Dimensions of proposed lights, traffic lights, signage are assumed in the absence of detailed drawings
5. Centre of roundabout to be a hard central reservation build up

Exclusions:

1. Any works or costs associated with landscaping
2. The demolition of any existing structures
3. Any works beyond the boundary line
4. Inflation beyond 2Q 2017
5. Professional fees
6. Planning and development control costs.
7. Value added Tax

Works Element	Estimated Cost		Notes
Construction Cost	£	1,211,000	
Allowances for Preliminaries	£	242,200	20% of construction items
Allowances for Traffic Management (TM)	£	302,750	25% of construction items
Allowances for Scheme Design	£	175,595	10% of construction items (including Prelims and TM)
Allowances for Utilities / Electricals	£	242,200	20% of construction items
Sub-Total for allowances and construction items	£	2,173,745	
Optimism Bias	£	956,448	44% of sub-total
Cost for Delivery	**£**	**3,130,193**	

Junction	B653 Cory Wright Way / Marford Road, Wheathampstead
Reference	Site 10
Location	This junction is a three arm roundabout located in a rural area, east of Wheathampstead and north of St Albans. The roundabout connects Marford Road and B653 Cory Wright Way and provides links to the A1 (M) and Welwyn Garden City to the east and Harpenden to the west. Marford Road leads into the town centre of Wheathampstead, approximately one mile to the east. This also provides a link into central St Albans. Cory Wright Way provides a by-pass for Wheathampstead and leads to Harpenden. The B653 Marford Road continues eastbound from the junction towards Welwyn Garden City.

Description of Problem
The roundabout already manages large traffic volumes and often experiences significant delays during the peak hours on the B653 approaches. The Hertfordshire County Council's (HCC) existing 2014 Base Year and 2031 Forecast Year COMET models (Version 3, March 2017) have been used to identify areas of pressure on the highway network. The COMET Base Year Model highlighted that Site 10 has an average junction delay of 1.0 minute in the AM Peak and a delay of up to 0.5 minutes in the PM Peak hours. Strategic modelling of the junction in future years using the 2031 COMET model has indicated increased delays would appear on all approaches, as the current layout would not provide sufficient capacity for future traffic flows. An average delay of 2.0 minutes has been identified on all approaches in the AM peak and an increase in delay by an average of 1.5 minutes in the PM peak. Therefore, improvements have been sought to reduce delays associated with the future increase in flow by improving the capacity of the junction. **Constraints:** The existing highway boundary limits the scope to which the existing junction can be widened and/or modified.

Design Improvement Feasibility Details

Two options have been considered for this junction: widening the B653 approach, by utilising farm land and introducing part time traffic signals with a reduction of the existing speed limit from 60mph to 40mph.

Widening the B653 approach by utilising adjacent farm land was not considered appropriate due to the relating land costs and the minimal corresponding reductions in delays.

Part time traffic signals have been proposed due to the ability to filter the peak hour traffic flows more efficiently and therefore reducing the delays experienced by motorists.

The proposed roundabout has been designed to DMRB standard Volume 6, section 2, Part 3 TD 16/07 Geometric Design of Roundabouts.

B653 Marford Road

The existing approach would be widened to provide a traffic lane for each movement. The nearside lane would accommodate vehicles travelling into central Wheathampstead, whilst the outside lane would accommodate vehicles turning right onto B653 Cory Wright Way. This allows for greater traffic flows and independent turning movements on this approach.

A 40mph speed limit is to be introduced on the approach to the roundabout at this arm to ensure adequate forward visibility of the proposed part time signal head is provided due to the lower approach speeds.

The central reservation has been modified to accommodate the widening.

B653 Cory Wright Way

New carriageway construction would be required as it is proposed that the alignment of the approach is altered. It is proposed that the approach is diverted further eastwards to allow for the oncoming vehicles to reach an appropriate speed before entering the roundabout.

It is proposed that this approach is also widened to two lanes at the entry to allow for one traffic lane per turning movement. The nearside lane would accommodate vehicles traveling towards Welwyn Garden City and Hatfield, whilst the off side lane would accommodate vehicles turning right into Wheathampstead.

A 40mph speed limit is to be introduced on the approach to the roundabout at this arm to improve visibility of the proposed part time signal head is provided due to the lower approach speeds.

The central reservation has been modified to accommodate the widening.

Marford Road

This approach would be widened from a single-lane entry to two lanes and accommodate one turning movement per lane. The nearside lane would be marked with a left turn arrow and the far side lane would be marked with an ‘ahead’ arrow.

The central reservation has been modified to accommodate the widening.

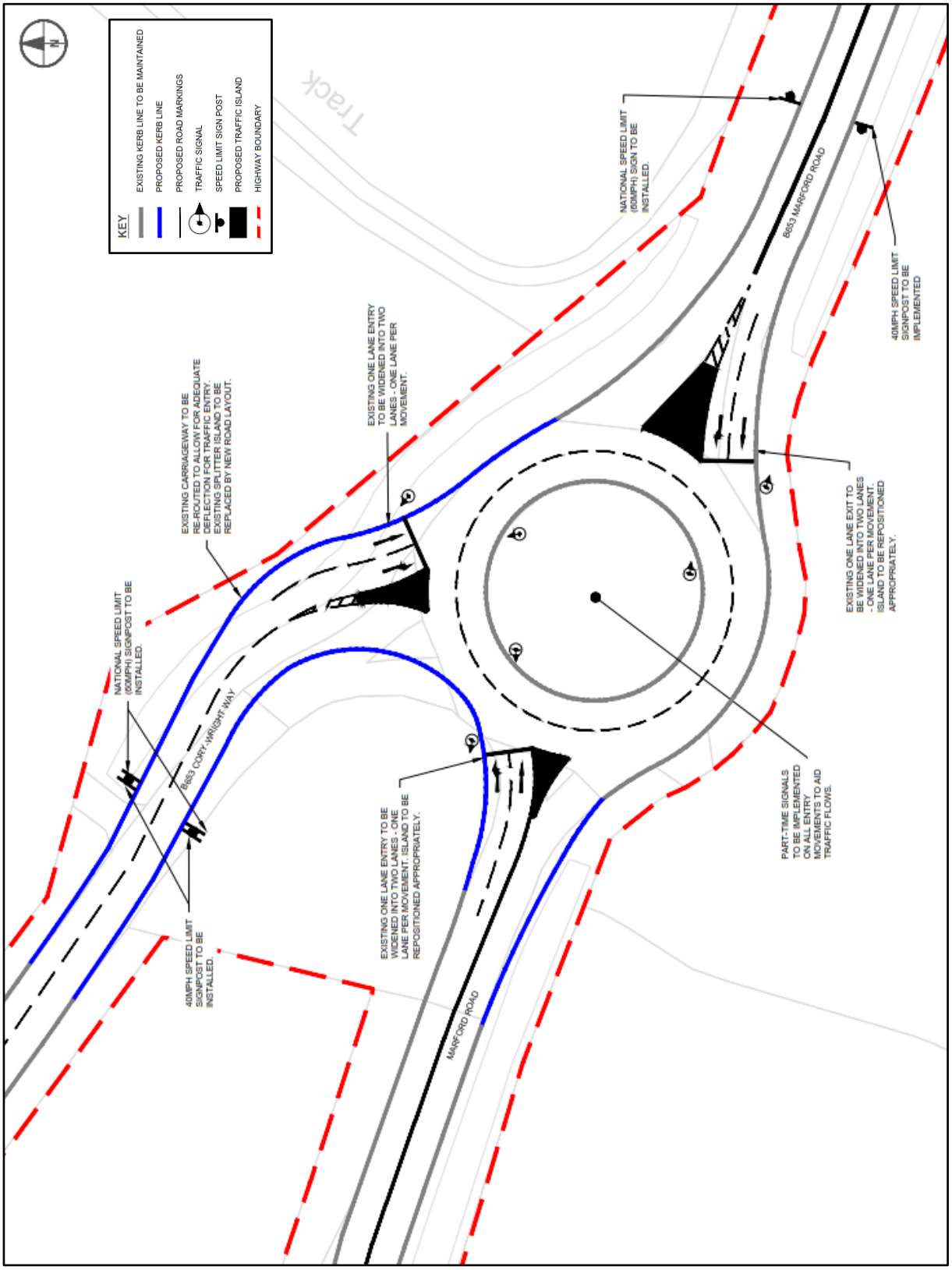
Part time signals are to be installed on all three approaches with the intent of aiding the flows during peak hours to reduce the severity of delays. These will be installed both on the roundabout for view from the stop lines as well as on the approach, with 215m of visibility (as per DMRB) before the signal to allow for vehicles to slow down in enough time.

The existing vegetation in the central roundabout island should be maintained to ensure it does not become overgrown, resulting in an obstruction to the sighting distances on the roundabout.

A circulatory road marking has been proposed to show the lanes in which vehicles from all movements should keep to. This should aid flows as they will allow for more vehicles to enter the roundabout at once; increasing the capacity.

Design Improvement Plans

Outline design:



Extract of the feasibility drawing no. 60534762-SADC-DWG-SITE 10 REV 1 (Refer to Appendix A for complete drawing)

Outline Cost Analysis

Basis of Order of Magnitude Estimate:

Site 10: B653 Roundabout - Cory Wright Way & Marford Road, Wheathampstead/60534762-SADC-DWG-SITE 10-REV 1

Assumptions:

1. Everything within the existing and new kerb lines will be broken out to 600mm depth
2. Allowed for laying new and diverting existing storm drainage only. We have assumed there are no foul drainage requirements on the site
3. The proposed Central Reservations are built up as per a typical bituminous footpath construction
4. Dimensions of proposed lights, traffic lights, signage & VRS assumed in the absence of detailed drawings
5. Centre of roundabout to be hard central reservation build up

Exclusions:

1. Any works or costs associated with landscaping
2. The demolition of any existing structures
3. Inflation beyond 2Q 2017
4. Professional fees
5. Planning and development control costs
6. Value added Tax

Works Element	Estimated Cost		Notes
Construction Cost	£	931,000	
Allowances for Preliminaries	£	186,200	20% of construction items
Allowances for Traffic Management (TM)	£	232,750	25% of construction items
Allowances for Scheme Design	£	134,995	10% of construction items (including Prelims and TM)
Allowances for Utilities / Electricals	£	186,200	20% of construction items
Sub-Total for allowances and construction items	£	1,671,145	
Optimism Bias	£	735,304	44% of sub-total
Cost for Delivery	**£**	**2,406,449**	

Junction	**A4147 Hemel Hempstead Rd/King Harry Lane**
Reference	**Site A**
Location	This junction is a three arm roundabout (commonly known as Bluehouse Hill roundabout) located to the south-west of St Albans, next to Verulamium Park. The roundabout connects the A4147 Hemel Hempstead Road, King Harry Lane and A4147 Bluehouse Hill. The A4147 is the main trunk road connecting central St Albans to Hemel Hempstead. The north-eastbound link connects to the A5183 which provides a route into the centre, whilst the south-westbound link connects to Hemel Hempstead and provides a route to the M1 at Junction 8. King Harry Lane provides a connection to the St Stephens area, south of St Albans.

Description of Problem
The roundabout currently experiences high volumes of traffic flows, with significant movement from the A4147 travelling north east into St Albans and south west into Hemel Hempstead. It is evident that conditions at the roundabout will worsen in future years, even without any additional development-related traffic increase. The Hertfordshire County Council's (HCC) existing 2014 Base Year and 2031 Forecast Year COMET models (version 3, March 2017) have been used to identify areas of pressure on the highway network. COMET Base Year model highlighted that Site A has an average junction delay of 1.5 minute in the both AM & PM peak periods and has been identified as a congestion hotspot in previous studies. The COMET 2031 forecast year model indicated an average delay of 2 minutes for every vehicle in AM Peak and PM Peak. The modelling also indicated the significant increase in delay on the King Harry Lane despite a relatively modest flow increase. This is due to the arm already being at capacity in the Base Year and therefore unable to accommodate more traffic. Therefore, improvements have been sought to reduce delays associated with the future increase in flow by improving the capacity of the junction. **Constraints:** The existing highway boundary limits the scope to which the existing junction can be widened and/or modified. The existing footways also constrain the site and the potential mitigation measures, as this ultimately needs to be retained to maintain pedestrian provision.

Design Improvement Feasibility Details

Due to the constraints at this junction, the option considered is an additional lane on each approach to accommodate individual turning movements. In particular, the right turn movement into King Harry Lane is sought to be improved.

This option is considered as the most appropriate for the site, where it is anticipated that junction capacity can be increased and delays reduced across the roundabout junction as a whole.

The proposed roundabout has been designed to DMRB standard Volume 6, section 2, Part 3 TD 16/07 Geometric Design of Roundabouts.

A4147 Hemel Hempstead Road

The existing approach would be widened to provide a traffic lane for each movement. The nearside lane would accommodate vehicles travelling north, whilst the off side lane would accommodate vehicles turning right onto King Harry Lane.

The site also has constraints of highway boundary which limits the extents of widening. Therefore, two lanes have been proposed with designated movement on each lane.

The two lanes would allow for straight-ahead movements to move independently from the right turning traffic, which in turn reduce the delays from the A4147. This independent movement for right turning traffic would aid the reduction of delays to vehicles travelling from the northbound direction.

The central reservation has been modified to accommodate the widening.

A 3.0m cycle track proposed by Hertfordshire County Council has been included within the design. However, no provision has been made within this mitigation option for cyclists to cross Hemel Hempstead Road to continue their journey.

Should the design progress, options for the continuation of the proposed cycle track should be investigated.

Consideration has also been made to enable the cycle track to be linked to the existing facility on King Harry Lane which leads to Verulamium Park. A 2.5m shared use width is the minimum width provided but this can be increased with only a minor reduction in capacity on the King Harry Lane approach.

Bluehouse Hill

This approach would be widened from a single-lane entry to two lanes and accommodate one turning movement per lane. The nearside lane would be marked with a left turn arrow and the far side lane would be marked with an ahead arrow.

The central reservation has been modified to accommodate the widening.

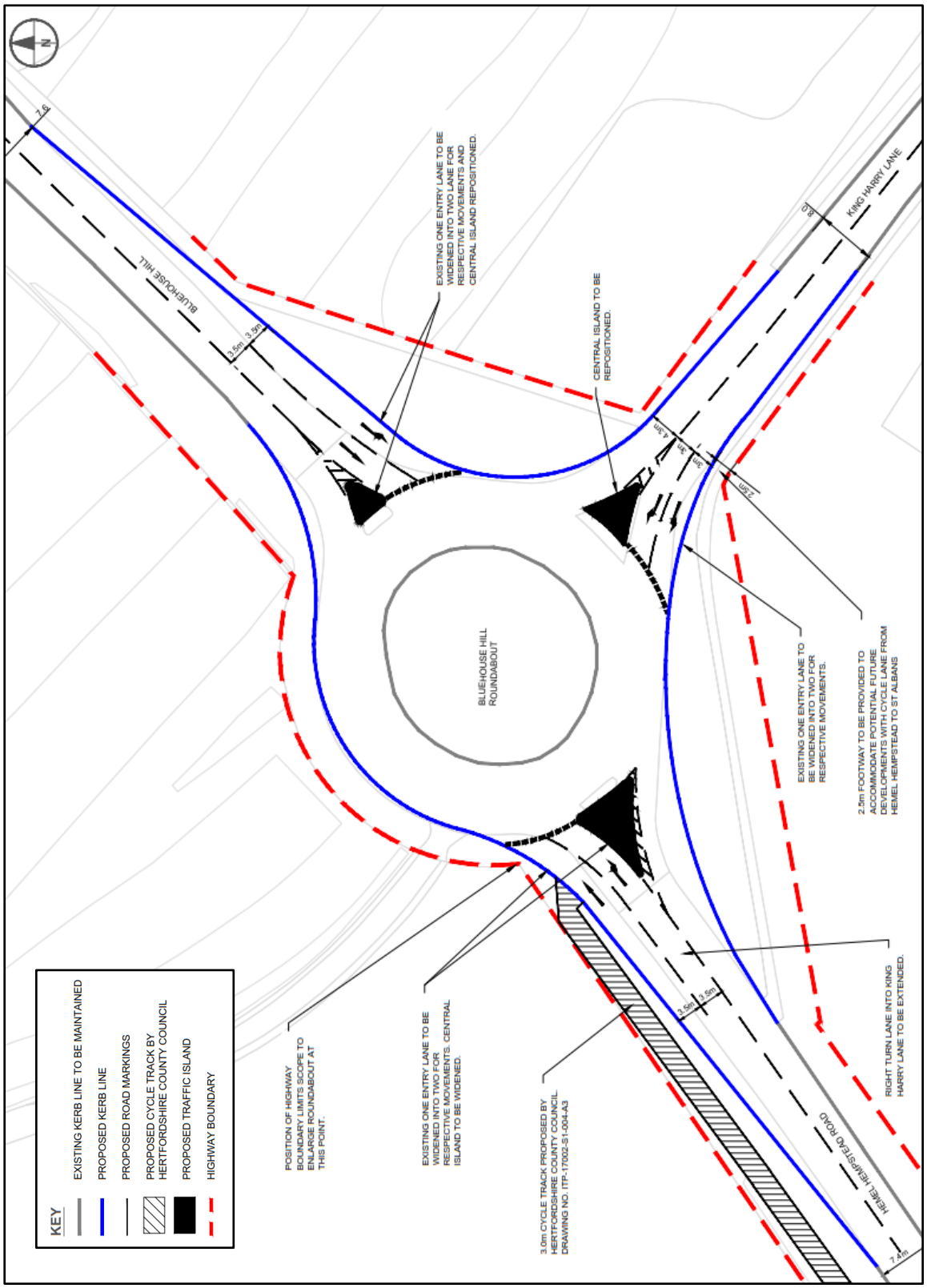
King Harry Lane

As with the other approaches, the single-lane entry would be widened to two lanes so each turning movement is independent of each other. The nearside lane would be marked with a left turn arrow and the far side lane would be marked with an ahead arrow. The lane widths have been restricted at this approach to 3.1m in order to maintain the existing footway.

The central reservation has been modified to accommodate the widening.

Design Improvement Plans

Outline Design:



Extract of the feasibility drawing no. 60534762-SADC-DWG-SITE A REV 1 (Refer to Appendix A for complete drawing)

Outline Cost Analysis

Basis of Order of Magnitude Estimate:

Site A: A4147 Hemel Hempstead Rd/ King Harry Lane/60534762-SADC-DWG-SITE A-REV 1

Assumptions:

1. Everything within the existing and new kerb lines will be broken out to 600mm depth
2. Works are to extend to the edge of the drawing for each of the 3 roads, Hemel Hempstead Rd, Bluehouse Hill and King Harry Lane
3. Allowed for laying new and diverting existing storm drainage only. We have assumed there are no foul drainage requirements on the site
4. The proposed Central Reservations are built up as per a typical bituminous footpath construction
5. Dimensions of proposed VRS, lights and signage assumed in the absence of detailed drawings
6. All works/ costs associated with the cycle track will be carried out by Hertfordshire County Council

Exclusions:

1. Any works or costs associated with landscaping
2. The demolition of any existing structures
3. Any landscaping/paving works beyond the line of road kerbing
4. Any works/costs associated with the cycle track
5. Inflation beyond 2Q 2017
6. Professional fees
7. Planning and development control costs.
8. Value added Tax

Works Element	Estimated Cost		Notes
Construction Cost	£	944,000	
Allowances for Preliminaries	£	188,800	20% of construction items
Allowances for Traffic Management (TM)	£	236,000	25% of construction items
Allowances for Scheme Design	£	136,880	10% of construction items (including Prelims and TM)
Allowances for Utilities / Electricals	£	188,800	20% of construction items
Sub-Total for allowances and construction items	£	1,694,480	
Optimism Bias	£	745,571	44% of sub-total
Cost for Delivery	**£**	**2,440,051**	

Junction	**A1081 Luton Rd/ Park Hill**
Reference	**Site B**
Location	The junction is a three arm traffic signalised junction, in a residential area within Harpenden, linking Park Hill with the A1081 Luton Road. The A1081 provides a link between Luton and St Albans, and is sited through Harpenden. Luton is to the north of the A1081 Luton Road/Park Hill junction, whilst St Albans is to the South. Park Hill leads to Roundwood Primary and Roundwood Park Schools, south-west of the junction and runs adjacent to the Nickey Line.

Description of Problem

The junction currently experiences high volumes of traffic, with the significant movements travelling north and southbound along A1081 Luton Road. However, delay for traffic is most prominent on the Park Hill Approach.

The Hertfordshire County Council's (HCC) existing 2014 Base Year and 2031 Forecast Year COMET models (Version 3, March 2017) have been used to identify areas of pressure on the highway network. COMET Base Year model highlighted that Site B has an average junction delay of 0.5 minute.

Results from the COMET Forecast Year 2031 model indicated an average delay at this junction of 1.0 minute, particularly affecting traffic approaching from Luton Road.

Therefore, improvements have been sought to reduce delays associated with the future increase in flow by improving the capacity of the junction.

Constraints

- The railway bridge to the east of the A1081 Luton Road/Park Hill junction, limits the scope to which the existing junction can be widened and/or modified.
- The highway boundary limits the mitigation options to be proposed.

Design Improvement Feasibility Details

Based on the existing geometry, the highway boundary and the existing constraint of the railway bridge, the option considered most appropriate at this junction is for Microprocessor Optimised Vehicle Actuation (MOVA) to control traffic signal timings.

This solution would allow the junction to generate its own signal timings cycle-by-cycle, varying continuously with traffic conditions. The available green time given to any of the approaches can be altered by assessing the number of vehicles approaching the signals, whilst also determining the impact that the queuing vehicles would have on the overall operation of the junction. Therefore, MOVA operated signals can reduce the delays at the junction, increasing capacity and reducing congestion. It is typically considered that the introduction of MOVA can reduce delays by an average of 13%, as reported in Traffic Advisory Leaflet 3/97.

Park Hill

New MOVA detector loops are proposed to be cut at typical distances from the stop line of 40 metres and 100 metres and associated ducting to be provided. It is proposed for the existing infrastructure to remain, including the pedestrian crossing across this approach.

A1081 Luton Road: Eastbound and Westbound Traffic Lanes

As on the Park Hill approach, new MOVA detector loops are proposed to be cut at typical distances from the stop lines of each approach at 40 metres and 100 metres, with the existing infrastructure to remain. The pedestrian crossing across the eastbound approach is proposed to be retained.

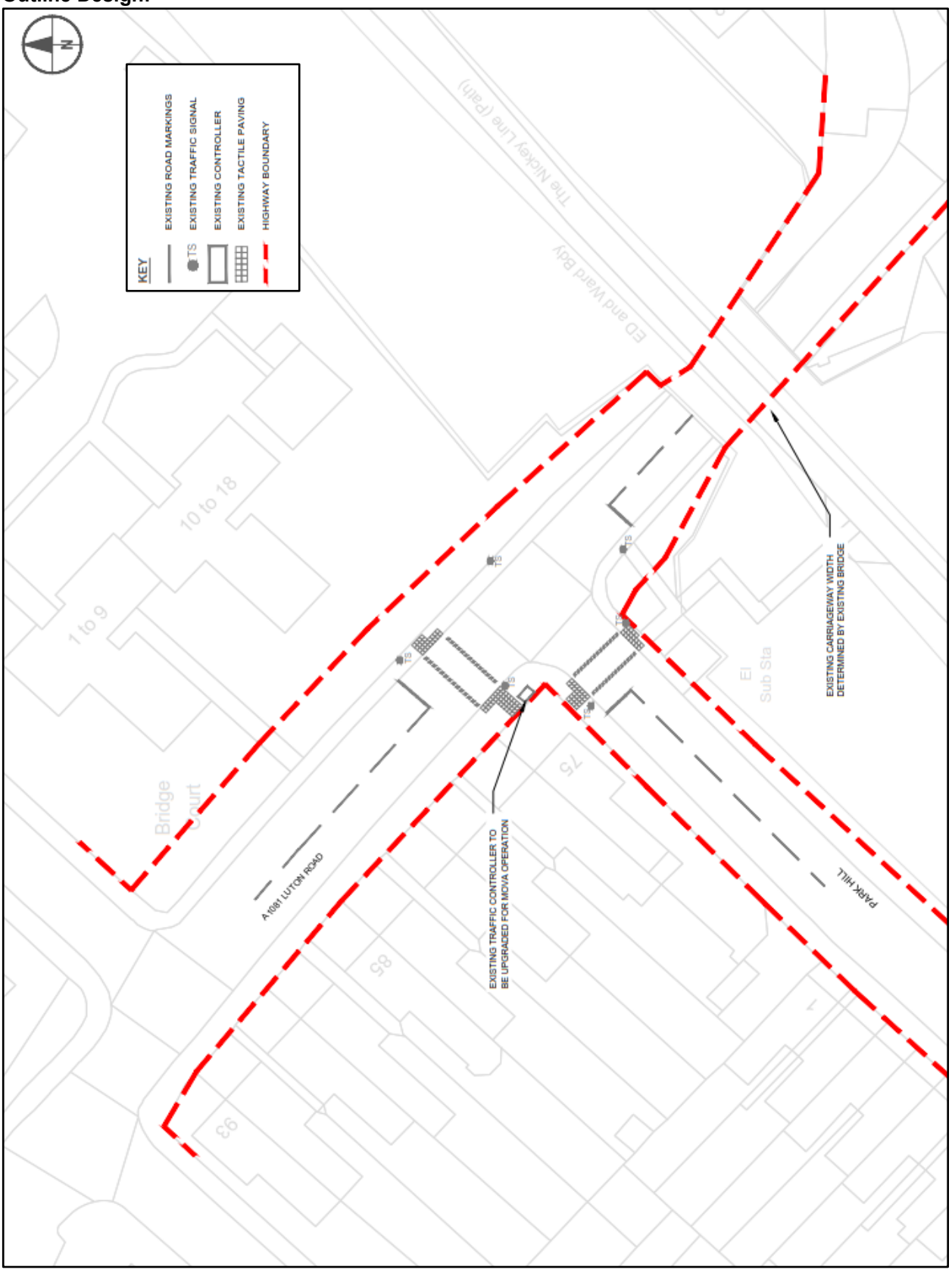
Further considerations

The existing controller at the junction may not have been maintained to the required standard, and this could affect the current signal timings. Additional capacity at the junction may be sought from checking the junction for maintenance defects and rectifying any issues.

Should the design progress, the location of the detector loops may differ based on the cruise time of vehicles appropriate at the time the scheme is implemented.

Design Improvement Plans

Outline Design:



Extract of the feasibility drawing no. 60534762-SADC-DWG-SITE B REV 1 (Refer to Appendix A for complete drawing)

Outline Cost Analysis

Basis of Order of Magnitude Estimate:

Site B: A1081 Luton Road/Park Hill Junction/60534762-SADC-DWG-SITEB-REV 1

Assumptions:

1. MOVA detector loops are to be diamond shape with lengths of equal size 0.6m
2. Cables will be run through pavement back to the junction
3. Assumed 3 man gang for saw cutting and cable laying

Exclusions:

1. For construction items only we have excluded prelims, traffic management, utilities
2. The demolition of any existing structures
3. Any works or costs associated with modifying the existing traffic signal junction
4. Inflation beyond 2Q 2017
5. Professional fees
6. Planning and development control costs
7. Value added Tax

Works Element	Estimated Cost		Notes
Construction Cost	£	27,000	
Allowances for Preliminaries	£	5,400	20% of construction items
Allowances for Traffic Management (TM)	£	6,750	25% of construction items
Allowances for Scheme Design	£	3,915	10% of construction items (including Prelims and TM)
Allowances for Utilities / Electricals	£	5,400	20% of construction items
Sub-Total for allowances and construction items	£	48,465	
Optimism Bias	£	21,325	44% of sub-total
Cost for Delivery	**£**	**69,790**	

Junction	**A1057 Hatfield Rd/Station Rd**
Reference	**Site E**
Location	The junction is a four arm roundabout, with a single lane entry on each arm, located in Smallford. It consists of the following roads: A1057 Hatfield Road, Station Road and Oaklands Lane. The south-west arm of the roundabout is the A1057 Hatfield Road and leads into central St Albans, whilst the north-east arm, also the A1057, leads into Hatfield. The A1057 is a primary road linking St Albans to Hatfield. Station Road is on the south-east arm of the roundabout, leading towards the A414 North Orbital Road and Colney Heath. The north-west arm is Oaklands Lane, providing a link to towards Jersey Farm. This arm also provides a less direct route into central St Albans via Sandpit Lane.

Description of Problem

The roundabout has a high number of vehicles travelling to and from St Albans and Hatfield along the A1057. Both the eastbound and westbound approach straight ahead movements have the largest flows.

The Hertfordshire County Council's (HCC) existing 2014 Base Year and 2031 Forecast Year COMET models (Version 3, March 2017) have been used to identify areas of pressure on the highway network. This roundabout was indicated to have an average junction delay of 1 minute, with 2-3 minutes delay on the A1057 Hatfield Rd Westbound approach from the COMET 2014 Base Year model.

The COMET 2031 Forecast Year model highlighted an average junction delay of 2 minutes for all vehicles in both peaks. An increase in delay of 30 seconds is observed in each peak period in 2031, compared to the 2014 model.

It is noted that the proposed Oaklands College Development, located approximately 1.5km north-west of this junction, is likely to introduce additional demand on local junctions. This may result in further increases to the delay at the roundabout and would also result in insufficient capacity. Refer to **Figure 1** for the map. **Figure 2** shows proposed accesses to the development and the nature of these.

Therefore, mitigation measures to reduce delay and increase capacity for existing and future traffic levels are sought at this roundabout.

In addition to the current and forecasted delays at this junction, the roundabout currently does not meet standards set out in the Design Manual for Roads and Bridges (DMRB).

Constraints:

The highway boundary constrains the roundabout junction and limits the scope to which the existing junction can be widened and/or modified.

Design Improvement Feasibility Details

Two options have been considered at this junction: providing a signalised junction rather than a roundabout, and upgrading the existing roundabout from single lane to two lane entry. Based on the existing highways boundary constraints and the perceived minimal reductions in delay and increase in capacity, the signalised junction option was considered as inappropriate.

Widening each approach of the roundabout, from the existing single lane entry to dual lane entry was considered suitable for further analysis. It is anticipated that this mitigation measure will increase roundabout capacity by enabling a greater flow entering the junction across all approaches. However, this increase in capacity is constrained by the length over which the approaches have been extended, based on the constraints of the highway boundary.

The roundabout has been enlarged to accommodate for the entry lane widening and provides two circulatory lanes. An overrun area is proposed around the central island to maintain circulatory widths in line with DMRB TD16/07.

The design is concept and as such, shows representative road markings and no signage. The required signage and detailed markings would be provided at later design stages.

Station Road

The current single lane entry is proposed to be widened to two lanes. The highway boundary is most apparent at this approach, where entry widths and the extents of the lane widening have been constrained. However, minimum requirements for each of these features have been satisfied and have been designed in line with DMRB, TD16/07.

The central reservation has been altered in line with the widening of the circulatory carriageway and the new approaches would have markings to indicate a left turn and a straight on and right turn.

A1057 Hatfield Road

Both the north-east and south-west approaches of the roundabout are proposed to be widened to two lanes, and as the other approaches, would have markings to indicate a left turn on the nearside lane and a straight on and right turn on the offside lane.

The zebra crossing on the north-east approach is proposed to be retained. However, this may need to be realigned due to the proposed modification of the central reservation.

The existing bus stops at each of the exit arms have been considered in the design, where these are to be retained in their existing locations.

Oaklands Lane

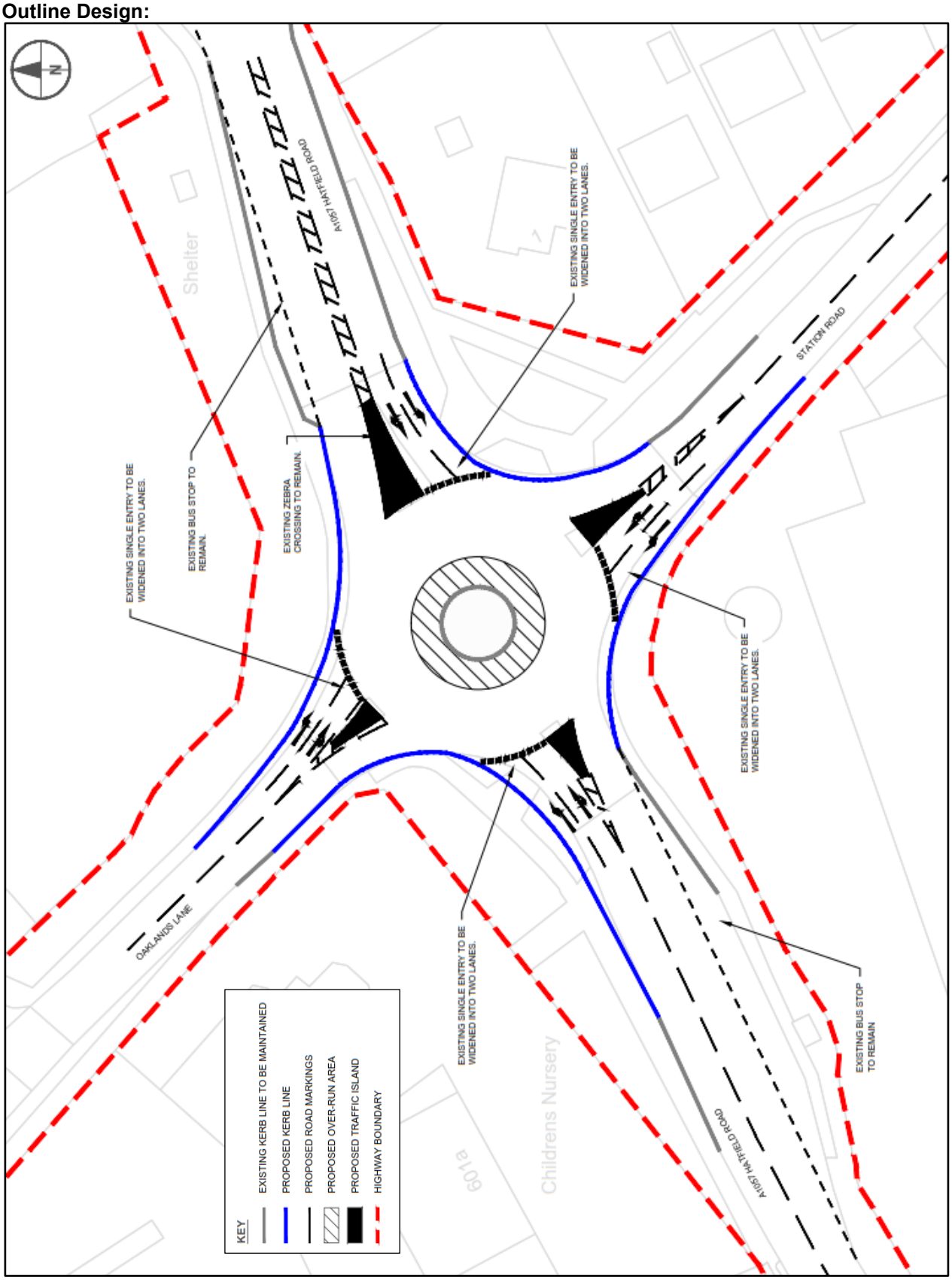
Similarly to the other approaches at this junction, Oaklands Lane is proposed to be widened to two lanes at the entry with a left turn arrow marked in the nearside lane and a straight ahead and right turn arrow marked in the offside lane. Again, this results in a modification to the central reservation.

The design is concept and as such, shows representative road markings and no signage. The required signage and detailed markings would be provided at further design stages.

HCC have recently upgraded the cycle link from Hatfield Road to the Alban Way along Station Road. There is also a long term aspiration from HCC to continue this into Oaklands Lane making use of the existing pedestrian crossing on Hatfield Road.

Design Improvement Plans

Outline Design:



Extract of the feasibility drawing no. 60534762-SADC-DWG-SITE E REV 1 (Refer to Appendix A for complete drawing)

Outline Cost Analysis

Basis of Order of Magnitude Estimate:

Site E: A1057 Hatfield Road/Station Road Smallford Roundabout/60534762-SADC-DWG-SITE E-REV 1

Assumptions:

1. Everything within the existing and new kerb lines will be broken out to 600mm depth including bus laybys
2. Allowed for laying new and diverting existing storm drainage only. We have assumed there are no foul drainage requirements on the site
3. The proposed Central Reservations are built up as per a typical bituminous footpath construction
4. Dimensions of proposed lights, traffic lights, signage & VRS assumed in the absence of detailed drawings
5. Centre of roundabout to be hard central reservation build up

Exclusions:

1. Any works or costs associated with landscaping
2. The demolition of any existing structures
3. Any works beyond existing kerb line, including the likes of paving, landscaping, bus shelters and the like other than that otherwise stated
4. Inflation beyond 2Q 2017
5. Professional fees
6. Planning and development control costs
7. Value added Tax

Works Element	Estimated Cost		Notes
Construction Cost	£	673,000	
Allowances for Preliminaries	£	134,600	20% of construction items
Allowances for Traffic Management (TM)	£	168,250	25% of construction items
Allowances for Scheme Design	£	97,585	10% of construction items (including Prelims and TM)
Allowances for Utilities / Electricals	£	134,600	20% of construction items
Sub-Total for allowances and construction items	£	1,208,035	
Optimism Bias	£	531,535	44% of sub-total
Cost for Delivery	**£**	**1,739,570**	

Appendix 33: Draft Transport Vision 2050 Consultation Response (December 2016)

PLANNING AND BUILDING CONTROL
Our ref: TH/tb/231216
Please ask for: Tracy Harvey
E-mail: tracy.harvey@stalbans.gov.uk
Date: 23 December 2016

Mr James Povey
Transport Policy and Growth Team Leader
CHN 216
Hertfordshire County Council
County Hall
Pegs Lane
Hertford. SG13 8DN

Dear James

Thank you for the presentation on the County's Transport Vision 2050 at the District Council's Planning Policy Committee on the 15th November 2016.

In general terms we welcome this consultation and the development of County's full strategy in 2017 - Local Transport Plan (LTP4). Overall we agree with the LTP Objectives and Principles (people, place and prosperity). We are also aware of the challenges and potential opportunities that LTP4 can bring.

However we would appreciate further clarity and consideration of the following key points which our Members have highlighted:

1. **General**
   - **a.** What weight will be placed on all Distric/Borough plans in this Vision?
   - **b.** How confident are County about future budget availability?
   - **c.** Further information requested on relative scoring and how the selection of the 5 major schemes was made.
   - **d.** Further information will be required with regard to how developers will contribute to transport infrastructure e.g. Community Infrastructure Levy (CIL).
   - **e.** Further consultation required regarding Urban Transport Plans in hotspots
   - **f.** Strategy seems to focus on disincentives for car drivers rather than incentives for use of other forms of transport. A more balanced approach is required, eg:
     - Incentives – consider subsidising public transport to encourage modal shift from cars
     - Disincentives – consider charging for use of roads
   - **g.** Increased parking charges would have a detrimental impact on the local economy.
   - **h.** The proposed freight terminal, which would have a major impact on roads in Hertfordshire, does not appear to have been given appropriate consideration. In particular, it would be useful to model its primarily road-to-road depot traffic volumes.

2. **Statistics and data**
   - **a.** Vision is based on growth in car use, but traffic levels are shown as not having grown recently.

b. Comparisons of growth in train use and levelling out of car use across the County and within Districts/Boroughs should be examined.
c. The increase in cycling to stations and recent/planned investment in cycle parking at stations should be given more consideration and encouragement.
d. Further updates on 2014 data (regarding deaths from air pollution and road causalities) are suggested. Statistics show accidents have decreased, but fatalities have increased.
e. Population growth – the document refers to negligible reduction in car use in 15 years. Does this mean car use has fallen despite considerable population growth?
f. Will the ageing population lead to people traveling during the day with significantly different patterns to today?

3. **A414 Corridor Capacity upgrades**
Further consideration is needed around the improvements that are necessary, in particular the disproportionate amounts allocated to the Jack Oldings roundabout compared to the roundabouts serving London Colney and the former M10.

4. **London Colney Roundabout and A414**
   a. In the analysis of the London Colney roundabout, no reference is made to the Colney Health "Longabout" or the Hatfield roundabout. The approach to all three would need linking up rather than being approached piecemeal.
   b. Further examination required to avoid impacting negatively on the minor roads adjoining and leading to the A414.
   c. Impact of local residents to the A414 needs consideration.
   d. A414 Bus Rapid Transport proposals – clarification required regarding effect on road capacity.

5. **Park Street**
   a. Roundabout pinch points also have not been mentioned.

6. **Bus Rapid Transport (BRT)**
   a. Further clarity regarding the BRT links to St Albans city centre is needed.
   b. The Abbey Line should remain as heavy rail and consideration should be given to funding the passing loop.
   c. Conjoining the scoring/options assessment, in the Steer Davies Gleave report, of the Abbey Line between Watford and St Albans is not appropriate. The Abbey Line should be assessed as a standalone route with existing working track separately to the assessment of the A414 BRT expressway.
   d. Further information on the link loop directly to Euston from the Abbey Line is suggested – has this been reconsidered?
   e. Have the routes of the Nicky Line & Lea Valley Line been considered for rapid transport?

7. **Advancement in electric vehicles**
   a. Technical advancements in electric vehicles needs to be further considered.
   b. There is little reference to electric scooters.

c. More electric charging points need to be considered.
d. Driverless car developments need to be considered.
e. Powered 2 wheeler developments need to be considered.

8. Airport expansion

a. Expansion and growth of both Luton and Stansted Airports should be taken into account.
b. In the Harpenden area, the implications for the B653, (towards Luton airport and towards the M1) are not addressed.

We look forward to receiving further updates in this consultation process with the development of the full strategy in 2017.

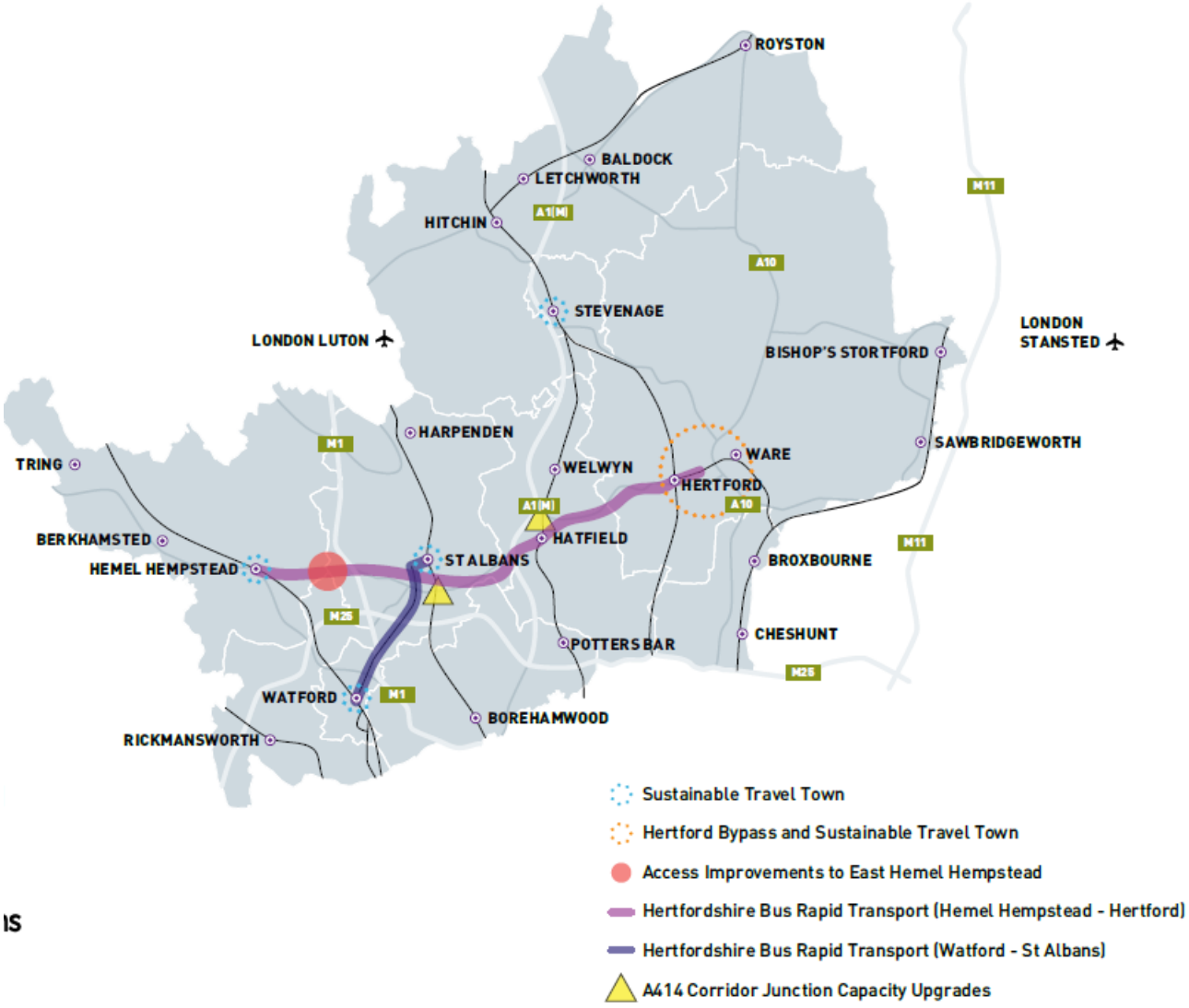
Yours sincerely

Tracy Harvey
Head of Planning and Building Control

Appendix 34: Transport 2050 – Map of Major Scheme Options; Transport Vision 2050 – A414 Future Corridor Improvements (2017)

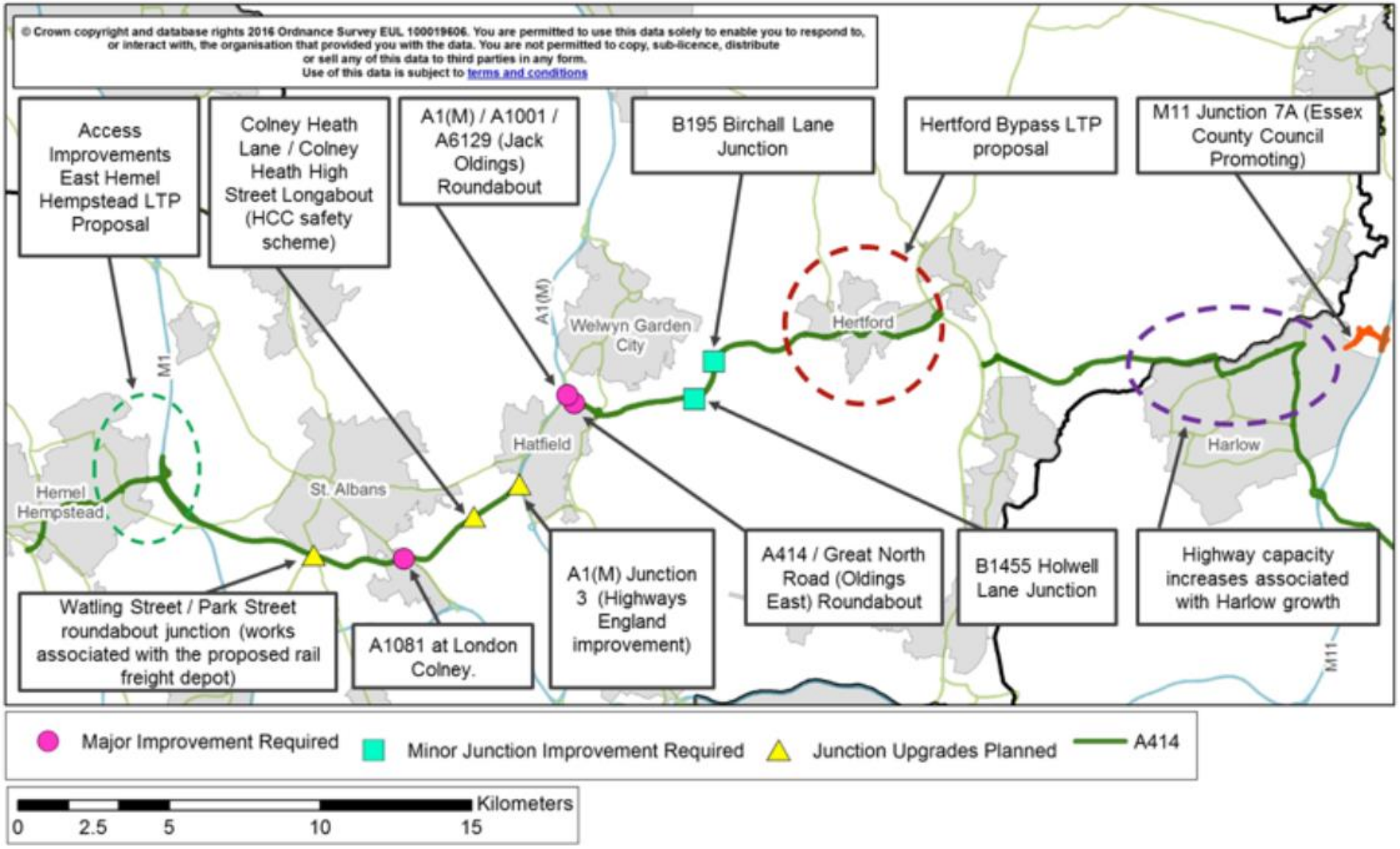
HCC Draft Transport Vision 2050 – Map of Major Scheme Options

Major Schemes



IS

Fig. 11: A414 future corridor improvements



Appendix 35: GTP – Recommended Locations of Growth and Transport Plans & GTP Stages of Development (2017)

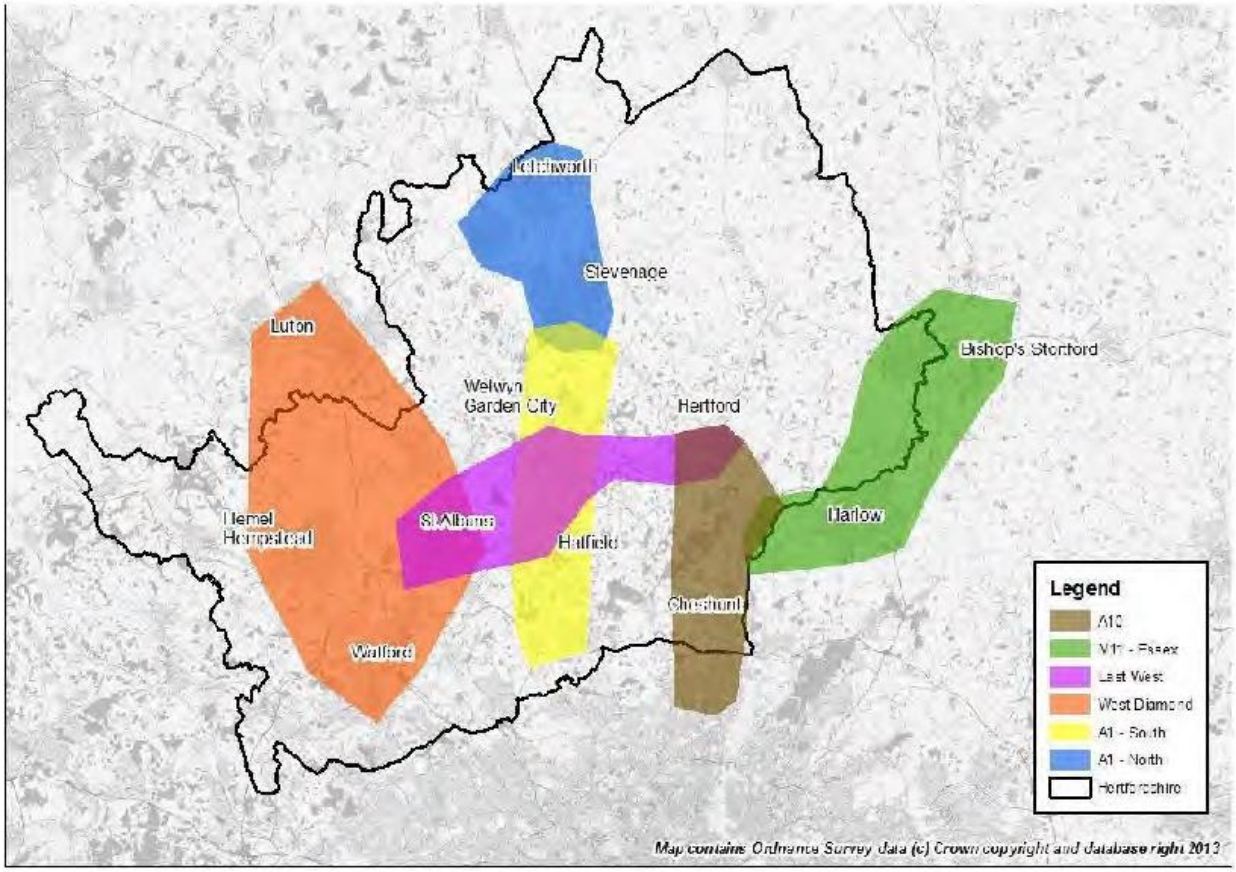
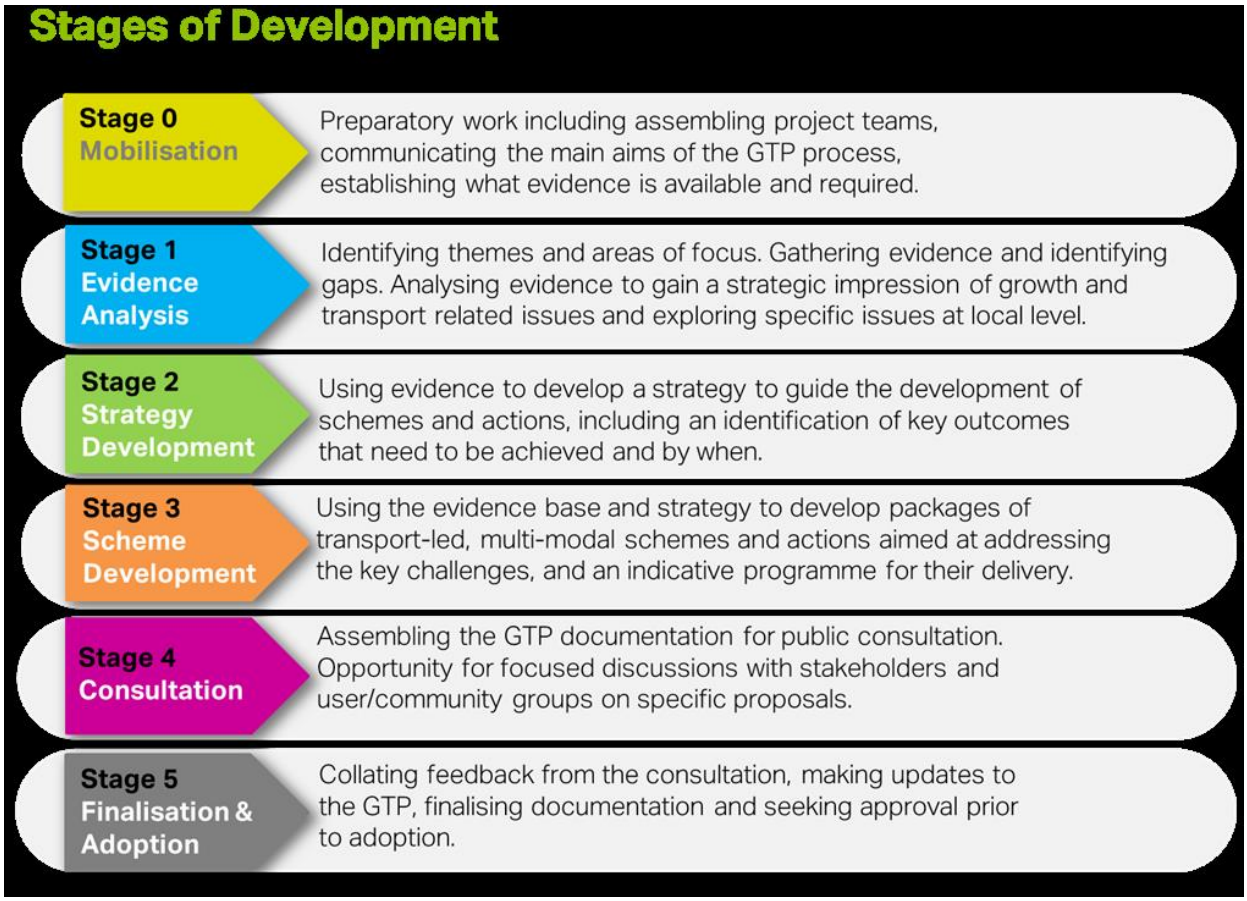


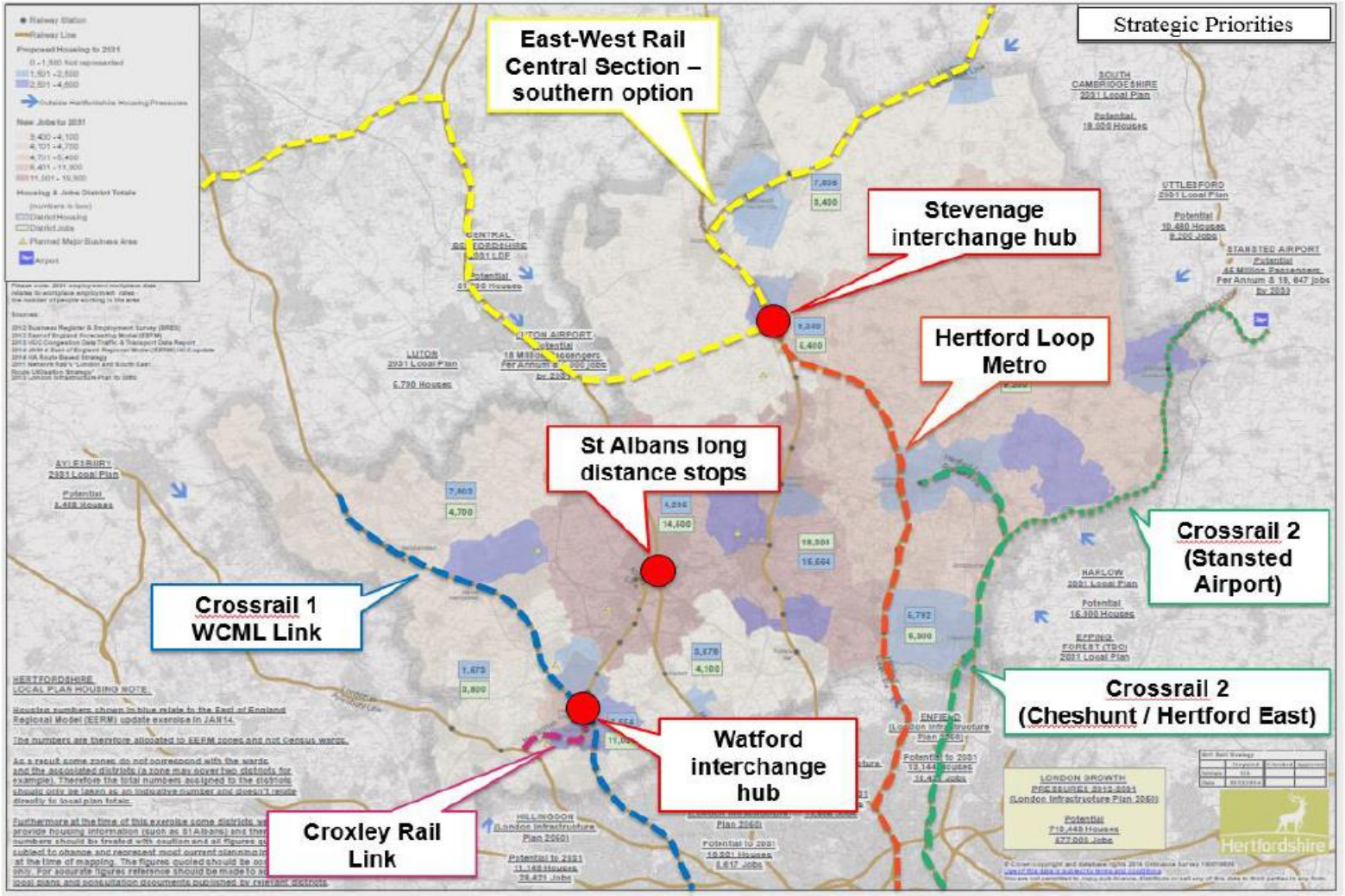
Figure 3: Recommended Location of Growth and Transport Plans

Draft GTP Stages of Development



Appendix 36: Top Strategic Priorities for the Hertfordshire Rail Strategy (June 2015)

Figure 5.2: Top Strategic Priorities for the Hertfordshire Rail Strategy



Appendix 37: List & Links – Traffic and Transport Data Report 2016, Hertfordshire County Travel Survey – District Profile 2015 and Hertfordshire Road Casualty Facts 2016 (based on 2015 data)

List & Links - Traffic and Transport Data Report 2016, Hertfordshire County Travel Survey – District Profile 2015 and Hertfordshire Road Casualty Facts 2016 (based on 2015 data)

Traffic and Transport Data Report 2016 (based on 2015 data)

The traffic data report shows in Hertfordshire:

- How the improving economy and increasing population in Hertfordshire has led to an increase in travel.
- Traffic volumes up 3% (compared to 2014 levels) with increases occurring across all road types and districts.
- Increases in rail and bus use.
- Increasing journey times and congestion in our key towns presenting us with ongoing challenges in terms of how our transport network is used.

To find out key data on how people are travelling around our transport network and the implications of this please visit www.hertfordshire.gov.uk/ttdr

Hertfordshire Road Casualty Facts 2016 (based on 2015 data)

The factsheet shows in Hertfordshire:

- Accidents have decreased by 4.7% (decreased by 4.3% nationally) compared with 2014.
- Casualties have decreased by 5.9% (decreased by 4.3% nationally) and is the second lowest total on record.
- Killed or Seriously Injured casualties increased by 3.3%, (and decreased by 2.9% nationally)
- Child fatalities were zero during 2015.

To find out key data on accidents in Hertfordshire please visit http://www.hertfordshire.gov.uk/services/transtreets/hertscounttravsurv/factactran/

Hertfordshire County Travel Survey – District Profile 2015

The district profiles show:

- Characteristics of an area (including age profile)
- Access to transport
- What types of trips people make
- How people travel to work and school
- What people think of transport in general

To find out key data on travel in Hertfordshire's districts please visit http://www.hertfordshire.gov.uk/hcts

Appendix 38: Draft Hertfordshire County Council COMET: AECOM Local Plan Forecast Run 3 – St Albans Journey Time Analysis (July 2018)

COMET Local Plan Forecast Run 3 – St Albans Journey Time Analysis

AECOM

Client name	Date	Project number	Project name
Hertfordshire County Council	July 2018	60555331	COMET Local Plan Forecast Run 3

Prepared by:	Checked by:	Approved by:
AG	JL	SK

Revision	Revision date	Prepared by	Checked by	Approved by
Version 1 – Draft for client comment	April 2018	AG	JL	SK
Version 2 - Final	July 2018	AG	JL	SK

1. Introduction

1.1.1 AECOM was commissioned in November 2017 to develop a 2031 forecast in COMET that takes into consideration Hertfordshire districts' latest Local Plan growth aspirations and transport infrastructure proposals.

1.1.2 In the context of St Albans, the included transport schemes were agreed between HCC and SADC in Autumn 2017, and include highway measures identified through Local Plan design work.

1.1.3 The assumed growth aspirations for St Albans are based on the published SADC Strategic Local Plan sites (as of Autumn 2017), plus built and committed developments since 2014. Job numbers exclude those in the Maylands LEZ, which for the purposes of this modelling were allocated to Dacorum district. The total growth assumptions are as follows:

- 8,822 additional dwellings (growth of 15% relative to 2014 Base Year)
- 4,527 additional jobs (growth of 7% relative to Base Year).

1.1.4 Part of the commission covers an analysis of journey times along selected routes in St Albans district in the latest forecast (Local Plan Run 3), including comparison with a previous forecast (St Albans Local Plan Do Minimum) and the model's 2014 Base Year. For reference, a list of highway and public transport schemes included in the two forecast scenarios is provided in Appendix A.

1.1.5 The following points should be borne in mind when interpreting the comparison between the Local Plan Run 3 scenario and the St Albans Local Plan Do Minimum forecast scenario:

- The Local Plan Run 3 scenario was produced using NTEM version 7.2, whereas the St Albans Local Plan Do Minimum is based on NTEM 7. In the context of COMET forecasting, this affects the assumed level of dwelling/employment growth in Great Britain outside Hertfordshire, and therefore the level of trip production/attraction.
- The Local Plan Run 3 scenario differs from the St Albans Local Plan Do Minimum both in terms of projected dwelling/employment growth in Hertfordshire to 2031 **and** forecast transport infrastructure assumptions. This means that is it not possible to conclude as to whether the differences between the scenarios stem from the differing growth scenario or the updated infrastructure assumptions.
- The Local Plan Run 3 scenario includes “bespoke” planning data for areas outside Hertfordshire including: Buckinghamshire, Luton, 2 districts in Cambridgeshire (South Cambridgeshire and Cambridge), and 3 districts in Essex (Epping Forest, Harlow, and Uttlesford). The growth assumed in these areas in the St Albans Local Plan Do Minimum scenario is derived from NTEM v7.
- The level of confidence in the reported journey times should be based on the route’s validation performance relative to WebTAG guidance. A summary of the routes’ validation performance is provided in Appendix B.

2. Selected Journey Time Routes and Results

2.1.1 Figure 1 shows the location of the selected journey time routes. There are 21 routes, and these are predominantly limited to within the St Albans district boundary. Route names starting with “HPD” are located in the vicinity of Harpenden, whereas route names starting with “STA” travel through the St Albans City area.

2.1.2 Table 1 presents the results of the journey time routes for the following scenarios:

- 2014 Base Year – “BY”
- 2031 St Albans Local Plan Do Minimum – “DM”
- 2031 Local Plan Run 3 – “LP3”

2.1.3 The values in Table 1 are presented in seconds. For each time period, there is a comparison between the Local Plan Run 3 relative to the Base Year and relative to the St Albans Local Plan Do Minimum. The shading is used to indicate the following:

- Green – a relative decrease in journey time
- Grey shading – relatively minimal journey time changes
- Red – a relative increase in journey time

2.1.4 The text following the results table below provides commentary on notable/significant changes in modelled journey times along the selected routes.

Figure 1: Selected Journey Time Routes (lengths shown in legend in metres)

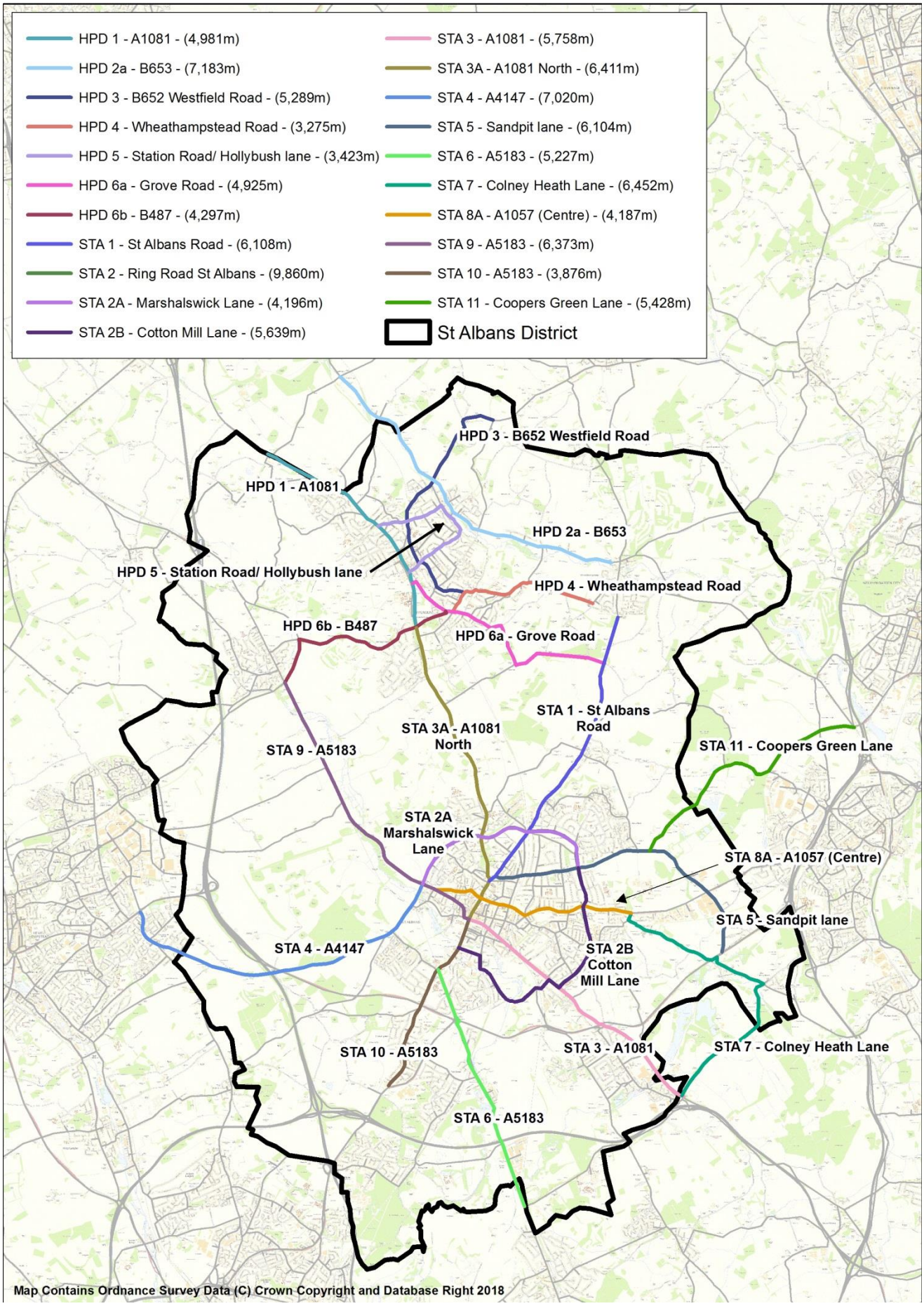


Table 1: Journey Times on Selected Routes (values are in seconds)

Route	Direction	AM Peak						Inter Peak						PM Peak					
		BY	LP3	SA	LP3 vs BY	LP3 vs BY	LP3 vs SA	BY	LP3	SA	LP3 vs BY	LP3 vs BY	LP3 vs SA	BY	LP3	SA	LP3 vs BY	LP3 vs BY	LP3 vs SA
HPD 1 - A1081	NB	519	514	552	-5	-1%	-7%	514	501	526	-13	-3%	-5%	581	565	611	-16	-3%	-8%
HPD 1 - A1081	SB	531	556	572	25	5%	-3%	504	538	541	34	7%	-1%	531	560	570	29	5%	-2%
HPD 2a - B653	NB	582	596	611	14	2%	-2%	576	578	578	2	0%	0%	596	600	601	4	1%	0%
HPD 2a - B653	SB	468	456	458	-12	-3%	0%	437	445	441	8	2%	1%	455	454	458	-1	0%	-1%
HPD 3 - B652 Westfield Road	NB	643	647	655	4	1%	-1%	625	627	628	2	0%	0%	640	643	643	3	0%	0%
HPD 3 - B652 Westfield Road	SB	565	570	574	5	1%	-1%	560	562	563	2	0%	0%	565	567	570	2	0%	-1%
HPD 4 - Wheathampstead Road	WB	271	274	277	3	1%	-1%	266	267	267	1	0%	0%	269	271	270	2	1%	0%
HPD 4 - Wheathampstead Road	EB	277	277	278	0	0%	0%	279	280	280	1	0%	0%	278	278	278	0	0%	0%
HPD 5 - Station Road/ Hollybush lane	NB	513	516	517	3	1%	0%	497	498	499	1	0%	0%	521	524	526	3	1%	0%
HPD 5 - Station Road/ Hollybush lane	SB	588	588	595	0	0%	-1%	495	497	497	2	0%	0%	592	593	593	1	0%	0%
HPD 6a - Grove Road	NB	489	491	491	2	0%	0%	449	451	451	2	0%	0%	454	459	463	5	1%	-1%
HPD 6a - Grove Road	SB	479	485	494	6	1%	-2%	473	474	474	1	0%	0%	476	480	482	4	1%	0%
HPD 6b - B487	WB	320	424	505	104	33%	-16%	272	286	285	14	5%	0%	292	317	339	25	9%	-6%
HPD 6b - B487	EB	323	420	448	97	30%	-6%	280	296	295	16	6%	0%	306	389	428	83	27%	-9%
STA 1 - St Albans Road	NB	564	571	574	7	1%	-1%	535	535	539	0	0%	-1%	527	531	542	4	1%	-2%
STA 1 - St Albans Road	SB	600	619	614	19	3%	1%	524	526	527	2	0%	0%	537	541	545	4	1%	-1%
STA 2a - Marshalswick Lane	WB	682	694	698	12	2%	-1%	591	623	616	32	5%	1%	569	620	603	51	9%	3%
STA 2a - Marshalswick Lane	EB	773	777	810	4	1%	-4%	691	719	727	28	4%	-1%	651	686	711	35	5%	-4%
STA 2b - Cotton Mill Lane	NB	877	898	935	21	2%	-4%	833	869	870	36	4%	0%	834	874	912	40	5%	-4%

STA 2b - Cotton Mill Lane	SB	856	919	868	63	7%	6%	784	796	803	12	2%	-1%	791	814	821	23	3%	-1%
STA 2 - Ring Road St Albans	NB	1,559	1,592	1633	33	2%	-3%	1,423	1,492	1486	69	5%	0%	1,403	1,494	1515	91	6%	-1%
STA 2 - Ring Road St Albans	SB	1,629	1,695	1679	66	4%	1%	1,475	1,515	1531	40	3%	-1%	1,442	1,500	1532	58	4%	-2%
STA 3a - A1081 North	NB	741	766	776	25	3%	-1%	734	746	749	12	2%	0%	897	919	943	22	2%	-3%
STA 3a - A1081 North	SB	829	928	927	99	12%	0%	730	737	766	7	1%	-4%	819	835	870	16	2%	-4%
STA 3 - A1081	NB	718	752	840	34	5%	-10%	649	677	740	28	4%	-9%	600	632	628	32	5%	1%
STA 3 - A1081	SB	775	883	886	108	14%	0%	680	736	732	56	8%	1%	754	808	831	54	7%	-3%
STA 4 - A4147	WB	530	526	597	-4	-1%	-12%	449	464	475	15	3%	-2%	574	535	669	-39	-7%	-20%
STA 4 - A4147	EB	642	662	761	20	3%	-13%	443	466	471	23	5%	-1%	478	495	508	17	4%	-3%
STA 5 - Sandpit lane	NB	698	637	722	-61	-9%	-12%	583	561	622	-22	-4%	-10%	667	623	733	-44	-7%	-15%
STA 5 - Sandpit lane	SB	646	604	688	-42	-7%	-12%	595	536	612	-59	-10%	-12%	663	625	713	-38	-6%	-12%
STA 6 - A5183	NB	760	796	930	36	5%	-14%	546	513	522	-33	-6%	-2%	782	726	745	-56	-7%	-3%
STA 6 - A5183	SB	477	539	596	62	13%	-10%	405	441	435	36	9%	1%	430	496	601	66	15%	-17%
STA 7 - Colney Heath Lane	NB	563	597	744	34	6%	-20%	554	543	598	-11	-2%	-9%	561	560	648	-1	0%	-14%
STA 7 - Colney Heath Lane	SB	515	591	593	76	15%	0%	512	547	569	35	7%	-4%	521	587	632	66	13%	-7%
STA 8A - A1057 (Centre)	WB	790	781	803	-9	-1%	-3%	739	755	766	16	2%	-1%	765	769	779	4	1%	-1%
STA 8A - A1057 (Centre)	EB	723	725	734	2	0%	-1%	719	712	733	-7	-1%	-3%	855	886	865	31	4%	2%
STA 9 - A5183	NB	484	490	499	6	1%	-2%	469	473	473	4	1%	0%	499	497	522	-2	0%	-5%
STA 9 - A5183	SB	493	600	534	107	22%	12%	475	445	478	-30	-6%	-7%	443	421	455	-22	-5%	-7%
STA 10 - A5183	NB	792	685	831	-107	-14%	-18%	478	468	475	-10	-2%	-1%	718	464	476	-254	-35%	-3%
STA 10 - A5183	SB	456	538	604	82	18%	-11%	469	493	493	24	5%	0%	493	531	641	38	8%	-17%
STA 11 - Coopers Green Lane	NB	353	435	400	82	23%	9%	337	378	392	41	12%	-4%	396	391	430	-5	-1%	-9%
STA 11 - Coopers Green Lane	SB	344	655	387	311	90%	69%	330	363	359	33	10%	1%	342	384	371	42	12%	4%

3. Analysis: Routes with Relatively Small Overall Journey Time Changes

3.1.1 Relative to the St Albans Local Plan Do Minimum and Base Year scenarios, the results of the Local Plan Run 3 forecast shows relatively low (<10%) changes in overall journey times along the following routes for all time periods and directions:

- HPD 1 – A1081
- HPD 2a – B653
- HPD 3 – B652 Westfield Road
- HPD 4 – Wheathampstead Road
- HPD 5 – Station Road/Hollybush Lane
- HPD 6a – Grove Road
- STA 1 – St Albans Road
- STA 2a – Marshalswick Lane
- STA 2b – Cotton Mill Lane
- STA 2 – Ring Road St Albans
- STA 8a – A1057 (Centre)

3.1.2 The small reduction in the northbound HPD 1 journey time in the Local Plan Run 3 relative to the St Albans Local Plan Do Minimum stems primarily from two locations: the A1081 Luton Rd /Station Road roundabout and the A1081 Luton Road / The Common roundabout. In the Local Plan Run 3 scenario, both roundabouts include a proposed flare on the northbound approaches.

3.1.3 The small increase in the southbound STA 2b journey time in the Local Plan Run 3 relative to the St Albans Local Plan Do Minimum stems primarily from delay at the Drakes Dr/A1081 (London Rd) junction.

3.1.4 Routes with larger journey time changes are discussed in section 4 of this note.

4. Analysis: Routes with Larger Overall Journey Time Changes

4.1 HPD 6b – B487

4.1.1 The primary cause of higher journey times in the Local Plan Run 3 relative to the Base Year is additional delay at the A1081/B487/Walkers Rd roundabout in Harpenden. The B487/A5183 roundabout near Redbourn is also responsible for a portion of this delay increase.

4.1.2 The moderate decrease in Local Plan Run 3 journey times relative to the St Albans Local Plan Do Minimum (particularly AM westbound direction) is due to a small decrease of ~50 Passenger Car Units (PCUs) along this corridor.

4.2 STA 3A – A1081 North

4.2.1 The primary cause of the increase in modelled southbound journey times for this route in the Local Plan Run 3 relative to the Base Year is additional delay at the A1081/Beech Rd/Batchwood Dr junction in St Albans.

4.2.2 Changes to journey times in other time periods/directions are less than 10%.

4.3 STA 3 – A1081

4.3.1 The southbound AM Peak journey time in the Local Plan Run 3 is approximately 14% higher than the Base Year equivalent. The main source of this additional delay is the A414 London Colney roundabout. Note that this roundabout has been modelled in the proposed “hamburger” form in the Local Plan Run 3 scenario. The “hamburger” form junction provides a separate east-west route through the junction for A414 traffic. Signal optimisation at this location does not indicate any significant potential for delay reduction in the strategic model.

4.3.2 The reduction in journey time for the northbound route in the AM Peak hour of ~10% in the Local Plan Run 3 relative to the St Albans Local Plan Do Minimum is also predominantly due to the A414 London Colney roundabout. COMET suggests a delay reduction on the northbound A1081 approach.

4.4 STA 4 – A4147

4.4.1 The journey time reduction of approximately 10-20% along this route (between the Local Plan Run 3 and St Albans Local Plan Do Minimum scenario) can be attributed to lower congestion at the A4147/King Harry roundabout (Ref: Site A). The model results suggest that this delay reduction may be attributable to the newly coded flared approaches added to this roundabout in the Local Plan Run 3 scenario.

4.4.2 Despite the journey time saving in this location, modelling suggests higher levels of delay in the Local Plan Run 3 (compared to St Albans Local Plan Do Minimum) at the Bedmond Rd/Leverstock Green Way junction in Hemel Hempstead. Note that this junction is represented as a roundabout in the Local Plan Run 3 scenario, whereas it remains a priority controlled layout in the St Albans Local Plan Do Minimum.

4.5 STA 5 – Sandpit Lane

4.5.1 There is a journey time reduction of approximately 10-15% along this route (between the Local Plan Run 3 and St Albans Local Plan Do Minimum scenario) in all time periods. This is caused by a decrease in junction delay at the Oaklands Lane / Hatfield Road / Station Road roundabout (Ref: Site E). This is likely to be attributable to the newly coded flared approaches added to this roundabout in the Local Plan Run 3 scenario.

4.5.2 To a lesser extent, the journey time reduction is also likely to be related to a decreased level of junction delay at the Sandpit Lane / Marshalswick Lane / Beechwood Avenue junction. The Local Plan Run 3 layout includes flared approaches (identified as a potential mitigation scheme associated with the Oaklands development site), whereas the St Albans Local Plan Do Minimum scenario does not.

4.5.3 Changes between the Local Plan Run 3 and the Base Year are 10% or less. In all time periods and directions, however, the forecast journey times are shorter than those in the Base Year.

4.6 STA 6 – A5183

4.6.1 The journey time increase of 10-15% between the Local Plan Run 3 and the Base Year along this route in the southbound direction in the AM and PM Peaks can be attributed to higher delay for southbound movements at the A414 Park St roundabout. Note that the A414 Park St roundabout is modelled as a partially signalised junction in the Local Plan Run 3 scenario and the St Albans Do Minimum scenario. Delays on the A414 (eastbound and westbound) approaches to this roundabout are lower in the forecast (signalised) scenarios compared to the Base Year.

4.6.2 The delay decrease between the Local Plan Run 3 and St Albans Local Plan Do Minimum scenario can also largely be attributed to the A414 Park St roundabout. The delay reductions for northbound and southbound movements appear to be a result of lower vehicle flow (potentially due to strategic re-routing) on some approaches to the roundabout in the Local Plan Run 3 relative to the St Albans Local Plan Do Minimum scenario.

4.6.3 The variations in journey times in the inter-peak are less than 10%.

4.7 STA 7 – Colney Heath Lane

4.7.1 There is a delay increase of 13-15% in the southbound direction in the AM and PM Peaks between the Local Plan Run 3 and the Base Year. This delay increase can be attributed to higher levels of delay through the A414 Colney Heath Longabout.

4.7.2 The A414 Colney Heath Longabout is represented with partial signalisation in both the Local Plan Run 3 and the St Albans Local Plan Do Minimum scenarios. This signalisation affects the Colney Heath High St approach to the longabout, and it is understood that has been designed to improve the safety of the exit from the High Street rather than to increase capacity.

4.7.3 In the northbound direction, there is a reduction of around 15% in the AM and PM Peaks between the Local Plan and the St Albans Local Plan Do Minimum. This is due to lower delay at the A414 London Colney Longabout, and likely to be related to the addition of the flared approach on High St.

4.7.4 The variations in journey times in the inter-peak are less than 10%.

4.8 STA 9 – A5183

4.8.1 The southbound AM Peak journey time in the Local Plan Run 3 scenario is 25% higher than the Base Year, and 15% higher than the St Albans Local Plan Do Minimum scenario.

4.8.2 The longer journey times for this route can be largely attributed to the Redbourn Road/Batchwood Dr roundabout. This delay increase is in spite of the addition of flared approaches on Verulam Road, Batchwood Drive and Redbourn Road in the Local Plan Run 3 scenario.

4.8.3 In the Local Plan Run 3 AM Peak, the vehicular flow through this junction is approximately 4% higher than in the St Albans Local Plan Do Minimum scenario. Whilst COMET is not designed as a tool for measuring junction operation, results suggest that delay for certain turns is up to 20 seconds lower in the Local Plan Run 3 compared to the St Albans Local Plan Do Minimum.

4.8.4 The variations in the other time periods are less than 10%.

4.9 STA 10 – A5183

4.9.1 There is a decrease of 14% and 35% in the northbound direction between the Local Plan Run 3 and the Base Year in the AM and PM Peaks, respectively. This can be attributed to a decrease in delay at the Watford Road / King Harry Lane / St Stephen's Hill roundabout. No improvement scheme has been tested here – the delay reduction appears to be a result of strategic re-routing and flow decrease on the nearby Watling St (parallel to Watford Rd).

4.9.2 Conversely, there is an increase of 18% and 8% in the southbound direction in the AM and PM Peaks, respectively. This is related to an increase in delay for the southbound movement through the same roundabout.

4.9.3 Comparison of the Local Plan Run 3 and the St Albans Local Plan Do Minimum scenarios shows a 3%-18% journey time reduction (depending on time period and direction) that is also attributable to the Watford Road / King Harry Lane / St Stephen's Hill roundabout. The delay reduction is likely to be linked to modest flow reductions on some congested approaches.

4.9.4 The variations in the inter-peak are less than 10%.

4.10 STA 11 – Coopers Green Lane

4.10.1 There is significant increase in AM Peak journey time for the westbound direction in the Local Plan Run 3 scenario relative to both the Base Year and St Albans Local Plan Do Minimum scenarios (90% and 69%, respectively). Modelling suggests this is related to increased delay at the junction of Coopers Green Lane and Hatfield Avenue. In the eastbound direction, there is a 23% and 12% increase (between the Local Plan Run 3 and the Base Year) in the AM Peak and the inter-peak journey times, respectively.

4.10.2 Although this journey time route does not give way to other movements at this junction, COMET suggests that the delay here is due to blocking back from the adjacent Hatfield Avenue/Froshbier Way roundabout (in Welwyn Hatfield District) where there is a significant rise in modelled delay. This is an area in COMET with known high levels of delay resulting from the level of granularity in the zoning system. The zoning in this area is being disaggregated as part of the ongoing COMET enhancement work.

4.10.3 In the PM Peak, there is a 12% increase in the PM Peak westbound journey time in the Local Plan Run 3 relative to the Base Year. Modelling results suggest that this delay is derived predominantly from the proposed roundabout providing access to the Symondshyde development.

5. Discussion

5.1.1 The results presented in this document should be interpreted in the context of the points set out in paragraph 1.1.5.

5.1.2 With the exception of the ring road in St Albans (STA 2A, STA 2B, and STA 2) and the A1057 (STA 8A), the 11 routes with the smallest changes in journey times relative to the Base Year and St Albans Local Plan Do Minimum scenario (i.e. those set out in section 3) are all located towards the north of the district. These 11 routes are illustrated in red in Figure 2 and Figure 3. These figures also show differences in delay and traffic flow between the Local Plan Run 3 and Base Year. Generally these 11 routes coincide with areas where flow and delay increases are lowest. The northern end of the district includes lower levels of assumed growth in housing and employment, as well as fewer highway network interventions. The main focus of delay towards the north of district is the A1081 / Walker Road /Redbourn Lane junction.

5.1.3 By contrast, the largest increases in journey times and forecast delay tend to be towards the southern end of the district. The routes that demonstrate this are STA3, STA6, STA7, STA9, STA10, and STA11[1]. Some of the largest increases in vehicle flows and therefore delays are on strategic roads (e.g. A405 and A414), not all of which are covered by journey time routes. These flow and delay increases are visible in Figure 2 and Figure 3.

[1] Note that known modelling issues affecting this route should be considered when interpreting STA11 results.

Figure 2: AM Peak – Flow and Delay Difference (Local Plan Run 3 versus Base Year)

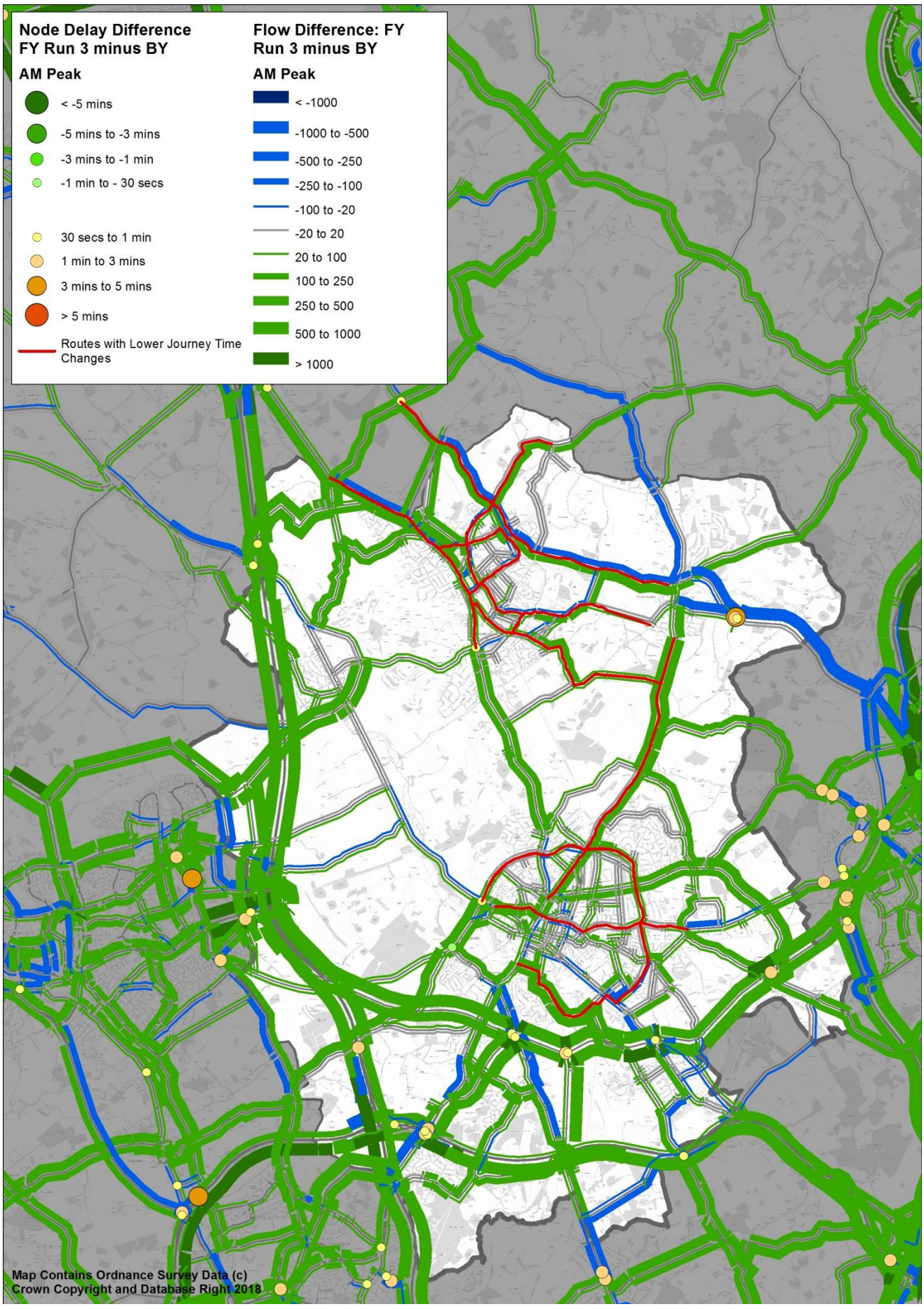
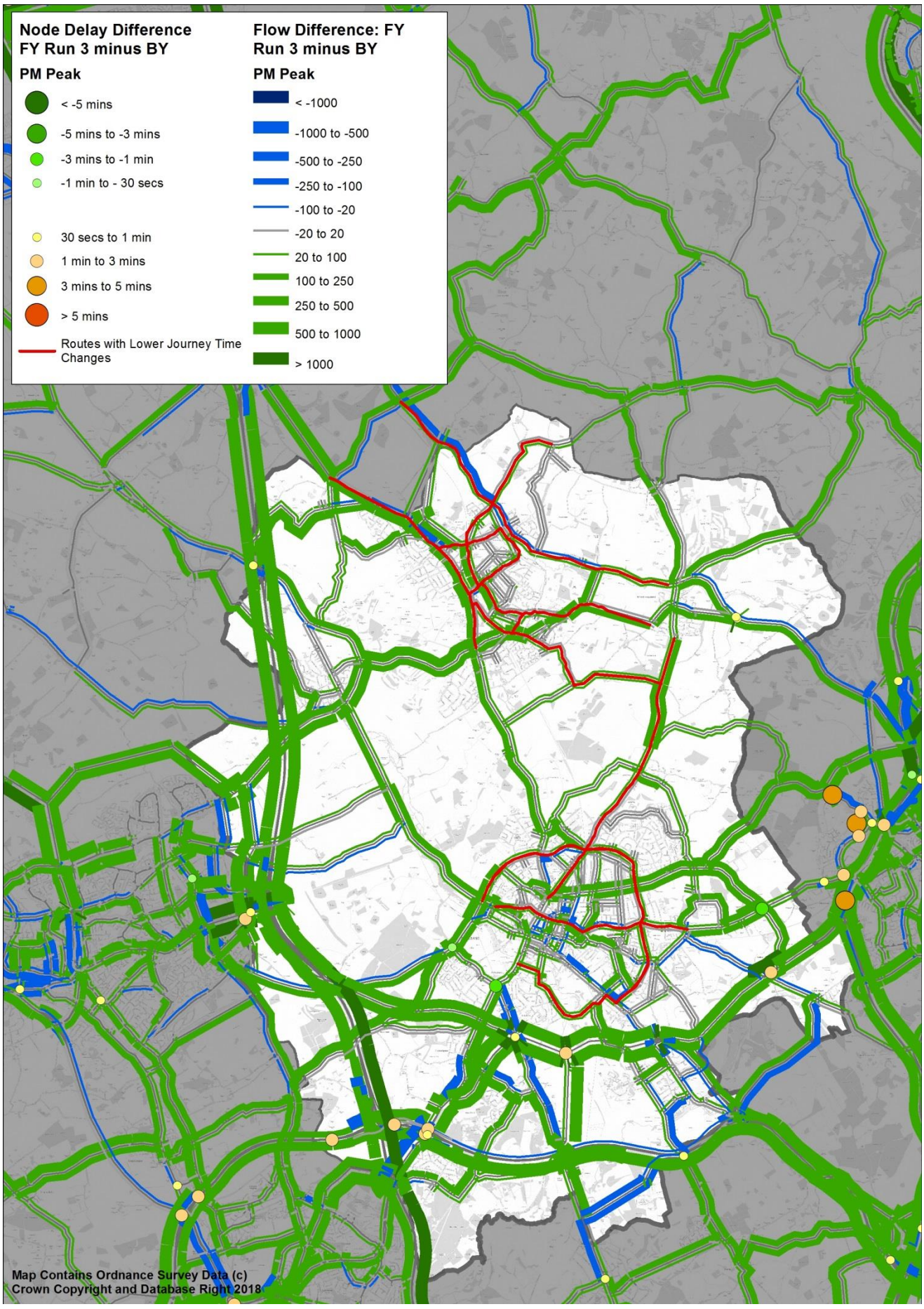


Figure 3: PM Peak – Flow and Delay Difference (Local Plan Run 3 versus Base Year)



6. Appendix A – Forecast Schemes

Table 2: Forecast Highway Schemes included in the forecast scenarios

Scheme	In Local Plan Run 3?	In St Albans Do Minimum?
Northwest Harpenden development access	Yes	Yes
A1081 Luton Rd / Station Road – junction improvements	Yes	No
A1081 Luton Road / The Common – junction improvements	Yes	No
Oaklands development site access	Yes	Yes (although different design compared to LP Run 3)
Sandpit Lane / House Lane enlargement of existing roundabout	Yes	No
Sandpit Lane / Marshalswick Lane – widening and right turn	Yes	No
Sandpit Lane / Coopers Green Lane – roundabout enlargement	Yes	No
A414 / A1081 – London Colney Roundabout – conversion to Hamburger layout	Yes	No
A5183 Redbourn Road/A4147 Bluehouse Hill/Batchwood Drive Roundabout – junction improvements	Yes	No
B653 Cory Wright Way/Marford Road, Wheathampstead – junction improvement	Yes	No
A4147 Hemel Hempstead Road/King Harry Road – junction improvements	Yes	No
A1081 Luton Road/ Park Hill Junction – signal optimisation	Yes	No
Hatfield Road/Station Road, Smallford Roundabout – junction improvements	Yes	No
A414 Colney Heath Longabout signalisation	Yes	Yes
Radlett Railfreight (spine road and associated junction improvements)	Yes	Yes

Table 3: Forecast Public Transport Schemes included in the forecast scenarios

Scheme	In Local Plan Run 3?	In St Albans Do Minimum?
SC1 Abbey Line shuttle bus service	Yes	No
Abbey Line frequency increase (service every 30 minutes)	Yes	No
Thameslink/Great Northern (timetable changes)	Yes	Yes

7. Appendix B – Journey Time Validation Performance

													86%	88%	83%
Route	**Direction**	**Observed**			**Modelled**			**Difference**			**% Difference**			**WebTAG Compliant?**		
		AM	**IP**	**PM**	**AM**	**IP**	**PM**	**AM**	**IP**	**PM**	**AM**	**IP**	**PM**	**AM**	**IP**	**PM**
HPD 1: A181 Luton Road - Northbound	Northbound	520	556	589	519	514	581	-1	-42	-8	-0%	-8%	-1%	YES	YES	YES
HPD 1: A181 Luton Road - Southbound	Southbound	623	502	485	531	504	531	-91	3	45	-15%	0%	9%	YES	YES	YES
HPD 2A: B653/ Lower Luton road - Northbound	Northbound	628	551	617	582	576	596	-46	25	-22	-7%	5%	-3%	YES	YES	YES
HPD 2A: B653/ Lower Luton road - Southbound	Southbound	662	545	582	468	437	455	-193	-108	-127	-29%	-20%	-22%	NO	NO	NO
HPD 3: B652 - Northbound	Northbound	691	627	613	643	625	640	-49	-1	28	-7%	-0%	5%	YES	YES	YES
HPD 3: B652 - Southbound	Southbound	765	711	711	565	560	565	-200	-151	-146	-26%	-21%	-21%	NO	NO	NO
HPD 4: Wheathampstead - Eastbound	Eastbound	279	255	261	277	279	278	-2	24	17	-1%	9%	6%	YES	YES	YES
HPD 4: Wheathampstead - Westbound	Westbound	305	276	272	271	266	269	-34	-10	-4	-11%	-4%	-1%	YES	YES	YES
HPD 5: Station Road - Northbound	Northbound	544	507	503	513	497	521	-31	-10	19	-6%	-2%	4%	YES	YES	YES
HPD 5: Station Road - Southbound	Southbound	549	484	525	588	495	592	39	12	66	7%	2%	13%	YES	YES	YES
HPD 6A: Grove Road - Northbound	Northbound	552	486	462	489	449	454	-63	-37	-9	-11%	-8%	-2%	YES	YES	YES
HPD 6A: Grove Road - Southbound	Southbound	484	472	475	479	473	476	-5	0	2	-1%	0%	0%	YES	YES	YES
HPD 6B: B487- Eastbound	Eastbound	408	319	365	323	280	306	-84	-39	-59	-21%	-12%	-16%	NO	YES	YES
HPD 6B: B487- Westbound	Westbound	319	319	365	320	272	292	1	-47	-73	0%	-15%	-20%	YES	YES	NO
STA 1: St Albans Road - Northbound	Northbound	538	496	516	564	535	527	26	39	10	5%	8%	2%	YES	YES	YES
STA 1: St Albans Road - Southbound	Southbound	675	532	512	600	524	537	-75	-8	25	-11%	-2%	5%	YES	YES	YES
STA 2: Ring Road St Albans - Northbound	Northbound	1,548	1,369	1,377	1,559	1,423	1,403	12	54	26	1%	4%	2%	YES	YES	YES
STA 2: Ring Road St Albans - Southbound	Southbound	1,412	1,297	1,335	1,629	1,475	1,442	217	178	108	15%	14%	8%	YES	YES	YES
STA 2A: Marshalswick Lane - Eastbound	Eastbound	599	529	594	773	691	651	174	162	57	29%	31%	10%	NO	NO	YES
STA 2A: Marshalswick Lane - Westbound	Westbound	638	530	551	682	591	569	45	61	18	7%	11%	3%	YES	YES	YES
STA 2B: CottonMill Lane - Northbound	Northbound	910	840	825	877	833	834	-33	-7	8	-4%	-1%	1%	YES	YES	YES
STA 2B: CottonMill Lane - Southbound	Southbound	813	767	741	856	784	791	43	16	50	5%	2%	7%	YES	YES	YES
STA 3: A1081 - Northbound	Northbound	846	754	819	718	649	600	-128	-105	-219	-15%	-14%	-27%	YES	YES	NO
STA 3: A1081 - Southbound	Southbound	613	563	631	775	680	754	162	117	123	26%	21%	19%	NO	NO	NO
STA 3A: A1081 North - Northbound	Northbound	694	665	779	741	734	897	47	69	118	7%	10%	15%	YES	YES	YES
STA 3A: A1081 North - Southbound	Southbound	882	757	803	829	730	819	-52	-27	16	-6%	-4%	2%	YES	YES	YES
STA 4: A4147 - Eastbound	Eastbound	616	455	667	642	443	478	26	-12	-189	4%	-3%	-28%	YES	YES	NO
STA 4: A4147 - Westbound	Westbound	504	451	534	530	449	574	26	-2	40	5%	-0%	8%	YES	YES	YES
STA 5: Sandpit lane - Northbound	Northbound	774	557	629	698	583	667	-76	27	38	-10%	5%	6%	YES	YES	YES
STA 5: Sandpit lane - Southbound	Southbound	660	562	618	646	595	663	-14	33	45	-2%	6%	7%	YES	YES	YES
STA 6: A513 - Northbound	Northbound	484	423	686	760	546	782	276	123	96	57%	29%	14%	NO	NO	YES
STA 6: A513 - Southbound	Southbound	463	424	454	477	405	430	14	-19	-24	3%	-5%	-5%	YES	YES	YES
STA 7: Colney Health Lane - Northbound	Northbound	626	519	638	563	554	561	-62	35	-77	-10%	7%	-12%	YES	YES	YES
STA 7: Colney Health Lane - Southbound	Southbound	508	504	533	515	512	521	7	7	-13	1%	1%	-2%	YES	YES	YES
STA 8A: A1057 (Centre) - Eastbound	Eastbound	792	761	756	723	719	855	-69	-42	99	-9%	-6%	13%	YES	YES	YES
STA 8A: A1057 (Centre) - Westbound	Westbound	800	715	850	790	739	765	-9	24	-85	-1%	3%	-10%	YES	YES	YES
STA 9: A5183 - Northbound	Northbound	429	436	453	484	469	499	55	33	46	13%	7%	10%	YES	YES	YES
STA 9: A5183 - Southbound	Southbound	558	481	521	493	475	443	-65	-6	-79	-12%	-1%	-15%	YES	YES	YES
STA 10: A5183 - Northbound	Northbound	710	545	646	792	478	718	82	-67	72	12%	-12%	11%	YES	YES	YES
STA 10: A5183 - Southbound	Southbound	404	428	485	456	469	493	52	41	8	13%	10%	2%	YES	YES	YES
STA 11: Coopers Green lane - Northbound	Northbound	338	338	484	353	337	396	15	-1	-88	4%	-0%	-18%	YES	YES	NO
STA 11: Coopers Green Lane - Southbound	Southbound	339	319	347	344	330	342	5	11	-5	1%	3%	-1%	YES	YES	YES